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Making the transition to curriculum integration: a curriculum design in middle level schools

Wallace Martin Alexander

MAKING THE TRANSITION TO CURRICULUM INTEGRATION: A CURRICULUM DESIGN IN MIDDLE LEVEL SCHOOLS

By

Wallace Martin Alexander

B.S. University of Maine, 1973

M.A. University of Maine, 1993

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Advisory Committee:

Edward Brazee, Professor of Education, Advisor

Brenda Power, Professor of Education

Anne Marie Read, Assistant Professor of Education

Phyllis Brazee, Associate Professor of Education

Constance Perry, Professor of Education

Jeffery Wilhelm, Associate Professor of Education

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An Abstract of the Thesis Presented
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The purpose of this dissertation was to investigate middle level teachers' transitional process as they move from an **interdisciplinary/multidisciplinary** curricular format to curriculum integration. This study was designed to identify key stakeholders in this transitional process and determine the role each played, and to identify and investigate the key steps and obstacles along the way.

The two primary participants in this study were identified as teachers in the process of transitioning to a curriculum integration model. They and two other teachers on their five-teacher team, five students, three parents, and the school principal were interviewed. Teacher interviews were most extensive, delving into their philosophical beliefs about teaching and learning, as well as details of their practice. Students and parents shared their thoughts and feelings about student involvement in planning curriculum and the school's principal elaborated on the role of leadership in curriculum change.

Other qualitative data gathering techniques used in this study included on site visits and analysis of curriculum-related documents, including curriculum unit guidelines,

assessment tools, and lists generated in student brainstorming sessions. **A** cross-case analysis was used to group answers to the same question looking for similar or different responses.

Five themes emerged related to the philosophical beliefs and guiding principles of the two primary teachers in this study: a) commitment to trusting student/teacher relationships, student involvement in curriculum planning, and democratic process in the classroom are cornerstones to enacting curriculum integration, b) this curriculum requires teachers to think in an integrative manner, c) integrative thinking and child-centered teaching can be learned, d) to bring about significant curriculum change, leadership is necessary at multiple levels, and e) team configuration can facilitate or complicate curriculum integration.

The findings of this study also reveal a number of benefits to curriculum integration, including: the motivational value that results from the ownership students feel when they are involved in curriculum planning, the constructive nature of learning which is enhanced by emphasizing connections across the curriculum, the need for students to become responsible and accountable for their own learning, and the effectiveness of cooperative learning and peer teaching.

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RATIONALE, BACKGROUND, AND ORGANIZATION OF THE STUDY

Statement of the Problem

A great deal has been written about the philosophy and theory of curriculum integration over the past hundred years, as well as accounts of successful examples (Hopkins, **1937;** Beane, **1993, 1997;** Alexander, **1995;** Pate, **1996;** Vars, **1996;** Brodhagen, **1998).** Still, for many of us, getting started is the hardest part. For a variety of reasons, people have a hard time taking the step from a teacher-oriented, subject-based curriculum to the collaborative, theme-based curriculum integration model. The intent of this dissertation is to produce a detailed description of the transition process experienced as a middle level team moves from an **interdisciplinary/multidisciplinary** curriculum approach to curriculum integration. The study was designed to identify key stakeholders in this transitional process and determine the role each played, and to identify and investigate the key steps and obstacles along the way.

Rationale

As a concept, curriculum integration has a good deal of appeal. Few people fail to recognize the need for individuals to make sense of the world around them in ways that are both functional and meaningful. It has been well documented that a curriculum emphasizing connections among the disciplines increases understanding, retention, and application. Over the past fifteen years, a number of reputable groups have advocated for

reforms that would help students better understand the interconnectedness of both the content and skills that are necessary for success in today's society. These educational organizations include the National Association of Secondary School Principals (1985), the Carnegie Council on Adolescent Development (1989), the American Association for the Advancement of Science (1989), the National Commission on Social Studies in Schools (1989), the National Council of Mathematics Teachers (1989), the National Commission of Music Education (1991), the National Middle School Association (1995), and the Maine Department of Education (1998).

Many of Maine's middle level schools have been involved in the surge of activity that has followed these recommendations. The Middle Level Education Institute at the University of Maine and the Maine Association for Middle Level Education have helped by providing resources and staff development for Maine educators. More recently, secondary schools in Maine have been impacted. The 1998 report of the Maine Commission on Secondary Education, Promising Futures: **A** Call to Improve Learning for Maine's Secondary Students, advocates for a number of practices that are basic tenets of curriculum integration. Core Principle **#2,** for instance, calls for learning experiences that, "engage students in academically challenging opportunities and extend their knowledge, skills, and habits of mind beyond what is comfortable and traditional" (1998, p. **6).** Core Principle # 5 speaks of a democratic process: "Learning requires adults and adolescents to develop and model equitable and democratic practices which integrate, enable, value, empower, and expect contributions from all members of our communities'' (1998, p.7). It further calls for ". ..democratic practices that honor and accommodate diversity, respect varying opinions, and which promote ownership, responsibility and

commitment must be supported" (1998, p. 7). Clearly this is an issue of considerable interest.

Despite the current thinking of many, however, theories of interdisciplinary and integrated curriculum are not new. We have a rich history of efforts to build connections among the various components of the curriculum and develop a sense of ownership through democratic practices, as well as between school programs and society. Current efforts in this area build on the shoulders of the giants of progressive education over the past 100 years (Vars, 1996; Beane, 1997). Various forms of "core curriculum" that were common in high schools across the country in the 1940s and 1950s are notable examples. Some models of core curriculum involved students in studying social issues and problems of the day, while learning and applying whatever content necessary to do so. L. Thomas Hopkins' "experience curriculum" and William Kilpatrick's "project method" in the 1920s and 1930s engaged students in learning skills and knowledge organized around significant and relevant themes. John Dewey believed that if students experienced true democracy in schools, they would then be equipped to bring about the democratic ideal in society. He started the Laboratory School at the University of Chicago in 1896 to test his theories. Francis Parker's Quincy Schools in the 1880s built on similar principles, as did the work of the John Herbart and the Herbartian Society that followed him. The Herbartians emphasized the need for teachers to build on the students' previous experiences and current knowledge, while creatively unifying student learning.

Much of the current dialogue on curriculum integration at the middle level was launched by James Beane, whose monograph, A Middle School Curriculum: From Rhetoric to Reality (1990/1993) challenged middle level educators to move beyond

organizational issues and to address what and how we teach. As an historian, as well as a curriculum expert, Beane's curriculum theories build on the work of the people and programs mentioned above.

A great deal has been written about the philosophy and theory of curriculum integration over the past hundred years, as well as accounts of successful examples (Hopkins, 1937; Beane, 1993, 1997; Alexander, 1995; Pate, 1996; Vars, 1996; Brodhagen, 1998). Still, for many of us, getting started is the hardest part. For a variety of reasons, people have a hard time taking the step from a teacher-oriented, subject-based curriculum to the collaborative, theme-based curriculum integration model. The intent of this dissertation is to produce a detailed description of the transition process experienced as a middle level team moves from an **interdisciplinary/multidisciplinary** curriculum approach to curriculum integration. The study was designed to identify key stakeholders in this transitional process and determine the role each played, and to identify and investigate the key steps and obstacles along the way.

Background

Curriculum integration is, "a curriculum theory that is concerned with enhancing the possibilities for personal and social integration through the organization of curriculum around significant problems and issues, collaboratively identified by educators and young people, without regard for subject-area lines" (Beane, 1997, p. 19). Four main areas are addressed in curriculum integration (these will be discussed in more detail in Chapter Two):

1) The integration of experiences

2) Social integration

3) Integration of knowledge

4) Integration as a curriculum design

This definition of curriculum integration reflects the work of educators who for the past century have advocated for an alternative to the traditional separate subject approach to curriculum (e.g. Dewey, 1938, Hopkins, 1937, Kilpatrick, 1918; Rugg, 1936).

As a curriculum design, the definition of curriculum integration used in this dissertation will refer to Beane's (1990) proposal for a middle school curriculum organized around "themes" which reflect significant social problems and issues and the concerns of youth. These themes arise from the intersection of students' concerns about self and the world around them. Integrated learning experiences are provided within these themes as students become actively engaged in planning and implementing their education.

Beane's proposed planning model involves brainstorming with students and getting their responses to two questions: "What questions and concerns do you have about yourself?' and "What questions and concerns do you have about your world?' Students identify potential themes from the overlap of the self and world questions. For instance, students may see a connection between "self' questions such as: "Will I live a long life?'; "How do homeless people survive?'; "How will I stay healthy?'; "Will my mother recover from her cancer?' and "world" questions such as: "Will science find cures for **AIDS** and other diseases?'; "Can we fix the damage to the ozone layer?';

"Will the earth become over populated?"; "How does CPR work?' They might further suggest, as a group of sixth graders actually did, that these questions could all be addressed in a theme of "Health and Survival." Once a theme is selected, students and teachers brainstorm activities that might help answer questions related to the theme. These questions and activities are then organized into a comprehensive unit of study. These units can be aligned to various standards, mandated curricula, and teacher "givens." Related to this, student-brainstorms also often include discussion of what will be expected of students by the world around us. Planning a unit usually involves the following steps (Beane, 1993, 1997; Alexander, 1995; Brodhagen, 1998):

1) Solicit students' questions about self
2) Solicit students' questions about the world around us
3) Identify themes that encompass questions of self and world
4) Brainstorm the worlds expectations of students
5) Select a theme
6) Identify all original questions related to theme
7) Brainstorm a KWL list
8) Identify teacher/curriculum givens that fit theme
9) Plan learning activities and instruction to address questions
10) Plan for time, space, schedule, and grouping
11) Plan assessment
12) Organize the unit and develop a syllabus

Units that result from this process offer students opportunities to learn new skills and content within the context of their own questions. The students, with guidance and

assistance from teachers, work collaboratively on in-depth research and projects using whatever knowledge is available, without regard to subject area lines.

Focus of the Study

Over the past decade, there has been a great deal of dialogue around the theory of curriculum integration. Much has been written, including several case studies of successful programs (Beane, **1993, 1997;** Alexander, **1995;** Pate, **1996;** Vars, **1996;** Brodhagen, **1998).** Still, despite all the rhetoric, these programs have not become common. There are many possible reasons why this is so, the most obvious of which is that our schools are just not set up for it. Textbooks are largely organized around separate subjects. Teachers interested in using curriculum integration have to be committed to spending large amounts of time locating resources. In most cases, colleges of education and state departments of education are also organized around separate-subjects, as are national and state standards. The State of Maine Learning Results, for example, includes a half page in the Preface on the importance of integrating content areas and **102** pages listing performance indicators in separate-subject categories. **As** we see, there are many signs pointing teachers toward a separate-subject curriculum. Hopkins suggested that a requirement of successful enactment of curriculum integration is a teacher with "an integrating personality" **(1937, p.** 255). Teachers in this environment can only assist the students in understanding their experiences if they, the teachers, themselves are actively involved in expanding their own learning. Hopkins suggests that teachers who fall short of this goal usually revert to presenters of predetermined subject-matter.

Other possible obstacles to enactment of curriculum integration may be more political. Conservative "back-to-basics" movements may find the philosophy underlying curriculum integration particularly hard to swallow. Elitists who favor special privileges for some children, usually their own, may also object. Current emphasis on standardized tests may keep teachers, especially those new to the profession, from trying innovations.

Another problem is the lack of models of transition. Even those who understand the theory and philosophy, and acknowledge the potential benefits, question how to get started. Brazee and Capelluti (1995) suggest that curriculum integration, which they refer to as "integrative curriculum," exists on a continuum moving from conventional separate-subject curriculum through interdisciplinary and multidisciplinary curricula which correlate subjects, to integrated where learning is organized around teacher-generated themes that cut across subject-area lines, and then to integrative, where students are actively involved in identifying and planning curriculum themes.

The purpose of this study was to document and investigate veteran teachers' journeys as they move from the interdisciplinary/multidisciplinary level to the integrative level which Beane refers to as "curricuIum integration.'' The guiding questions for this study included:

1. Why did the teachers decide to change their previously successful practice?
2. How did they know when the time was right?
3. How and when were the key stakeholders involved? Including:
    - Teachers
    - Students

- Parents
- School administrators

4. What steps were involved in the transitional process?

5. What obstacles turned up and how were they addressed?

One of the problems of research in this area is common misuse of terminology. Over these past ten years, the term 'curriculum integration' has become a generic catch-all for any curricular approach that suggests making connections across traditional content areas. Beane **(1997)** contends that the use of the term in this way does a disservice to a long line of progressive philosophers and practitioners who defined and practiced curriculum integration as a curriculum design that went well beyond rearranging subjects. This study will adhere firmly to the definition articulated on page four.

Organization of the Study

Chapter Two of this dissertation synthesizes current and historical literature related to the ideals of curriculum integration. This will include sections focusing on:

- An analysis of several early educational philosophers and how their work may have influenced the theory of curriculum integration.
- A summary of the evolution of curriculum in public schools over the past century, including both the separate subject approach and various alternatives.
- Since my work focuses on the middle school level, a look at the history of the junior high school and middle school movements, with emphasis on curriculum proposals within them.

• **A** look at how empirical research on how integrated interdisciplinary curricula designs effect student achievement.

• **A** summary of recent literature on curriculum integration.

• **A** review of the literature on the change process, especially as it applies to school innovation.

• Team structure and it's effect on curriculum integration.

Chapter Three explains how educators participating in this study were chosen and data-gathering methodology is described. The rationale using qualitative methods is discussed. These methods include classroom observations; interviews with teachers, students, parents, and administrators involved in the case study, and analysis of relevant documents.

Chapters Four and Five present the findings. Why teachers choose to implement a curriculum integration model, transitional steps in the implementation process, and advantages and disadvantages of curriculum integration from the viewpoints of students, teachers, parents, and administrators are addressed.

Chapter Six summarizes the observations and conclusions that can be drawn from the data gathered in this study. Significance of the findings, omissions and limitations are discussed, as are suggestions for future research.

