

AN ABSTRACT OF THE THESIS OF

Sue Shields for the degree of Doctor of Education in Education presented on December 3, 1997. Title: A Profile of the Commonalities and Characteristics of Contextual Teaching as Practiced in Selected Educational Settings.

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Contextual teaching is emerging as an important concept in education reform efforts. This field study attempts to clarify the concept of contextual teaching by defining and identifying characteristics found in the research literature, experienced teacher observations and practices, and students' views of contextual teaching.

The foundation for this field study was developed out of a larger project funded by the U.S. Department of Education known as the Oregon State University Contextual Learning Institute and Consortium. The purpose of this project was to conduct research in contextual teaching and learning in five Portland, Oregon, high schools involving 32 teachers and 350 students.

This field study involved three of the five high schools (7 teachers and 11 students) and five experienced teacher/consultants.

Those involved in this study define contextual teaching in varying ways, but there was unanimous agreement that the basis for contextual teaching is making the connections between what a student is trying to learn and some aspect of a real world experience. A consensus of teachers participating in this study define contextual teaching as school

experiences that provide meaning, relevance, real life experiences, and connections. The key characteristics of contextual teaching as identified by this study included:

- Students learn more by combining knowing and doing wherever possible.
- Students see that learning expectations have some connection to everyday life.
- Students draw connections between different subject-matter disciplines bringing together content and context of application.
- Students and teachers use teamwork and collaboration to solve real-life problems.
- Emphasizes that active and involved students learn more, while requiring creative ways of dealing with school structure and calendar.
- Contextual pedagogy stresses teaching knowledge and skills differently, not teaching different knowledge and skills.
- The role of the teacher changes from expert to that of coach.

Based upon findings of this field study, contextual teaching can be defined as an educational and instructional strategy focusing on enabling students to see meaning and relevance in their education. Knowledge and application of knowledge are deliberately tied together in the teaching act. Contextual teaching aims at helping all students make connections between subject-matter content and context of application.

**A Profile of the Commonalities and Characteristics  
of Contextual Teaching as Practiced in  
Selected Educational Settings**

**by**

**Sue Shields**

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# **A PROFILE OF THE COMMONALITIES AND CHARACTERISTICS OF CONTEXTUAL TEACHING AS PRACTICED IN SELECTED EDUCATIONAL SETTINGS**

## **CHAPTER I**

### **INTRODUCTION**

Jan Barker, math teacher at Pickens High School, South Carolina, asks students on the first day of class to write their names on cards and place them on their desks to help everyone learn names and to get to know each other. One particular student added some artwork to her card: She drew a circle with a slanted line through the word math and then added a comment, "I hate math!"

Mrs. Barker took that as a challenge. She taught students through problem-solving and hands-on laboratory activities. She used the positive effects of combining classroom work with real-life applications in a teaching methodology called contextual teaching.

Mrs. Barker later observed:

This girl turned out to be my best student and received A's in the last two 9 weeks . . . I truly believe she was a potential drop out, but she realized she could be successful in math and she stayed in school . . . I credit contextual teaching with this success. It is an active way of learning; it is hands-on and it works. (Jan Barker Takes Math to New Levels in Getting Kids to Understand New Concepts, 1997, p. A10)

Contextual teaching is a relatively old concept that has recently been rediscovered by some educators. Building on a strong base of research in the cognitive sciences, many education reformers are attempting to shift the main method of instruction from rote memory of academic content to contextualized understandings and application of knowledge. Key observation of Judith Anderson (1996) and her colleagues in the U.S.

Department of Education, Office of Educational Research and Improvement, in a report entitled *Building on What We've Learned: Developing Priorities for Education Research*:

Further research should focus on the design of instructional strategies needed to improve knowledge and skills in different content (and interdisciplinary) areas in a variety of settings, and with students from a variety of ethnic and sociocultural backgrounds. (p. 4)

Further expansion of the contextual teaching knowledge base promises to provide a powerful resource for use in efforts to improve teaching and learning for all students. However, there is a great need for additional inquiry that examines the characteristics of contextual teaching and investigates conditions of learning that promote transfer of knowledge to real-life problem-solving issues.

In one sense contextual teaching can best be understood as a recognition that the human brain works best as an integrated whole. A decade of cognitive science research has produced much evidence supporting this assumption (Raizen, 1989). All cognitions are deeply contextualized, the learning of academic knowledge is enhanced by the building of contextual frameworks regardless of where they are constructed. Cognitive science research has shown that most cognitions are improved with contextualized information (Brown, Collins, & Duguid, 1989).

### WHY IS CONTEXTUAL TEACHING IMPORTANT?

Why is contextual teaching emerging now as a concept, and why is it important to define it and identify the commonalities involved in this teaching methodology? Knowledge and skill acquired in educational settings too often translate poorly to real-life environments. The fit between what is learned in school settings and what is required in contemporary workplaces has become a contentious issue, dividing educators from employers and even putting academic and vocational educators at odds. There is little consensus about what must

be done to bridge this divide (Bailey & Berryman, 1992; Resnick, 1987; U.S. Department of Labor, Secretary's Commission on Achieving Necessary Skills [SCANS], 1992).

Individuals who perform poorly in school-based, theoretical academic subjects can perform well on a job. This is true for jobs requiring scientific and mathematical knowledge as well as technical skills. Employers, and many educational leaders as well, have expressed a strong desire to solve the riddle of how to help students learn more. This desire has motivated new interest in combining the teaching of abstract knowledge with real-life applications into a strategy called contextual teaching (U.S. Department of Labor, SCANS, 1992).

The transformation of the workplace from *labor intensive* to *brain intensive* means that front line workers must be able to think, solve problems, communicate effectively, and apply mathematical and scientific principles to work tasks. In the emerging workplace, application of knowledge has become just as important as acquisition of knowledge.

Contextual teaching attempts to combine the two concepts of academic and vocational education that have usually led separate lives in educational institutions. However, the notion that knowledge should be learned for its own sake, rather than for the sake of application, has a long and deep history in educational philosophy. Therefore, the concept of contextual teaching has not been generally accepted by teachers of traditional academic subjects such as English, mathematics, sciences, and social sciences, even though many subjects such as music, art, physical education, drama, journalism, and vocational subjects are taught contextually.

The phrase contextual teaching implies a connection between academic content and the context in which the content is applied. Academic knowledge is defined by its use in various educational settings such as schools and colleges. Academic knowledge can also be

defined as literary or classical knowledge rather than technical or vocational knowledge. It is interesting to note that *Webster's II New Riverside Dictionary* (1996) defines academic as pertaining to liberal or classical education rather than technical or vocational education, not practical but theoretical. Historically, an academic education has become synonymous with theoretical knowledge which is not generally expected to produce specific practical results. Vocational and technical knowledge has historically been related to the application of knowledge and is usually connected to a job or career.

### A RESEARCHER'S BIAS

The hypothesis or bias of this researcher is that education does not exist in isolation from real-life and cannot be designed as if it did. Education is part of a culture that requires students to acquire knowledge, and be able to apply what they know to problem-solving situations. Contextual teaching has the appearance of being a promising pedagogical practice that provides individuals with a bridge between the acquisition of knowledge and its application. But, what are the characteristics of this teaching method? What makes it work for students? By utilizing field study techniques new learning about this teaching technique can be acquired.

### THE STUDY PROBLEM STATEMENT

The study's purpose was to clarify contextual teaching by identifying and defining the commonalities and characteristics of this concept and application. This was accomplished by reviewing the research literature, interviewing expert teachers who have utilized contextual teaching with students, observing selected secondary school classrooms, and interviewing selected students who have experienced contextual teaching.

## RESEARCH QUESTIONS

The research in this study addressed six basic questions:

1. How does the research literature define contextual teaching and how is it described?
2. How does a panel of teacher consultants who have had success in utilizing contextual teaching techniques characterize and define the methodology?
3. How does a selected group of secondary school teachers actually practice contextual teaching in the classroom?
4. What do high school students who have experienced contextual teaching have to say about this teaching methodology?
5. What is the definition of contextual teaching based upon this investigative field study?
6. What are the key characteristics and commonalities of contextual teaching based upon the findings of this field study?

## IMPORTANCE OF THIS STUDY

With educational reforms sweeping across the country, educational leaders have paid relatively little attention to the process of teaching until the last few years. How can more students be helped to reach the higher standards espoused by political leaders and educational leaders, if there is no change in teaching practice. But it is the teaching process that can have the greatest impact on student learning. Position papers on longer school days and years, block scheduling, more testing and reporting, higher standards, and better assessment practices tend to ignore the improvement of teaching and learning.

Information released by the Oregon Department of Education (1996) revealed that the annual statewide high school drop-out rate increased from 6.6% in 1994 to 7.4% in 1995, one school year. At that rate, Oregon's 4-year dropout would be 29.6%. School administrators involved in the state survey indicated students most frequently cited irrelevant course work and teaching techniques that did not match their learning styles as the major causes for leaving school. Norma Paulus, Oregon Superintendent of Public Instruction, connected: "We are losing bright, talented kids who are not challenged by the out-dated curriculum and outmoded teaching methods. They do not see the relevance of a high school education and are lured to low-wage jobs" (Carter, 1996a, p. B3).

On the positive side, this same survey identified schools with a decline in the drop out rate. Comments of high school principals at schools where drop-out rates had declined credited efforts to create school programs related to real-world experiences and to connecting academic teaching to real-world applications. Interviews with school principals in this survey point to a pedagogical change in education called contextual teaching indicating that students who do not learn well in traditional classrooms often feel classes are boring and not related to their lives.

The evidence supporting the need for contextual teaching exists. However, a major dilemma exists in how to bring contextual teaching to the majority of classrooms. There are varying definitions and numerous misunderstandings about the characteristics of contextual teaching, making it difficult to describe to educators.

## DEFINITION OF THE WORD CONTEXT

In order for educators to understand contextual teaching, a clear picture must be painted of how it fits into their classrooms. Many contextual strategies that are similar in approach must be defined and clarified so appropriate transfer into classrooms can be made.

*Context* is defined as "(a) the explanatory words and ideas surrounding a particular word or statement in a discourse; (b) the circumstances in which an event occurs" (*Webster's II New Riverside Dictionary*, 1996, p. 153). Key words lending understanding to contextual teaching are *meaning* and *interrelated*. The word *interrelated* has been defined as *connected*. Contextual teaching attempts to connect course content with its application. Ultimately, the goal is to connect and bring meaning to the material, helping students understand why they are learning it.

Unfortunately, there is confusion among educators about the definition and practice of contextual teaching (Weinbaum & Rogers, 1995). Contextual teaching has been defined in many ways, as applied academics, constructivism, laboratory training, thematic and interdisciplinary instruction, problem-based teaching, project-based teaching and brain-based teaching/learning (Weinbaum & Rogers, 1995). Each of these descriptive phrases in one way or another is rooted in the concept of contextual teaching. This helps explain the frustration educators have settling on a common definition and framework for the contextual teaching methodology. Accordingly, there is value in briefly reviewing each of these contextual teaching definitions.

## APPLIED ACADEMICS

Applied academics features workplace-related classroom activities, simulations and group-work. Emphasis is placed on the application of academic subject matter to real-life

situations (Walker & Walker, 1990). The Center for Occupational Research and Development (CORD) located in Waco, Texas, has been a leader in the development of applied academics in mathematics and science curricula. Materials from CORD are used by teachers throughout the United States as well as in other countries. These are prepared contextualized instructional materials which have the advantage of a common theme.

In the early 1980s, the State Directors of Vocational Education representing approximately 32 states retained CORD, to develop a new high school applied physics course called Principles of Technology. The State Directors established as goals of this course increased enrollment of vocational students in physics, improved science and mathematics knowledge and skills, more hands-on experiences for students and increased work-based examples in classrooms. The Principles of Technology course was developed as an applied physics course based on the established principles of physics, but within the context of workplace applications.

In 1985, Dale Parnell wrote *The Neglected Majority*, an important catalyst for the development of the federally funded Tech Prep Associate Degree Program. In an interview with Dale Parnell (personal communication, February 1996), he defined Tech Prep as a program linking secondary schools with community colleges aimed at serving the majority of students. His original idea was to incorporate more applied academics instructional materials into classrooms. Since 1985, the program has grown into a comprehensive nationwide endeavor, coupled with the national school-to-careers movement. In *The Neglected Majority*, Parnell (1985) used the term applied academics interchangeably with the term contextual teaching.

## CONSTRUCTIVISM

Constructivism is a philosophy and theory of teaching and learning, emphasizing the learner as an active maker of meaning. Students uncover meaning in their learning.

Constructivism stresses that learning, at its best, is socially constructed as learners interact with each other. The learner applies knowledge in solving relevant, contextualized problems in the student's life experiences. Learning results in conceptual change, and optimal learning involves metacognition, reflecting about one's learning through the entire process

(Glatthorn, 1995). The Systematic Initiative for Montana Mathematics and Science (SIMMS) project is an example of a math program that has a constructivist theoretical foundation. The statewide effort, funded through the Montana Council of Teachers of Mathematics and the National Science Foundation is an integrated mathematics sequence for grades 9 through 12. It is rooted in applications and accessible for all students. The new curriculum features different levels with such topical units as:

- *Fair is Fair* (division)
- *So You Want to Buy a Car* (data organization)
- *Having a Ball* (non-Euclidean geometry)
- *More or Less* (inequalities)
- *Crazy Cartoons* (transformational geometry) (SIMMS).

## LABORATORY TRAINING

Laboratory training is an educational strategy based on various experiences students have participating in laboratory experiments. This teaching strategy has been utilized in science classes, but has not been generally used in teaching other academic subjects.

Laboratory training aims to provide students with simulated laboratory experiences that will

influence attitudes and develop higher levels of competency. Laboratory training assumes these competencies can be learned through group participation and simulated experiences. Learning, in this model, resides in the personal discoveries of the student and is later integrated with other knowledge and ideas (Joyce & Weil, 1986).

### THEMATIC INSTRUCTION

Thematic instruction links subject matter content with practical application. Thematic instruction takes a variety of forms and models, including parallel teaching, integrated teaching, thematic instructing and team teaching. Common themes are often used by teacher teams to promote integrated instruction (Willis, 1991). Thematic instruction combine content organizers and teaching methodology.

Thematic instruction selects a broad study theme and attempts to integrate various subject matter disciplines into daily teaching sessions. This model may contain eight brain-compatible elements: (a) absence of threat, (b) meaningful content, (c) choices, (d) adequate time, (e) enriched environment, (f) collaboration, (g) immediate feedback, and (h) mastery (application) (Kovalik, 1994).

An example given in Kovalik's (1994) work is the use of a Lewis and Clark theme with art lessons designed around cobblestone, clay sculptures and watercolors, writing lessons with journal writing, a business letter to a wildlife organization, science lessons with botany and ornithology, and math lessons with story problems and scale of miles.

### PROBLEM-BASED TEACHING AND LEARNING

Problem-based teaching and learning is a strategy whereby students' knowledge of an issue is assessed. Needed information is identified; students then gather information and

collaborate on the evaluation of an established hypothesis in light of the data they have collected. The teacher role is as coach (Stephien & Gallagher, 1993). The Center for Problem-based Learning at Northern Illinois University has established a consortium to train educators in how to design problem-based materials and use cognitive coaching techniques, investigate the effects of problem-based learning on students in wide educational settings, and link together educators interested in enhancing the problem-solving ability of learners of all ages.

### PROJECT-BASED TEACHING/LEARNING

Project-based teaching and learning refers to a spectrum of activities which share the following: a problem or question that is meaningful to the students and requires students to create a product using various investigative procedures and culminating with a presentation. Successful projects have included many elements including those that:

- Emanate from a problem or question that is meaningful to students.
- Take substantial time, much of which is scheduled into the regular school day (not just an add-on, or primarily done as homework).
- Require students to engage in real investigation, using a variety of methods and sources in their exploration.
- Require students to create a tangible end product that takes real effort and has lasting value.
- End with students preparing a presentation of their work to a real audience.
- Include opportunities for students to reflect on their own learning.
- Blur the boundaries between disciplines. The emphasis is on the issues being analyzed, skills mastered, and concepts understood.

- Blur the line between *slow* and *fast* learners.

- Create a culture of accomplishment within the classroom, similar to the culture in a sports team where everyone wants and needs high performance from one another. The focus is on issues and processes rather than subject matter (personal communication, M. Swanson, June 19, 1996). *Jobs for the Future* (Boston, Massachusetts) and The Autodesk Foundation (Marin County, California) are national leaders in the School-to-Careers movement featuring project-based teaching and learning as a key instructional strategy for the delivery of program content. Five national benchmark school districts have participated in specific teacher training programs with project-based teaching and learning as its focus (*Jobs for the Future*, 1996).

## BRAIN-BASED TEACHING AND LEARNING

An element of brain-based teaching and learning espoused by Eric Jensen (1994) in *The Learning Brain* focuses on ways to assist people to make learning connections and to change instruction to match student learning styles. Contextual memory is the term for the type of memory used to describe experiences remembered effortlessly (e.g., "What did you have for dinner last night?"). Contextual memory is based on location and circumstances, or context of application.

## HISTORICAL BACKGROUND

Educators have explored how to bring meaning to the teaching-learning process to help students see relevance in subject matter course work. Benjamin Franklin referred to a dualism of theory and application in learning, and proposed bridging theory and application as an educational idea. He sought a balance between the useful and the ornamental. Franklin

said, "It would be well if they could be taught everything that is useful and everything that is ornamental, but art is long and their time is short. It is, therefore, proposed that they learn those things that are likely to be the most useful and most ornamental" (Bruner, 1961, p.4). Franklin was attempting to merge school and workplace by urging that merchants be taught French, German, and Spanish so they could do business across many cultures. He further urged pupils be taught agriculture, supplemented by farm visits so they could become better farmers. General understanding was to be achieved through a knowledge of history plus a diligent study of mathematics and logic, and careful observation of the natural world. It required a well-disciplined, well-read student. Balancing the usefulness and the ornamental has been a constant challenge for American schools. In *The Process of Education*, Jerome Bruner (1961) combined Franklin's useful and ornamental into skills and general understanding to enable one to deal better with "the affairs of life." Bruner (1961) felt skills were matters of direct concern to one's career or profession.

Wheatley states that there is a view of unconnectedness and applied to the classroom and existing curricula, then there is a loss of connectedness and meaning. The practice of breaking teaching and learning into unconnected subject matter disciplines is what Wheatley (1994) refers to as the "Newtonian model of the world." Wheatley (1994) describes the Newtonian model as one based upon the practice that "things can be taken apart, dissected literally or representationally (as we have done with academic disciplines), and then put back together without any significant loss" (p. 8). In organizing the school curriculum, educators have done exactly that. As a consequence, students see little connection in their courses.

Wheatley (1994) holds the view that unconnected subject matter brings a loss of connectedness, a loss of meaning, and a loss of the ability to solve problems and apply

learning outside of the school classroom. Recent educational efforts point the schooling experience toward assisting students in making connections between (a) knowing and doing, (b) knowledge and application of knowledge, (c) the school world and life outside the school, (d) one subject matter discipline and another, and (e) head and hands (Weinbaum & Rogers, 1995).

The need to develop better educational practices and instructional strategies helping connect students with the rapidly changing workplace is apparent to this researcher. This study attempts to develop a clear understanding of the pedagogical practice of contextual teaching as defined as a practice whereby students connect subject matter knowledge with the context of real-life applications.

When looking at educational systems and how they are set up (master schedules, who teaches, what, when, etc.) the curricula looks unconnected. Oftentimes, school leaders get caught up in numbers, monthly progress reports, quarterly reports, and yearly evaluations and give little attention to supporting students and teachers to making the connections between the school curricula and real-life.