Chapter **2**

AN HISTORICAL PERSPECTIVE OF CURRICULUM INTEGRATION

Introduction

Over the last decade, the term curriculum integration has become a generic catch-all for any curricular approach that suggests connections between traditional content areas. James Beane, in his recent book, Curriculum Integration: Designing the Core of Democratic Education (1997), contends that using the term in this way does a disservice to a long line of progressive philosophers and practitioners who defined and practiced curriculum integration as a curriculum design that went well beyond rearranging subjects. Today's generic use of the term seems ahistorical, which isn't surprising given educators' traditional disregard for the lessons history has to offer (Beane, 1997; Vars, 1996).

Beane, a well-known curriculum theorist and historian, has become a modem-day spokesman for curriculum integration as it is historically defined. He acknowledges many people over the past two hundred years as having a hand in development of the theory, but points to L. Thomas Hopkins as finally putting the pieces together in the late 1930s. According to Beane, curriculum integration is: "A curriculum theory that is concerned with enhancing the possibilities for personal and social integration through the organization of curriculum around significant problems and issues, collaboratively identified by educators and young people, without regard for subject-area lines" (1997, p. 19).

Beane further elaborates on the four major dimensions of curriculum integration (p. **4-9):**

(1) Integration of Self/Experiences

Our beliefs about ourselves and the world are constructed out of our experiences. Effective learning experiences (Beane calls this integrative learning), become part of us. These experiences are integrated into our schemas of meaning. They also become part of our problem-solving repertoire in the future as we integrate past experiences to solve new problems. This kind of learning requires organizing curriculum around "whole ideas," with a constant emphasis on relevance and reflection. This search for meaningful integration of school experiences is contrary to much schooling today, where the emphasis is on accumulation of bits of information that are supposed to be stored away for future use, usually on some test.

(2) Social Integration

A second dimension of curriculum integration assumes that one of the purposes of schools in a democratic society should be, "providing common or shared educational experiences for young people with diverse characteristics and backgrounds" (Beane, p. 5). This dimension incorporates the notions of "core curriculum'l and "democratic classrooms," and is manifesting itself today in classrooms that increasingly emphasize developing communities of learners, connection of schools and communities, and involving students in the developing problem-centered curriculum organized around personal and social concerns.

(3) Integration of Knowledge

People in the real world, when faced with a problem, do not begin their problem-solving process by asking which part is language arts, science, or social studies. They use all available knowledge that seems relevant. You see, knowledge is always integrated in real-world problem-solving situations. It is only in school that it is not. This brings to mind Dewey's "water-tight compartments," where schools expect us to store our knowledge. According to Dewey:

> One trouble is that the subject-matter in question was learned in isolation; it was put, as it were, in a water-tight compartment. When the question is asked, then what has become of it, where has it gone to, the right answer is that it is still there in the special compartment in which it was originally stowed away. If exactly the same conditions recurred as those under which it was acquired, it would also recur and be available. But it was segregated when it was acquired and hence is so disconnected from the rest of experience that it is not available under the actual conditions of life. It is contrary to the laws of experience that learning of this kind, no matter how thoroughly ingrained at the time, should give genuine preparation. **(1938,** p. **48)**

If we look at school as an accumulation of tidbits of information, subject-areas may be adequate compartments in which to store them. If, on the other hand, we see

school as an exploration of personal concerns and relevant social issues, knowledge must be considerably more fluid and integrated.

(4) Integration as a Curriculum Design

As a curriculum design, curriculum integration involves organization around problems and issues of real personal and social significance. Learning experiences are planned within the context of these themes (Beane calls them "learning centers), and designed to facilitate true integration of knowledge. Activities involve real application of knowledge.

All four of these dimensions of curriculum integration are promoted when students are actively involved in the curriculum-planning process.

While Dewey and Hopkins are the names most commonly connected to the theory of curriculum integration, it is certain that the work of hundreds of others contributed as well. Hopkins regularly refers to Dewey, whose theories on "experience learning" have impacted education for nearly a hundred years, and William Kilpatrick, most noted for his "project method." In the first part of this chapter, however, I will push a little further back. Who, for instance, influenced Dewey's educational philosophy? My intent in this section will be to briefly mention several of these earlier philosophers and how they may have influenced curriculum theory.

Grounding in the Philosophy of Education

Dewey's touch appears in all four of the "dimensions" of curriculum integration identified by Beane. In **1930,** Dewey referred to Francis Wayland Parker as "the father of

progressive education" (1930, p. 203), a term which today is often credited to Dewey. Parker is best known for his work as Superintendent of Schools in Quincy, Massachusetts beginning in 1875. The progressive pedagogy that resulted from implementation of Parker's philosophy became known as the "Quincy Method." His impact was especially profound in the area of literacy instruction, and accounts of classroom practice in Quincy at times sound suspiciously like those of today's most effective whole language classrooms. While it is clear that Parker influenced Dewey, Parker himself was always careful to point out that teaching methodology in the Quincy schools represented nothing new, but merely historic knowledge of educational philosophy and common sense. The methods used, Parker contended, were the very methods used when people learn in real world settings, everywhere other than in schools. He also grounded his work in that of earlier European philosophers:

> It was two hundred years ago that Comenius said "let things that have to be done be learned by doing them." Following this, but broader and deeper in significance, came Pestalozzi's declaration, "Education is the generation of power." Last of all, summing up the wisdom of those who preceded him, and emphasizing it in one grand principle, Froebel surmised the true end and aim of all our work – the harmonious growth of the whole being. This is the central point. Every act, plan, method, and question should lead to this. (Parker, 1883, p. 18)

A few decades after Parker acknowledged Froebel's statement about "harmonious growth of the whole being," Kilpatrick restated the same basic thought when he described

a classroom scene where children are actively involved in a program of curriculum integration:

> We see dynamic learning – creative; we see responsible learning – acting in the view of consequences. We see shared thinking – while these students act together – the democratic process at work. And finally, the character effect – the whole self is being remade all the time. And also, because the child is active, some sort of community life is being made all the time. These two aspects, the self on the one hand, the community on the other hand are going on all the time. (Quoted in Wisconsin Department of Public Instruction, 1996)

The harmonious growth/remaking of the whole self is a common goal here.

In addition to the three philosophers mentioned in Kilpatrick's quotation above (Comenius, Pestalozzi, and Froebel), both Parker and Dewey also frequently referenced to Rousseau. While this is certainly not an exhaustive list of the thinkers who influenced Parker's and Dewey's, and later Hopkins', theories of education, they provide a logical starting point. I will try to briefly touch on some of their contributions and beliefs that seem to relate directly to the theory of curriculum integration.

John Amos Comenius

John Amos Comenius (1592-1670) was a Bishop of the Catholic Church, a realist philosopher, and a prolific writer. In 1652, he declined the position of President of Harvard College.

Two overriding principles of Comenius' philosophy of education address the need for education to be universal and to follow a "natural" pattern. In The Great Didactic, he states:

> It is quite clear that the order, which is the dominating principle in the art of teaching all things to all men, should be, and can be, borrowed from no other source but the operations of nature. **As** soon as this principle is thoroughly secured, the processes of art will proceed as easily and as spontaneously as those of nature. (1657, p. 252)

In the interest of making education universal, much of Comenius' work included outlining of practical aspects of the school environment and methodology of teaching. He maintained that education should follow natural processes, and suggested a system composed of four, six-year cycles: "**A** mother school (0 - 6 years) should exist in every home, a vernacular school (6 - 12) should exist in every hamlet and village, a gymnasium (12 - 18) in every city, and a university in every kingdom or province" (1657, p. 408). The schools, according to Comenius, would start with a broad overview of concepts and progress to more detailed, as well as from concrete to abstract as students get older.

Comenius' emphasis on natural methods challenged the dogmatic and castigating practices of his day. He maintained that the need to use punishment to get students to do their schoolwork was not due to depraved morality on the parts of the students, but because the curriculum and pedagogy made no sense to them. Instead, he suggested curriculum based on function. Students need to be able to see an immediate usefulness

for what they are learning. Comenius also spoke to the strengths of children learning from peers and suggested multiaged groups.

The disengagement of school children that Comenius saw sounds very much like our current situation, eerily so, in fact. His call for a more relevant curriculum and suggestions for instruction around functional concepts is the battle-cry of curriculum integration advocates today. One would think that we might have learned something in the **340** years since Comenius. Inappropriate curriculum is a major contributor to the number of students who choose to "tune out" in our schools, as well as the escalating social and behavioral problems we face.

Jean Jacques Rousseau

Jean Jacques Rousseau (1712 - 1778) spoke avidly of the overuse of language-dominated lessons with young children, suggesting teachers should, "Give your schoolers no verbal lessons; he should be taught by experience alone" (1762, p. 56). He popularized a sense of realism as he argued for free expression of children's natural instincts to learn and the substitution of observation of nature for books and classical studies.

Rousseau saw society as artificial and unnatural. Society, according to Rousseau, is corrupt and immoral, while nature is pure and virtuous. He believed that all children are born in a natural state of purity with full potential to develop perfect self-love, self-knowledge, and social virtues. Educationally, Rousseau believed that young children need time to develop this self-love before they enter society. He referred to this as a period of "negative education." Seeing literature as an unnatural way to learn about the

natural world, he recommended that young children should learn about nature by discovery and sensation, "Let him know nothing because you told him, but because he learnt it for himself." (1762, p. 131). Further, Rousseau said, "You have not got to teach him truths so much as to show him how to set about discovering them for himself' (1762, p. 168).

Rousseau saw reading as a **skill** better learned when children were a little older and could understand its usefulness, possibly even as a natural part of the transition from childhood to adulthood. In speaking of Emile he said, "He learned to read late, when he was ripe for learning, without artificial exercises" (1762, p. 81).

Dewey was certainly affected by Rousseau's theories of education. In Schools of Tomorrow, he spent considerable time explaining the relevance of Rousseau's work. In the same volume, however, Dewey commented on the highly theoretical nature of Rousseau's theories, "If Rousseau himself had ever tried to educate any real children (rather than that exemplary prig, Emile), he would have found it necessary to crystallize his ideas into more or less fixed program" (1915, p. 60).

Regardless of the lack of practicality of some of Rousseau's theories, his thoughts on the value of children learning by experiencing the world seems to have profoundly affected Dewey and many others, and also seem to figure prominently into Hopkin's and Beane's curriculum integration dimensions of "Integration of Experiences and Self."

Johann Pestalozzi

As a practitioner, Johann Pestalozzi (1746 - 1827) was impacted by the theories of Comenius and Rousseau. He looked at these theories, however, through the lens of a

practitioner. **As** a teacher he saw education as power, a means for the disadvantaged to elevate their status in society. He tried to implement Comenius" and Rousseaus's vision of universal education. In pursuing this goal, Pestalozzi worked with the poor, attempting to help them become socially, morally, and economically self-sufficient.

Pestalozzi found Rousseau's ideas about "negative education" to be impractical, much as Dewey did a hundred years later. It just wasn't practical to try to keep children isolated from the perceived corruption of society. Pestalozzi did, however, try to implement the philosophy of "mother schools" into his own schools, basing them on love and support for children.

Much of Pestalozzi's instructional practice revolved around "object teaching" (Tanner & Tanner, 1995, p. 18). Object teaching involved children observing tangible objects from their immediate environments, using their senses, developing concepts, and expressing their ideas and conclusions in words. Critics found Pestalozzi's vision of object teaching somewhat limited, mainly because of the failure to establish interrelations among the objects. Even so, Pestalozzi's object teaching brought many innovations into schools, including widespread use of oral language in the primary grades and written language in upper grades. The observation process opened the door for science to enter schools as an academic subject. Even mathematics took on a different look with the use of concrete examples to introduce mathematical concepts, much as manipulatives are used today.

In How Gertrude Teaches Her Children, Pestalozzi states:

> I believe it is not possible for common popular instruction to advance a step, so long as formulas of instruction are not found

> which make a teacher, at least in the elementary stages of knowledge, merely the mechanical tool of a method, the result of which springs from the nature of the formulas and not from the skill of the man who uses it. (1801, p. 41)

It is easy to see how Dewey built on Pestalozzi's ideas. In his laboratory school, objects and materials from students' local environments were critical. A difference, however, seems to be that they were tested in real life experiences and there was an emphasis on connectedness. In Dewey's school, Pestalozzi's object lessons were transformed into learning by inquiry, a critical component in the enactment of curriculum integration.

Fredrich Froebel

Fredrich Froebel (1782 - 1852) began his work as an educator as an intern to Pestalozzi. Froebel was also heavily influenced by Rousseau's theories, especially the notion of "negative education." This led to Froebel's suggestion to implement this idea by establishing a new institution, separate from existing schools. This led to the formation of kindergartens. A basic premise of Froebel's vision of kindergarten involved children learning through play. He also advocated for "group activities" in schools, as a means of developing a sense of community and social responsibility in children (Froebel, 1826).

While Froebel is best know for formulating the idea of kindergarten, he also promoted literacy as a bridge between the struggles of our personal and social worlds:

"Everything and every being comes to be known only as it is connected to the opposite of its kind, and as its unity, its agreement with its opposite of its kind" **(1826,** p. **42).**

He saw language as the tool to mediate this struggle: "The alphabet thus places man within reach of the highest and fullest earthly perfection. Writing is the first chief act of free and self-active consciousness" **(1826, p. 225).**

Another idea of Froebel's became a building block for Dewey. Froebel believed in using "activities to reproduce on the child's level the occupations of the mature society" (Tanner & Tanner, **1995,** p. **21).** An expanded version of this idea became the basis of the program at Dewey's laboratory school.

The purpose of Froebel's kindergarten ("child's garden") was to "cultivate" a child's development, and it socialization and emphasized the importance of establishing an emotionally secure environment for all children. As Rousseau and Pestalozzi, he believed in nature as a primary source of learning and that schools should provide a warm and supportive environment for children. This emphasis on the child's development and socialization validates the "Social Integration" dimension of curriculum integration.