## STUDENTS TODAY

If contextual teaching is to be clearly understood and practiced, there are some substantial barriers to be removed. Several stand in the way of a more connected education for students in American schools, causing lack of student achievement and learning.

### Barrier One: Cheating and Apathy

Students today are challenged to survive academically, to get good grades, and to find school relevant to their present and future lives. A 1995 survey conducted for the publication *Who's Who Among American High School Students* indicates that nearly 80% of

the nation's top high school juniors and seniors with "B" averages or higher not only believe cheating is widespread but have themselves cheated in one way or another. Students may cheat for a variety of reasons. An article in *The Oregonian* newspaper (Graves, 1996) reporting on this survey noted that 76% of the high school student high achievers, nationwide, admitted to dishonesty. Students said, "Cheating is not a big deal." Students are inclined to cheat in classes they consider irrelevant, according to Bill Graves (1996), writer for *The Oregonian*. Their schedules preclude wasting time on what they consider useless information. The article further cited public figures such as Tonya Harding, O. J. Simpson, and former U.S. Senator Bob Packwood as having "flawed personalities and not worthy of imitation." Paul Kraus (1996), editor of *Who's Who in American High School Students*, said, "I don't think we should be shocked that this standard of behavior has trickled down to our young people. They are not living in a vacuum" (Graves, 1996, p. B1).

Recent studies also indicate apathy among many secondary school students. Students are not finding sufficient connections between the classroom academic work and real-life work and societal demands. The attitude of many high school students was summarized by one high school student: "I know it is up to me to get a diploma, but a lot of times school is just so dull and boring . . . you go to this class, go to that class, study a little of this and a little of that, and nothing connects'" (Parnell, 1995, p. 6).

### Barrier Two: The Bell-Shaped Curve

The symbol of American education has traditionally been the bell-shaped curve, which is based on the assumption that only a limited percentage of the population is born with the ability to learn higher level cognitive skills. At the earliest levels of formal education, instruments like intelligence tests, which primarily measure verbal and

mathematical abilities, are used to label students and indicate where they fit on the bell-shaped curve.

This view of human intelligence has led educators to label students, using such terms as talented and gifted, smart, average, special needs, slow, reluctant learner, or at risk students. Such labels have led to false images of students. A labeled image can obliterate our reality and experience with students in other settings and how they learn, such as labels can become barriers hindering students' learning and finding meaning in their education.

"Striving to find a meaning in one's life is the primary motivational force in man" (Frankl, 1963, p. 154). Students are searching for meaning and connectedness and labels do not help in that process.

#### Barrier Three: Organizational Resistance

High schools have remained essentially unchanged over the past 50 years (Parnell, 1995, p. 34). Indication of this include textbooks that do little to connect content with context, a standardized system of grading periods and time-based Carnegie units, an instructional delivery system that does not recognize individual student differences in learning speeds and styles, a standardized view of intelligence, and standardized teacher licensing and certification that does not usually relate to how a teacher performs in a classroom. While these practices were enacted with good intentions, they generally ignore the need of students to learn within the context of real-world situations. In many ways these standardized teaching methods and curricular approaches have become a barrier for educators who desire to restructure classrooms and to implement new instructional strategies such as contextual teaching.

Contemporary demands on educational institutions and teachers are often unrealistic. Financial restraints caused by tax initiatives, time constraints, administrative

directives, and unclear community directives often force elementary and secondary teachers to choose between what they know is good teaching and their job security. This presents another barrier to the use of contextual teaching methodologies. In addition, the contemporary emphasis on student scores indicated by national standardized tests, high content standard performance criteria, and proposed national teacher certification may bring even greater pressure upon teachers to emphasize subject matter content over instruction practices that will help students reach those high standards.

#### Barrier Four: Cover the Material

Another barrier to contextual teaching is the teacher mind-set to cover, not uncover, the material. Many teachers fear, with reason, that connecting subject matter to real-world experiences will not allow time to cover all the materials in the adopted textbook or follow the state or district curriculum guides. The need to get through a prescribed amount of materials presses teachers and students alike to fall back on rote learning rather than developing active thinking and connected learning. Too often, the fragmented knowledge that comes from isolated subject matter teaching is of limited real-life application except to pass a classroom test.

#### Barrier Five: Loss of Control

Some teachers fear classroom introduction of learning based primarily on contextual teaching and learning will cause loss of control. An orderly learning environment is important but not always demonstrated by quiet classrooms and straight rows of chairs. Contextual teaching often requires students to work in groups and teams and solve problems together using discovery methods. Teachers are not comfortable enough to take this risk of not having things orderly.

Secondary school classes taught by traditional methods fail to interest many students who are looking for more practical applications. This assertion is supported by surveys and studies that document the failure of secondary students in the United States to demonstrate learning on standardized tests in a comparable way with students from other nations. Recent National Assessment of Educational Progress test results, for example, reveal that many young Americans lack the basic skills they need to function successfully in many jobs today (National Assessment of Educational Progress, 1995).

Children come to school excited about learning. Current teaching strategies squelch this enthusiasm. Have educators lost the emphasis on the action part of the teaching and learning process? Picture young children learning. Kindergartners like to explore, set things up, knock things down, put things together, pull things apart, creep, walk, talk, imitate, and draw which expand their learning. Yet in much of the schooling process, particularly in the middle level schools and high schools, the primary emphasis is on passive learning processes, i.e., looking, listening, and memorizing. Not only are a limited number of learning styles addressed but many students no longer have the interest to learn in an active fashion. They have become spectators rather than active participants.

#### Barrier Six: Differing Perceptions

Recent data collected from an urban Portland, Oregon, area high school (typical information retrieved after a first semester of a school year) indicated 40% of the students in ninth grade classes were failing at least one class and 25% of the students had two failing grades (personal communication, J. Henstand, Principal, Milwaukie High School, June 5, 1996). This finding raised several questions for school administrators. Questions included: Were the classes too hard? Were grading standards too high? Were appropriate curricular materials being used? Was the teacher using appropriate instructional techniques? Educators

viewing these data cited the following reasons for the lack of student achievement: (a) Student skills are substandard as they entered their classes, requiring that teachers spend additional time reteaching concepts deemed essential to move students' learning to the next level of material, (b) lack of student motivation, and (c) disruptive students interfere with learning of other students. Students suggested that the subject matter emphasis too often had little to do with their lives and their future goals. This suggests considerable difference of opinion between students and teachers.

Part of the problem in removing some of the educational barriers is the different views of education voiced by administrators, teachers, counselors, and students. A recent Gallup Poll study conducted for the Waco, Texas, based Center for Occupational Development confirmed this observation. Respondents of this Gallup Poll (The Gallup Organization, 1997) consisted of 210 teachers, administrators, and counselors; 4,248 students; and 108 employers. Table 1 reveals that when asked the questions, "Teachers show how to use what is learned in everyday life?" 49% of the students answered yes, while 82% of the teachers/administrators polled answered yes. This means there is a large disparity between student and educator perception about the connectedness of their educational efforts.

Educators seem confused about the key issues necessary to increase student achievement and there is certainly a great disparity between student and educator perception. Increasing student achievement is not a matter of identifying and sorting the smart from the less smart student. Students who do not achieve well on standardized tests may be viewed as an embarrassment, a failure of the educational system. Contextual teaching attempts to develop the best in all students, not simply labeling and sorting the so-called smart students from the others and emphasizing their accomplishments. Contextual

teaching assumes that all students can learn if the application becomes apparent and if students can see meaning in the lesson to be learned.

TABLE 1  
COMPARING PERCEPTIONS AMONG STUDENTS AND TEACHERS/ADMINISTRATORS

	Number of Yes Responses	
	Student ( <i>n</i> = 4,248)	Teacher/Administrator ( <i>n</i> = 210)
Teachers show how to use what is learned in everyday life	49%	82%
Teachers match student talents with careers	37%	76%
Students share with other students how what they are learning in class applies to careers	25%	56%
Teachers help students know the meaning of what they are studying	64%	90%

*Note.* From *Executive summary: Gallup school-to-work index*, by The Gallup Organization, 1997, March 29, Waco, TX: Center for Occupational Research and Development.

An educational administrator cited an example to this researcher from her own experience. She recalled asking her high school math teacher, some 29 years ago, "Why do I have to learn this?" During the Oregon winter flood of 1996, she had to figure the volume of water in her flooded basement. "At last I found a reason for learning those math equations in high school," she announced, "but I can't remember how to solve the problem." What could her math teacher have done differently to provide her with more here and now meaning? It is the goal of contextual teaching to connect the theoretical with practical applications that can be transferred to future problem-solving.

## CONTEXTUAL TEACHING AND SCHOOL REFORM

There is some indication that contextual teaching is on the increase in U.S. schools. As an example, in 1987 the Southern Regional Education Board (SREB) formed a consortium involving 19 states and more than 100 high school sites under the project title of "Making High Schools Work Through Integration of Academic and Vocational Education." The primary purpose of this consortium is to encourage the use of applied teaching strategies in high school classrooms.

Integrated learning is not a model that gives schools and teachers a packaged curriculum or teaching formulas. Rather, it is a dynamic way to evolve into a new method of teaching and learning. It is a way to change what is taught, how students are taught, what is expected of them, how teachers relate to each other, how students relate to each other, and how students and teachers interact. (Bottoms, Presson, & Johnson, 1992, p. 72)

The responsibility for helping students understand the relationship between subject matter disciplines and the application of that knowledge falls heavily upon the teacher. Fortunately, many of the national organizations representing classroom teachers and college professors are giving attention to contextual teaching. Credit must be given to organizations such as the American Association for the Advancement of Science, the National Science Teachers Association, the National Council of Teachers of Mathematics, the National Council of Teachers of English, the American Vocational Association, and others for their efforts to bringing education and real-life issues closer together. Their publications, workshops, and conference themes indicate the interest as seen in conference brochures and marketing flyers.

Robert Marzano (1992) speaks to using knowledge in meaningful application. He asserts that there are different learning tasks involving students in the meaningful use of knowledge. These tasks involve decision-making, investigation, experimental inquiry,

problem-solving, and invention. Marzano's dimensions model incorporates a complex teaching-learning process based upon cognitive research. Marzano concludes that learning is a very complex process and has been in piecemeal change over the years, but has ultimately failed to prepare many students for the world in which they will live, a world where it will require a lifetime of learning. According to Marzano (1992):

It's not too late to change. By systematically finding out about the dimensions of learning and applying what we learn, we can transform schools into true centers of learning in which students develop the kinds of thinking that will enable them to live rich and productive lives. (p. 180)

Educators are increasingly making efforts to create learning communities that reflect an emphasis on teaching and learning, which looks for ways to integrate instruction, provide thematic instruction, develop more relevant lessons, and help teachers see the relationships between teaching strategies and student motivation. This of necessity involves a more complete understanding of contextual teaching. Many teachers have long taught for meaning by providing students with as many real-life experiences as possible, but much of the educational reform effort has not been aimed at improving teaching and learning. Restructuring efforts, site-based management, team teaching, cooperative learning, alternative scheduling, and authentic assessment all have been implemented in many schools, but these reforms have not changed the teaching and learning process.

Fred Newmann completed a national education longitudinal study of education in 1988. In reviewing up 5 years of study on school restructuring, Newmann concluded:

Like hammers and screwdrivers, the effectiveness depends on your purpose, on how you use them. Not all schools use the tools in the same way. There is a concern on how educators are using the restructuring movement to get results. It all needs to focus on the quality of instruction and the quality of student work. (cited in Brandt, 1995a, p. 73)

Restructuring should, according to the Newmann (1988) study, focus on the teaching-learning process and defining standards for high quality student learning, and then

develop a teaching process that helps students meet those high standards. This is the foundation for the formation of a learning community.

### DOES CONTEXTUAL TEACHING MAKE A DIFFERENCE?

Schools in different parts of the nation, using contextual teaching strategies, are making a difference in student achievement. An example is Swansea, South Carolina.

Swansea High School, South Carolina, was a high school with many problems. The drop-out rate was among the worst in the state, along with low test scores, small numbers of students transferred to post-secondary institutions, experienced high teen pregnancy rates, and had a community wealth (socioeconomic status) ranking of 87 out of 92 school districts in the state. Community attitudes regarding education were poor due to intergenerational illiteracy. Some 56.6% of the adults 18 years or older in the community held no high school diploma. The average income was less than \$14,000 with more than one-third of the students on free or reduced-price lunches. District educators were frustrated. Educators began to look for ways to use technology and improve instructional strategies in addressing these problems. Over the decade of the 1980s, Swansea educators built an impressive record. Teaching strategies incorporated contextual teaching methodologies. As a result of their efforts, they looked to the Tech Prep Contextual Teaching Program. The Tech Prep Program starts in grade 7 and continues through grade 14. Strategies include teaming of academic and vocational teachers, integrating curriculum and relating classes to the world of work. Recent data now indicate the following results: (a) pregnancy rate dropped from 14% in 1989 to 2% in 1994; (b) transfer to post-secondary institutions increased from 35% to between 50% and 60%; (c) dropout rate in 1996 was reduced to 3.4%; (d) higher test scores resulted in Swansea High School being named one of the seven demonstration sites for the

Southern Regional Educational Board's (SREB) High Schools at Work Program in a 19-state consortium; (e) instructional practice changed from lecture and drill to contextual teaching; and (f) Swansea teachers were recognized and made presentations at national training sessions (Sarvis, 1995).

Gene Bottoms of the Southern Regional Education Board High Schools That Work Project cites as a source of success the integration of vocational and academic subjects which leads to a greater diversity in teaching and addressing learning styles. He indicates that teachers who have traditionally lectured for most of their class time are discovering new ways to actively engage students in the learning process. Assignments require students to find information in places other than textbooks and to produce products such as research reports and videotapes. Teachers in the Swansea project who related academic concepts to real-world expectations reported students work harder and learn more (Sarvis, 1995).

In the other example of contextual teaching success, a math research project in Utah (1996) validated the effectiveness of contextual teaching strategies. Traditional opinions have often held that students in applied mathematics classes are initially less prepared and subsequently less successful at attaining mathematical skills, and fewer benefitted by their participation in course work than their allegedly more successful and more talented algebra counterparts. Teachers in selected Salt Lake City, Utah, schools decided to test this belief. They wanted to know whether using contextual, career-centered, integrated approaches to math instruction would have a beneficial effect on students as contrasted with the more traditional, less applied approaches to mathematical instruction.

Results showed that participation in the contextual and applied math programs produced higher student achievement over the contrasting traditional math approach. Any pre-course differences that favored the traditional algebra groups either disappeared

following course work or were replaced by differences favoring the contextual learning groups. Students in the applied groups were equally capable of performing math skills, and were more positive in their attitudes about math and their math abilities (Lewis, 1996).

Professor Lauren Resnick (1987) of the Learning Research Development Center at the University of Pittsburgh has developed an enlightening comparative analysis of how individuals learn in contemporary schools and colleges and how they learn in real-life situations. Her comparisons are instructive to us in gaining an understanding of the concept of contextual teaching (see Table 2). It is the aim of contextual teaching to develop greater congruence between school learning and real-life learning.

TABLE 2

## SCHOOL LEARNING AND REAL-LIFE LEARNING

School Learning	Real-Life Learning
Abstract learning with emphasis on content	Applied learning with emphasis on context
Symbol manipulation and memorizing	Problem-solving and reasoning
Individual learning and working alone	Cooperative learning and teamwork
Moving from general learning to the specific	Concrete learning moving from specific to general

*Note.* From "Learning in and out of school," by L. Resnick, 1987, December, *Education Researcher*, p. 16.

CONTEXTUAL LEARNING INSTITUTE  
AND CONSORTIUM

A Contextual Learning Institute and Consortium (CLIC), funded by the U.S. Department of Education, was established in 1995 in the School of Education at Oregon State University, Corvallis, Oregon. It was the aim of this consortium to conduct research in the field of contextual teaching and learning and evaluate the effectiveness of contextual

teaching as an instructional strategy. Five Portland, Oregon, area high schools were selected as the first members of this consortium. The high school principal of each school led a team of academic and vocational teachers during the 1995-96 school year endeavoring to integrate academic and vocational education through the use of contextual teaching methodologies. Teacher teams were provided 13 days of in-service training with ongoing technical support over an 18-month period. An independent project evaluation process collected information on teacher and student perceptions and attitudes about contextual teaching. This project provided the foundation for this investigative field study.

The study conducted by this research included three of the five Portland, Oregon, area high schools. Seven academic teachers and 11 of their students participated in the study in conjunction with the federally-funded contextual teaching and learning grant sponsored by Oregon State University. Observations, interviews, and surveys were conducted over the 1995-96 school year along with a collection of sample lessons, practices, models, and artifacts. These data contributed to the profile for contextual teaching characteristics, commonalities, and definition. The CLIC project allowed access to evaluations and data collected from 5 high schools, 35 teachers, and 5 teacher/consultants.

## ORGANIZATION OF CHAPTERS

Much is yet to be discovered about how the human brain processes knowledge and how people learn to use that knowledge to solve real-life problems. This study focused on one method: contextual teaching. By identifying the commonalities and characteristics of contextual teaching, this study describes, defines, and evaluates the effectiveness of contextual teaching and the emerging national interest in contextual teaching and learning methodologies.

Chapter I includes a brief overview of the importance of this study, the problem statement and related research questions. Certain pedagogical theories related to contextual teaching have been examined. Some of the primary barriers to implementing contextual teaching have been analyzed, as well as some examples of how contextual teaching is working. Chapter II includes a literature review and provides a theoretical framework for the study. The chapter shows how cognitive and constructivism theory were synthesized in arriving at the approach taken for the investigation and analysis in this study. Chapter III is a detailed description of the research methods used to collect data and analyze the study findings. Chapter IV presents the observations and findings of the study. Chapter V concludes the study citing recommendations and implications for future research.

## **CHAPTER II**

### **WHAT WE ALREADY KNOW ABOUT CONTEXTUAL TEACHING: A REVIEW OF THE LITERATURE**

The purpose of this chapter is to review the literature related to contextual teaching. This review will highlight commonalities and characteristics as well as give definition to contextual teaching. A growing body of evidence supports the notion that combining theory and application can lead to higher academic achievement and increased motivation and interest in learning. The search of the literature base indicates a great deal of effort is being expended in the study of various educational reform programs across the United States. There is little study on the strategy of contextual teaching. This chapter provides further definition of contextual teaching, a rationale for change in instructional practices, and an historical perspective and basis for a theoretical framework. It further investigates the various contextual-like strategies and programs, cites other factors involved in contextual teaching, and provides a summary of the literature.

#### **HISTORICAL AND THEORETICAL PERSPECTIVES**

Combining knowledge and doing and to add relevance to America's classrooms is not a new concept. Mathematicians and philosophers have complained about this problem in pedagogy for centuries. The father of modern analytic geometry, Descartes, was one of many who argued that learning geometry from the theoretical results in "synthetic treatment" and impedes understanding (Grant, 1995, p. 115).

Vocational education has provided hands on approaches in the teaching situation. Foreign language teachers teach with a cultural context, and integrated curriculums have

been used in secondary schools for years. The link from the real-world to today's classrooms that match student learning styles has not been a predominant factor in school reform. Impact in the classroom has not been a major target for reformers (Parnell, 1995).

Wilhelm Wundt (1832-1920), one of the founders of modern psychology, advocated an integration of knowledge with experience and of cognition with activity. But it was the work of physician, psychologist, and philosopher William James (1842-1910) that gave further foundation for the practice of contextual teaching (Burkhardt, 1983, pp. 30-36).

James urged teachers to teach with "no reception without reaction, no impression without correlative expression" (Burkhardt, 1983, p. 30). He believed the human mind played an active role in organizing thought and that the perception of truth is rooted in experience. He wrote extensively about his vision, was an advocate of functional psychology, and a pragmatist regarding human experience. He felt that beliefs and knowledge cannot be separated from action and experience (Burkhardt, 1983, pp. 33-46).

As a result of his beliefs around functionalism and pragmatism, the cognitive process of connecting knowing and doing was central to James's theory of teaching. At the same time, he was wary of an unbalanced approach that sacrificed actual content in the interest of "making learning interesting." In *Talks to Teachers*, James (cited in Burkhardt, 1983) expressed the fear that education was growing too soft and permissive: "Soft pedagogies have taken the place of the old steep and rocky path to learning. From this lukewarm air the bracing oxygen of effort is left out. It is nonsense to suppose that every step in education can be interesting" (cited in Burkhardt, 1983, p. 68).

John Dewey, an admirer of William James, provided extensive foundation to the development of contextual teaching. The difference between James's and Dewey's works was that James emphasized individual goals for education while Dewey stressed social goals

(Parnell, 1995, p. 19). It was thought that pragmatism as a theory of meaning was developed in the late 19th or early 20th centuries by Charles S. Pierce and William James (Skilbeck, 1970, p. 6). In his theory of curriculum, Dewey tried to bring together the various elements which he regarded as relevant and important: (a) the interests and learning capacities of the individual child; (b) the child's life history of experience; (c) a generalized, scientific method of inquiry; (d) different types of subject matter; (e) the social context; and (f) democratic values.

Connections and experience are themes in Dewey's work. He believed the "office of the educator" was to select those things within the range of existing experience that have the promise and potentiality of presenting new problems (Skilbeck, 1970, p. 51). He wrote, "knowledge is a perception of those connections of an object which determine its applicability in a given situation" (Dewey, 1916, p. 396). He said, "there is a strong temptation to assume that presenting subject matter in its perfected form provides a royal road to learning" (Dewey, 1916, p. 220).

Jerome Bruner (1966) believed a theory of instruction seeks to take account of the fact that a curriculum reflects the nature of knowledge itself, but also the nature of the knower and the knowledge being processed. It is the enterprise *par excellence* where the line between subject matter and methods grows necessarily indistinct. Bruner held that body of knowledge enshrined in a university faculty and embodied in a series of authoritative volumes is the result of much prior intellectual activity.

The connections theme continues in Boyer's (1995) "The Educated Person," describing school problems as youth problems:

Far too many teenagers feel unwanted, unneeded, or unconnected. Without guidance and direction, they soon lose their sense of purpose, even their sense of wanting purpose. Great teachers allow their lives to express their values. They are matchless guides as they give the gift of opening truths

about themselves to their students. I often think of three or four teachers out of the many I have worked with who changed my life. What made them truly great? They were well informed. They could relate their knowledge to students. They created an active, not passive climate for learning. More than that, they were creative human beings who taught their subjects and were open enough to teach about themselves. (Boyer, 1995, p. 24)

Fifty years ago, Mark Van Doren wrote, "The connectedness of things is what the educator contemplates to the limit of his capacity." "The student," Van Doren said, "who can begin early in life to see things as connected has begun the life of learning" (Boyer, 1995, p. 25).

Dale Parnell's *Logo Learning* (1995) defines contextual teaching as a relentless search for meaning in the teaching-learning process and an avenue to education reform, with emphasis upon the integration of content with context. Contextual teaching promotes an emphasis on continuity in learning. Contextual teaching is a way of helping every student experience success in learning, and it is a means of helping students learn to use resources, information, technology, and systems, and to work as an effective team member.

### CONTEMPORARY PRACTICES CONTRIBUTING TO CONTEXTUAL TEACHING

Contextual teaching is one teaching strategy that bridges brain-based teaching with classroom practice. "Integrated thematic instruction" (Kovalik, 1994, p. 2) provides meaningful content and combines two or more subjects. The *being there* interaction with the real-world is one guideline in building meaningfulness into the content, ensuring that the curriculum is age-appropriate, compatible with the appropriate stage of brain development. It offers content that excites the interest of the students and the teachers, and is useful to the students, thus creating an emotional bridge between the teachers and the learners. Kovalik (1994) emphasizes that students still learn traditional content, but they learn it in context

and use it in a way in which it is used in real-life. As a result, students will seldom say, "Why do we have to do this?" Contextual teaching can help students find answers to the following important questions:

- Why do I have to learn this?
- Why do we have to go to school?
- Why do we have to use a textbook?
- Why don't we just use television or the Internet?
- Am I going to be able to find a job because of this education?

### SCANS Report

According to the Secretary's Commission on Achieving Necessary Skills (SCANS), "learning in order to know" should not be separated from "learning in order to do" (U.S. Department of Labor, SCANS, 1992, p. XVI). This charge precedes the document's much publicized competencies aimed at combining education and the workplace.

The SCANS report requires a range not only of basic skills but also of personal qualities, including thinking skills. According to this report, these skills are not taught well through conventional instructional practice with its emphasis on individualized rather than cooperative learning, abstract principles and decontextualized context, and fact acquisition rather than problem-solving. Thus, the SCANS has called for changing instruction through more experiential learning outside of classrooms and more contextualized teaching.

According to SCANS, teachers and schools must begin early to help students see the relationship between what they study and its applications in real-world contexts (U.S. Department of Labor, SCANS, 1996).

By referring to the work of cognitive scientists, the SCANS report explicitly linked the demands of employers to the claims of education reformers. The metaphor of "cognitive

apprenticeship" captures this approach. Just as apprentices learn their tasks in the context of ongoing work, so, too, the student-as-apprentice-learner would learn academic competencies in some meaningful context. Simpler components would be mastered before moving to more difficult tasks; the master or teacher would provide guidance at early stages and then allow the apprentice/student to do more. The teaching would include not only a complete range of technical skills, but also the interpersonal skills, the customs, and the culture of the craft. As a model of teaching, this is quite different from the standard didactic approach in which learning lacks context and the ultimate goal of instruction is either unclear or abstract (Grubb, 1996, p. 536).

### Brain-Based Learning

Brain-based learning is another emerging research topic, related to contextual teaching, that is increasingly appearing in the literature. It is asserted that matching teaching with how the brain functions provides the vehicle for transforming schools into a place of engaging and powerful learning experiences.

Caine and Caine (1991) stress that:

One thrust of the brain principles is that the brain responds differently to meaningless and meaningful information and situations. If we want students to use their brains more fully, we have to teach for meaningfulness. Many problems in education stem from the fact that meaningfulness is disregarded or misunderstood. (p. 91)

Practical application of brain-based learning for educational purposes may be difficult, but it is encouraging that research is currently being conducted (Sylvester, 1995).

Brain-based strategies receiving wide acclaim in education reform circles are contextual teaching; thematic, integrated curriculum; cooperative learning; and portfolio assessment. These practices require more effort and energy than the traditional teaching modes, yet educators are drawn to them because they help produce higher student

achievement and are more enjoyable to teachers. Contextual teaching practices appeal to educators because these approaches seem to be inherently right for a developing brain, even though they require more professional effort and are not nearly as economical and efficient as traditional forms (Sylvester, 1995, p. 24).

One of the key principles identified by brain-based learning research is that memories are very poor in rote, semantic situations. Memory works best in contextual, episodic, event-oriented situations which include motor learning, location changes, and/or music and rhythm. The brain is poorly designed for traditional textbook memory approaches (Jensen, 1994). *Contextual* is the term for the type of memory one uses to remember effortlessly (e.g., "What did you have for dinner last night?"). Contextual memory can be described as based in location and circumstances, or context. Jensen's (1994) research discovered that contextual memory has unlimited capacity, forms quickly, is easily updated, requires no practice, is effortless, and is used by everyone. Memory is context-dependent; it is based on an individual's relationships and position in space and time.

The formation of this type of memory is motivated by curiosity, novelty, and expectations. It is enhanced by intensified sensory input: sights, sounds, smells, taste, touch. The information can also be stored in a fabric or weave of "mental space," which is a thematic map of the intellectual landscape where learning occurs as a result of changes in location or circumstances, or the use of thematic teaching, storytelling, visualization, and metaphors (Jensen, 1994, p. 100).

By learning about a subject in context, with a story, a map, or something relevant, memory and recall improves. Contextual teaching also provided the framework for updating the memory by giving a kind of *revised edition* of the cognitive map. Instead of putting most of the emphasis on memorization and recall, it may be more effective to place more

emphasis on the context in which something is learned. Context provides more *hooks* and allows learners more time to make connections with what they consider to be important to them. Reading, hearing, or experiencing the background on a topic aids understanding and recall. The placement of information learned into a conceptual context, such as historical or comparative, boosts recall (Jensen, 1994, p. 98).

### Applied Academics

The Applied Academics concept, which is advocated as a foundation for the Tech Prep movement, has developed into a full-scale effort to restructure educational experiences for students (Hull, 1995, pp. 49-50). Attempts to teach academic skills, within a contextual framework related to life and workplace needs, place an emphasis on relevance. These programs:

- Use practical applications drawn from real-world and workplace situations to teach communication, mathematics, science, technology, and other subject areas;
- Engage students in the learning process by making instruction more relevant to their needs and goals;
- Focus on hands-on, laboratory-style activities; and
- Integrate and sequence curricula to allow maximum exposure and access to the various disciplines for the maximum number of students.

An important byproduct of the applied academics process is excitement. Students who are actively engaged in the learning process are more likely to be motivated and enthusiastic and to achieve at high levels (Hull, 1995, p. 66).

Practitioners of applied academics programs suggest the following guidelines for educators:

- Research and brainstorm to devise learning experiences that point out the connections among academic, real-world, and workplace skills.
- Develop hands-on activities geared toward varied learning styles.
- Visit local business and industrial sites to see first-hand how academic skills are applied in the workplace.
- Solicit input from the business on what skills it requires of students entering the work force.
- Seek feedback from students and teachers about new courses and new teaching methods.

Applied academics programs teach skills that are critical to students' personal and occupational success. Not only do they serve as a basis for helping both students and academic programs meet performance-based accountability standards and measures, they also generate enthusiasm and excitement among students and teachers, a key to the success of any educational reform. Applied academics programs help reestablish the connection between what schools teach and what students need to know (Atkinson, Lunsford, & Hillingsworth, 1993, p. 11).

Results of student participation in a year-long Applied Communications class indicated students gained self-confidence. Scores on the Stanford Test of Academic Skills showed an average improvement of 24% in reading comprehension and 23% in English skills — three times the expected yearly improvement (Walker & Walker, 1990, p. 31).

The Boeing Company Applied Academics Program (Wang & Owens, 1995) reported the following major findings after 4 years of participation with school partnerships in the area of applied academics.

- Students scored significantly higher than comparison students in post-tests.

- Students were more confident about their ability to learn mathematics and science after a year's Applied Math or Principles of Technology course. The results of tests in Applied Math and Principles of Technology indicate that these students were not only challenging for applied academics students, but also for those enrolled in traditional mathematics and physics classes.

- All sites surveyed were appreciative of the support they received from Boeing and hoped that Boeing would continue to support them.

- Results of student surveys showed that applied academics students who were at the lower end of academic achievement tended to gain greatest in applied academic courses (Wang & Owens, 1995, pp. 1-3).

### Problem-Based Learning

Problem-based learning, another contextual practice, is defined as a way to increase students' achievement and motivation through: (a) learning how to use processes to assess what they know, (b) learning how to identify why they need to know, (c) gathering information, and (d) collaborating on the evaluation of hypotheses. Teacher roles are changed from Sage on the Stage to Guide on the Side (Stephien, Gallagher, & Workman, 1993, p. 25).

In problem-based learning, when searching for a problem, several areas are explored regarding the problem. An event, dilemma, topic, or controversy can be a fertile setting for a problem-based unit if it contains at least one situation and problem-solving role that (a) brings students into contact with significant skills and subject matter, (b) produces learning outcomes consistent with teacher curriculum responsibilities, (c) features appropriate content and complexity, and (d) contains an authentic, concrete, and manageable ill-structured problem (Stephien, Gallagher, & Workman, 1993).

Research suggests a significant increase in the use of problem-solving by those students using problem-based techniques compared to no similar increases with a comparison group. Students in the problem-based course gained as much, if not more, factual content than the comparison students (Stephien, Gallagher, & Workman, 1993, p. 353). The U.S. Department of Education has awarded funding for continued work in this area because of these successes (Stephien, 1992, p. 355).

### Interdisciplinary Instruction

Interdisciplinary instruction is another contextual instructional method. It takes on a variety of forms from "parallel teaching" to groups of teachers from different subjects teaching together in units. Advocates claim it offers many advantages — first and foremost, that it mirrors the real-world better than traditional, discipline-based instruction (Willis, 1991, p. 2). States such as Virginia, Texas, and New York are moving ahead with interdisciplinary approaches as well as are individual school districts.

Theme studies are characteristic of interdisciplinary instruction. The basic premises of theme studies as distinguished from other forms of interdisciplinary curriculum are:

1. They are broad, with many subtopics, and are dedicated to developing students' critical and creative thinking and ways of knowing that are significant for learning in all the traditional disciplines.
2. They represent the content and process of what students are expected to learn in school; they are not "add-ons" or "special events" in the curriculum.
3. During their development, they are often the most important study focus of students and teachers.
4. They incorporate many traditional subject areas in ways that maintain the integrity of each discipline.

5. Each theme is developed over an extended period of time through the study of many subtopics within the theme.
6. Inquiry is at the heart of each theme: studies are question-driven and students are involved in searching for their answers, often using primary sources.
7. The entire community becomes the learning laboratory for theme studies, providing diverse resources for exploring questions derived from the theme.
8. They offer learning opportunities for students at different developmental levels and with varying abilities.
9. They encourage differentiated and diversified learning activities and assignments.
10. The evaluation of student growth is ongoing and formative, and uses alternative methods of teacher assessment and learner self-assessment (Curriculum Report, 1992, p. 1).

### School-to-Careers

The National School-to-Careers movement emphasizes contextual education, connecting learning to the work place. The concept of contextual learning applies to learning throughout our lifetimes and across the settings in which we find it necessary to learn (Weinbaum & Rogers, 1995, p. 2).

Jobs for the Future has defined School-to-Careers: "To help young people make more successful transitions from school to careers and further learning, educators and employers have come together in states and communities around the nation to create stronger linkages between their two worlds" (Jobs for the Future, 1996).

The goals of the school-to-careers movement are to provide better education, stronger employment prospects, positive adult role models, and multiple post-secondary

options for all students. School-to-careers experiences are designed to develop young people's competence, confidence, and connections that can ensure successful careers and citizenship. This philosophy is a major belief of this movement. School-to-careers partnerships involve three fundamental elements: school-based learning, work-based learning, and connecting activities. School-based learning creates restructured educational environments that support the teaching of academic content in real-world contexts. Work-based learning provides students with opportunities to develop critical workplace and career-related skills through career exploration activities, internships, and highly structured and carefully managed part-time jobs that relate to classroom learning. By coordinating and administering these efforts, connecting activities help integrate and reinforce the lessons students learn at school and at work (Jobs for the Future, 1996).

Results of a study of 10 (3 in 1990 and 7 in 1991) school-to-careers programs indicate the following:

1. Schools have experienced significant expansion over time. The numbers and types of students, industries, and schools involved in school-to-careers programs have all increased.
2. Programs have significant sustained employer involvement and the intensity of employer involvement has increased over time.
3. Significant percentages of students who have participated in school-to-careers programs are enrolling in post-secondary education and training.
4. Students, employers, and teachers are extremely supportive of the school-to-careers approach.
5. Programs have become more involved in strategies for systemic change in schools, workplace, and the institutional connections between them.

6. Many school-to-careers models appear to be more expensive per pupil than the typical high school educational program, but they cost more because they provide more extensive services and supports.

7. Three critical activities contribute to the success of these programs: staff development, released time for teachers, and coordination.

8. Institutional barriers (schedules, Carnegie units, program design) must be addressed.

9. Principal leadership is essential to the success of school-to-careers programs (Kopp & Kazis, 1995, pp. 14-15).

The above report indicates that innovations require changes in how high school is organized for student participation: (a) what goes on inside the classroom is different; (b) how teachers related to students, to other teachers, and to employers and others is different; (c) new curriculum materials and sequences are often created; (d) teachers are expected to broaden their repertoire of instructional techniques; and (e) bell schedules, length of class periods need to be changed (Kopp & Kazis, 1995). Of the 10 schools participating as "Promising Practices" schools, 7 indicated they used integrated curriculum, one used project-based teaching, and 6 utilized applied academics (Kopp & Kazis, 1995, p. 67).

Content standards setting is a current trend for academic and vocational/professional/technical education. Recently the National Center for Research in Vocational Education came out with the following guidelines for contextual learning as related to the school-to-careers movement:

1. High school expectations for all students help them achieve high academic standards and master the knowledge and skills that will qualify them for employment, further education, and career advancement.

2. Career-related academic curricula that stress the application of knowledge and skills motivate students to achieve high levels of academic performance.

3. Multiple assessment strategies help students demonstrate their talents and abilities whether they work individually or in collaboration, and assist educators in improving student performance and instructional programs.

4. Educators and community members work together to develop high quality programs for all students (Rahn, 1996, p. 35).

### Cognitive Apprenticeship

Cognitive apprenticeship refers to how people are taught and learn before formal schooling. The model of instruction involves a visible, physical activity compared to learning that is not visible. Cognitive strategies are central to integrating skills and knowledge in order to accomplish meaningful tasks (Collins, Brown, & Newman, 1989, p. 8). Advocates of cognitive apprenticeship believe reading, writing, and mathematics can be taught through methods that have traditionally been employed in apprenticeship to transmit complex physical processes and skills. Teachers are coaches, showing students how to do a task and helping the students do it. The teacher oversees students learning while students observe, enact, and practice the skills. Goals of cognitive apprenticeship are to help students generalize the skill to learn when the skill is or is not applicable, to transfer the skill independently when faced with novel situations, and to situate the abstract tasks of the school curriculum in a context that makes sense to students (Collins, Brown, & Newman, 1989, p. 9).

### Project-Based Teaching and Learning

Michelle Swanson, Communication Arts teacher, Sir Francis Drake High School in San Anselmo, California, and Jobs for the Future Consultant, an advocate of contextual teaching using project-based teaching as an instruction delivery states:

You use the teachable moments daily with contextual teaching. You build patterns of success and acknowledge that. There are many pairs of adult eyes on every student. You take risks. If you fail, everyone fails; but we all learn from our mistakes. (M. Swanson, personal communication, June 1995)

The term project-based learning refers to a spectrum of activities. According to Michelle Swanson (personal communication, Project-based Teaching Workshop, Milwaukie, OR, June 1995), there are no definitive, research-based answers as to which type of project learning produces the best results. But, successful projects seem to share some important features. For example, successful projects:

- Emanate from a problem or question that is meaningful to students;
- Take substantial time, much of which is scheduled into the regular school day (not just an add-on, or primarily done as homework);
- Require students to create something, a tangible end-product that takes real effort and has lasting value;
- End with students preparing a presentation of their work for a real audience;
- Include opportunities for students to reflect on their own learning;
- Blur the boundaries between disciplines;
- Blur the line between slow and fast learners; and
- Create a culture of accomplishment within the classroom, similar to the culture in a sports team where everyone wants and needs high performance from one another (Bridges, 1992, pp. 29-57).