Unfortunately, as often happened, as the theories of the European philosophers of education were stripped-down as they were Americanized, Froebel's vision of kindergartens being institutions separate from schools was lost.

Johann Herbart

Johann Herbart also seems to be a key contributor to the theory of curriculum integration. Tanner & Tanner describe Herbart as, "the first educational writer to put emphasis on instruction as a process" **(1995,** p. **19).** Herbart emphasized the need for

teachers to build on the students' previous experiences and current knowledge. This is the underlying basis of the constructivist view of learning. If this philosophy is to be implemented, it requires that teachers know of students' previous knowledge and interests. This led Herbart to formulate the "five formal steps of teaching and learning," that looked very much like the more modem model of lesson planning made famous by Madeline Hunter (Tanner & Tanner, **1995).**

The main point for Herbart, however, was the need to creatively unify students' knowledge. His process was designed to help teachers and students focus on connections among lessons and subjects. As Herbart's ideas were stripped-down and mechanized, this underlying philosophy was lost. Tanner & Tanner suggest that Hunter's version did exactly that. Further, they suggest that, even though Hunter's model has been mandated in school districts across the United States, there is no research to support a positive effect on student learning. As an explanation of the huge popularity of the process, they point to political pressures: "By linking a neatly designed teaching model to supervisory procedures, Hunter gave administrators the vehicle they needed to respond to political pressures generated by calls for school reform" **(1995,** p. **21).**

Once again, the Americanized version of a European philosophy largely missed the point. Still, Beane credits the Herbartian Society with keeping alive Herbart's commitment to connecting the traditional subjects, the basis of the "Integration of Knowledge" dimension of curriculum integration.

L. Thomas Hopkins

While it is clear that a number of philosophers contributed the first three dimensions of curriculum integration, as identified by Beane, it was L. Thomas Hopkins in the 1930s who put these together as a coherent curriculum design. Beane cites Hopkins' definition of curriculum integration as "organized around the immediate, abiding interests and assured future needs of the learner, utilizing materials selected from areas of the social heritage regardless of subject division" (in Sweeney, et. al., 1932, p. viii).

As Hopkins emphasized the importance of personal and social integration, he suggested that integration of knowledge is a key to young people realizing both. While commenting on Hopkins' work, Curriculum Principles and Practices (1929), Beane points out that, "It was here, as well, that he criticized the increasingly inappropriate use of the term "integration" to describe curriculum projects that actually involved multidisciplinary, broad fields and other organizations that were rooted in subject-matter rather than personal and social integration" (Beane, 1997, p. 27-28). Then, as now, the term was widely misunderstood and misused.

In Integration: Its Meaning and Application, Hopkins summarized the basic principles of his "Experience Curriculum." He prefaces these principles with cautions regarding the difficult nature of this work:

> ... owing to the fact that promoting the all-around growth of the child in a continuously changing learning situation is one of the fundamental concepts. This makes less agreement among its advocates in both theory and practice than that found among the

> proponents of other types of curriculum in which consideration is given more to an aspect of the total growth of the learner and to fixed-in-advance learning situations. (Hopkins, **1937,** p. **253)**

Note again Hopkins' reference to all-around growth of the child, much as Comenius', Pestalozzi's and Kilpartick's. Hopkins introduces these principles as: "**...** a series of purposeful experiences growing out of pupil interests and moving toward an ever more adequate understanding of and intelligent participation in the surrounding culture and group life**" (1937,** p. **253).**

These key principles of Hopkins' "Experience Curriculum" include:

> **1.** Learning best takes place when the child as an active individual is dealing intelligently with situations confronting him in interacting with his environment.
>
> **2.** The selection, development, and direction of the experience is a cooperative undertaking in which pupils and teacher work together under teacher guidance.
>
> **3.** In the experience curriculum a true guide brings to the learning situation: (1) an integrating personality, **(2)** a varied and intelligent interaction with the culture, **(3)** an understanding of children at the age level of those whom he guides in the learning process, **(4)** an understanding or the process whereby children become increasingly intelligent in their interactions with the culture, and (5) a capacity, desire, and realization of continued growth.

4. The direction involved in the process of learning is toward an ever more intelligent participation in the environment in which the child may be located.

5. The experience curriculum usually begins with clarification of philosophy, rarely with reexamination of subject-matter.

6. The experience curriculum is centered in the interactive process and is directed toward making that more intelligent for all individuals concerned under the circumstances.

7. Since the key words of the experience curriculum are growth, development, and improvement in the life and living of all individuals concerned, it follows that the curriculum must be constantly changing. **(1937,** p. **253-259)**

As in the curricula suggested by all the educational philosophers mentioned previously, Hopkins' "Experience Curriculum" requires that curriculum begin with experiences and situations confronting the learner as he interacts with his own local environment. Further, it suggests that the experiences and activities cannot be planned too far ahead of time by either the teacher or the students. The scope and sequence is not rigidly set in advance. The idea is that the experiences must have immediate relevance to the learners. By doing this, according to Hopkins:

> The child learns to find worth-while purposes, to think through his problems, to work with others and independently, and to rely upon his judgment in choosing, planning, and evaluating the experiences

> which to him are significant. Under this viewpoint the teacher is not an instructor but a guide. (Hopkins, 1937, p. 254-255)

As pointed out in Principle #3, teachers in this environment can only assist the students in understanding their experiences if they, the teacher, themselves are actively involved in expanding their own learning. Hopkins suggests that teachers who fall short of this goal usually revert to presenters of predetermined subject matter.

The ultimate goal of all learning in the "Experience Curriculum" is for children to better understand their environment so they can more successfully interact with it. The central focus is on building community, not necessarily on the individual child, and certainly not on the masses of isolated facts and information stored in traditional school subjects.

Hopkins' "Experience Curriculum," and the theory of curriculum integration that grew out of it, is the culmination of at least three hundred years of educational philosophy calling for personal, experiential, and social integration, as documented throughout this paper. Yet we seem not much closer to systemic enactment than we were in the time of Hopkins, or Comenius for that matter. The recurring theme of "harmonious growth of the whole being" goes directly in the face of current trends to focus on tidbits of knowledge, rather than on learners. The call for local and individual relevance is falling by the wayside as the discussion of a national curriculum heats up. The overwhelming emphasis on experiential learning has been bartered away in the interest of more coverage. The vision of universal education which would equalize the "power" disappears in the actions of sorting and classifying that dominate our schools. Those who think that poor, low socioeconomic children have an equal chance for success in our

schools are sadly mistaken. Current efforts to dismantle public schools by installing a voucher/school choice system would certainly aggravate this situation.

All of this feeds into the question of why curriculum integration has never become mainstream. Certainly the benefits are well-grounded in philosophy and research.

Evolution of Curriculum in Our Public Schools

The discussion of how the curriculum should be organized is as old as our schools themselves. There is no arguing the fact that the separate subject approach to curriculum is firmly entrenched. It is hard for us to even imagine a time when this might have been seriously questioned. Today, even with renewed interest in establishing connections within the curriculum, separate subjects still retain their distinct identities in most interdisciplinary/multidisciplinary formats. At other times over the past hundred years, however, legitimate contenders have challenged the separate subject curriculum. These reforms took on many names, including the activity curriculum, project method, core curriculum, experience curriculum, integrative, multidisciplinary, multidisciplinary, correlated, and curriculum integration (Beane, 1997). While none of these became dominant, they all contributed to our present knowledge base and to the articulation of curriculum integration as a curriculum design.

The primary purpose of this section is to trace the evolution of curriculum integration, as defined by Beane and introduced in Chapter One of this dissertation. Many things played a part in the development of this concept, including the alternative curriculum models mentioned above. One of the problems in beginning this historical

overview is deciding where to start. The story of how the classical humanist version of the separate subject curriculum achieved and maintained dominance, despite the attempts of major reform groups to alter it, is important. Another significant part of this story revolves around the work of progressive educators in the first half of the twentieth century, including philosophers such as Dewey, Kilpatrick, and Hopkins. The history of the junior high and middle school movements is also integral to this discussion, leading to an analysis of the current status of curriculum integration.

Separate Subject Curriculum

The earliest forms of a separate subject curriculum were usually linked to the doctrine of "mental discipline." Mental disciplinarians believed that, "certain subjects had the power to strengthen faculties such as memory, reasoning, will and imagination" (Kliebard, **1986,** p. 5). In the **1890's,** however, the doctrine of mental discipline was beginning to be seriously questioned. Research studies of that time suggested that the foundations of this theory were not holding up (Kliebard, **1986).** Rapid societal changes were also bringing traditional educational practices into question. The flood of immigrants, the migration of the population to urban centers, new compulsory school attendance laws, and the dawning of the industrial revolution were among the factors that fed the discussion of changes in our educational system (Krug, **1964;** Kliebard, **1986).**

Nearly thirty years of discussion and re-examination of the efficiency of our schools and their lack of uniformity of curriculum came to a head in **1892,** when the National Education Association established the Committee of Ten to develop a national

curriculum policy for secondary schools (Tanner & Tanner, **1995).** Kliebard **(1986),** commenting on the formation of the Committee, said:

> The immediate impetus for creating the Committee in the first place was that high school principals had been bewailing the fact that different colleges were prescribing different entrance requirements and, since about half of the high school graduating class went to college, it became exceedingly difficult to prepare students differently depending on their choice of college. (p. **10)**

Charles Eliot, president of Harvard University, chaired the committee. Committee members were college presidents and professors, who shared a goal of bringing congruency and order to the high school curriculum. Their primary interest was to more systematically prepare students for college study. Given the make-up of the group, it is not surprising that they had an "ivory tower" view of education, and it is unfortunate for curriculum integration advocates that they chose to largely disregard the social issues of the time. From the committee's point of view, high schools should serve the function of preparing the intellectually elite for college (Tanner & Tanner, **1990, 1995).** In all fairness to the committee, they probably never anticipated high schools serving the vast majority of youth, as American schools do today. In **1892,** the percentage of students graduating from high school was very small (Tanner & Tanner, **1995).** Nevertheless, many of the original recommendations of the committee still dominate our schools today, including the teaching of a prescribed sequence of traditional and classical courses and the use of the Carnegie Unit to evaluate student progress.

Paradoxes also existed in the Committee's report. For one thing, it stated that "secondary schools do not exist for the purpose of preparing boys and girls for colleges" (Tanner & Tanner, 1995, p. **42).** Despite this statement, the report proceeded to recommend a sequence of courses aimed almost entirely at college preparation. The committee also stood firm on the need to teach the courses in exactly the same way and to the same depth for all students, even though they knew full well that the vast majority of students would not go on to college (Kliebard, 1986; Tanner & Tanner, 1990, 1995).

Aligned with Eliot's vision of a restructured and highly ordered high school was a commitment to shortening and enriching the elementary program (Tanner & Tanner, 1995). Eliot advocated cutting back on the amount of time devoted to arithmetic and grammar and promoted science as a way of thinking, not something learned from books. When the Committee of Fifteen met in 1895 to determine what the elementary curriculum should be, however, they disregarded what Eliot said, and proceeded to follow what he had done with the high school curriculum. Their report recommended a mechanical eight-year progression of curriculum in the elementary school. Each year in the progression held narrowly defined courses to be covered and mandated "rigid isolation of the elements of each branch" (Tanner & Tanner, 1995, p. 46).

Other national committees followed the Committee of Ten, determining what content would be covered in each subject, and solidifying the separate subject approach to curriculum. Beane suggests that by "looking in a mirror" these twenty-five white, male academicians (Committee of Ten and Committee of Fifteen) determined what all children should know (1997, p. 76). And it lives on today, reinforced by the current standards movement. Advocates of curriculum integration, on the other hand, decide

what the curriculum should be by "looking out at young people and the world" (Beane, 1997, p. 76). This is a view of curriculum that incorporates beliefs from some of the major reform groups that emerged to challenge the humanists' rigid adherence to a strictly separate subject approach.

Challenges to the Separate Subject Approach

Beane and Kliebard identify three major reform groups who, for seventy-five years following the report of the Committee of Ten, made serious attempts to displace their humanist curriculum (Beane, 1997; Kliebard, 1986). The "developmentalists" of the "child-centered" movement advocated for a curriculum "reformed along the lines of a natural order of development in the child" (Kliebard, 1986, p. 28). They called for new research into the stages of child and adolescent development, as well as into the nature of learning itself. Kliebard, in summarizing the philosophy of the developmentalists, states: "From such knowledge, a curriculum in harmony with the child's real interests, needs and learning patterns could be derived. The curriculum could then become the means by which the natural power within the child could be unharnessed" (Kliebard, 1986). Kilpatrick's "Project Method" (1918), as well as the activity movement and the experience curriculum, built on this philosophy (Kliebard, 1986; Wraga, 1996).

A second major reform group was the "social efficiency educators" (Kliebard, 1986). They also advocated the use of science in designing curriculum but assumed a very different focus than the developmentalists. Social efficiency educators thought schools should exist to meet the needs of society. Their vision included a highly differentiated curriculum, where students would be sorted and funneled into programs

that would prepare them for their predicted roles in later life. According to Kliebard: "That vision included a sense that the new technological society needed a far greater specialization of skills and, therefore, a far greater differentiation in the curriculum than had heretofore prevailed" (1986, p. 29). This view of curriculum is a world apart from the Committee of Ten's commitment to all students accessing the same curriculum. The focus on vocational training in our schools grew out of this movement (Kliebard, 1986).