Starting points for teachers to think about prior to designing projects include:

1. What you want students to know and be able to do when they finish the program (not just the course). Included in this are: knowledge of and experience in all aspects of the industry; specific technical skills, knowledge, and experience; habits of mind; work habits and skills; and values.
2. Current interests, competencies, hobbies, and redispositions of the students and the teachers (in other words, the underutilized resources you currently have).
3. Contributions that students might be able to make to others in the school, community, or workplace (in other words, unmet needs you can identify).

For teachers, project work is likely to mean: More coaching and modeling, finding out, cross-disciplinary thinking, teamwork, finding multiple sources, multi-dimensional assessment, varied materials and media, and contact with the community; and less telling, knowing, specialization, privacy/isolation, reliance on texts, testing, paper and pencil, and closed-door teaching (personal communication, M. Swanson, Project-based Teaching Workshop, Milwaukie, OR, June 1995).

Project-based learning projects indicate some preliminary findings (Tretten & Zachariou, 1996a). Four schools in Marin and Sonoma Counties in California have participated in the TinkerTech I project, supported by the Autodesk Educational Foundation. Assessment procedures include interviews of experienced project-based teachers and principals, as well as questionnaires administered to those educators and a sampling of parents. The findings are as follows:

1. Teachers and administrators continue to be enthusiastic about project-based learning and its positive effects on students and student learning.
2. Students enjoy participating in project-based learning.

3. Project-based learning is becoming increasingly institutionalized in curriculum and instruction, and in the school's culture.
4. There appears to be a greater understanding of what a project is as distinguished from classroom activities.
5. While project-based learning includes certain basic principles, it is flexible enough to allow for different applications.
6. The principal's active support and leadership are important elements in the institutionalization of project-based learning.
7. Teachers continue to report that they value the support they receive from the Autodesk Educational Foundation, especially in terms of getting time to plan and develop projects.

TinkerTech I project assessors noted that high Likert averages and very high percentages (90% to 100%) of agreement on almost all items related to the positive effects of project-based learning and the relatively consistent need for more time to plan and implement project-based learning.

### Tech Prep Program

*The Neglected Majority* (Parnell, 1985) cites the tech-prep associate degree as an avenue of success for students in the middle of the bell-shaped curve. The foundation for tech-prep, which is an articulated series of classes from grades 11 through 14, is the contextual teaching methodology in the classroom. The federal government has funded the tech-prep movement for 7 years with emphasis on integrating academic and vocational education. It has now evolved into the school-to-careers movement and many of the other programs previously mentioned. Often there is a misunderstanding among educators about content and context, but frequently the content, or teaching for knowledge, is lost without

providing meaning or application to the student. A good contextual lesson would combine both the knowing and the doing. Content and context must function side by side in delivery of the tech-prep program (Parnell, 1985).

## RATIONALE AND STRATEGIES FOR CHANGE

There has been an abundance of literature over the past several years regarding the need for education to change in the United States. Reasons to change instructional practice range from the business community requesting new skills for its future workers, to increasing student dropout rates, to lack of student motivation, to the changes in the American family that seem to require a different type of support for students. One of the biggest challenges today is that students are not in tune with the entrenched traditions of schooling, the "you'd better know this because it'll be on the test" mentality (Brandt, 1995b, p. 70). What follows are some reasons why change in today's classrooms indicate the need for more contextualized teaching.

The search for a better approach to organizing the curriculum is largely driven by a desire for connections. To understand this, we might begin by viewing the separate subject curriculum as something like a set of jigsaw puzzle pieces with no picture to guide us in putting them together, and no guarantee that they make a picture. Not only would putting the pieces together be a difficult task, it would border on the irrelevant, since most people would agree that the purpose of the pieces is to make a picture and that the pieces themselves have no real meaning apart from the picture they make. Young people understand this well; that is why they ask: "Why do we have to do this?" (Beane, 1995, p. 46)

There are new prospects for reform and optimism among the experts (Grubb, 1996, p. 544). Changing teaching so that intrinsic motivation is improved by providing meaningful contexts for students themselves — is proposed in this study. Recent analysis of teaching and learning for disadvantaged children has concluded that more active, student-centered approaches are the most promising ways of teaching such students.

Work in America is changing rapidly from the Tayloristic model (of breaking complex jobs into a myriad of simple rote tasks, which the worker then repeats with machine-like efficiency) to new high performance forms of work organizations. The National Center on Education and the Economy (1990) recommends new approaches to education and training that will better prepare our students for this new workplace.

No nation has produced a highly qualified technical work force without first providing its workers with a strong educational background. U.S. children rank low on most international tests, behind children in Europe and Eastern Asia, and even behind children in some newly industrialized countries (National Center on Education and the Economy, 1990, p. 3).

The U.S. educational system was not designed to meet the needs of front-line workers. The system is a combination of education programs for full-time college students and short-term training for the severely disadvantaged. Education is rarely connected to training and both are rarely connected to an effective job service function (National Center on Education and the Economy, 1990, p. 4).

*Crossroads in Mathematics: Standards for Introductory College Mathematics Before Calculus* (Cohen, 1995) includes in its standards for student-constructed knowledge and pedagogy, the following essential components for effective instruction: (a) teaching with technology, (b) interactive with collaborative learning, (c) connecting with other experiences, (d) multiple approaches, and (e) experiencing mathematics in meaningful activities.

*The Vocational Education Draft: Standards for National Board Certification* recently published by the National Board for Professional Teaching Standards (1996) includes: (a) a meister-apprentice relationship needs to exist in the classroom (p. 45); (b)

"there needs to be a marriage of both hand and mind learning" (p. 43); (c) "teachers need to appreciate how knowledge in their subject field is created, organized, and linked to real-world settings" (p. 2); (d) "teachers need to think systematically about their practice and learn from experience"; and (e) student mastery of specific content needs to be coupled with engaging students in contextual learning experiences (p. 40).

In the new vision for vocational education, a call for multidisciplinary projects, high quality instruction for all students, and the infusion of academic studies with vocational education are important. The National Board for Professional Teaching Standards report (1996) cites the most successful schools in the country having begun to enhance student learning by replacing conventional teacher-centered didactic instruction with more activity-based, project-oriented methods (p. 9).

Changes in instructional strategies are also needed due to the demand for remedial courses at the secondary and post-secondary level. Concerned lawmakers have been pressuring K-12 schools to do a better job of preparing students, but also are eyeing remedial courses as they trim budgets.

The growing percentage of entering students who take remedial or development courses is perhaps the best-kept secret in the higher education community. According to the American Council on Education, 90% of all private and 95% of all public four-year colleges schedule remedial classes. And the public is just beginning to learn how many students actually take these courses. At all but the few remaining selective colleges, the numbers typically range from 40% to 70% of entering freshmen. It is also important to note that being required to take remedial courses is a powerful predictor of both dropping out of college and of defaulting on student loans. (Gray, 1996, p. 530)

Educators and others committed to creating "other ways to win" need to consider (1) changes in the guidance provided to students and their parents, (2) changes in the curriculum and in the instructional methods employed, and (3) changes in the demeaning way many teens in the academic middle are treated in our high schools. (Gray, 1996, p. 533)

In many high school college-prep classes students are expected to act like office copying machines: the teacher lectures, and the students take notes and then reproduce on the test what they copied. While learning experts argue that this is the least effective teaching strategy for all students, it is mastered early on by the academically blessed, who excel as the content becomes more abstract and more detached from any context. The problem is that the academically blessed now amount to less than one-third of those in college-prep curriculum. The majority come from the academic middle and do not learn this way very well.

The learning styles of those in the academic middle are typically more concrete. They learn best when instruction is put into a relevant real-world context. Yet according to a U.S. Department of Education research study, only 18% of all teachers spend more than 10% of their class time putting subject matter into any context at all (Gray, 1996, pp. 533-534). If the college-prep curriculum is to be instructionally effective for everyone, this must change. There are many questions about schooling in general, about curriculum coherence, and about limitations of curriculum reform, as well as about the need to address issues of pedagogy (Beane, 1995, p. 158).

## **CHAPTER III**

### **METHODOLOGY**

This study was part of a larger research project at Oregon State University, Corvallis, Oregon, funded by the United States Department of Education, which investigated the practice of contextual teaching and learning. Five Portland, Oregon, area high schools participated in the project which involved 32 teachers and 350 students. The study represents the development of a definition of contextual teaching, what the literature, teacher/consultants, teachers being trained, and students have to say about contextual teaching and the development of a profile of contextual teaching practices.

#### **THE RESEARCH APPROACH UTILIZED IN THIS STUDY**

The research methodology employed was an investigative field study. Data were collected from teacher and student interviews, observations, and surveys (see Appendix A) during a one-year time span. Storytelling was used extensively by the teachers. They described their personal and professional experiences with contextual teaching. The goal of developing a greater understanding of contextual teaching became clear as the interviews and observations progressed.

Qualitative research has many characteristics in common with ones attributed to science and program evaluation. Good qualitative research, like good science, utilizes accurate, reliable, and valid observations; gathers evidence systematically; and analyzes objectively. Scientific method seeks to discover laws, generalizations, and regularities.

The investigative field study approach favors the researcher as an *interpreter*.

All research depends on interpretation, but with standard quantitative designs there is an effort to limit the role of personal interpretation for that period between the time and research design is set and the time the data are collected and analyzed, sometimes thought of as a "value free" period. Standard qualitative designs call for the persons most responsible for interpretations to be in the field, making observations, exercising subjective judgment, analyzing, and synthesizing, all the while realizing their own consciousness. (Stake, 1995, p. 41)

Extensive fieldwork was employed in this study through a constructivist framework with the researcher fulfilling the role of gatherer of interpretations. This researcher spent a year in the field making observations and exercising subjective judgment to construct a contextual teaching framework.

As a professional educator, this fieldworker had empathy for the study of contextual teaching. Years of collecting data in the classroom and working with students and teachers assisted the researcher in establishing an appropriate comfort level. Familiarity with different teaching models and strategies provided necessary background. Each model/strategy is unique and approaches instruction differently. Acknowledging responsibility to coach and guide rather than dispense knowledge seems a popular theme in the literature.

Qualitative researchers are noninterventionists (Stake, 1995). This researcher observed ordinary public school classrooms, interviewed teachers during education workshops, and asked reflective questions. A relentless search for patterns and consistencies was conducted.

The teachers appeared at ease during the interviews and observations. A *naturalistic* research style was used (Bogden & Biklen, 1992). Fieldwork refers to being a part of the subject's work, not a person who pauses while passing by, but a person who has come to learn. Access to teachers was not a problem since the teacher/consultants had been selected

because of their familiarity with the researcher. The first set of interviews proved to be extremely important. The researcher was unsure of the questions and nervous, but the teacher/consultants were relaxed and animated, making the research process feel more comfortable. Their answers aided in developing the researcher's questions, focusing the study. Over time, the researcher and teachers became more relaxed with informal interaction and telephone calls between them became commonplace.

Initial researcher concerns revolved around these questions:

1. Should teachers be interviewed individually or in groups? Both methods were employed.
2. What was an appropriate interview length? Interviews were limited to 45 minutes.
3. Can a researcher be discreet and unobtrusive in the classroom? The researcher was introduced as an observer, not an evaluator, studying contextual teaching.
4. Will audiotaping be effective? This researcher found that some faculty interviewed were uncomfortable and distracted by audiotaping. Therefore, some interviews were conducted by taking only field notes. However, all five teacher consultants were interviewed using audiotapes.

Once these questions had been answered, the interviews were scheduled. The initial interviews varied from 20 to 45 minutes in length. The questions asked of teachers and teacher consultants included:

1. What is your definition of contextual teaching?
2. How did you arrive at this definition? Describe your journey in education to this point.
3. How many years have you been teaching? What is your subject area?

4. What do you see as the key elements of contextual teaching?
5. Why is this a better way to teach than other ways?
6. Give an example of a contextual teaching lesson from your experience.
7. What in your experience makes you think contextual teaching is a superior way to teach?
8. Other comments?

The interviews with the teacher consultants were audiotaped and then transcribed to writing and edited as outlined in Chapter IV. The researcher also kept informal notes on question sheets. The themes were highlighted using a pattern-matching technique sorting for commonly used words. From this information, the researcher proceeded with a literature search on contextual teaching which formed the foundation of Chapter II.

Attempting to narrow the focus of the study, the researcher shared progress with a small group of doctoral student colleagues and a professor. During brainstorming sessions, the research title, problem statement, and questions were discussed. Thus, the study title became: "A Profile of the commonalities and characteristics of contextual teaching as practiced in selected educational settings."

Conversations followed with other professors, teachers, the CLIC Project Director and Project Evaluator who helped refine the questions and methodology to be employed. The researcher and participants were comfortable with the researcher taking notes during the interviews and observations. Due to prior classroom experience with this type of procedure, the researcher transcribed quickly then sent photo copies of the verbatim notes to the participating teachers. They were pleased to receive the notes which were then used as a foundation for further discussion and observation.

Reflecting his belief that the best way to understand what people think about their world is to listen to how they talk about it, Agar (1980) suggests that the interview is the most important aspect of participant observation. He suggests the informal interview can happen almost anywhere. This reflection was beneficial for background information as the researcher conducted the fieldwork in a variety of settings: school staff rooms, classrooms, offices, conference rooms, hallways, a Columbia River ship, and in a car.

Major differences between qualitative and quantitative research assisted this researcher to choose the qualitative methodology. This helped focus and refine the study's questions and the purpose. Bogden and Biklen's (1992) checklist criteria for evaluating qualitative research proposals was helpful (p. 50).

Stake's (1995) "More or Less Special Characteristics of Qualitative Study" was instrumental in the study design as well, as seen below. It was used as a template for the researcher and seemed efficient.

## CHARACTERISTICS OF QUALITATIVE STUDIES

### Holistic

Its contextuality is well developed;

It is case-oriented (a case is seen to be a bounded system);

It resists reductionism and elementalism; and

It is relatively noncomparative, seeking to understand its object more than to understand how it differs from others.

### Empirical

It is field-oriented;

Its emphasis is on observables, including the observations by informants; and

It strives to be naturalistic, noninterventionistic, and there is a relative preference for natural language description, sometimes disdaining grand constructs.

### Interpretive

Its researchers rely more on intuition, with many important criteria not specified;

Its on-site observers work to keep attention free to recognize problem-relevant events; and

It is attuned to the fact that research is a researchers-subject interaction.

### Empathic

It attends to actor intentionality;

It seeks actor frames of reference, value commitments;

Although planned, its design is emergent, responsive;

Its issues are emic issues, progressively focused; and

Its reporting provides vicarious experience (Stake, 1995).

### Other Characteristics of Good Qualitative Studies

1. Its observations and immediate interpretations are validated: (a) triangulation of data is routine; (b) there is deliberate effort to disconfirm own interpretations; (c) its reports assist readers to make their own interpretations; and (d) its reports assist readers in recognition of subjectivity.

2. It resists the exploitation of the specialist's platform.

3. It is sensitive to the risks of human subjects research.

4. Its researchers are not just methodologically competent and versed in some substantive discipline, but versed in the relevant disciplines. (Stake, 1995)

Case study application (Stake, 1995; Yin, 1994) was also important in establishing the methodology used. Parts of the study seemed like a specific case study but the research questions and problem statement were more congruent with investigative field studies. Borg, Gall, and Gall (1981) identify characteristics of a case study similar to this study as follows: (a) studies a complex educational phenomena in a natural context, (b) provides detailed descriptions, (c) has an explanatory purpose, (d) uses multiple data sources, and (e) has a conceptual framework.

Stake (1995) suggests checking with participants with pre and post-interviews and surveys with copies of verbatim notes given back to the participants. This researcher used this technique. Teachers participating in this study stated they appreciate this follow-through from the observations.

Field work requires four general phases through which researchers and their subjects pass in the course of the study: (a) initial contact; (b) understanding role of self and others; (b) taking on a role and changing it as necessary; and (d) stabilizing and sustaining of role definitions by researchers and participants. The fieldwork in this study was approached with this sequence in mind.

Obtaining permission for the study was a long, complex process due to the researcher having to secure approval of the consent form from the Oregon State University Research Office due to the need to differentiate between this research project and the larger CLIC project. The teachers were agreeable, interested, and gracious. The researcher kept in mind Bogden and Biklen's (1992) list of questions and how to respond:

1. What are you actually going to do?
2. Will you be disruptive?
3. What are you going to do with your findings?
4. Why us?
5. What will we get out of this? (p. 83)

The school districts varied in their approaches to research conducted in the school. One district required a letter explaining the procedures and committee approvals. Another district required completing a form and approval by a research office. Two districts had no procedures for research study participation. The university required a human subjects consent form (see Appendix B).

## THE RESEARCH QUESTIONS

The research questions and issues surrounding them emerged during the early parts of this study. The researcher adjusted the questions numerous times. Changes occurred after teacher interviews or observations. The problem areas became progressively clarified and redefined. The course of this study could not be charted in advance. Beginning with a data base, the researcher reduced the breadth of the inquiry to give more concentrated attention to the emerging issues (Partlett & Hamilton, 1976; Stake, 1995).

This study addressed six basic questions:

1. How does the research literature define contextual teaching and how is it described?
2. How does a panel of teacher consultants who have had success in utilizing contextual teaching techniques characterize and define the methodology?
3. How does a selected group of secondary school teachers actually practice contextual teaching in the classroom?
4. What do high school students who have experienced contextual teaching have to say about this teaching methodology?
5. What is the definition of contextual teaching based upon this investigative field study?

6. What are the key characteristics and commonalities of contextual teaching based upon the findings of this field study?

These questions served as a foundation and focus for the study design, procedures, and data collection techniques. The following thought helped in formulating the questions: "Direct the looking and the thinking enough, and not too much" (Stake, 1995, p. 15).

## RESEARCH DESIGN/PROCEDURES

The research design provided a pathway for the study. The researcher took a step-by-step approach with the sequence of events that was logical and practical. For this study, the design consisted of five components (Yin, 1994): (a) a study's questions; (b) its propositions, if any; (c) its units of analysis; (d) the logic linking the data to the propositions; and (e) the criteria for interpreting the findings.

A criteria for designing case studies assisted the researcher (Yin, 1994). The research design focused on the perceptions and experiences of the participants (Locke, Spirduso, Wyrick, & Silverman, 1993). Detailed descriptions of what they said or did formed the basis for inductive analysis (Locke et al., 1993). The nonrandom sampling of teachers was small, yet yielded new insights into contextual teaching. Initially, five teacher/consultants were interviewed. Next, surveys were distributed to 35 teachers participating in the project. Twenty teachers completed the surveys over the year. During the 1995-96 school year, subject-matter teachers were requested to participate in this study. After gaining Principal permission, 7 teachers volunteered to be key research informants. These teachers also participated by completing a quarterly progress report. They were interviewed and observed in the classroom twice. Eleven of their students were also interviewed.

Documentation of research field notes consisted of: field notes, interview transcripts, artifacts, and samples of contextual lessons. The field notes contained descriptions of the activities with researcher reflective perceptions.

Triangulation is a rationale and protocol for using multiple sources of evidence (Yin, 1994). Triangulation assists in clarification and accuracy which helps in determining validity of data observed. The data collected include multiple sources such as teacher interviews, observations, surveys, literature review, and student interviews.

An informal participant checking occurred each time the researcher came into contact with a teacher/consultant or project teacher. Participant interest has been continuous in the study and its findings. Some have requested the complete study.

## ANALYSIS AND INTERPRETATION

Analysis began from the first teacher/consultant interviews. The researcher began dissecting the information, attempting to keep a focus on the problem statement and research questions. The goal of clarifying and understanding contextual teaching always remained at the forefront.