The third major reform group was the "social reconstructionists" (Beane, 1997), or as Kliebard referred to them, the "social meliorists" (Kliebard, 1986). The social reconstructionists were committed to not only preserving the status quo of society, as the social efficiency educators advocated, but to making society better. It was clear that society was changing, and they wanted schools to help give direction to that change. By promoting democratic ideals, they hoped to address inequality in society, both economic and social (Kliebard, 1986; Wraga, 1996). Kliebard again offers a bottom-line summary:

> Times indeed had changed, but, according to the social meliorists, the new social conditions did not demand an obsessional fixation on the child and on child psychology; nor did the solution lie in simply ironing out the inefficiencies in the existing social order. The answer lay in the power of the schools to create a new social vision. (Kliebard, 1986, p. 29)

Correlation of the Curriculum

As the Committee of Ten determined the curriculum for all children, Charles DeGarmo, President of the Herbart Society, challenged the Society at their 1895

Conference to consider the underlying problems facing public schools (Wraga, **1996).** First of all, there was the problem of determining what knowledge schools should present. The amount of available knowledge was rapidly increasing, as were the number of students in the schools. Then there was the issue of the school's role in the development of students' "moral character." DeGarmo concluded that "if school studies are to reveal our duties to ourselves and neighbors, and to sweeten our disposition toward others, they must be full and rich, throbbing with the life of the world, and no longer merely formal, cold, and abstruse" (Quoted in Wraga, **1996).** The answer, for DeGarmo, was "correlation" of the curriculum... the "harmony of educational functions performed by the various studies in enabling the pupil to master his environment and become fitted for his work in life" (DeGarma, **1895,** as cited in Wraga, **1996).**

DeGarmo, along with Herbart Society colleague Charles McMurry, maintained that if teachers do not help students see the relations among subjects, students are not likely to make connections. DeGarmo went on to suggest several models of "correlation," some making interdisciplinary connections, and others transcending disciplines in an integrated fashion (Wraga, **1996).**

> One involved identifying "inter-relations" among studies within departments, such as those among geography and history, economics, and politics. Another type of correlation involved identifying relations among departments, such as those among geography and the natural sciences... The relations among subjects within a department were usually "constant," while those among

> departments were "occasional," implying that more opportunities existed for intradepartment connections than interdepartment. The third type of correlation was embodied in what DeGarmo called "concentration," which involved "the subordination of the secondary to primary studies." (p. 119)

Each of these models attracted notable advocates and subgroups developed. The "connection" model, for instance, is associated with both the work of Colonel Francis W. Parker in the Quincy schools and T. Ziller's culture epoch theory. Both focused on one subject or area of study to which the rest of the curriculum was subordinated. For Parker, the unifying center was the natural sciences. For Ziller, it was the history and literature of a country. DeGarmo found both of these to be too narrow and advocated for correlation among departments (Wraga, 1996).

And so the debate began, a debate that continues today, and in which the issues have changed little in a century. Even after Dewey joined the Herbartians in condemning compartmentalized curricula and solitary, individual pedagogy, the influence of the Committees of Ten and Fifteen continued. There were certainly attempts during the first two decades of the century to implement the theories of the Herbartians and Dewey, but the underlying philosophy was often misunderstood or poorly implemented. Advocates often became overly child-centered and embraced activity for it's own sake, rather than focus on the use of subject matter to understand personal and social experience. Dewey, of course, severely criticized these methods in Experience and Education (1938). The issues of the time were, in fact, very much like those we face today:

> These issues include matters of terminology and definition, a variety of interdisciplinary organizations ranging from simple connections between subjects to integrating student experiences with the wider world, the importance of making school experience applicable to life and the dominance of the discipline-centered curriculum as an obstacle to achieving integration. (Wraga, p. 121)

The ambiguity of curriculum terminology greatly confused matters then, as it does now. It was common for different groups to use the same terminology, but with very different meaning. Kliebard (1986) contends that John Dewey effectively took advantage of this confusion:

> He found himself using the same language as his contemporaries, but he generally meant something considerably different and, while competing interest groups eagerly looked to him for support and leadership, Dewey's own position in critical matters of theory and doctrine actually represented a considerable departure from the main line of any of the established movements. **As** such, he is not as much a central figure in one or another of these groups as he is someone who synthesized and reinterpreted certain of their ideas, and, consequently, he became identified in a way with all of them. (p. 30)

Dewey's Vision and Influence

Dewey did not see philosophy as abstract theoretical absolutes. He believed that knowledge of philosophy arose from testing hypotheses against social events. In his pursuit to understand life's everyday events, he applied philosophical examination and scientific analysis to all aspects of human life. Dewey's theories of education reflect this viewpoint.

One of Dewey's primary areas of interest in the early part of the century was the rapid social change taking place across the country. The social/cultural knowledge of people from rural agricultural communities did not prepare them for industrialized society and urban life. The household, which had been the center of acquisition of this social/cultural knowledge was no longer the center of productivity. Dewey saw the increased division of labor that resulted from industrialization as exaggerating the distance between social classes. He also saw this as a threat to the very foundations of democracy. To Dewey, true democracy had implications beyond government and defined a way of living together that breaks down class barriers (Dewey, **1901).** He saw schools as the key to this process, stating that, "democracy has to be born anew every generation, and education is the midwife" (Dewey, **1916,** p. **83).** Because of Dewey's beliefs about the nature of philosophy, he believed that the only way to reach and understand the democratic ideal (or any ideal for that matter) was by actually experiencing it. If students experienced true democracy in schools, they would then be equipped to bring about the democratic ideal in society. True to his philosophical beliefs, Dewey felt it necessary to test his theories of education in a real school setting. Under his direction in **1896,** with the help of many others, the Laboratory School at the University

of Chicago was established for this purpose (Kliebard, 1986; Tanner & Tanner, 1990, 1995).

With Dewey's commitment to democracy, it is not surprising that the laboratory school was community-centered. Students, parents, and teachers were all involved in planning the school's programs and curriculum (Mayhew & Edwards, 1936). Lessons started with students' interests, but were always connected to the real world: "... what the child learns in schools is carried back and applied in everyday life, making school an organic whole, instead of a composite of isolated parts" (Dewey, 1900/1968, p. 91).

Traditional disciplines of knowledge were infused in students' activities and projects, but Dewey criticized the presentation of information in isolated separate subjects:

> We do lie in a stratified earth, one of which is mathematical, another physical, another historical, and so on. We should not be able to live very long in any one taken by itself. We live in a world where all sides are bound together. **All** studies grow out of relations in the one great common world. When the child lives in varied but concrete and active relationship to the common world, his studies are naturally unified. It will no longer be a problem to correlate studies. The teacher will not have to resort to all sorts of devices to weave a little arithmetic into the history lesson, and the like. Relate the school to life, and all studies are of necessity correlated. (Dewey, 1900/1968, p. 91)

He questioned the transferability of information acquired in this way:

> One trouble is that the subject-matter in question was learned in isolation; it was put, as it were, in a water-tight compartment. When the question is asked, then what has become of it, where has it gone to, the right answer is that it is still there in the special compartment in which it was originally stowed away. If exactly the same conditions recurred as those under which it was acquired, it would also recur and be available. But it was segregated when it was acquired and hence is so disconnected from the rest of experience that it is not available under the actual conditions of life. (Dewey **1938,** p. **48)**

Rather than "subjects," his organizing centers for the curriculum in the Laboratory School were "occupations" which mirrored work in the real world (Dewey, 1900/1968), moving beyond the idea of "correlation" of traditional subject areas and distancing Dewey from the Herbartians.

With the school's emphasis on community, most activities and projects were cooperative and promoted social interdependence. Teachers helped students plan their projects and monitored their progress. Teachers were also responsible for deciding when students were ready to move ahead intellectually and/or socially (Mayhew & Edwards, **1936).**

A number of progressive approaches to education grew out of the work of Dewey and the Herbartians (Wraga, **1996). A** notable one was William Kilpartick's "Project Method" (1918), which was built on Dewey's belief that children need to be engaged in

activities related to life in existing society. Kilpatrick proposed that units of work, which he called "hearty purposeful acts," should replace subjects as curriculum organizing centers. In doing so, children could address topics of interest and become involved in authentic problem-solving activities (Kilpatrick, 1918).

Other initiatives such as the experience curriculum and the activity movement built on Dewey's work and the project method. A number of accounts of these programs exist in the literature from the first quarter of the 20" century (Kliebard, **1986).** These programs were far from mainstream and most schools maintained the separate subject curriculum advocated by the Committees Ten and Fifteen (Wraga, **1986).** The introduction of Carnegie Units in **1909** helped solidify the separate subject approach (Krug, **1964).**

The Search Continues

As social issues of the Great Depression era became devastating in the 1930's, schools looked for ways to help young people cope. New interest was sparked in the integrative, educative ideal, especially at the high school level (Wraga, **1996).** This interest spawned a flurry of research. Henry Harap, while chairing a joint research committee representing several prominent national education groups, discovered rapid increases in the use of integrated units to organize curriculum. Harap suggested this was due to educators' realization of the ineffectiveness of fragmented curriculum where "subjects were broken up into small pieces unrelated in experience, and the school day was broken up into disconnected periods" (Harap, **1937,** as cited in Wraga, **1996).** The result, according to Harap, was that the "learner never grasped a situation as a living

whole, and he rarely responded as an organic whole" (Harap, 1937, as cited in Wraga, 1996). Harap traced the history of **interdisciplinaryhntegrated** curriculum up to that point, including such notable names as Dewey, Kilpatrick, Bruner, Parker, the Lincoln School, and many more. He also defined an integrative unit of learning: "... a complete and coherent learning experience having a purpose which is meaningful to the pupil, accepted as his own, and which is closely related to a life situation" (Harap, 1937, as cited in Wraga, 1996).

At the same time Harap conducted his research, the National Council of Teachers of English (NCTE) was issuing An Experience Curriculum (1935) and A Correlated Curriculum (1936). These two volumes provided a broad, comprehensive look at interdisciplinary/integrated curriculum in American schools. During the same time period, the Eight-Year-Study (Aikin, 1942), possibly the most significant curriculum experiment ever, was launched (see section on the Eight Year Study below).

Also within this incredible flurry of growth and research, the Society for Curriculum Study (forerunner of Association for Supervision and Curriculum Development), created the Committee on Integration, chaired by L. Thomas Hopkins of the Lincoln School at Teachers College.

The Lincoln School at Teachers College, Columbia University opened in 1917 as an experimental school. One of the ideas they investigated was the integration of curriculum. Students at the Lincoln School spent half their time in traditional separate subjects and half in the "General Course." The main characteristics of the General Course were:

> (1) that the children must be educated for life in a democracy, **(2)** that the content included in the course must consider the basic problems of such a society, and **(3)** that the democratic procedure must operate in the classroom. (de Lima, **1941,** as cited in Wraga, **1996,** p. *25)*

Within this General Course, integration was defined as:

> … integration is concerned (1) with the unity and coherence of personality, *(2)* with the integrity of the individual's total experience, **(3)** with the mutually rewarding relation of the individual and his society, **(4)** with the mutual interaction, in a coherent pattern of all the functions of the school and the community in providing the student with an integrated and increasingly self-directed personal experience and development classroom. (de Lima, **1941,** as cited in Wraga, **1996,** p. *25)*

L. Thomas Hopkins worked as a professor at the Lincoln School when he assumed the chairmanship for the Committee on Integration for the Society in **1935.** The assignment for this group was to explore integration from the various perspectives (philosophy, biology, psychology, aesthetics, education), and make suggestions on application of curriculum integration in schools (Wraga, **1996).** The result of this group's work was Integration: Its Meaning and Application (Hopkins, **1937),** from which emerged ideas of the experience curriculum and curriculum integration as coherent curriculum designs.

Hopkins wrote extensively about curriculum integration, which he defined as: "... organized around the immediate, abiding interests and assured future needs of the learner, utilizing materials selected from areas of the social heritage regardless of subject division" (Hopkins, 1932, as cited in Beane, 1997, p. 27).

As Hopkins emphasized the importance of personal and social integration, he suggested that integration of knowledge is a key to young people realizing both. While commenting on Hopkins' work, Curriculum Principles and Practices (1929), Beane points out that, "It was here, as well, that he criticized the increasingly inappropriate use of the term "integration" to describe curriculum projects that actually involved multidisciplinary, broad fields and other organizations that were rooted in subject-matter rather than personal and social integration" (Beane, 1997, p. 27-28). Then, **as** now, the term was widely misunderstood and misused.

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The ultimate goal of all learning in the "Experience Curriculum" is for children to better understand their environment so they can more successfully interact with it. **As** in

Dewey's Lab School, the central focus is on building community... not necessarily on the individual child, and certainly not on the masses of isolated facts and information stored in the traditional school subjects.

In Interaction: The Democratic Process (1941), Hopkins continued to advocate for a collaboratively planned curriculum and a democratic classroom:

> The curriculum of the school should be designed by all of those who are most intimately concerned with the activities of the life of the children while they are in school. This, of course means the children themselves, together with their teachers, parents, other educators, and citizens of the community. (p. 12)

The work of Dewey, Kilpatrick, Hopkins, and others during the 1920s, 1930s, and 1940s generated considerable interest. There was also a good deal of research taking place, including the Eight-Year Study. The Lincoln School was one of the thirty schools involved in the Eight-Year Study.

The Eight-Year Study

The Eight-Year Study (Aikin, 1942; Chamberlain, 1942) was probably the most important and comprehensive curriculum experiment ever undertaken in the United States. The focus of the study was success in college, comparing students from experimental high schools where curriculum integration had been implemented, and students from high schools with traditional, separate-subject-oriented curricula. The magnitude and significance of this study warrant a detailed discussion.