All of the interviews were typed and coded using a pattern-matching system. The data gathered relied on Bogden and Biklen's (1992) coding categories of: (a) setting/context codes, (b) definition of situation codes, (c) perspectives held by subjects, (d) subjects' ways of thinking about people and objects, (e) process codes, (f) activity codes, (g) strategy codes, (h) relationship and social structure codes, and (i) methods codes. Common themes in the interviews used by this researcher: (a) relationships, (b) activity, (c) relevance, (d) connectedness, (e) hands-on, (f) real-life, and (g) learning styles.

The *cut-up-and-put-in-folders* approach was implemented by the researcher using a highlighter pen, then cutting and pasting the themes together (Bogden & Biklen, 1992, p. 176). The sorting became a continuous activity for the researcher. Literature exploration was also a continuous activity. During these processes, the researcher constantly looked for ways to simplify the data — with tables, charts, and graphs (Bogden & Biklen, 1992). Surveys were analyzed by documenting how many of the teachers answered specific questions affirmatively. These tables are found in Chapter IV.

Realizing reflective practice to be important, this researcher made a conscious effort to journal subjective comments during interviews and observations. "It helps to read materials, attend lectures, to discuss, and to read field reports — but expertise comes largely through reflective practice" (Bogden & Biklen, 1992, p. 163). Each time an interview or observation took place, reflective questions were raised: Were the right questions asked? Is triangulation taking place? What kind of methodology is this? Should the methodology be changed? The researcher used the model shown in Table 3 as a study design.

TABLE 3

## FIELD WORK STUDY DESIGN MODEL

Development of Problem Statement and Research Questions Prior to Fieldwork			
Literature Review	Teacher/Consultant Interviews	Teacher Interviews, Observations, Surveys	Student Survey and Interviews
Outcome: Contextual Teaching Definition, Profile of Commonalities, and Characteristics			

## LIMITATIONS OF THIS STUDY

This study was limited by a selected group of participants from selected schools and selected students. All participants volunteered to be involved with this study and brought their own biases to the study. The researcher entered this study with a bias that contextual teaching will improve student achievement and that by interviewing practitioners common threads of continuity can be identified.

As relates to objectivity, Wolcott (1995) states:

The process of forming links between ideas in the observer's mind and what one has observed is dialectical: Ideas inform observations and observations inform ideas. The prime mover in the process is the researcher. Whatever constitutes the elusive quality called "objectivity," mindlessness is not part of it. (p. 163)

Even though every effort was made by this researcher to be objective, the purpose of the study was kept in focus. It was not a mindless study but a persistent search to seek out the commonalities and characteristics of contextual teaching.

## **CHAPTER IV**

### **DEVELOPING A PROFILE OF CONTEXTUAL TEACHING**

#### **PARTICIPATING HIGH SCHOOLS**

Five Portland, Oregon, area high schools participated in a 1995-97 Oregon State University School of Education Contextual Learning Institute and Consortium (CLIC). This consortium of schools provided the foundation for this study. In order to develop a profile of contextual teaching and based upon experience with schools in the consortium, the study was focused on a selected group of teachers and schools participating in the CLIC project. The criteria for school and teacher selection in this study included the following: (a) targeted academic teachers who had taught contextually for one school year or more; (b) targeted high schools that were comprehensive in nature with a broad range of departments and courses; (c) targeted schools that have contextual teaching teams of teachers; and (d) schools where the principal supported the concept of contextual teaching and was willing to participate in the research.

Two of the five consortium schools were eliminated using these criteria. One of the eliminated schools was a professional-technical high school which used selective admissions and the other eliminated school did not have a contextual teaching team nor leadership sufficiently interested in contextual teaching to be included in this study. For the purpose of this study, the three high schools and teachers participating will be known as High School A, High School B, and High School C.

These schools were from three different districts. The school district compositions and participating high schools are seen Table 4.

TABLE 4

## COMPOSITION OF SCHOOL DISTRICTS INVOLVED IN THIS STUDY

District	Number of High Schools	Schools Participating
1	4	A
2	12	B
3	1	C

High School A was one of four schools in a large suburban public school district of 14,500 students. A total of 1,465 students, grades 9-12, attended this comprehensive high school. The school district consisted of three comprehensive high schools and one occupational skills center. High school A's faculty consisted of 65 full time certified teachers, 5 counselors, and 4 administrators.

The principal of High School A was in her second year at the school, coming from a large urban school district as a district level staff and curriculum developer in an adjacent state. She was the first female principal in the history of the school. She was enthusiastic about contextual teaching at the start of the project but gradually gave responsibility for the contextual teaching project to an assistant principal. However, the participating faculty members remained enthusiastic throughout the project.

High School B, one of 12 urban high schools in a large metropolitan school district with a student population of 1,169 and a professional staff of 83. The principal was in his second year as principal there. He had worked in this same school district for all 26 years of his educational career as an administrator in other schools, as a teacher, and as a coach. His continued leadership over the course of the project was important to the success of contextual teaching at this school. He was instrumental in starting a contextual teacher team

in this high school. A core group of students were taught by chemistry, mathematics, language arts, and social science teachers. This group of teachers collectively planned their contextual lessons for their assigned group of students. Some taught contextual lessons with other classes as well.

High School C had a student population of 1,466 and 66 certified teachers, 5 administrators, and 4.5 counselors. This school is known statewide for its visionary thinking and contextual teaching practices. During the course of the consortium project, two different principals were involved. The first year, the deputy superintendent of the school district served as an interim principal; toward the end of the project, a principal nationally active in speaking and writing on contextual teaching was hired. This school had organized grades 9 and 10 into student *houses* where four academic teachers team teach a group of 90 to 100 students daily in an interdisciplinary format. They also had a common planning time every other day where an assigned counselor, a learning specialist, and an administrator joined the contextual teaching team. The subject matter areas taught by this teacher team were language arts, social science, science, career development, and personal finance. Integrated and thematic units using project based teaching/learning was commonplace here.

#### THE ROLE OF THE SCHOOL PRINCIPAL IN THIS STUDY

The principals' role in this field study was one of facilitation. Their collective leadership provided: (a) application and participation in the Contextual Learning Institute and Consortium; (b) a signed letter of intent at the onset; (c) development of contextual teaching teams; (d) common planning/meeting time for the teachers; (e) commitment to the concept of contextual teaching; (f) creative ideas regarding contextual teaching to incorporate into the culture of the school; (g) team membership; and (h) opportunities for

staff development including conferences, field trips to other schools, and workshop participation.

The 7 teachers selected for this part of the study represented three high school content areas: (a) 1 from physics, (b) 3 from language arts, and (c) 3 from social studies.

The selection criteria for selecting these 7 teachers included:

- A high interest and participation in contextual teaching indicated by completion of periodic progress reports for the larger CLIC project.
- Classroom observations by this researcher.
- Demonstrated commitment to the project by attendance at CLIC quarterly meetings.
- Willingness to participate in additional interviews and classroom observations.
- Teaching in an academic setting.
- A teacher at one of the high schools participating in the project.
- Recommended by their school principal.

The purpose of this field study was to clarify the concept of contextual teaching. This was accomplished by identifying the characteristics and commonalities of contextual teaching as described in the literature outlined in Chapter II, and as outlined by expert and experienced teachers, as practiced by selected high school teachers participating in this study, and as viewed by high school students. The remainder of this chapter will concentrate upon the findings from the following three research questions:

1. How does a panel of teacher/consultants who have had success in utilizing contextual teaching techniques characterize and define the methodology?
2. How do a selected group of secondary school teachers actually practice contextual teaching in the classroom?

3. What do high school students who have experienced contextual teaching have to say about this teaching methodology?

## RESEARCH QUESTION TWO

How does a panel of teacher/consultants who have had success in utilizing contextual teaching techniques characterize and define contextual teaching?

Five teacher-consultants were selected for interviews in this study. Criteria for selection of these individuals was developed by this researcher as follows:

- Minimum of two year's teaching contextually.
- Known and respected (credibility) in education.
- Teacher of language arts, economics/social sciences, mathematics, physics, chemistry, or biology.
- Not on staff at the three study high schools.
- Possessed group facilitation skills and experience.
- Willing to participate in this study.
- Nominated by selected school administrators.
- Connected with K-12 schools and/or higher education.

The selection process took approximately 2 months of telephone calls, letters, and personal interviews. The five teacher consultants selected hold many important credentials including: an author of two contextual teaching English textbooks; a community college associate dean; a physics teacher trained for 3 years by The Center for Occupational Research and Development (Waco, Texas) in teaching the applied physics course called Principles of Technology; a math teacher teaching in an Engineering, Math, and Science Academy and university adjunct instructor; a certified ChemCon instructor (an applied

chemistry program designed by The American Chemical Society); an internationally respected Junior Achievement applied learning consultant in the field of economics. Teacher consultants met on a regular basis with this researcher.

To establish a baseline for a definition of contextual teaching and give direction for the study, each of the teacher-consultants was interviewed during the summer of 1995. Each was asked seven questions and asked to comment regarding contextual teaching. The questions asked were as follows:

1. What is your definition of contextual teaching?
2. How did you arrive at this definition? Describe your journey in education to this point.
3. How many years have you been teaching? What is your subject area?
4. What do you see as the key elements of contextual teaching?
5. Why is this a better way to teach than other ways?
6. Give an example of a contextual teaching lesson from your experience.
7. What in your experience makes you think contextual teaching is a superior way to teach?
8. Comments?

The responses of each consultant were developed into field notes from audiotapes and edited for purposes of clarity and brevity.

#### Question 1: What Is Your Definition of Contextual Teaching?

Teacher/Consultant 1: Contextual teaching creates a situation in which the student is connected with their personal interests and needs somehow. They must feel some type of emotional commitment or involvement in the learning process.

Teacher/Consultant 2: The teaching part has to do with presentation of subject matter curriculum material in such a way that it is meaningful to students everyday life.

Students need to see that what they are expected to learn has some direct connection to everyday life.

Teacher/Consultant 3: Contextual teaching is teaching that connects what a student is learning with the context of that student's life.

Teacher/Consultant 4: Contextual teaching is making teaching relevant to students so they can use their own experiences, and so they can go from the theoretical to the more concrete.

Teacher/Consultant 5: The key characteristics of contextual teaching is that teachers put students in a situation where they can draw the connections that are necessary between the different subject matter disciplines and different skills that we teach in our schools. This is easier said than done. There are some key beliefs involved: 1. You have to believe that an active learner will learn more, but in active learning it means we must be more creative about how we structure the school day and we use time. 2. As a teacher you have to give up some control (very hard to deal with). In economics we use the process of total quality management. If I believe in total quality management then I have to use that system in my classroom so the students understand it. That means I have to empower them to make the right decisions. That also means I have to give up some control. That is one of the things I have found is very difficult to do. I was introduced to Junior Achievement in 1985. The Junior Achievement program is very contextual in it's entirety, offering some great insights into the value of giving students more power in their education. We still have students who are apathetic and students who refuse to come to school, but the ones that are there seem to be growing. The ones that are there seem to become more involved.

Questions 2 and 3: How Did You Arrive at this Definition? Describe Your Journey in Education to this Point. How Many Years Have You Been Teaching? What Is Your Subject Area?

Teacher/Consultant 1: I arrived at my definition of contextual teaching by trial and error over a period of two or three years. I started teaching junior high school in Santa Fe in 1974. I taught there for six years. I taught standard mathematical types of things. For a couple of periods of the day I was in a laboratory setting where students were in and out of the classroom and I got a little start there. I taught at junior high school for three years and then moved to the high school where I have been teaching for twelve years. I guess my background has been in the liberal arts tradition. However, over the years I received enough feedback from students to feel very uncomfortable with what I was doing. The traditional teaching approach seems to work reasonably well for many of the advanced students although often they did not see the point of what you were doing. But that approach does not work very well for the students that get Sophomores in Algebra and Juniors in Geometry who are not going on to college and could never understand the purpose of the two column problem. Over time, my discomfort has grown and I have talked a lot about it to colleagues that feel the same way and we have looked for a way of changing.

You asked me the question about what could be changed. I would change geometry and algebra to make it more concrete, more discovery-oriented from the beginning.

When my younger daughter went through this process, and over a period of four or five years she taught me that there are a lot of students whose interests and needs just don't fit the traditional liberal arts academic model. And then three years ago we started doing some integrated type of work - electronics teacher and math teacher merged classes for a few weeks and did some projects. We evaluated the project and had the students fill out some forms and describe what they had learned and what they felt they had gotten out of it. The student interest was higher than I had ever seen before in a lot of classes. Students felt very good about being able to do something and see the product when they finished. They learned that they could work with others whether they knew them or liked them or not and that they could solve problems. They learned that what they were learning in the classroom had application outside the classroom. The very positive results we get out of a lot of kids who normally are not very positive about mathematics has sold me on the idea that we need to make a change in that direction. So over the last two years we have been integrating math, electronics, drafting and English in our block and trying to find ways of doing this. This means developing a different kind of schedule. In general, most of the students are enthusiastic. They like the idea of not being lectured at everyday, they like the idea that they are doing is useful and they like working independently to help in producing this. They know there is going to be a product and have some involvement in developing that product.

Teacher/Consultant 2: It seems that in my classes we tend to digress away from the subject material and tend to talk about things that are relevant to students. These digressions tend to be away from subject material and pointed to things that interest the students. It is always my task to try to bring that topic back to the curriculum material. Students are tremendously interested in things that pertain to their life. It is my challenge to bring the discussion back to my area of science. Connecting what they are interested in with my science curriculum is contextual teaching or learning and that is the goal I attempt to achieve. I think a lab science is contextual and pointing the curriculum at everyday situations has been my goal. I just completed my 26th year of science teaching.

Teacher/Consultant 3: As a teacher it always seemed to me that students paid more attention if I could demonstrate to them the urgency of the lesson. If I could show them that as they studied Shakespeare that it would really matter to them, they could then care and learn. Contextual teaching is a fundamental teaching technique. I saw it described in the SCANS report, it is given a new name but it is still that marvelous technique that works. When I saw it in the Secretary's Commission for Achieving Necessary Skills, (U.S. Department of Labor, SCANS, 1991) report and connected it with my own practice, I thought I should talk about it.

I started teaching when I was 23 years old - if you want to figure out how old I am that was in 1963. I was hired as an instructor at the University of Oregon. So I began teaching English at the University of Oregon and was a university professor from then until 1982 when my husband made a career move. I began to be chair of an English Department for grades 7-12 in an independent middle/high school. And then my husband made another career move so I began working in a community college as an administrator. So I have been in universities, high schools and colleges. I learned contextual teaching from a professor I had as an undergraduate. That professor could make anything live and seem pertinent. Her name was Elizabeth Pope and she was a brilliant scholar. She taught literature in a way that made you believe that if you did not understand it you could not live today in this century. I learned from her how to teach and it is contextual. We have millions of ways of doing this

and today the current emphasis is on the context of the business world or the context of industry or the context increasingly is to connect English with automotive technology or English with some other vocation. The context can vary as long as it is germane to the student now.

Teacher/Consultant 4: I was a traditional teacher for thirty-one years in Chemistry and Math and I just happened to go to an Applied Chemistry (ChemCon) workshop and all of a sudden it made sense to me. All of a sudden teaching was relevant - I realized we were sending kids through the traditional Chemistry program and they had no clue what acid rain was and everything was theoretical. I just said there has got to be a better way to do it. This was about five years ago.

#### Question 4: What Do You See as the Key Elements of Contextual Teaching?

Teacher/Consultant 1: I see a big difference between traditional mathematics and contextual types of learning and projects, which is maybe the way you do contextual learning. There has to be a connection between the subject content and something that is of interest to the student or something the student feels a need to learn. If you can establish that connection you have accomplished something. There is a product. The student finishes this and they say here is something I completed. There is a product out of this thing they can hold in their hand and that helps them see meaning.

Teacher/Consultant 2: For me contextual teaching involves hands on, real-life experiences. In some way that hands on experience needs to be focused on student life.

Teacher/Consultant 3: I think there are at least seven key elements in contextual teaching.

1. One has to pay attention to the objective and make sure that it includes doing something with one's knowledge — demonstrating knowledge as an outcome is very important.
2. Contextual teaching must demand proficiency. That is to say, it is imperative that the student obtain the objective or we are wasting everybody's time.
3. The student should connect everything with the world and that is the heart of it — connections — linking classes or connecting school work with the business world or partnering in school to work.
4. Work has to be significant - it can't be trivial or busy work. It can't be purposeless. We do best if we give the students an audience other than the teacher or the parent. It is best if it be a project for someone who ultimately is going to care and be in a position to act upon the advice the students give.
5. Contextual teaching must entail a study of critical thinking and being able to analyze ones own thinking processes.
6. Contextual teaching depends upon collaborative work. Because if the context is the world of work or automotive tech, one has to work collaboratively.
7. Attention to the individual student is a crucial part of contextual teaching. If we cannot get inside the brain of the student and reach the student where they live, we can't help them. It is imperative to deal with the person as a student, and as an individual.

Teacher/Consultant 4: There are two important elements in contextual teaching. First is relevancy, finding something the students can relate to, and second it must be ongoing. When someone asks me when do you study the triad table, I say all the time. It is a better way to learn than in traditional Chemistry with formulas. We start the first unit with a topic and they need to know what a formula is so we review the formula then about equations, and then Chapter 2. You repeat this and go to chapter three which you also repeat. By the time the year is over all of a sudden they can do formulas. We never did sit down and give them the traditional five pages to write and read the formulas - I think that contextual learning is also involving repetition, I never get the question, "why are we doing this?"

Teacher/Consultant 5: I had to find ways to open doors and create a stairway to greater understanding instead of creating a ceiling for students. I don't want to over-organize any activity. One of the skills that really allows students to demonstrate their abilities is how well they organize. I do not want to create too much more framework because I am fearful that more framework actually builds ceilings. The same thing can be said about the grading system. I do not want to limit students. Even though grades are still something I will have to do I have started incorporating more and more projects. When students work in groups they have a leader and everyone in the group gets a base pay and then depending upon how the group does then they get the bonus pay. The bonus goes to the group leader and the group leader distributes to whoever they feel deserves more points. By doing that it creates an atmosphere of wanting to be excellent as opposed to just trying to get enough to get the grade. Basically, students are competing with other groups. The teaching skills that I used as a coach were great skills to transfer into the classroom. That means that I am developing a partnership with the students, we have a common goal, I am not their evaluator or assessor. I want them to be successful and I believe that students want to be successful. I try to get myself in a position of coaching them towards success as opposed to being the teacher or the leader or the guru. I want them to know that I am in the ball game with them. I found the best way do that is to create the Friday night big game. I do that through the projects. What I have to do is create some common ground for the competition. I have to have a scoring system, that is the grade and I have someone else do the evaluating as much as possible. I try to get some business or the community representative to come in and access the project. That is how we created the pay system through the grade but the assessors are the people. That also teaches them about deadlines. As a teacher I am expected to give them second, third, and fourth chances. But they know that on May 27 that is when the evaluating is going to be done in front of this panel. Those folks don't come back. It creates a little bit more of a real-life atmosphere that you have to be prepared.

#### Question 5: Why Is this a Better Way to Teach than Other Ways?

Teacher/Consultant 1: I think we must change our understanding of the way people learn. The brain makes connections when there is something to connect to. I don't think anybody can produce any hard evidence to show us that the lecture techniques we are using now actually work for all students. In fact there may be evidence to the contrary that they don't work very good. The teachers sit around in a faculty room and complain about what they had to go through as education majors. They can never see what they were learning in the college classroom had anything to do with what they were teaching. There was never

that connection. And yet we turn around and do exactly the same thing to students in our classrooms. The work I have done in contextual teaching has produced some results for the students in terms of their self satisfaction about what they are doing and their self esteem that you just don't get out of the traditional mode of teaching. Grades only matter to those that make A's and F's. Students in-between do not seem to see it as a big deal one way or the other.

Teacher/Consultant 2: If students have a hands-on experience and if students learn by doing I think they can really learn. What they do, what they see, what they learn has some meaning for their individual life.

Teacher/Consultant 3: It is a better way to teach because the student finds meaning in the work. Students will be motivated to learn if they see meaning in what is to be learned.

Teacher/Consultant 4: I personally think contextual teaching is a better way to teach. When I started thirty years ago, students were pretty passive. You say I am the teacher, you have to learn this, and they bought it. They do not buy that anymore. Students learn better now days if they can see some reason why they are doing it. Educationally this idea of connecting content with application is a better way to learn.

Teacher/Consultant 5: I believe an active learner learns better. I think they retain more. I might add that I think it makes my job more enjoyable now that I am doing more of this. I think it creates a better situation for the teacher. I am not the one who has to have all the answers, I am the one who has to guide them. I find I get to know the students more on an individual basis. I find I get to feel more like I am guiding them and it makes my job a lot more enjoyable. Before, when I was the one who had to have all of the answers and do the assessment and hold the hammer over their heads. It created a lot of stress in my life . . . this doesn't. Contextual teaching reduces the stress. I have looked at it more from my position as a teacher, but I do believe that students benefit when they are working in an atmosphere that is more conducive.

#### Question 6: Give an Example of a Contextual Teaching Lesson from Your Experience

Teacher/Consultant 1: In our integrated program we start the year by building a metal rocket that the student designs, builds, and launches. Unlike the kits that we buy we do not support any parts except the engine so they have to make the fins. We use scraps. We use tape that we wrap around dials and then slide off and that makes a good body type, pieces of balsa wood, paper clips, cut up balloons for parachutes, everything is made except the engine. The student designs it, and how big to make the fins, where to locate them and all these things.

We teach mathematics that involves area and figures, surface areas, we look at using formulas to calculate the center of pressure and the center of gravity so we can determine whether or not the rocket is stable and we use some trigonometry to determine the height the rocket obtains. And so we teach a lot of those things to the student and they listen and pay attention. Those that do not get it when you tell it to them come in later and you work with them one-on-one so that they understand how to do the mathematics. Every student does it and they understand pretty well what is going on and how it works and then

they go out and build this rocket, launch it and see it, and write about what they thought. We did that with four or five projects during the year and the results were very much the same.

Teacher/Consultant 2: One particular highlight happened early in my science teaching career. It had to do with bridge building or modeling. Of course, modeling is one of the fundamental concepts or methodologies in science. We were building bridges and actually destructing bridges upon completion. It was an engineering type of assignment. Not only did the students enjoy it, but their families became involved in it. It was surprising how many students would ask their mothers or fathers to assist and give advice. This brought the assignment to their home and it became a part of their life. It was an experience that the entire family enjoyed. Additionally, I remember another assignment that I thought was particularly important and that was in a general math class involving making change in a grocery store type situation. Students would have a partner and they would pretend to purchase and then we would have some monopoly money and coins and they would tend the purchase and then make change. It was surprising how many students have difficulty doing that.

Teacher/Consultant 3: I can tell you exactly how to construct a contextual teaching lesson for literature. The method I recommend is to create a question that arises from literature when the literature has not yet been assigned. Have the students discuss this issue from the personal point of view which may deal with real life. These students have no idea what is coming up in the literature but when they then read the literature they are going to say "ah ha," "wow," "I care about that." Then one sends the students into the text to gather information and evidence. But that is not going to be interesting unless the student connects the text with real life. As a culminating practice one asks the student to do something with the knowledge he has acquired from studying the poets, to do something with the knowledge that will make a difference to the community. I extend contextual teaching into the community — whether it be the school, the whole class or the community in a larger sense. If we study literature and we are not able to do something larger for a larger audience we have failed.

Teacher/Consultant 4: In the first unit of our Applied Chemistry (ChemCon) book it starts off where there is a mythical town of Riverwood. These students find some dead fish. The students report it to the authorities and the authorities do not know what has caused the fish kill so they shut down the water supply and they cancel a big fishing tournament. That is the theme of a whole unit. What caused the fish to die? You go through and study that something has dissolved in the water - could it be the acid? They go through the process trying to figure out what killed the fish and finally they find out that there was excess of rain a very heavy rainfall and the water was going to flood the town. So they had to release a lot of water and releasing this caused an excess of air and dissolved nitrogen. The water killed the fish. This was the same thing that happened in the Columbia River last summer - trying to save the little fish going through the spillway so they would not get chopped up - they put so much water out and the larger salmon died. The culmination of this activity is that we had a town council meeting where the students divide themselves in the town council, the various power companies, the engineers, the taxpayers and the town council has to decide who is going to pay for this. Are we going to reimburse the merchants? Does it come out of the town council funds? Are we going to pay the power company or the taxpayers? It is an

activity where the students actually decide who is going to pay for the fish killing, and it is a great teaching-learning experience.

Teacher/Consultant 5: This last year we had a business consultant come to my classes. This was her third time to come into my class first semester. She did not like the canned presentations even though they were good she wanted to do something more exciting. She brought in a product that they had introduced that did not do well and they wanted to reintroduce the product. She made it a real-life problem. She made out the calendar of her visits and she said okay here are the 10 elements of the presentation from marketing. On this day I am going to teach the class about this element and so on. My job was to reinforce that follow up and give students time. We broke the class into four different marketing groups. They then, after learning all of the elements, had to do the research and directed graphics to put the presentation together. Then she brought in her bosses. They sat there and the students have to give their marketing presentations to her bosses. That is where some of these marketing ideas really came out. The Product was an acne product. It's a facial wash. She figured one of the biggest problems was the name (Oxi-Resi-Don't) and so did all of the students. So they had the freedom to come up with a new name and a whole new packaging. They had a lot of new names. One was "Clear Away." Two of the groups saw that level of excellence that they were searching for and they had a vision of what they wanted to do and they had good leadership.

Two of the groups treated it like a typical — we will show up and try to wing it. The students started making comments about the groups that were winging it. It was not funny, it was different when I was the evaluator. But they were winging it in front of the business people. It was a joint embarrassment among the students. How could you do that? I thought that was a good lesson. As a matter of fact, I am going to use the video tape of all four of these presentations when we start school next year to help the students come up with the definition of quality. We will have them go through and watch them all and then pick out the elements that were quality and the elements that weren't. If we try to create - they have to see what they are shooting for. I don't want to create too much competition. But if they see the two that were good quality they are going to shoot for that if not higher.

#### Question 7: What in Your Experience Makes You Think Contextual Teaching Is a Superior Way to Teach?

Teacher/Consultant 1: When I work with the students that know they are going to college they tend to do well. But, when I look at the majority of students that are unlikely to complete a four year college program, and I look at their success rate, and their scores, and their classroom attitudes, I see a lot of negatives there. Then I look at kids that we have worked with contextually and I see some significant changes there and I guess it's those things that make me think it's working. And of course, there is research on how the brain works and how people learn that supports contextual teaching.

Teacher/Consultant 2: Sometimes I have students come back and visit and they tend to talk about those experiences that were contextual. They highlight their contextual student experiences. On every case it tends to be an assignment where they had their hands involved in the assignment and they remembered something about how it applied to their individual life at the time. For me, I have enjoyed it, I call the Applied Physics course, Principles of

Technology, my *tinker toy* course. Every single day we break out some equipment and we assemble the equipment then we perform with the equipment. We take some data and manipulate that data to a chart or graph and usually in the student wrap-up we question how it has to do with information that is going to be relevant to a technician. In the Principles of Technology course it is really aimed at educating the student who will be a technician. Oftentimes, I say that in science if you can't take measurements maybe it does not belong in the field of science. This means reading gauges and making some kind of measurement. I enjoy contextual teaching and I think the students enjoy manipulating the equipment. After 26 years of teaching, it is a breath of fresh air every single day.

Teacher/Consultant 3: Students care, they try, they enjoy and they remember when experiencing contextual teaching. They learn a way of discovering an imaging and creating and thinking. I think they are equipped to learn for a life time. I have worked with students who say, "Why do I have to learn this?" who have experienced contextual teaching and gone on to become really concerned citizens.

Teacher/Consultant 4: It has been my observation that contextual teaching is better because my students seem to score just as good if not better on their test scores, but I think more importantly is that we are reaching more students. The middle majority of students are learning a lot better. Sometimes we give ourselves too much of a pat on the back. I could walk into my classroom with a straight lecture and the advanced kids are not going to score any differently — but the middle majority students do a lot better with contextual teaching. It is my conclusion that contextual teaching reaches far more students than the traditional method.

Teacher/Consultant 5: The students I have had that went to college, as well as those that went out to work, the ones that made reference back to the things we did in our high school, always remind me of the contextual projects we did. They don't say how well you gave a good lecture on Karl Marx. They talk about how their business did or how valuable the projects were. When we do the one on investing and managing your money they will bring that up. They never say that was as good a speech as you ever gave. Those are the things that count . . . testimonials. I love running into my former students and talking to them most of the time. You get better feedback in a conversation than you ever do in an evaluation.

#### Question 8: Comments?

Teacher/Consultant 1: The only thing I can think of is that I would like to see more interest in the student's emotional involvement in their learning. We talk about making connections or grabbing their interests but we don't verbalize that it is often emotional. When you get that, you get learning, "on demand learning." The students need to know this to do the work they want to do because they are emotionally involved in that work and therefore they come to you and say I need to know this. They are much more willing to learn this way.

Teacher/Consultant 2: Time is a big problem. . . . Schools, and education in general, must be more creative about the use of time. Must we really be locked into a six or

seven period day for 9 months, for 12 years? Good contextual teaching requires new ways to use school time.

Teacher/Consultant 3: If one is trying to teach students to write - then teach them to write collaboratively so you can say here we have common subjects now let us together as a group figure out what our main idea is and let us together figure out the main points we want to make and then let us independently write up sections of this outline. Then at the end bring it all together. I think one can teach people to read collaboratively. It is a good idea when the material is long and boring, divide it up and everyone can share the sections that they read. So I think there are a lot of approaches or techniques in order to learn contextually in collaborative reading and writing.

I do not think we should lecture a lot at people — maybe 50 minutes for a keynote. People really need the time and the opportunities to work at schools together and they also need opportunities to work with other schools. I would take a forward moving school and ask them to work with one school for three days and then move on to another school so there can be an exchange of ideas and new perspectives. The more the teachers have something of substance to talk about and to talk with each other the more they will learn. The danger is that people will talk about interdisciplinary for example and think that is contextual without understanding that if one has a literature component in an interdisciplinary course it is still necessary to make the literature contextual.

Teacher/Consultant 4: I think there is a lot of misunderstanding about contextual teaching. Sometimes it has been related to Applied Chemistry or the Applied Physics or applied anything. There is this big thing out there that applied or contextual is ok for some people but not ok for your talented and gifted. I am finding that contextual teaching is a very sound fundamental approach for all education, and I don't think we should differentiate between contextual teaching for the at-risk kids or the talented and gifted. I think it is just a sound fundamental education. It is a practice that can be used with all students.

Teacher/Consultant 5: We must make collaborative learning happen on a bigger scale. There has to be more time and more opportunity for people to be brought together. The term *think tank* needs to happen more often. We have to avoid using some of the old terms. We have to bring folks together so they can talk about what the real stuff of education called teaching and learning. We must get over the idea that we are independent contractors.

### RESEARCH QUESTION THREE

How does a selected group of secondary school teachers actually practice contextual teaching in the classroom? The 7 teachers employed the following contextual teaching practices in their lessons (see Table 5).

TABLE 5

PROFILE OF CONTEXTUAL TEACHING PRACTICES AS PRACTICED BY THE  
TEACHER PARTICIPANTS ( $N = 7$ )

Practice	Teacher Participation						
	1	2	3	4	5	6	7
Field trip experience	X	X				X	
Applied communications							X
Teacher designed interactive assignments	X	X	X	X	X	X	X
Projects	X	X	X	X	X	X	X
Interviews	X	X	X	X	X	X	X
Community-based work	X	X				X	X
Employer participation	X	X	X	X		X	X

A profile of the 7 selected teachers reveals an average of 20.2 years in teaching per teacher (see Table 6).

TABLE 6

YEARS OF TEACHING EXPERIENCE FOR THE TEACHER PARTICIPANTS ( $N = 7$ )

Teacher	Subject	Years in Education
1	Language Arts	22.5
2	Physics	7.0
3	Social Studies	31.0
4	Language Arts	23.0
5	Social Studies	12.0
6	Social Studies	23.0
7	Language Arts	23.0

## TRAINING PROVIDED

Thirty-five teachers from the five project schools attended a 10-day workshop in June 1995. The teacher/consultants facilitated small group discussions with their specific subject matter. School groups also had an opportunity to meet together. Nationally known speaker/experts presented as well. The 7 teachers who participated in this study were part of the group of 35.

A variety of staff development strategies were implemented as the teachers were introduced to contextual teaching. Interviews with teacher/consultants were held late in the second week of the workshop. This information helped this researcher focus this study and develop the research questions.

Quarterly meetings were held with all CLIC participants at the different participating high schools and a final *celebration dinner* meeting was held at a *contextual location*, the Oregon Trail Interpretive Center, a National Historical landmark near one of the schools. Presentations included teachers sharing their successes in the classroom, activities, curriculum issues, education reform agendas, and business/industry relationships. Teachers completed quarterly progress reports relaying their *in progress* perspectives on the implementation of contextual teaching.

During the 1996 spring term this researcher focused on the 7 selected teachers for the study by conducting (a) individual classroom observations, (b) team meeting observations, (c) individual teacher interviews, and (d) student interviews.

The 1995-96 school year concluded with a 3-day CLIC workshop highlighted by school summary presentations, business/industry speakers and a national presenter on integrated, thematic curriculum, and concluding remarks by The Contextual Learning Consortium leaders.

The contextual teaching methodology, combining subject matter content with the context of application, was used during the 1995-96 school year by 32 teachers, involving 350 students, working in 15 subject areas in five Portland, Oregon, area high schools. Twenty of the participating teachers responded to a post-school-year questionnaire requesting opinions about the efficacy of using the contextual teaching methodology. It was the overall opinion of these teachers that:

- Students retained learning better when the content was linked to their real-life experiences.
- Involving students in activities where they can apply their new learning reinforced their understanding of subject matter.
- All students learned more (gifted, average, less gifted).
- Students accepted more responsibility for their own learning.
- Student discipline problems, absenteeism, and tardiness were down.
- Contextual teaching methodology is more demanding of teachers than in traditional academic classrooms.

During this culminating project workshop and part of the external evaluation, 20 teachers completed a survey on, "Opinions Concerning Contextual Teaching Methodology after Using the Contextual Methodology During the 1995-96 School Year." Results of this post survey can be seen in Table 7. This survey was conducted by an internal CLIC evaluation at the conclusion of the larger project.

TABLE 7

TEACHER OPINIONS CONCERNING THE CONTEXTUAL TEACHING  
METHODOLOGY RATINGS ( $N = 20$ )

Item	Responses ( $M$ )
1. Contextual teaching methodology will create a higher student interest in the subject matter.	1.35
2. Students retain learning better when the content is linked to their real-life experiences.	1.20
3. The best demonstration of understanding of subject matter content is the ability to apply the knowledge to new situations.	1.40
4. Understanding of the subject content is the most important element of student learning.	2.75
5. Students' long-term application of learning will be enhanced by use of contextual methodology.	1.70
6. Involving students in activities where they can apply their new learning reinforces understanding of subject matter content.	1.40
7. The contextual teaching approach is suited only for less gifted students.	4.45
8. College bound students should be taught using a theory based curriculum.	4.15
9. In contextual teaching, content is less important than demonstrating the ability to work with other students on joint projects.	3.50
10. The academic gains of students with poor academic records will not be significantly increased by contextual methodology.	4.15
11. Contextual teaching methodology eliminates the need for teachers to concentrate on student mastery of subject matter content.	4.00
12. Using contextual teaching methodology reduces student absenteeism.	2.05
13. Students learn best when they understand the reason for mastery of the subject matter.	1.70
14. Good students do not benefit from contextual methodology.	4.55
15. Students who are motivated and involved in the learning process present fewer discipline problems.	1.40
16. A major limitation of contextual teaching methodology is the extensive requirement for equipment.	3.25

Table 7 (Continued)

17. Contextual teaching methodology was more demanding of teachers than traditional academic content based classes.	2.60
18. Contextual teaching methodology is not significantly different than the current teaching methods used in my discipline.	3.10
19. There will be no difference in the level of learning of college bound students in classes using contextual teaching methodology.	3.25
20. The academic gains of average students will be significantly increased by using contextual teaching methodology.	2.05

*Note.* Scale: 1 = Strongly Agree, 2 = Agree, 3 = Don't Know, 4 = Disagree, 5 = Strongly Disagree

The teachers surveyed clearly see contextual teaching as a superior way to teach. Nearly all the respondents agree or strongly agree that students retain learning better when the content is linked to their real-life experiences, and that the contextual teaching methodology creates higher student interest in the subject matter being taught. It is also interesting to note that nearly all the respondents disagree or strongly disagree with the statement that the contextual teaching approach is suited only for less academically gifted students, or that college-bound students do not benefit from the contextual teaching methodology. There was also strong disagreement with the statement that contextual teaching eliminates the need for teachers to concentrate on student mastery of subject matter content. Rather, contextual teaching will help more students learn more.

### CLASSROOM OBSERVATIONS

Two separate classroom observations of each teacher were made by this researcher in the spring, 1996, which helped to substantiate the variety of experiences that might be involved in contextual teaching. The following are a sampling of observations.

### Observation #1

This researcher accompanied a contextual teacher team and their students on a field trip from High School A, on a day long trip up the Columbia River of Oregon on the Great Rivers II vessel. The Great Rivers II is a tourist ship that leaves Jantzen Beach early each morning. Captain Ed, a long-time Columbia River skipper, began narration at 7:00 a.m. and continued narratives throughout the day. He explained the Pacific Northwest economies, relationship to the river, wildlife, transportation, geography, history, and geology. He was a long-time Columbia River skipper. Stops were made during the cruise at Bonneville Dam, with a separate self-guided tour; the Columbia River Gorge Interpretive Center at Stevenson, Washington; and at Hood River, Oregon, for touring and exploration.

The students were well-prepared for this experience with a packet of contextual assignments (see Appendix B samples of contextual assignments) given by each of the teachers. Assignments involved an interdisciplinary and integrated approach. Students asked questions of the teachers, crew members, and tour guides as they searched for answers to their contextual learning questions.

This researcher observed and interviewed the students, teachers, and high school principal during the field trip; positive responses to contextual teaching were made by both teachers and students. As one student said, "This is the first time I have really been interested in school work. I am here everyday and enjoy learning." The staff was well organized with clear learning goals and modeled a cohesive interdisciplinary team-teaching approach. The lessons on the ship were a culminating project for this contextual class led by a teaching team.

### Observations #2

An English teacher in High School B was observed as she delivered a lesson from a ready-made contextual teaching curriculum called Applied Communications. This program was developed for national distribution at the University of Indiana and contains workbooks, videos, and teaching modules.

One lesson observed included watching an applied communication video featuring job readiness and skills needed to work in a security company. The skills emphasized included listening, writing, and speaking. Students completed a writing assignment after the video and participated in a short discussion on job readiness. The teacher also included daily journal writing and current movie reports which were created by the students.