Sponsored by the Progressive Education Association in the 1930s, the Eight-Year Study grew out of the realization of high school educators that the cooperation of colleges would be needed if they were to ever feel free to experiment with innovative curriculum designs. At that time, the high school curriculum predominately focused on college entrance requirements, which were locked into sixteen Carnegie Units (Aikin, **1942;** Chamberlain, **1942).**

In **1930,** the Progressive Education Association initiated a dialogue by establishing a committee to study the potentially unsatisfactory relationship between school and college. In **1931,** the committee submitted a report. This report pointed out a number of shortcomings with the high schools, many related to curriculum. They found the high school curriculum unrelated to the concerns of youth. Not only did it lack relevance, but it also lacked continuity. High school students moved through a curriculum that was fragmented, disconnected, and lacking in challenge to think creatively. The committee saw this as a result of the high schools' focus on meeting college requirements. Furthermore, they doubted the rationale that success in college depended on the Carnegie Unit-approach of studying isolated subjects for certain lengths of time. The Eight-Year Study experiment was planned to test these assumptions (Aikin, **1942;** Chamberlain, **1942).**

Critical to the implementation of the experiment was the cooperation of over three hundred colleges and universities who agreed to waive traditional college entrance requirements for students from the experimental high schools. It was decided that students from the experimental schools would be admitted to the colleges and universities based on recommendations by the high schools, rather than by grades and unit

requirements. The original waiver was for five years, beginning in **1936,** but was later extended to eight (Aikin, **1942;** Chamberlain, **1942).**

High schools applied to be experimental schools. All had to demonstrate a commitment to implement "progressive" curriculum designs. Thirty schools were chosen. They represented a full range of demographics by size, socioeconomic status, and geographic locations (including urban and rural, as well as public and private). Curriculum changes in the schools began in **1933.** There was no prescribed curriculum to be tested, so individual schools decided on what curriculum changes to make based on the unique needs of their own students and communities. As the experiment unfolded, some schools took curriculum integration to much higher levels than others, resulting in a continuum of "progressiveness."

Student assessment and evaluation were obviously critical issues in the experiment. Colleges and universities needed to see some sort of data documenting progress of the college-bound students. The experimental schools themselves needed data on which to base improvements and innovations. Finally, there needed to be some consistency of objectives as to the direction of curriculum changes. Available tests at that time only measured achievement of traditional subject matter. Ralph **W.** Tyler headed the committee who helped the experimental schools develop new evaluation tools, based on objectives reflecting thinking process. All thirty experimental schools had input into the process of identifying objectives. Consensus was reached on objectives, such as development of thinking skills, sensitivity to social problems, and work skills and habits. These objectives were defined in terms of behaviors and evaluation instruments were developed. These instruments used a variety of

methodologies including tests, interviews, and questionnaires (Aikin, **1942;** Chamberlain, **1942).**

In **1936,** when the graduating high school classes entered college, **1475** students from experimental schools were accepted. Each of these students were systematically matched with another student entering the same college from a non-experimental high school. These control-group students had attended traditional high schools and had met the usual college entrance requirements. The pairs of students were matched on the basis of scholastic aptitude test scores, gender, race, socioeconomic class, home and community backgrounds, and interests. Personal interviews, as well as document analysis were used to gather data to determine these pairings.

Achievement and accomplishments for these students were documented throughout their college years. Aikin identified eighteen areas where students in the matched pairs differed. To summarize the main finding: Students from the experimental schools attained slightly higher total grade point averages than students in the comparison group. They went on to specialize in the same fields as the comparison group. Foreign language was the only individual subject area where the experimental group didn't attain higher GPA's. Students in the experimental group received more academic honors and were judged to be more precise, systematic, and objective thinkers. They were also judged to be more intellectually curious, and more actively concerned about what was happening in the world. They also received more non-academic honors than the comparison group and demonstrated higher levels of resourcefulness.

Possibly the most interesting findings in the Eight-Year Study came from those high schools judged to be most experimental, those who moved the furthest toward

curriculum integration and student involvement. According to Chamberlain, students from these schools were:

> ... strikingly more successful than their matchees. Differences in their favor were much greater that the differences between the total Thirty Schools and their comparison group. Conversely, there were no large or consistent differences between the least experimental graduates and their comparison group. **(1942,** p. 209)

This indicates that small changes in the curriculum had little academic impact. The higher the level of implementation of the progressive curriculum, the greater the impact on students' achievement.

Other Studies

A number of other studies on success in college followed the Eight-Year Study, including Cook **(1951)** and Gale **(1959).** Cook's study at West Virginia University spanned nineteen years, comparing the academic achievement of graduates from two West Virginia high schools. One of the high schools, Morgantown, was described as a "typical high school in an urban area" (Cook, **1951).** The community was located near the site of West Virginia University and inhabitants embraced professional and business points of view. The curriculum and teaching methodology at Morgantown High School was described as "largely dominated by the traditional college-preparatory purpose" (Cook, **1951).**

The comparison school was University High School, a laboratory school on the campus of West Virginia University. **As** a laboratory school, it was a site of a good deal of experimentation in both curriculum and methodology. Curriculum was integrated and focused on situations involving life-problems. Students at University High School shared responsibility for determining school policies, including the curriculum. The study began in 1932, and involved a sampling of the graduating classes from both high schools over the nineteen-year period from 1928 to 1946. Students were paired by gender, IQ, age, and grades in high school. The reliability of the mean differences in all matching factors indicated statistical comparability of the paired groups. The basis for comparison was the academic-achievement records made by the two groups during their first four semesters at West Virginia University.

Results of the comparison over the nineteen-year period not only indicated significantly higher academic achievement by the graduates of the experimental school, but also showed that the gap between the two schools widened with each succeeding semester. The superior academic achievement by University High School graduates also showed up in all areas of study, including English, mathematics, the sciences, and social sciences. Gale, in another longitudinal study, compared students from the same high school during their college matriculation period and first college semester. Graduates from the "core curriculum" program in the high school were compared to a control group composed of graduates from the school's conventional curriculum. The core curriculum program involved students in a study of significant social issues and problems, integrating various content areas. Subjects for the study were selected randomly from graduates of the two programs throughout the period of 1947-1952. Samples included

239 graduates from each curriculum group. The participants were compared by gender, intelligence, and their year of graduation.

Gale's study looked at a number of comparisons, including success during the college matriculation process, scholastic achievement, and social achievement. Scholastic comparisons were based on grades from the subjects' first semester in college and scholastic honors.

Results indicated that graduates from the core program had been as well-prepared for college matriculation as the graduates from the conventional program. Both groups were accepted to colleges and universities equally. Academic achievement was also very similar. Non-core graduates showed slight advantages in sciences, while core graduates held an edge in English and the social sciences. There were no significant differences in numbers of academic honors. Socially, graduates from the core program tended to receive more recognition from honorary organizations.

The underlying message from this research is clear... when students from programs emphasizing integration of curriculum and democratic process move to a higher level of schooling, they perform at least as well as other students in academic areas, and excel in some areas. The research indicates that the benefits include social/interpersonal, critical thinking, and problem solving skills. This is the same conclusion drawn by Gordon Vars in his extensive review of the literature on general education, integrated, core programs **(1996).**

Willis' follow-up study of a number of students involved in the Eight-Year Study, The Guinea Pigs After **20** Years **(1961),** suggests that there is evidence that experiencing a progressive curriculum can even influence individuals' success in later life. Willis

revisited the students from the Eight Year Study twenty years after graduation and found them to be more successful than the control group in their careers, finances, and social recognition.

Core Curriculum

After World War II attendance in high schools sky-rocketed. Educators saw a need to provide something for those who were not college bound (Wraga, **1996;** Tanner & Tanner, **1995).** Thus the idea of "general education" grew. At the Lincoln School, "general education" had been defined as the part of the curriculum designed "to meet the general needs of the whole high school population" (deLima, **1942,** as cited in Wraga, **1996,** p. **127).** Advocates of "general education" continued to attack extreme departmentalization of the school day. In **1960,** Hock and Hill, with comments which could have come from DeGarmo and McMurry sixty-five years earlier, suggested that, "If there is little or no correlation between *teaching* in any two classes, then there is little likelihood that there is any correlation between the *learning"* (p. 5).

Closely related to the idea of "general education" was the "core curriculum" movement. Following the lead of the Eight-Year-Study, core curriculum became popular in America's high schools during the **1940s** and **1950s.** Designing learning activities and knowledge organized around personal and social issues and problems, core curriculum practitioners produced programs that closely approximated Beane's definition of curriculum integration.

By the early **1950s,** "core curriculum" programs were widespread. Books on core practices were common in the literature of the day and several newsletters appeared. The

National Association for Core Curriculum (NACC) formed in **1953** and its newsletter, The Core Teacher, has been published continuously since, due in recent years largely to the vigilant work of Gordon Vars.

Faunce and Bossing, in Developing the Core Curriculum **(1951),** offered the following definition: "The 'core curriculum' designates those learning experiences that are fundamental for all learners because they derive from **(1)** our common, individual drives and needs, and **(2)** our civic and social needs as participating members of a democratic society" (p. **4).**

Core Curriculum is another of those terms that meant very different things to different people. In an attempt to clarify the terminology, Harold Alberty of Ohio State University defined five types of Core programs in his book Reorganizing the High-School Curriculum (Alberty & Alberty, **1962).** These classifications provide a continuum of the amount of integration and student involvement in the curriculum. In a "Type One" program, all students take a "core" of common subjects. In "Type Two," there is an emphasis on correlation among two or more subjects. In "Type Three," two or more subjects are combined to form a new course. "Type Four" Core Curriculum is organized around significant problems and/or issues, usually identified by the teacher. Skills and content to be taught depends on the needs of the students. "Type Five" organizes curriculum around the particular interests, concerns, and needs of the students in the class. **All** planning of this curriculum is done in collaboration with the students.

A common characteristic of Core Curriculum programs, except some 'Type One," were that students worked with the same teacher for extended blocks of time.

Decline of Progressive Education

A search of the literature on progressive education programs mentioned above shows a sharp decline in the late 1950s and 1960s. Many people have speculated on the cause. Probably the most commonly cited explanation involves the Cold War in the late 1950s and especially the 1957 launch of Sputnik (Kliebard, 1986; Wraga, 1996). Kliebard described it like this:

> Within a matter of days, American mass media had settled on a reason for the Soviet technological success. Just as Prussian schools were widely believed to be the basis for the victory of the Prussians over the Austrians in the Battle of Konigratz in 1866, so, implausibly, did the Soviet technological feat become a victory of the Soviet education system over the American. Quickly, life adjustment education was seen as the primary example of America's "soft" education in contrast to the rigorous Soviet system. While American schoolchildren were learning how to get along with their peers and how to bake a cherry pie, so the example went, Soviet children were being steeped in the hard sciences and mathematics needed to win the technological race that had become the centerpiece of the Cold War. (1986, p. 265)

Beane points out that progressive education was actually in trouble before this as it became a favorite target for the far right-wing during the McCarthy era of the 1950s, who saw progressive education as a communist plot and the cause for juvenile

delinquency. Renewed attack by the classical humanists aggravated the situation. In 1949, for example, Mortimer Smith claimed that our schools had become intellectually inferior because of the trend toward, "...building the curriculum around 'major goals' or 'objectives' and integrating all subject matter around these goals" (1949, p. 45).

Individual teachers continued to practice progressive methodology throughout the 1960s and 1970s, although it seems safe to say that they were scarce. The separate subject curriculum was solidly on top once again, with little sign of organized resistance. These ideas resurface again, however, as a basic tenet of the middle school movement.

Curriculum and the Junior High / Middle School Movements

The idea of distinctive schools for young adolescents has always been based on a combination of factors. One of these has been the growing awareness of the developmental characteristics and needs of this unique age group. At the same time, however, both the junior high and the middle school movements were initiated for more logistical reasons. To fully appreciate the curriculum issue, it is important to understand the history of these middle grades schools. It is also important to understand the process of change.

The Junior High School

Junior high schools first emerged in the 1920s. Before that time, schools followed an 8-4 format, with eight years of elementary schooling and a secondary level for grades nine through twelve. One of the problems with this format was that many students dropped out before reaching secondary school. It was thought that some type of

transition from elementary to secondary was needed. College admission was another issue. Universities were interested in getting secondary students better prepared for college at an earlier age. These were some of the issues that led the Committee of Ten, under the direction of Harvard University President Charles Eliot, to recommend a move to a 6-6 format, extending secondary education by two years while cutting the elementary to six. In this way, college preparatory classes could begin at an earlier age. Gruhn and Douglass (1956) explained the rationale for this change like this:

> The seventh grade, rather than the ninth, is the natural turning point in the pupil's life, as the age of adolescence demands new methods and wiser direction... The transition from the elementary to the secondary period may be made natural and easy by changing gradually from the one-teacher regimen to the system of special teachers, thus avoiding the violent shock now commonly felt upon entering the high school... By the proposed change, the students in the seventh and eighth grades would gradually gain the inspiration of the high school life, and the desire to go farther in the languages and sciences which they have already begun under favorable conditions. The result would doubtless be a more closely articulated system, with a larger percentage of high school graduates. (p. 11)

Sensitivity to the needs of young adolescents was a driving force in this movement as well. Gruhn and Douglass **(1956)** continued:

> Actually, the basic philosophy and virtually all the important administrative and instructional features of the early junior high schools were largely the outgrowth of the recommendations of the various committees that served for two decades beginning with the Committee of Ten in **1892.** For instance, basic concepts underlying the junior high school idea which were stressed by the various committees on reform included: **(1)** better provision for the needs of young adolescents, **(2)** better provision for exploration by the pupils of their interests and abilities, **(3)** better individualization in the instructional program, and **(4)** better articulation between elementary and secondary education. (p. 5)

A 1927 National Education Association paper, The Junior High School, further illustrates the rationale for junior high schools:

> (1) Meeting individual differences of pupils – enabling pupils to follow the lines of their interest and ability.
>
> (2) Prevocational training and exploration resulting in wise choice of later school courses and life work.
>
> (3) Counseling or guidance – bringing pupils into contact with influences that should give direction and purpose to their lives.
>
> **(4)** Meeting the needs of the early adolescent group.

(5) Bridging the gap between elementary and secondary schools – proper coordination between lower and higher schools.

(6) Development of qualities of good citizenship – preparation of pupils to play a larger part in the life of the community.

(7) Providing opportunities for profitable self-activity – early development of leadership, individuality, and initiative.

(8) Retention of pupils between compulsory school age.

(9) Continuation of common education or regular scholastic or academic training.

(10) Rounding out a complete unit of training beyond the elementary grades for those who must leave school early.

(11) Introduction of new subjects into the curriculum.

(12) Effecting economy of time in education.

(13) Stimulation of educational advancement.

(14) Beginning of definite occupational training.

(15) Giving opportunity for earlier preparation for college.

(National Education Association, 1927).