### Observation #3

Interviewing graduates about their high school experience and writing about the interviews was another example of contextual teaching observed by this researcher in this English classroom. The activity was called "Living History Lessons." The principal had given interview tips the day before this lesson on interviewing graduates of the high school, and the interview questions were designed with teacher assistance. The high school graduates interviewed by the students came from around the high school attendance area, several were parents and employees of the school district. Graduates ranged in age from 25 to 70 years of age. Displays of the student work (written summaries/pictures) appeared in the school library display case following the writing unit.

### Observation #4

A contextual teacher-team from High School C planned and designed student learning projects together for a block of 9th and 10th grade students. They met throughout

the year during an every-other-day planning session. The school supported this concept and was committed to implementing contextual teaching practice. One of the interesting observations was of a project called *Define a Decade*. Students were placed into teams with the assignment to study a specific decade in history. Students researched various aspects of that decade with activities such as publishing a decade newspaper, paintings depicting significant events on the classroom walls (with art teacher assistance), and delivering a culminating live skit wearing the costumes of the period. This researcher observed the wall art, student classroom interaction, and teacher planning sessions. In all cases, the teacher indicated that student attendance was up and discipline problems down with students actively engaged in their learning.

#### Observation #5

A garden project (researcher observed garden area during teacher-led tour) was developed by the contextual teacher-team at High School C. Students were assigned responsibility for a 3-foot square plot of ground behind the school. The objectives of this project included the scientific study of cells, plant growth, and use of the microscope. Students also wrote in journals about their gardens, built a garden shed, and cared for this area of the school as evidenced by obvious protective student attitudes. During one observation the teachers asked where an absent student was when someone said, "I bet he's out at the gardens." Indeed, he was out watering and weeding.

#### Observation #6

An inquiry unit was developed as another contextual teaching project. The teachers were concerned about meeting the state content standards in the area of developing inquiry skills. The culminating year-end project thus became the *Inquiry Unit*. Students were given

a study framework to explore an area of interest. Two students interviewed for this research project mentioned this unit and their topics. Students were asked to study an interest of theirs. One student, who had always been fascinated by dreams, conducted a study of dreams. Another student had seen a story on television about cows. She developed a research project on a study of cows.

#### Observation #7

Community-based experiences were observed in 4 of the 7 teacher observations and interviews. An example of one observation was science and social studies teachers co-teaching a unit called *Watershed Fair*. Students were assigned in and out-of-school experiences that might environmentally enhance part of the community. The teachers noted one student who could not read or write very well, but he became very active in this project and successfully assisted the teachers in sponsoring the *Watershed Fair*.

Not all of the contextual projects at this high school were successful. As an example, one contextual-team reported a failure with a landfill simulation study. They were unsure why the students did not like it and felt perhaps they were not as organized as they might have been, or that the project goals were not clear.

#### Observation #8

The strategy of tying local employers and businesses to the classroom was observed in 6 of the 7 teachers' classrooms. This involvement ranged from job shadowing to integrating language arts with radio communications by creating a local children's talk show, to creating a community newspaper with help from community newspapers. The School to Careers movement has provided foundation components, funding, and impetus for this strategy. As an example, in one observation, a nationally recognized commercial

graphics art studio loaned High School A an employee skilled in developing clay model animated characters for television. This company representative worked with graphic arts students to develop animated characters for a real-life television production. Two of the students were actually employed by this studio as student interns.

### STUDENT INTERVIEWS

Eleven students were selected by the 7 teachers participating in this study for a focus group interview. This researcher requested that student selection reflect diversity (gender, ethnicity), and that the students represent different academic achievement (see Table 8). The students self-described their status as: (a) 5 = good students, (b) 5 = average students, (c) 1 = below average student.

TABLE 8  
STUDENT PROFILES

Student	Gender	Diversity	Grade	GPA
1	Male	White	9	B
2	Female	White	10	A
3	Female	Asian/American	9	A/B
4	Male	White	11	B/C
5	Female	White	11	B/C
6	Female	White	12	B/C
7	Male	White	12	A
8	Male	Hispanic	9	B/C
9	Male	Hispanic	11	A
10	Female	White	9	B/C
11	Female	Asian/American	9	A/B

## STUDENT PERSPECTIVES

The 11 students responded to five questions in the focus interview.

*Tell me about your education experience (teaching-learning aspects).*

- School has become interesting.
- I now like to learn.
- I'm a hands-on learner.
- It all depends on the teacher and my relationship with them.
- I enjoy school, it's been good.
- I like teachers who ask questions not the same old blah, blah, plug, and chug.
- I like to listen.
- I like the traditional way better because I know what to expect, I'm not learning enough, I haven't learned prepositions yet.
- Kids make fun of me in math and science.

*What are your understandings of contextual teaching? What is it? What are its key elements? How did you learn about it?*

- It's cool.
- It's more fun.
- I love this way of teaching.
- There is no teacher, only a coach and each student shares knowledge.
- The lesson is applied to practical uses in real life.
- From what I've been able to see, there is more interaction, the résumé thing, stuff you can use.
- It tries to integrate subjects, but everything else seems the same.

*Give some examples of contextual teaching that you have experienced.*

- I loved the automotive unit.
- I liked to study the history of the guitar — I made a model and explained the parts.
- I liked the decade unit — we painted a section of the classroom wall depicting a 1960s history and then did a skit about it.
- The gardening project was cool.
- The housing project was interesting.
- I liked the inquiry unit. My project was on dreams, asking friends about dreams then analyzing them.

- The field trip on the Columbia River was great.
- I can use the desktop publishing software.
- The job application and résumé study was helpful.
- I developed my autobiography with use of technology.
- I applied physics to rides at the Rose Festival.

*What do you think are advantages of contextual teaching as compared to other teaching strategies.*

- You pay more attention.
- More hands on.
- I learn more.
- They [teachers] act more human than other teachers.
- I like it a lot, it's more fun.
- Makes us want to learn.
- Teachers don't focus on grades, they focus on learning.

•I see a reason to go to class, I can see the effects of it when I apply for a job, I'm ready.

•It's more interesting than sitting and listening to lectures.

•Sometimes there is too much freedom, sometimes I need a kick in the butt, sometimes it's confusing.

•I might get off track and not learn as much.

•I can't think of any disadvantages.

•I'm missing out on meeting new people [students in same classes] and missed some fun things other classes are doing.

•Some people might get lost in the madness. This kind of teaching is a little unorthodox.

•It's hard to keep up with assignments, not a lot of time to work.

•It is sometimes confusing.

•I might be behind next year.

*Disadvantages/comments.*

•Parents don't know about it.

•Teachers are sometimes unorganized, kids run around and are disruptive.

•I'm not used to it.

•I'm more organized.

•Everything's pretty easy for me.

•It's a good idea.

•I learn better with other people, that's good because we worked a lot in groups.

•We learned a lot compared to doing worksheets, we did a lot of daily writing, a nice little change, you can write about anything.

- I like this way better than the old way.
- It's a good idea, the students are interested and learn better.

### OTHER STUDENT OPINIONS

In the larger Contextual Learning Institute and Consortium Project, student opinions were solicited by an end of the 1995-96 academic year student survey. There were 310 responses to the survey. There was a considerable mix in grade level and subject matter disciplines. Student survey items dealt with the students' perceived academic progress and learning styles and student opinions about contextual teaching and learning as they have experienced it.

### PARTICIPATING STUDENT OPINIONS SUMMARY

The 11 study student-participants said that they learn better if they know *why* a given lesson is important and when they know how to *apply* knowledge and skills to real-life situations.

Students said that they enjoyed the contextual learning classrooms more than the traditional classrooms where you just sit in rows and listen. As one student observed, "In traditional classrooms, you go to this class, go to that class, you study a little of this and a little of that and nothing connects."

The students felt they learned more and wanted to see more contextual teaching utilized in more of their classes. Block students gave highest marks in favor of contextual teaching. The longer class sessions and teamwork are significant keys for successful contextual teaching experiences. Student opinion was positive regarding contextual teaching.

Based upon an examination of the research literature, teacher expert opinions, student and teacher perspectives, and observation of classroom practices, certain conclusions can be reached about the commonalities and characteristics of contextual teaching. At the outset of this field study, it was the initial hypothesis of this researcher that contextual teaching is a promising pedagogical development and much can be learned about contextual teaching by utilizing the field study techniques outlined in Chapter III. This research focused upon bringing clarity to the concept of contextual teaching by concentrating on the following research questions:

1. How does the research literature define contextual teaching and how is it described?
2. How does a panel of teacher consultants who have had success in utilizing contextual teaching techniques characterize and define the methodology?
3. How does a selected group of secondary school teachers actually practice contextual teaching in the classroom?
4. What do high school students who have experienced contextual teaching have to say about this teaching methodology?
5. What is the definition of contextual teaching based upon this investigative field study?
6. What are the key characteristics and commonalities of contextual teaching based upon the findings of this field study?

## RESEARCH QUESTION ONE

How does the research literature define contextual teaching and how it is described?

One could easily become confused about contextual teaching upon reading the research literature because so many different terms and phrases are used to essentially describe the same thing: contextual teaching. However, whether it is called experiential learning, or situated cognition, or logolearning, or project-based learning, or applied learning, or integrated instruction, they call for the cognitive process of integrating knowing with doing.

Contextual teaching has its roots in nineteenth and early twentieth century educational psychology and philosophy. It was William James (1842-1910), physician and philosopher, considered the founder of the field of modern psychology, who gave the concept of contextual teaching form and focus. As a proponent of functional psychology, he held that belief and knowledge cannot be separated from action and experience. His favorite observation was, "No reception without reaction, no impression without correlative expression" (James, 1958, p. 41). James urged teachers to develop teaching approaches that helped students put new knowledge to immediate use by combining knowing with doing.

The work of John Dewey (1859-1952) has been important in the development of the concepts involved in contextual teaching. Dewey wanted teachers to use real-life social settings in the teaching learning process. He argued repeatedly against the separation of knowledge from experiential application. His influence provided the intellectual foundation for most of the education reforms of the 1920s and 1930s. In 1931 John Dewey commented on these criticisms in a lecture at Harvard University:

We are in the midst of great educational uncertainty, one probably unparalleled at any past time . . . conservatives who urge a return to former standards and practices, and radicals who criticize present conditions agree

at least on one point: neither party is satisfied with the way things are.  
(Dewey, 1931, p. 1)

It can be observed that the Dewey comment on the condition of education in 1931 could easily have been made in 1997. Educators are still endeavoring to get it right. What is important to note is that Dewey brought forward in the public consciousness the concept that learning in order to know must be connected with learning in order to do.

These early educational reforms stressed the theory of learning by doing and influenced the development of such diverse educational initiatives as student government and vocational education, and became known as the Progressive Education Movement. The Progressive Education Association went out of existence in 1955 amidst charges that the followers of Dewey placed so much emphasis on the doing side of education that knowing was diminished.

The rise of cognitive science in the 1950s and 1960s has also provided important insights into contextual teaching and learning. Jerome Bruner (1996), who taught and researched at Harvard University for many years, might be called the father of the modern cognitive science movement. Bruner worked at bridging philosophical and biological theories about learning to form the beginnings of cognitive science. It was Bruner's work in understanding the processes of the human brain and relating that to the teaching and learning process that sparked new interest in the study of how humans learn. Bruner (1996) states:

Thoughtful people have been forever troubled by the enigmas of applying theoretical knowledge to practical problems. Applying psychological theory to educational practice is no exception to the rules, not much less puzzling than applying science to medicine. . . . The challenge is always to situate our knowledge in the living context that poses the "presenting problem," to borrow a bit of medical jargon. And that living context, where education is concerned, is the schoolroom — the schoolroom situated in a broader culture. (p. 44)

There is one presenting problem that is always with us in dealing with teaching and learning, one that is so pervasive, and so much a part of the fabric of the education process, that we often fail to notice it. The proverb, "the fish will be the last to discover water," best describes this dilemma. Teachers will often say, "How can I reach all my students in all their diversity?" Students often ask the question, "Why do I have to learn this?" The answers to these perplexing questions and their relevance to the teaching and learning process have been largely overlooked in current education reform efforts. Contextual teaching aims, at least in part, to providing answers to these important pedagogical questions.

In a recent large scale of student achievement in Texas, Ronald Ferguson (1997) found that the single most important measurable cause of increased student learning was teacher expertise and teaching methodology including teachers preparation and experience levels (cited in Darling-Hammond & Falk, 1997). The effects were so powerful that the wide disparities in achievement between black and white students in his sample were almost entirely accounted for by the differences in the qualifications of teachers.

## RESEARCH QUESTION TWO

How does a panel of teacher consultants who have had success in utilizing contextual teaching techniques characterize and define the methodology?

The panel of experienced teacher consultants defined contextual teaching in varying ways. Unanimous agreement existed for contextual teaching as teaching that overtly attempts to connect what a student is learning to some aspect of a real-world experience. They also agreed that this is easier said than done. However, the panel of experienced

teachers studied indicated that at least seven key elements were involved in this brief definition.

1. The first element was establishing a clear linking objective between knowing and doing. Knowledge is important, but not in isolation from the practical application of that knowledge. What a student must know in any given lesson should be established early, as well as how the student can apply that knowledge. Contextual teaching aims at increased proficiency and increased numbers of students learning.

2. The second element is to find something to which the student can relate. Students must believe that what they are expected to learn has some connection to everyday life.

3. The third element involved in contextual teaching creates a learning environment where students can draw the connections among different subject matter disciplines and bring subject matter content together within the context of application.

4. The fourth element emphasizes that an active and involved student will learn more than a passive student. Active learning requires new and creative structures for the school day and the use of class time.

5. The fifth element of contextual teaching is teamwork and collaboration. Students and teachers work together to solve problems. Students need time and opportunity to develop teamwork skills.

6. The sixth element requires the understanding that contextual teaching and learning is not about teaching different knowledge and skills, but teaching knowledge and skills differently. It is a shift in pedagogy.

7. The seventh element of contextual teaching changes the role of the teacher from expert and having all the answers to the role of a coach. The coach leads and plans for better performance through teamwork.

### RESEARCH QUESTION THREE

How does a selected group of secondary school teachers actually practice contextual teaching in the classroom?

In the Oregon State University School of Education Contextual Learning Institute and Consortium, the contextual teaching methodology was practiced by 32 high school teachers during the 1995-96 school year. This project involved 350 students in five Portland, Oregon, area urban high schools. Contextual learning teacher teams were formed in each school with the teams led by the school principal.

Out of the 32 teachers involved in the project, 7 teachers were selected to participate in this field study research. The 7 teachers were selected on the basis of their demonstrated interest in teaching contextually and their academic teaching areas of English, social studies, and science which have usually been taught with traditional methodology.

The validation process involved a review of course syllabus materials, conversations with the teachers about contextual lessons, classroom visitations by this researcher, and gaining the opinions of the teachers in an end-of-the-school year interviews.

#### What the Teachers Said They Would Try To Do

In pre-contextual lesson discussions with the teachers and from an analysis of the course syllabus materials, the teachers were fairly united in indicating what they were attempting to accomplish. These proposed accomplishments can be summarized into seven major areas:

1. The academic curriculum will be tied to practical, real-world problems and challenges insofar as possible.
2. Students will be involved in many hands on experiences.
3. Lessons will be aimed at helping students develop knowledge and skills linked to vocations or avocations.
4. The major focus of the teaching process will be to help students see meaning in each lesson by making the connection between knowledge and the application of knowledge.
5. Wherever possible, lessons will be developed with active student participation. Lessons should not only be academically appropriate, but interesting and fun.
6. Collaborative teamwork on the part of teacher teams and student teams will be enacted using interdisciplinary approaches wherever possible.
7. The role of the teacher will change from the lecturer role to a facilitator/coach role.

#### Researcher Observations

In order to validate the proposed accomplishments of the teachers and determine if teachers were doing what they proposed, classroom visits to assess the congruence between proposals and practice were conducted. Four different contextual teaching strategies were observed aimed at fulfilling the proposed accomplishments.

The first strategy observed was an integrated interdisciplinary approach culminating with an all-day field trip on the Columbia River. A team of four teachers were involved from the disciplines of social studies, science, English, and mathematics. The students were given problem-solving activities involving environmental issues, history of the peoples of the Columbia River, the Bonneville Dam, and mathematics problems (e.g., analyzing the

speed of the river flow and computing the progress of the boat, Great Rivers II, at varying rates of speed). Journal writing was required of each student as well.

The second strategy was called an interactive thematic teaching technique. The teaching team included four teachers representing science, social studies, health, and English. The lesson was entitled, *Define a Decade* and involved 90 high school freshman and sophomores. Student teams were assigned a decade in history to research. Student teams were required to publish a newsletter writing about such research topics as the economy of their decade, the cost of goods and services, the dress and styles of their decade, careers of their decade, political and social issues of the time, and scientific discoveries and inventions. As culminating events/activities, student teams delivered a live skit of decade events and painted the events in segments on a classroom wall.

Another strategy observed was problem-solving in a physics class. Students were challenged to use technology as a tool to solve physics problems involving the integrated study of mechanical systems, fluid power systems, thermal systems, and electrical systems. Students were assigned various real-life problems involving some aspect of physics. As an example, one student team developed an instrument to measure how fast individuals were walking in the high school halls. What was striking in observing this problem-solving approach in terms of contextual teaching was that students focused on meaning. Instead of focusing on memorization, the students endeavored to understand the application of knowledge.

In summary, all of the teachers were doing what they had proposed to do at the beginning of the school year, and had documented student progress. The teachers had moved, almost unobtrusively, from the role of lecturer to the role of coach and facilitator.

Four areas of observation and comment were apparent to the researcher. Teachers, positive in their appraisal of contextual teaching, made these comments.

#### One: Typical Teacher Comments About Contextual Teaching

- It works well for all students.
- It is more time consuming.
- It creates much better results in student performance, attendance, and student discipline.

- We cannot continue to try to operate in a vacuum and lose 70% of our students. Contextual teaching just may be the answer.

- This is the direction we need to follow in education. Contextual learning is the vehicle that allows us to provide a meaningful learning experience in schools. Students learning about themselves, how they learn as individuals and as team. It is from the heart as well as the head!

- Contextual teaching demands commitment and energy. It is challenging and time-consuming to develop, teach, and refine contextual lessons; however, the payoff is worth it. Active and involved students present fewer attendance and discipline problems. When students see an application for the content, they are willing to commit to learning. The students and I had fun.

- The contextual approach makes learning more interesting and more practical for all students.

- Students are given the opportunity to exceed expectations.
- Contextual teaching is interesting for students and teachers. It is an effective learning strategy.

**Two: General Observations Made by Teachers After Implementing Contextual Teaching for the 1995-96 School Year**

- Teachers must be lifelong learners.
- Teachers must have rich backgrounds to teach contextually.
- Not all teachers are prepared to teach this way.
- Whatever is taught, there should be some kind of real-life connection.
- Teachers need a lot of energy to teach using this method.
- My teaching has developed a compassionate connection with students.
- Students need to see the application first.
- Contextual teaching builds confidence and confident students can succeed in the next level.
- Students thrive when the end product is known.

**Three: Advantages of Contextual Teaching as Observed by the Classroom Teachers**

- Contextual teaching engages and motivates students.
- Teacher and student energy level goes up.
- Student learning goes up.
- Textbooks may not be needed, only supplementary materials and abundant reference material for some concepts.
- Student attendance is better.
- Student productivity is up.

**Four: Disadvantages of Contextual Teaching as Observed by the Classroom Teachers**

- Increased planning time is needed, particularly when involving teacher teams.
- It is hard to evaluate as you're doing it.

- Time limits the covering the needed material. We must organize the school day and year differently.

#### RESEARCH QUESTION FOUR

What do high school students who have experienced contextual teaching have to say about this teaching methodology?

Student opinions of contextual teaching methodology were solicited in an end of the 1995-96 school year questionnaire developed by the CLIC outside evaluation, as well as conducting interviews with 11 of these students. There were 310 usable responses to the CLIC survey.

Students indicated that they learn better and remember longer if they can see the application of the knowledge to be learned. Both of these factors are foundation stones in the theory of contextual teaching and tend to support the validity of the contextual teaching methodology (see items 4 and 7 in Table 9). When students were asked to respond to the statement, "If I use information I have learned, I remember it better," there was an overwhelming response with most students indicating *almost always*.

Typical comments from students were overwhelmingly positive. However, it must be noted that a few students were uncomfortable with working in groups and with the lack of the *sit-in-rows and listen* structure of the traditional classroom.

Here is a range of student interview comments:

- I used to hate school. I don't dread it now.
- I am a hands on learner, so this is great for me.
- This makes school fun and easier to learn.

•From what I am able to see, there is more interaction and stuff that you can use later.

- I like the traditional classroom better. I wonder if I am learning enough?
- I like to listen more than participate.
- I like teachers who ask questions, not the same old blah, blah, plug and chug.

TABLE 9

STUDENT SURVEY: LEARNING STYLE AND  
ACADEMIC PROGRESS ( $N = 310$ )

Item	<i>M</i>
1. Based on my past grades and performance in school, I would consider myself (a) an excellent student (A student), (b) a good student (B student), (c) an average student © student), or (d) a poor student (D/F student).	Data not reported
2. I do not have to work hard to learn my subjects.	1.92
3. It is easy for me to learn things by reading about them.	1.96
4. I learn best if I understand how I can use the information.	1.41
5. I learn best by listening to the teacher, taking notes, and reading about the subject.	1.89
6. I enjoy working with others when I learn.	1.44
7. If I use information I have learned, I remember it better.	1.29
8. Good grades are easy for me to get.	1.88
9. I prefer studying by myself.	1.94
10. Knowing why we are learning something and applying it to problems helps me learn.	1.67

*Note.* Scale: 1 = Almost Always, 2 = Sometimes, 3 = Almost Never.

## RESEARCH QUESTION FIVE

What is the definition of contextual teaching based upon this investigative field study?

One word that stands out in the research of the literature, classroom observations, and student and teacher interviews; it is the word *connections*. As one student said in criticism of previous school experiences, "you study a little of this and a little of that, and nothing connects." Teachers involved in this study, as well as students, were unanimous in stressing that contextual teaching help students make the connections between what goes on in the classroom with what goes on in real-life situations.

Another word that was commonly used by students and teachers was *application*. Teachers observed that students engaged in activities that required use of learning, both content knowledge and their application of knowledge developed together. The literature review and students comments, in particular, indicated that too often in the school experience little effort is made to connect classroom teaching with the world in which students live on a daily basis. Often the presentation of fragmented knowledge, presented in subject matter disciplines, is primarily used to pass a superficial knowledge test, rather than to solve real-life problems.

The word *meaning* often appeared in the literature and was used often by students and teachers. The teachers involved in this study explained that large numbers of students are not finding meaning in their school experiences. They are not learning to solve real-life problems or even to acquire the knowledge they are told they will need later. Teachers concluded that few teaching strategies will so effectively help students find meaning in their education as helping them understand the connection between classroom subject matter and

the challenges they will encounter in the course of living. Contextual teaching should always strive to find some concrete meaning or purpose for every classroom lesson.

This study has concluded that it is possible to define contextual teaching based upon the words that continually appeared in the literature, in classroom observations, and in student and teacher interviews.

### DEFINITION OF CONTEXTUAL TEACHING

Based upon the findings of this field study, contextual teaching is defined as an educational philosophy and an instructional strategy which enables students to see meaning and relevance in their education. Knowledge and the application of that knowledge are deliberately tied together in the teaching process. Contextual teaching aims at helping all students make the connections between subject matter content and the context of application.

### RESEARCH QUESTION SIX

What are the key characteristics and commonalities of contextual teaching based upon the findings of this field study? Besides providing connections, meaning, and relevance for student learning, the following characteristics were found in this study.

- The heart of contextual teaching is helping students make the connections between subject matter content and the context of application.

- Teachers endeavor to integrate subject matter content with the context of application or use.

- Teachers endeavor to assure that more students gain knowledge. Subject matter content is not shortchanged, but to retain knowledge, students must actively see the application of knowledge.

- The focus of the teaching learning process is student learning rather than subject matter and the teaching act is always aimed at teaching for meaning, relevance, and connection.

- Teaching must relate the subject matter content to real-life situations wherever possible. Student assignments cannot be viewed as busy work or trivial.

- The teacher must also be a learner applying critical thinking and analyzing thinking processes.

- Contextual teaching depends heavily upon collaborative teamwork which requires extra planning time.

- Contextual teaching moves the teacher away from the role of lecturer to the role of coach and facilitator.

- Teaching teams were more successful and satisfied than were teachers teaching in isolation.

## SUMMARY

As a result of this study, certain conclusions and recommendations can be developed about contextual teaching. By triangulating conversations with the panel of teacher/consultants, interviews with, and observations of the teacher participants, and interviews with students characteristics and commonalities about contextual teaching are revealed. These are described in the Chapter V.

## CHAPTER V

### CONCLUSIONS

Significant concluding observations from this investigative field study include the areas of teaching and learning, teaching teamwork, the use of instructional time, and a definition and characteristics of contextual teaching. A key observation emanating from this study focuses upon how to help all students, rather than just some students, to increase student achievement. This study has endeavored to highlight potential strategies.

### TEACHING AND LEARNING

Contextual teaching viewed as teaching a different set of facts, or knowledge, or skills is inaccurate. Contextual teaching is teaching facts, knowledge, and skills but in a different way.

One of the significant criticisms of schooling today as found in the literature and supported through teacher observations is the failure to help students make the connections between: (a) one subject matter discipline and another, (b) knowledge and the application of knowledge, (c) schooling and real-life experiences, (d) integration of content standards and vocational education, (e) subject-matter content and the context of application, and (f) knowing and doing.

The contextual teaching profile highlights a variety of strategies used by the teachers: field trip experiences, applied communication simulations, teacher designed interactive assignments, project-based teaching, interviews, community-based work, and employer participation. These instructional strategies observed in the study emphasized

helping students make connections. The contextual strategies ranged from 1-minute lessons to 9-week units.

Teachers observed and interviewed saw contextual teaching as an instructional strategy for all students that should be promoted and pursued because more students were successful in their classes and were motivated to come to class. They worked diligently to help all students relate their school work with the real world and to be able to apply their learning in real-life contexts. Their teaching combined rigor (content standards) and relevance (contextual teaching strategies) with the goal that all student learning would increase. A review of student grades and attendance records indicate higher student achievement, attendance, and grades.

The inclusion of all students in contextual teaching was observed. Teachers indicated that all students gained from contextual teaching strategies: the special needs student, the average student, and the gifted student.

Educators still know so little about the human brain processes knowledge and how individuals learn. Brain-based teaching and learning have great potential for teachers. Earlier cited research indicate significant increases in student achievement when brain-based teaching and learning is implemented. This practice needs to become commonplace in school; teachers need more training and the understanding that is an asset to helping understand student learns better.

#### TEACHER TEAMWORK

Teachers and students involved in this research frequently stressed the importance of collaborative learning. Contextual teaching works best when teachers collaborate and when students learn to work easily in teams.

The transformation of the workplace from labor-intensive to brain-intensive requires teamwork based operations based on the literature review. Workers must remain resourceful, enthusiastic, imaginative, and know how to work in teams. This observation argues for teamwork and contextual problem-solving in education settings, and not the isolated acquisition of knowledge which is much too typical of contemporary education. Both teachers and students were better prepared for school and seemed to enjoy the schooling experience.

After spending time in the classrooms of the 7 study teachers, it is clear that those teachers recognize the importance of working together with common planning time and allowing students to do the same. Teacher teamwork also allows for increased networking with colleagues. Teachers participating in this study indicated a sense of renewal and enthusiasm for contextual teaching. This was a result of the opportunity to work closely together with continuous dialogue during the school year and during summer workshops. As teachers' schedules are developed, it is important that time to work together be included in the school's master schedule.

## ORGANIZATION AND THE USE OF INSTRUCTIONAL TIME

One unanticipated result of this study has been the request to think differently about the use of time in the educational process. Contextual teaching requires longer school periods and more teamwork planning time. Educational institutions seem to be trapped into utilizing time only on the basis of summer vacation, quarter systems, 9-month school years, and 45 to 50-minute periods. This research indicates a need for common teacher planning time and the use of block scheduling for best results.

Education has been trapped in a standardized system of grading periods, semesters, and teaching hours that does little to recognize individual student differences in learning speeds and styles. Teachers in the study indicated a need to better understand their students' individual learning styles. They sought input, student inventories, and direction from the school guidance departments and school psychologists for assistance with their students.

Many of the teacher experts and teacher participants in this study felt that for contextual teaching to be really effective, teachers need common planning times, as mentioned previously. Time has become the constant and competence the variable. Contextual teaching requires a restructuring of school days, school years, and testing and grading practices, with competence the constant and time the variable.

Providing students with more contextual experiences requires more teacher planning and resource time. Both teachers and students seemed flexible in their approach to time. In this study, flexibility is required by teachers, students, and administrators for increased student success.

#### DEFINITION AND KEY CHARACTERISTICS OF CONTEXTUAL TEACHING

Consensus from this group of teachers stressed that the definition be user friendly, not so complicated that other teachers could not understand what it was or did. Those involved in this study define contextual teaching in varying ways, but there was unanimous agreement that the basis for contextual teaching is making the connections between what a student is trying to learn and some aspect of a real-world experience. The teachers participating in this study define contextual teaching as school experiences that provide meaning, relevance, and real-life experiences and connections. The key characteristics of contextual teaching is identified by this study included:

- Students learn more by combining knowledge and doing wherever possible.
- Students see that learning expectations have some connection to everyday life.
- Students draw connections between different subject matter disciplines bringing together content and context of application.
- Students and teachers use teamwork and collaboration to solve real-life problems.
- Emphasizes that active and involved students learn more, while requiring creative ways of dealing with school structure and calendar.
- Contextual pedagogy stresses teaching knowledge and skills differently, not teaching different knowledge and skills.
- The role of the teacher changes from expert to that of coach.

Based upon findings of this field study, a common definition of this research should be adopted as follows: Contextual teaching can be defined as an instructional strategy focusing on enabling students to see meaning and relevance in their education. Knowledge and application of knowledge are deliberately tied together in the teaching act. Contextual teaching aims at helping all students make connections between subject matter content and context of application.

### RECOMMENDATIONS FOR FURTHER RESEARCH

In a study of this kind, one becomes increasingly aware of the vast amount of research and knowledge about teaching and learning yet to be uncovered. Several areas are suggested for future research.

- Teachers indicate that administrative commitment and support was critical in order for contextual teaching to be successful. School administrators need to give more than lip service to contextual teaching. It changes a traditional school environment when students are

not lined up in rows or are out in the halls or community doing their learning. Further study is needed regarding the importance of school leadership in the practice of teaching contextually. Additional study of successful practices would also help administrators in understanding the difference contextual teaching can make.

- Educational leaders, at all levels of education, must give higher priority to improving the teaching-learning process with special attention given to the effectiveness of contextual teaching for studying the teaching-learning process with special attention given to the effectiveness of contextual teaching. Pre-service teacher training and in-service professional development programs in contextual teaching are fundamental to the advancement of this methodology. Research attention must be given to the study of the management of time to match how students best learn. The staff development models and strategies that are most effective and efficient is another area of research needed.

- The student viewpoint regarding contextual teaching needs further study and clarification. The current approach to teaching, as described in the Bill Graves (1997) report on Marshall High School, works for some students, particularly those bound for the university. However, the theoretical teaching approach does not work well for the majority of students who do not learn easily using abstractions. This study was limited to 11 students. Some of the students did not understand their own learning style or know what options even exist for instructions. Students of all ages need to have a better understanding of what works well for them as learnings. This researcher sees a next step for contextual teaching would be more student involvement in the teaching-learning process. An examination of the student's role in designing curriculum is needed. Questions needing to be addressed: Whose context is it? Should the contextual lessons be the teacher's idea or the students'? Should the school assign contextual topics? Further exploration is needed in this area.

- This study did not address the issues of testing to indicate student success.

Certainly the area of assessment needs attention with the use of standardized instruments that would measure increased student learning. The ACT tests taken by students in the larger CLIC study did not address this with much satisfaction. It took into account content knowledge in specific content and student achievement in four academic areas. Student surveys were used as a measure to determine student satisfaction and understanding of contextual teaching.

- The continued rise in the Oregon high school dropout rate is alarming. There is much emphasis in Oregon educational circles regarding the Certificate of Initial Mastery (CIM) and Certificate of Advanced Mastery (CAM) but little on the change of instructional practice to meet student learning needs. Higher standards are incorporated into the CIM and CAM but many teachers are still teaching the same way they were taught: via mastery lecture with student achievement not improving. Additional monitoring of the dropout rate as the CIM and CAM are implemented needs to be addressed in Oregon

- This study did not focus on subject matter content. However, subject matter content must not be overlooked. This study only urges a balance between content and the context of application. Contextual teaching is a promising practice aimed at bridging the gap between higher standards and the student achievement required to meet those standards. Research on how content standards can be met with contextual teaching practices would be beneficial.

This study concludes that contextual teaching can raise student achievement in selected courses, increase student attendance, promote collegiality between and among students and teachers, and provide renewed enthusiasm for teaching. Therefore, contextual teaching should be taught to pre-service and in-service staff.

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## **APPENDICES**

## **APPENDIX A**

### **STUDENT AND TEACHER SURVEYS**

Contextual Teaching Study

Spring 1996

STUDENT INTERVIEW QUESTIONS

1. Tell me about your educational experience (teaching-learning aspects).
2. What are your understandings of contextual teaching? What is it? What are its key elements? How did you learn about it?
3. Give some examples of contextual teaching that you have experienced.
4. What do you think are advantages of contextual teaching as compared to other teaching strategies?
5. Disadvantages?
6. Comments/other.

Contextual Teaching Study

Spring 1996

TEACHER INTERVIEW QUESTIONS

1. Tell me about your professional educator background (length of time taught, subjects taught).
2. What are your understandings of contextual teaching? What is it? What are its key elements? How did you learn about it? When did you begin to implement contextual teaching in the classroom?
3. Give some classroom examples of contextual teaching.
4. What do you think are advantages of contextual teaching as compared to other teaching strategies?
5. Disadvantages?
6. Comments/other.

## **APPENDIX B**

### **HUMAN SUBJECTS CONSENT FORM**

## INFORMED CONSENT FORM FOR TEACHER

Contextual Course Study

Sue Shields, Research Investigator

You are invited to participate in a research project. This study will look for the characteristics and commonalities of contextual teaching as practiced in selected educational settings. The results of the study will be of value to both those seeking new knowledge about the practice of contextual teaching and those making instruction decisions.

The research investigator will observe and take field notes in contextually taught classes and will interview the teachers and students of these classes regarding their perceptions of contextual teaching. Demographic and academic information from high school counseling offices will be used to develop student profiles for the observed classes. There is no foreseeable risk for participants. Data can be accessed by only the research investigator and the supervising profession; fictitious names will be used to refer to students, teachers, and schools; and a numerical system will maintain the confidentiality of the research and the report.

Participation is voluntary, and a participant may withdraw from the study at any time without penalty or prejudice. If you wish to participate, the only requirement is your signature on this consent form, which then grants the research investigator access to the following:

- Your classroom, to observe and record instructional characteristics.
- The high school counseling office, to record appropriate demographic and academic data.

Your students who wish to participate and their parents or guardians will also submit signed consent forms to authorize access to those students' records.

Questions about this research may be directed to Dr. Betty Duvall, Professor of Education at Oregon State University (541) 737-5197, or to Sue Shields, Research Investigator (503) 656-0545 or 653-3921.



I have read the above description of procedures and agree to participate in this research project, and I hereby give my informed and voluntary consent for the research investigator to have access to my classroom and to all appropriate records. I understand that I will receive a copy of this signed consent form.

---

Teacher Signature

---

Research Investigator Signature

---

Date

---

Date

## **APPENDIX C**

### **SAMPLE OF CONTEXTUAL ASSIGNMENTS**

## SAMPLE OF CONTEXTUAL ASSIGNMENT #1

Transportation Unit: One of the goals of this unit is to give you a better understanding of the auto and transportation industries.

### Basic requirements:

1. A well-organized notebook.
2. Table of contents.
3. A well-written report — details later.
4. Two visuals. We will give you one. You will create one.
5. Documented use of newspapers, television, and movies.
6. A basic understanding of the relationships of the auto and fossil fuels.
7. An oral presentation.

### Getting started:

1. You should have completed the family history of automobiles. We expect it to cover a minimum of 60 years. If this presents a problem, it needs to be discussed with your teacher.
2. You were given an assignment on the purchase of stock. You were given \$5,000 and told to purchase two different auto companies. You were given \$10,00 and instructed to purchase four different companies that were impacted by the auto industry. Remember when you divide the dollar amount by the price per share to carry it out two decimal points.
3. You and your partners need to discuss responsibilities and make sure that you select a topic that is interesting to the entire team. Be sure to discuss topic selection with your instructor.
4. Expand your thinking. Pick a topic that has opportunities for visuals, is interesting, and you are sure that you can find adequate materials for your research.

### Evaluation.

**DAILY ASSIGNMENTS — NOTEBOOK — VISUALS — ORAL PRESENTATION  
USE OF CLASS TIME WILL BE EVALUATED DAILY.**

## SAMPLE OF CONTEXTUAL ASSIGNMENT #2

## Columbia Gorge Cruise: "Natural Resource Land Use Economics Activities"

In our study of the historical/traditional and current uses of the Columbia River this year we have examined from two perspectives, the impacts humans have had on this most important natural resource. Today you will see first hand, from the "river view" as it were — the resource, its functions, its values, and your role in protecting its future.

Using the materials I have provided in this packet, please consider the following issues and prepare them for discussion on Monday, June 3, per. 5.

- I. List and explain the locations and cultural/social behaviors of the First Oregonians who inhabited the Columbia Gorge are since over 10,000 years ago.
  - A. From an economic standpoint, how did these people manage the resource for their advantage.
  - B. From a human values standpoint, how did these people manage the resource of their advantage and for future generations.
  - C. How did their management affect other life in the management area.
- II. List and explain the cultural/social behaviors of Oregonians who inhabit the Columbia Gorge are now and in the last 200 years.
  - A. From an economic standpoint, how do these people manage the resource for their advantage.
  - B. From a human values standpoint, how do these people manage the resource for their advantage and for future generations.
  - C. How does their management affect other life in the management area.

## SAMPLE OF CONTEXTUAL ASSIGNMENT #3

## Columbia River Gorge Field Trip

Questions for your Chemistry credit portion of this trip:

1. Based on your sample of river traffic between Portland and Bonneville Dam, determine the % of river craft in the Recreational, Agricultural, and Other categories. Make a table below to show your tallies, and show your calculations.
2. How many cubic meters of water per second flow past Bonneville Dam at its current level? Show any calculations you need to perform.
3. How is Columbia River Water treated for those towns and cities who use it for drinking water? What evidence can be seen of this use and treatment?
4. List 10 different pollutants you have observed in the river today.
5. List five different sources of pollution which you observed on the trip.