To address these concerns, the junior high school was born. Gruhn and Douglass reported that the number of these junior highs grew from about fifty in 1920 to nearly two thousand in 1930 (1956, p. 19).

Interest continued as schools began to explore programs and curricula. Gruhn and Douglass mention integration as one of the six functions of a junior high school –

Integration, Exploration, Guidance, Differentiation, Socialization, and Articulation (1956). The purpose of "Integration" was:

> To provide learning experiences in which a pupil may use the skills, attitudes, interests, ideals, and understandings previously acquired in such a way that they will become coordinated and integrated into effective and wholesome pupil behavior.
>
> To provide for all pupils a broad, general, and common education in the basic knowledges and skills which will lead to wholesome, well-integrated behavior, attitudes, interests, and understandings. (p. 31)

As educators continued to look for ways to address the needs of young adolescents, "units" became more popular as organizing centers for the curriculum:

> At first these were largely subject matter units. Even so, some encouragement was given by the unit approach to the better correlation of learning outcomes between subject areas. Later, especially in the 1930s, the activity unit received more attention. The latest development in unit teaching is the experience-centered unit. In the experience-centered unit there is a tendency to reach beyond narrow subject matter lines and to draw upon the previous learning experiences of pupils in any areas both within and without the program of the school. It is obvious that the experience-centered unit, effectively used, may also lead to better integration of learning outcomes. (Gruhn & Douglass, 1956, p. 33)

So, as we see, the original junior high school movement reflected educators' recognition of the developmental transition experienced by young adolescents. Attempts were made toward implementing school programs responsive to these needs. The progressive nature of the programs, however, spelled doom for the underlying philosophy of the junior high as the separate-subject approach to curriculum completely took over.

The Middle School

The middle school movement emerged for many of the same reasons that junior highs had been created. A perceived need for a realignment of grade levels in schools was a factor. By the 1960s the junior high school had become a school for grades 7–9, either as a separate entity or as an annex to the high school. Research at that time indicated that the onset of puberty was taking place at an earlier age (Beane, 1990). To some people, this suggested a need to reexamine the middle-grade configuration, possibly sending the ninth graders on to high school and including grades six or five and six in a new middle school configuration.

As luck would have it, a growing problem of overcrowding in the elementary schools developed during the late 1950s and early 1960s as well. Removing grade six or five and six from the elementary school, when coupled with the research on puberty, made for an attractive answer to the problem. In urban areas, the possibility of moving children from segregated neighborhood schools to new racially integrated schools was also attractive. **All** of these issues contributed to the formation of the first middle schools.

But, just as its junior high school predecessor, the middle school movement went much deeper than logistical issues. By the early 1960s, a great deal of dissatisfaction existed among educational leaders concerning the state of affairs in the junior high school. William Alexander, John Lounsbury, Conrad Toepfer, Gordon Vars, and many others spoke out against the junior version of the high school, which they saw as inappropriate for serving the needs of young adolescents. These people became leaders in the middle school movement. Under their leadership, a philosophy for middle level education emerged. Underlying the whole philosophy was a commitment to understanding the developmental characteristics and needs of young adolescents and designing middle level programs to address this knowledge. Other tenets of the philosophy included establishing the middle school as a distinct organizational structure, not an extension of the high school, and implementing other structural changes such as organizing teachers in interdisciplinary teams, establishing exploratory programs, and use of a block schedule (Beane, **1990).**

Growing interest in the middle school movement led to formation of the National Middle School Association (NMSA) in **1973,** with Gordon Vars as its first president. In **1977, NMSA** published the report from their Committee on Goals and Directions, chaired by William Alexander. The report featured the following goals:

> (1) Every student should be well known as **a** person by at least one adult in the school who accepts responsibility for his/her guidance.
>
> **(2)** Every student should be helped to achieve optimum mastery of the skills of continued learning together with a commitment to their use and improvement.

(3) Every student should have ample experiences designed to develop decision-making and problem solving skills.

(4) Every student should acquire a functional body of fundamental knowledge.

(5) Every student should have opportunities to explore and develop interests in esthetic, leisure, career, and other aspects of life.

(National Middle School Association, 1997, p. 19)

Thus, the middle school movement was off and running. Middle schools replaced junior highs in most parts of the United States. The most common grade configuration became grades six to eight and interdisciplinary teaming became common practice (Wraga, 1996).

The question that screams to be asked at this point is, "What of the curriculum?' Some researchers have made a case that not much has changed since junior high schools first appeared. Lounsbury and Clark, for instance, commenting on the results of 1989 shadow studies with eighth graders, reported that:

> Progress in climate is more apparent than progress in curriculum. Positive attitudes toward students, genuine concern for them and their developmental needs is evident, but the curriculum of content remains largely unchanged, even in many teamed situations. Schools have instituted recognition programs, developed fun activities like a dress-up day, organized interdisciplinary teams, established special classes or arrangements for students with unusual needs – all to the good – but the curriculum of content, the

> bread and butter of the school program, still is not reflective of what is known about the nature and needs of early adolescents. (Lounsbury & Clark, 1990, p. 13)

A couple of years later, citing the results of John Lounsbury and J. Howard Johnston's 1987 shadow studies of sixth graders in 132 middle schools (1988) and data from 2400 schools collected by the Johns Hopkins Center for Research in Elementary and Middle Schools (1988), Larry Cuban, maintained that while there is evidence of cases of integrated, core, and correlated curriculum throughout both the junior high and middle school movements, the vast majority of middle school teachers retain a separate subject approach to curriculum, even when organized on interdisciplinary teams (Cuban, 1992).

Citing this data in his 1990 monograph, A Middle School Curriculum: From Rhetoric to Reality, James Beane challenged middle level educators to take a serious look at the curriculum issue:

> … if early adolescence is a distinct stage of human development and if middle school is to be based on the characteristics of that stage, then presumably the curriculum would be designed along developmentally appropriate lines and would thus look different from that at other levels. If "reform" means that the relationship between schools, including teachers, and early adolescents are to be reconstructed, than the curriculum, as one of the powerful mediating forces in the relationship, would presumably be changed. (p. 6)

Beane cautions, however, that taking on this challenge would carry inherent dangers for the middle school movement:

> The movement has, no doubt, succeeded to the extent it has partly because it has not been attached to any larger social or political reform efforts that might bring it into conflict with dominant, powerful interests and partly because it has not taken on substantive curriculum change that would touch the deep subject area loyalties held by educators both inside and outside middle schools. (p. **7)**

Change at this level is a very complex and difficult process. Joan Lipsitz **(1984)** summed it up nicely in her landmark work, Successful Schools for Young Adolescents: ". . . translating philosophy into curriculum is the most difficult feat for schools to accomplish. . . the translation to climate and organizational structure appears to be much easier" **(1993,** p. **188).**

Experts on the change process would agree. Michael Fullan, for instance, distinguishes various orders (levels) of change, including the "cultural" changes that must take place during successful implementation of reform. Developing new curriculum documents and standards, adding new classes, and reorganizing students and teachers are all easy. They represent concrete structural solutions... first order changes at best. **A** new curriculum, however, would embody different values and expectations. These are issues of school culture and personal paradigms, requiring more difficult, second-order changes. Structural changes, as Fullan indicates, must go hand-in-hand with changes in culture (Fullan, **1993).**

Beane (1990; 1993) suggests that the complexity of implementing higher order change, in combination with pressures from special interest groups have led middle level educators to avoid the curriculum reform issue. The result in many middle level schools has been a curriculum that attempts to please everyone, with interdisciplinary teams where teachers make token attempts to correlate their separate subjects, advisory programs to address students' affective and social needs, exploratories to address aesthetic and technical concerns, etc. Beane concludes that:

> While such a plan helps to maintain a kind of equilibrium among competing interests, it also creates a fragmented collection of curriculum pieces without any coherent or broadly unifying theme. (1993, p. 15)

Still, alternatives to the fragmented, separate-subject curriculum in the middle school have surfaced, both in theory and practice.

The Process of Curriculum Change: Implementation/Enactment

Curriculum development is viewed by many as consisting of three major stages (although these stages may overlap and intertwine considerably): curriculum planning, implementation, and evaluation (Marsh & Willis, 1995). **A** main focus of schools is often on the planning stage, developing lists of content and skills for children to learn. Evaluation of curricula is also considered important. It is important to know if the curriculum is working and if the students are learning. What happens between these two stages is also very important, however, and is also often neglected or even completely disregarded. What kinds of things can be done to ensure realization of the planned

curriculum in the classroom? How can teachers be assisted and supported in times of change? How are the roles of students, teachers, and school leaders changing? How do teachers and students develop a sense of ownership in relation to the curriculum. What does effective leadership in the area of curriculum implementation/change look like? Answers to these questions have been less than definitive. Some believe threats and demands for accountability are the answers. Others see these tactics are extremely detrimental to the high levels of motivation generated by feelings of empowerment, professionalism, and ownership, for both teachers and students. Discussion of implementation/change become even more problematic when we throw in introduction of innovative curriculum practices, such as curriculum integration.

Curriculum Change/implementation

Implementation of anything new, including a new curriculum, brings in elements of change. Certainly something as different as curriculum integration requires significant change for most educators. It is questionable how effectively classroom practices can be changed by writing new curriculum documents. Classroom practices are changed by changing what teachers and students believe (Fullan, 1993). The tough question is how to go about that. One of the things necessary is for teachers to look critically at what they do (Marsh and Willis, 1996).

This critical look at one's practice is a necessary part of change. We are not motivated toward meaningful change because of mandates or demands for accountability. As Fullan (1993) suggests, we need to see benefits for ourselves and our students. Until

we can look at our current practice with a critical eye, we may never consider alternatives.

Fullan, in his article, "Getting Reform Right" (1995) discusses different orders of change and the cultural changes that must take place during successful implementation. Developing documents is the easy part. They represent concrete structural solutions, first order changes at best. The harder part comes with implementation, which often involves changing the way teachers think, feel, and work. New curriculums may embody different values and expectations. These are issues of school culture, requiring more difficult second-order changes. Structural changes, as Fullan indicates, must go hand-in-hand with changes in culture.

Schema theory may also help explain why teachers are reluctant to consider curriculum change. It doesn't matter how good an idea is, most teachers have a well-established schema as to what curriculum looks like. To change that requires the cultural changes Fullan talks about. It requires teachers to look into their practices and assess whether what they do is the best thing for kids. Enactment of curriculum integration is a good example of radical change. Even teachers who agree with the basic tenets of curriculum integration often question implementation. Their schemata keep them from seeing it implemented. They need to see working models, hear success stories, be involved in on-going dialogues, have safe environments in which to experiment, be supported, and provided with training to become reflective practitioners. These are things curriculum leaders can help provide.

Leadership

School leadership comes in many forms. It can come from within, as well as from above. Highly skilled leaders know how and when to share leadership and power. While schools have traditionally been completely hierarchical, with power and knowledge aggressively protected by the few at the top, some believe that a web-like model might be more appropriate for schools (Helgesen, **1990).** In this leadership model, knowledge is accessible to all, power is shared, and the leader is accessible to all members of the organization.

Fullan emphasizes that important changes can not be mandated. This is a far cry from the demands for accountability and adherence to standards that I keep hearing. Fullan further points out that important changes require "skill, motivation, commitment, and discretionary judgment on the part of those who must change" **(1995,** p. **204).** These are certainly not things that can be mandated.

So, what needs to accompany the development of curriculum documents and standards? What are school leaders to do? In many cases, democratic and liberal leadership may be the single most important factor in curriculum change (Fullan, **1993).** Ideally, this leadership would come from the principal of the school, or curriculum director. **As** teachers and students take on new roles, so must principals and other individuals in leadership positions within the school.

Team Structure and Curriculum Integration

Interdisciplinary teams have become the basic organizational structure in middle level schools. **A** team generally consists of two to five teachers representing basic core

subject areas, who teach a common group of students, share a common block schedule, and have a common planning time (Arnold & Stevenson, 1998). When compared to non-teaming schools, schools that use an interdisciplinary team structure enjoy a more positive school climate, have a higher rate of parent contacts, have a higher rate of job satisfaction for teachers, and produce higher student achievement scores (Flowers, Mertens, and Mulhall, 1998). However, while the implication is that simply implementing teaming will have a positive effect on teachers and students, others have found that unless teams do significant follow-up work after they form, these outcomes are not likely to be sustained (Erb and Doda, 1989; Felner, Jackson, Kasak, Mulhall, Brand, and Flowers, 1997). Studies also show that most teams do not begin to maximize their potential, (Dickinson and Erb, 1997; Arnold and Stevenson, 1998).

This failure of teams to maximize their potential is sometimes due to administrative issues: lack of leadership and support; lack of adequate common planning time; and lack of site-based control in scheduling and grouping (Arnold and Stevenson, 1998). But, even when adequate structures and administrative supports are in place, many teams still fail to perform at a high level. According to Arnold and Stevenson,

> They fail to create a full sense of community with and among their students. Team philosophy, mission, and standards are often unclear or not understood, especially by students. Use of planning time is often only marginally effective. Separate subjects continue to be taught on a bell schedule in a didactic manner, and curriculum integration is infrequent or even nonexistent. (1998)

Team size can also be a factor in team effectiveness. Typical five-teacher interdisciplinary teams include 120 – 140 students. Reports from the W. K. Kellogg Foundation's Middle Start initiative in Michigan, however, showed that teams of fewer than 90 students have more and a higher quality of interactions among team members, and that these teams made more curricular connections in their instruction (Flowers, Mertens, and Mulhall, 2000). Arnold and Stevenson suggest that even smaller teams, comprised of two or three teachers and 40 to 75 students, magnify the positive effects of teaming (1998). This "partner team" structure enhances communication among teachers and students, allows for more flexible scheduling, and provides time for students and teachers to form close relationships.

When true curriculum integration is a desired outcome, team size becomes even more of an issue (Jackson and Davis, 2000; Arnold and Stevenson, 1998; Alexander, 1995b & 1993). Curriculum integration requires high levels of contact and communication among teachers, high levels of cooperation among students, close relationships between teachers and students, and flexible block scheduling. The partner team structure facilitates these concepts. Partner teaming also helps teachers transition into curriculum integration (Alexander, 1995b & 1993). When teachers are responsible for more than one subject, the boundaries between subject areas are broken down and this helps teachers see how subjects may integrate.

Chapter 3

METHODOLOGY OF THE STUDY

Purpose of Research

The review of the literature in Chapter Two documents a rich history and suggests both academic and social advantages to curriculum integration. Still, as a curriculum design, it has never been truly mainstream. Like many things, getting started can be the hardest part. Brazee and Capelluti (1995) suggest that curriculum integration, which they refer to as "integrative curriculum," exists on a continuum moving from conventional separate-subject curriculum through interdisciplinary and multidisciplinary curricula which correlate subjects, to integrated where learning is organized around teacher-generated themes that cut across subject-area lines, and then to integrative, where students are actively involved in identifying and planning themes. The purpose of this study was to document and investigate a veteran middle level team's journey as they move from the interdisciplinary/multidisciplinary level to the integrative level which Beane refers to as "curriculum integration."

This research was designed to identify key stakeholders in this transitional process and determine the role each played, and to identify and investigate the key steps and obstacles along the way. Key questions that drove the research include:

1. Why did the teachers decide to change their previously successful practice?

2. How did they know when the time was right?
3. How and when were the key stakeholders involved? Including:
    - Teachers
    - Students
    - Parents
    - School administrators
4. What steps were involved in the transitional process?
5. What obstacles turned up and how were they addressed?

Selection of Methodology

The intent of this study was to produce a description of the transition process experienced as middle level teachers move from an interdisciplinary/multidisciplinary curriculum approach to curriculum integration. For that reason, a qualitative case study became the method of choice. According to Merriam, **"A** qualitative case study is an intensive, holistic description and analysis of a single instance, phenomenon or social unit" (1988, p. 21). Case studies, "focus on a specific situation or phenomenon; and they are heuristic – that is, they offer insights into the phenomenon under study" (Merriam, 1988, p. 21). By relating the experiences of a team that successfully makes the transition, information will be provided to the larger middle level community. The goal was to offer information that can help develop theory. "Qualitative inquiry is inductive – focusing on process, understanding, and interpretation – rather than deductive and experimental" (Merriam, 1988, p. 21). Yin describes it like this: **"A** case study is an empirical inquiry that: investigates a contemporary phenomenon within its real-life context; when the

boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used" **(1989,** p. **23).**

While a great deal has been written about the theory of curriculum integration, as well as accounts of successful examples, there is not a lot of information about the transition process experienced by teachers and students. This is exactly why a phenomenological study and a qualitative approach were needed. In discussing qualitative case studies, Merriam says that, "They are useful in presenting basic information about areas of education where little research has been conducted" **(1988,** p. 27). Interviews and observations in the school setting provided primary data. Analysis of relevant documents provided triangulation.

Definitions of Terms

The following definitions were used in this study:

Early adolescence: The developmental period usually occurring between the ages of **10** to **15.**

Middle level school/classroom: Any schools or classrooms including grades five to eight.

Separate Subject Curriculum: The separate subject curriculum is based on the concept of knowledge organized by "disciplines" or scholarly fields of specialized inquiry. Within this approach students are expected to encounter and master selected content from various disciplines through school subjects that are intended to represent them (Beane, **1999).**

Multidisciplinary Curriculum: The multidisciplinary or multi-subject curriculum is intended to correlate two or more subjects in relation to some organizing theme, concept, topic, or issue. Planning for such a curriculum usually begins with identification of a topic or theme, followed by the question, "what can various subject areas contribute to the study of the theme?" (Beane, 1999).

Interdisciplinary Curriculum: "Interdisciplinary" is a broad term used to refer to both curriculum designs and projects that seek *to* combine two or more disciplines of knowledge. Interdisciplinary curriculum design begins with particular disciplines and uses them to create new fields of inquiry, such as Art History or Environmental Studies, in which the individual disciplines are necessary – but not alone sufficient – for work within the new field of inquiry (Beane, 1999).

Curriculum Integration: "Curriculum integration is a curriculum design that promotes personal and social integration through the organization of curriculum around significant problems and issues, collaboratively identified by educators and young people, without regard for subject area lines" (Beane, 1997).

Setting and Participants

This study was conducted with a seventh/eighth grade team consisting of five teachers and 100 students, parents, and the school principal in a middle level school in rural Maine.

Selection of Subjects and Access

Purposeful case sampling was used in this study. Purposeful sampling, "selects information-rich cases for indepth study" (Patton, 1990, p. 182). This study required access to middle level teachers who were involved in enacting curriculum integration. To establish criterion sampling (Patton, 1990), regional experts on middle level curriculum were consulted to suggest possible teachers and teams. Based on these suggestions, two teachers on a five-teacher team were located and agreed to participate. A preliminary interview confirmed that they were in the process of planning for enactment of curriculum integration.

The principal and superintendent of the school were contacted to receive required permissions. **All** students on the team, and their parents, were approached for permission to participate in the study. This type of study produces questions about right to privacy, informed consent, and protection from harm (Bogdan & Biklen, 1992; Glesne & Peshkin, 1992). Informed Consent Agreements were used to inform all participants about the study. Participation was voluntary, thereby minimizing risk.

Data Collection

Multiple sources of evidence are critical to establish credibility in case studies (Merriam, 1988; Patton, 1990; Yin, 1989). Patton suggests that by comparing data from various sources, "data provide cross-data validity checks" (1990, p. 188). Data for this study was collected from three sources: classroom observations of teachers and students; interviews with teachers, students, parents, and administrators; and analysis of relevant documents, such as unit guidelines and assessment rubrics. The first 2-3 days at the site

were used to establish contact with teachers and students, become familiar with the school, and become comfortable at the site. After that, interviews and document collection were ongoing. Interviews were scheduled at times when the teachers and students were not in class.

Observations:

Classroom observations were critical for several reasons. Observation of classroom practices provides information that may not be seen in interviews and document analysis and can be juxtaposed against other data sources to enhance credibility and confirmability (Bogdan & Biklen, 1992; Merriam, 1988; Patton, 1990; Yin, 1989). Observation also helps make the data transferable, provided it is characterized by thick/rich description (Guba & Lincoln, 1985).

In this case, observations provided descriptive data about the setting and information about specific classroom activities and brainstorms. At the same time, they allowed me to become a participant and interact with the students. This helped develop mutual-trust, which was important during the interview process. Classroom observations were conducted **3-4** days per week for several weeks during the spring of 2000.

Detailed field notes were recorded during observations. They included full descriptions of activities, quotations from the conversation, and my own impressions at the time (Merriam, 1988). As soon as possible after observations, I reread my field notes and added reactions, questions, and learnings, thus providing notes-on-notes (Kleinman, 1993). All of this was keyed into my computer in preparation for formal analysis of the data.

Interviews:

Data was collected from both formal and informal interviews. Interviews provided descriptive data for comparison with that from observations, as well as information about the participants' understandings, beliefs, and feelings about curriculum integration (Bogdan & Biklen, 1992; Merriam, 1988; Patton, 1990; Yin, 1989).

A combination of structured and unstructured interviews were used:

> … the structured interview is the mode of choice when the interviewer knows what he or she does not know and can therefore frame appropriate questions to find it out, while the unstructured interview is the mode of choice when the interviewer does not know what he or she doesn't know and must therefore rely on the respondent to tell him or her. In the structured interview the questions are in the hands of the interviewer and the response rests with the interviewee; in the unstructured interview both questions and answers are provided by the respondent ("Tell me the questions I ought to be asking and then answer them for me") (Guba & Lincoln, 1985).

All interviews began with a structured protocol and progressed to open-ended questions, usually asking respondents what else they thought was important in our discussion of the curriculum. This was especially true of the teacher interviews.

Interviews were tape recorded and transcribed. I did all transcription myself because it helped me become familiar with, and start to analyze, the data.

A cross-case analysis (Patton, 1990) was used to group together answers to the same question looking for similar or different responses.

Teacher interviews were the most extensive. It was essential to document the history and evolution of the teaching team. While some of this focused on descriptive information, it was also important to delve deeply into the philosophical beliefs of the teachers and why/when/how these beliefs developed. "What drives teachers to continue to push into new and challenging areas?" "Have they always been risk-takers?" "What preparation was necessary?' "Who were their mentors?' "Where did they seek information and support?"

Student interviews focused on their understanding of the principles of curriculum integration, how they felt about being prepared for the next level, and how they felt about the high level of responsibility that was expected of them.

Parents were asked about their level of involvement, how they were kept informed, and their understanding of "why" as well as "what" was taking place.

The school principal was questioned as to his understanding of the philosophy and research surrounding curriculum integration and his role in supporting the teachers and students.

Qualitative research requires a strong relationship between data collection and analysis. Questions continue to emerge from data that have been collected (Bogdan & Biklen, 1992; Merriam, 1988; Patton, 1990; Yin, 1989). Responses from initial interviews and observations suggested new lines of inquiry, such as the possibility of teachers helping colleagues learn to think integratively. As themes emerged, they suggested new questions.

Document Analysis:

Documents were collected when possible:

> Program documents provide valuable information because of what the evaluator can learn directly by reading them, but they also provide stimulus for generating questions that can only be pursued through direct observations and interviewing. The program records and documents serve a dual purpose: (1) they are a basic source of information about program decisions and background, or activities and processes, and (2) they can give the evaluator ideas about important questions to pursue through more direct observations and interviewing (Patton, 1990, p. 233).

Selected documents included a stratified purposeful sampling (Patton, 1990) of recent unit guidelines, assessment rubrics, and students' reflective writing. These documents provided evidence of the type of curriculum the students experienced before my arrival.

Data Analysis:

Analysis of qualitative data, according to Bogdan & Biklen (1992) is "the process of systematically searching and arranging" (p. 153). As suggested by Lather in her discussion of "research as praxis'' (1986), data was analyzed informally throughout the study to allow new questions and themes to emerge. Formal analysis was done at the end of the data-collection phase of the study.

Data from observations and interviews were read multiple times and coded (Bogdan & Biklen, **1992;** Merriam, **1988;** Patton, **1990;** Yin, **1989).** Copies of field notes and interviews were cut up to facilitate physical organization by coding category. Quotations and passages were arranged by similar content and each coding category was summarized. Conclusions were drawn by analyzing patterns in the data (Bogdan & Biklen, **1992;** Merriam, **1988;** Patton, **1990;** Yin, **1989).**

Analysis followed Eisner's model of educational criticism, which involves a sequence of description, interpretation, and evaluation (Eisner, **1994).** Analysis in this study was done at two levels, beginning with a descriptive analysis. Interpretation of these findings then facilitated analysis at a more abstract level to produce a picture of the teachers' and students' thinking and learning in regard to curriculum integration.

Researcher's Perspective and Subjectivity

On the issue of researcher bias, Patton **(1990)** says: "Because the researcher is the instrument in qualitative inquiry, a qualitative report must include information about the researcher'' (p. **472).**

It is important for the researcher to be up-front about personal and professional information that may influence data collection, analysis, and/or interpretation.

The theory and practice of curriculum integration and the notion of a democratic practice in the classroom have been the primary focus of my work over the past ten years, both as a student and a teacher. After several frustrating years teaching at the high school level, I found myself questioning my own classroom practice, as well as that of teachers

around me. Consequently, I left high school teaching in **1992** and took some time to consider the future direction of my career.

Even as I was figuring out what type of a career change I should make, I found myself enrolling in **a** graduate-level class in middle level curriculum and organization. During the next year, I was introduced to people and ideas that would shape my work since that time. At that time, the middle level curriculum dialogue was in full swing, stirred up by the curriculum integration work of James Beane and Barbara Brodhagen and Beane's **1990** monograph, A Middle School Curriculum: From Rhetoric to Reality. It was also at this time that I was introduced and trained in the "Foxfire" approach of teaching and learning. Both curriculum integration and "Foxfire" are deeply rooted in the theories of John Dewey. For me, these experiences ignited two fires, one to learn all I could about the history and philosophy of progressive education, and another to see these theories applied in a modern classroom.

While my university studies facilitated the theoretical inquiry, it was a year-long professional association with Kathy McAvoy and Dennis Carr, a sixth-grade partner team at Mount Jefferson Junior High School in Lee, Maine, that supplied the opportunity to see theory turned into practice. Working together throughout the summer of **1993,** we planned to enact curriculum integration in their classrooms. To make this rather long story short, we did it – and it worked. Students responded favorably and exceeded our expectations. Parents were thrilled to see their children excited about school again. The culmination of this first-hand experience with curriculum integration was the publication of Student-Oriented Curriculum: Asking the Right Questions (Alexander, **1995).** Indirectly, this event put me in touch with a new audience. It put a new spin on my

career and resulted in opportunities to work with many of the most notable curriculum specialists in the current middle school movement including, James Beane, John Lounsbury, Ed Brazee, and Chris Stevenson to name a few. These people greatly impacted my thinking.

My work with curriculum integration has continued since that time at multiple levels: first as a middle level classroom teacher, and later as a doctoral student, a university instructor, and a staff-developer.

All of this points to the fact that I have a bias toward curriculum integration. It has been the primary focus of my work for more than ten years. However, with this subjectivity comes knowledge, passion, and questions. According to Hesse, "The attempt to produce value-neutral social science is increasingly being abandoned as at best unrealizable, and at worst self-deceptive, and is being replaced by social sciences based on explicit ideologies" **(1980,** p. **247).** In a similar vein, Namenwirth offers, " Scientists firmly believe that as long as they are not *conscious* of any bias or political agenda, they are neutral and objective, when in fact they are only unconscious **(1986,** p. **29).** This dissertation is not merely a study of the merits of curriculum integration. Rather, it is a study of the transition process for those who wish to move their classroom practice in this direction.

Finally, the nature of this study brings up issues of reciprocity. **As** I worked with the teachers in this study, a give-and-take developed. The teachers readily used my knowledge and research findings to advance their change process. Lather speaks of reciprocity as a key component of praxis-oriented research **(1986).** She states that reciprocity is an excellent data gathering technique because, "the researcher moves from

the status of stranger to friend and thus is able to gather personal knowledge from subjects more easily" (p. **263).** Further, Lather suggests that we, "use our research to help participants understand and change their situations" (p. **263).**

Credibility and Ethics

The nature of qualitative research often necessitates the human researcher becoming the instrument. While this requires precautions that will be discussed below, Guba and Lincoln **(1985)** suggest that there are several advantages to "the human as the research instrument":

1) Responsiveness – The human can "interact with the situation *to* sense its dimensions and make them explicit" (p. **193).**

2) Adaptability – While the human is an imperfect instrument, he/she is infinitely adaptable.

3) Holistic emphasis – Any phenomenon is part of a larger context and, "the human instrument is the only one available capable of grasping all this buzzing confusion in one view" (p. **194).**

4) Knowledge base expansion – The human instrument can deal simultaneously with propositional and implicit knowledge.

5) Processual immediacy – The human instrument can "process data just as soon as they become available, to generate hypotheses on the spot, and to test those hypotheses with respondents in the very situation in which they are created" (p. **194)**

6) Opportunities for clarification and summarization – The human instrument is unique in his/her ability to summarize data on the spot and feed them back to respondents for clarification and correction.

7) Opportunity to explore atypical or idiosyncratic responses – With other instruments, atypical responses have limited use and are often discarded. "The human instrument can explore such responses not only to test their validity but to achieve a higher level of understanding than might otherwise be possible" (p. 194).

While these are notable advantages, they are meaningless unless the human instrument is also credible and trustworthy. Validity, reliability, and generalizability are key issues in all types of research. Validity and reliability speak to the credibility and trustworthiness of the data. Generalizability questions whether/how the findings pertain to other situations and/or individuals. Quantitative research relies on the strict rules of experimental process and established methods of statistical analysis to address questions of validity and reliability. Random sampling, large numbers of subjects, and random assignment to experimental and control groups ensure generalizability. In dealing with children in an educational setting, however, these methods are often not practical. This is especially true when the aim of the research is to seek information on which to formulate theory, rather than testing an established theory. Qualitative research relies on subjective data collection and analysis. Qualitative researchers, therefore, must be especially conscious of their research design and the accuracy of their data.

Qualitative researchers use a method of "triangulation" to confirm data and minimize researcher bias (Guba & Lincoln, 1985; Huberman & Miles, 1994). In this study, triangulation was used to compare findings from observational information,

interviews, and information from document analysis. Classroom observations gave the researcher access to a variety of activities, brainstorms, and discussions. Interview information broadened the perspective and supplied a better idea of the deep understandings and beliefs of the key stakeholders. Documents were used to verify information from the other sources.

To ensure accuracy of data in this study, interviews were taped and carefully transcribed. Views provided by the participants were cross-checked and validated through the triangulation process, looking for evidence from observations and document analysis to substantiate interview information. Whenever practical, member checks (Guba & Lincoln, **1985)** were used as interviewees were asked to respond to my interpretations and conclusions about the data.

Generalizability of qualitative research is always a controversial issue (Bogdan & Biklen, **1992;** Merriam, **1988;** Patton, **1990;** Yin, **1989).** This becomes even more so when the research focuses on a single case. This case study was not intended to produce any broad generalizations, but to provide some basic information in an area where little research has been done. **As** with much qualitative research, the generalizability of the results is largely left to the reader. The intent of this study was to provide a descriptive account of the transition process experienced by this team. The results are applicable to other middle level teachers in similar situations, or those who can reproduce a similar situation, and to theory-building of the change process.

Chapter 4

THE STUDY

This chapter presents the interview and observational data from Green Lake Middle School. It includes demographic information, my observations on the atmosphere of the school, and a description of my role as a researcher and participant. The unit I observed was the final unit of the school year, a unit on energy and transportation. It integrated math, science, reading, and language arts and included a design/engineering component where teams of students planned and constructed vehicles. A full description of this unit can be found in the Appendix.

Also included in this chapter is background information on the two participating teachers, including their individual and team histories; their previous knowledge of the theory of curriculum integration; their views on the advantages of a project-based, integrated curriculum, for both students and teachers; their curriculum-related professional preparation; and their thoughts on next steps toward their curriculum goals.

Finally, the chapter presents thoughts on this curriculum from students, parents, other teachers on the team, and the principal of the school.

The words of the participants of this study appear prominently throughout this chapter, often followed by my brief reflections. A full report of my findings, conclusions, and recommendations appear in Chapter Six.

Demographics of the School

Green Lake Middle School is a 5 – 8 middle school in rural central Maine. Located about thirty miles from Bangor, Maine's third largest city, Green Lake has a population of approximately 3500 people. The town of Green Lake has a hospital, a large construction company, and some other light industry. This is a working class community, with many inhabitants living at a low socioeconomic level.

The total population of the school is approximately 400, with about 100 students at each grade level. This is a K – 8 district that includes several small towns surrounding Green Lake, where the school is located. High school students go to a private secondary school in the same town.

Grades five and six are organized in two-teacher teams, most multi-aged, and one grade-level team for each grade. The level of mixing of the fifth and sixth graders on the multi-aged teams varies greatly, as does the level of curriculum integration.

Grades seven and eight are organized in two, five-member multi-aged teams (Green and Gold). One team is composed of two groups of seventh graders (approximately twenty per group) and three groups of eighth graders. The other team has three seventh grade groups and two eighth. These configurations flip-flop from year to year. Both teams have teachers assigned to teach science, math, social studies, language arts, and reading. Even though the teams are multi-aged, all instruction is delivered to grade-level groups. Both teams are heterogeneously grouped.

The school uses a rotating schedule. Teachers see four of their five groups of students each day, and begin the next day with the group they missed the previous day.

Teams have a double planning period each day, and they generally use half of this time for team planning and the rest for individual planning.

The physical plant has two stories. Most of the seventh and eighth grade classrooms are on the first floor, along with the office, faculty room, library, computer lab, gymnasium, cafeteria, consumer science room, and a very large music room. The second floor contains two science labs, all the fifth and sixth grade classrooms, the guidance office, and two other classrooms across the hall from the science labs, which are used by grades seven and eight.

Shelly Lincoln and Tina Kimball, the subjects of this dissertation, teach on one of the seventh and eighth grade teams (Gold). Since Shelly teaches science, she is located in one of the science labs on the second floor. Tina, the team leader this year, has the classroom directly across the hall from her. Tina teaches language arts to some groups and reading to others. The other language arts/reading teacher is a veteran of twenty-eight years. The math teacher has taught for eleven years, all in this school. The social studies teacher is an interim. He took the place of Tina's husband, who moved into the position of Assistant Principal at the beginning of this year. The principal is also new. Both the math and social studies teachers will be leaving at the end of this school year.

Shelly's room is large. There are twenty-five desks with seats attached in the front of the room facing a large teacher's lab table. Behind the desks are ten lab stations. One wall has windows along its entire length, with bookshelves below. There are two computers and a telephone near the teacher's lab table, and a large chalkboard behind. Cabinets and shelves line two walls and there are two small storage rooms behind the

teacher's area. One of these adjoins the other science lab. Student work and projects, both completed and in progress, line shelves, tables, and cabinet tops.

Tina's room is smaller. The twenty desks are mostly arranged in clusters of three or four. Three computers are arranged along one wall. A large chalkboard takes up most of another wall, and windows a third. Again, student work is displayed everywhere, even on the ceiling.

Students begin their day in homerooms. Both Shelly and Tina have seventh grade homerooms. The principal and students give announcements. On Fridays, the whole school has Sustained Silent Reading for twenty minutes before classes begin. Every other day, the Gold Team teachers have three classes, followed by lunch, a double planning period, and their fourth class. On the opposite day they have two classes, double planning period, lunch, and two more classes. During the teachers' planning periods, students are in exploratory classes including, art, physical education, computers, Spanish, and consumer science.

The Curriculum

The organization of the eighth grade curriculum will be discussed in detail later in this chapter. Most teachers are departmentalized, with occasional attempts to make interdisciplinary connections. Shelly and Tina, however, integrate most of what they do, organizing their curriculum around "challenges" focusing on themes from the science curriculum. Students have a great deal of input into these units. Typically, after common background information is provided, groups of students plan research and/or projects on the topic, or on selected parts of the topic. At times, Shelly and Tina have attempted to

draw other teachers into their themes. More recently, they have tried to involve students at still higher levels by asking for their input in planning entire units and assessments. Their hope for the final unit of the year was that the entire team would participate in a totally integrated unit.

Atmosphere of the School

On my first few visits to Green Lake, a number of things struck me. Most prominent was the atmosphere of the school. Everyone smiled - students, teachers, administrators, secretaries, and custodial staff. Administrators and teachers greeted students as they entered the school. The following, from some of my early notes, sums up the feeling in the school:

> I am struck by the good vibes in this building. The principal and assistant principal are truly kids' people. The care and concern for the children is easily seen in their faces. I'm sure the kids see it too. They greet the students as they enter in the morning, clearly trying to acknowledge as many as possible. Teachers also greet students with smiling faces. I feel immediately at home. It appears the students do too.

The banter among students, teachers, and administrators was lively, yet respectful. In the several weeks I spent in this school, I never heard a student putting down another student.

Principal, Mr. S., talked about how the atmosphere of the school has changed in recent years:

> To me the atmosphere of the school correlates with the attitudes of the teachers. Teachers are very powerful and should not be underestimated. If they have **a** negative attitude in permeates everything, including community perception and student perception of the school. This results in roadblocks, bad press, and many discipline issues. Five or six years ago, Green Lake Middle School was described by the superintendent at a public board meeting as the "black hole of Calcutta." At a board meeting the principal (not myself) described student behavior as out of control, and these remarks were published in the newspaper. Needless to say, the community had no faith in Green Lake. This has turned around tremendously. Data would show the number of major discipline situations have decreased almost 50% in five years. Bad press has ended with a lot of positive press. Instead of minor issues becoming major issues by staff, their attention is on cumculum instruction and programming.

Mr. **S.** further shared his thoughts on how this change in the school's atmosphere took place:

> To achieve this, the teachers and teacher-leaders are very important. They are on the front line. If they are happy, their students are happy. If the students are happy, the parents are happy. If parents are happy, there is community and board support. How does one keep teachers happy? This involves

> including the teachers in the decision-making process, treating them as professionals, allowing them to use their strengths, supporting them with staff development/training opportunities, and avoiding top/down decisions as much as possible.

While the whole school has a very positive atmosphere, Shelly's and Tina's classrooms exemplified caring and respect. **A** parent visiting the school on my first day there said, "Watch Shelly and Tina when they talk to the kids. See how they look deeply into their eyes? You can see they really care, and the kids know it.'' Some early notes about these teachers and the way they interact with students may help the reader sense this caring:

> **SL** keeps it fresh. She maintains a high energy level. When she talks to individual students, she looks deep into their eyes. I can feel how much she cares. I'm sure they do too.
>
> **SL** never stops... never sits down. She is constantly shifting gears. She has very different things to respond to... all questions and answers are different. She has to be ready for anything all the time... constantly adlibbing.

The second quotation is a reflection on the way Shelly's students are often working on very different things. She has to be prepared to field questions on various topics and help groups of students who are moving in very different directions and have very different needs.

Tina's classroom was much the same. She always models what she wants from the students. On my first visit **I** wrote:

> Class starts by wishing a couple of students **a** happy birthday. Writers' workshop begins with several minutes of journal writing. Everyone is writing, including TK. The room is silent. The students **look** like they are enjoying this activity/time. A previous mini-lesson was on doing an Internet bibliography. Students have forms that are supposed to be handed in. All students are working on a story. TK too.

Another thing that interested me in these two classrooms was the level of engagement of the students. With few lapses, they enthusiastically went about their work. Not overly concerned with my presence, they were very self-directed. The following is an example from my notes:

> This is Shelly's first class of the day. In the first five minutes, she makes several announcements concerning the culmination of the current unit on the nervous and endocrine systems. She reminds students about rubrics (these have been written individually by students to match their projects), upcoming presentations, and final self-evaluations which need to be typed. Without further ado, she says it's time to get to work. The students respond immediately. Several students go directly to Shelly with questions. Groups locate their materials and are quickly off to work. Some go directly to the classroom computers, others are off to the computer lab, one group is video taping. A group of four girls are turning one of the storage rooms into a "virtual body." They have covered

the walls and shelves with large chart paper on which they have illustrated the nervous and endocrine systems. The display wraps around three walls of the room. The girls are preparing to "guide" us through these virtual body systems. They have written individual parts of the tour. Some of the organs are animated. I can't wait to see the finished product.

At the end of this period, these students moved to Tina's classroom, where various parts of these projects continued.

I would like to share one more example from my observation notes that illustrates the caring and trust demonstrated by these teachers:

> At lunchtime Shelly was explaining *to* me that she has to go to the bank and then has duty in the cafeteria. Before she has a chance to leave, Wendy (7th grade girl from SL's homeroom) comes in in tears. She says to Shelly, "I need you... now!" Shelly put her arms around Wendy and led her to the back of the room. She was sobbing so hard that it was hard to understand her explanation. Her friend is waiting in the front of the room. The issue is with the math teacher who may think she is cheating(?). Wendy has major problems with organization and has recently been put on medication. Shelly has been working with her before and after school on organization skills. The math teacher wants to see Wendy during study hall. Shelly does not like this because other kids will be there. At Shelly's request, Tina joins the discussion.

> Both teachers are very calming, trying to get the facts. Shelly will see the math teacher. Tina will watch Shelly's study hall so Shelly can take the math teacher's and the math teacher can talk privately with Wendy.

This is what an "Adult Advocate for Every Student" (This We Believe, 1995) is all about! Part of my journal entry that day turned out to be an e-mail message to Shelly and her principal:

> I couldn't stop thinking about Wendy. What a great example of what This We Believe calls "An adult advocate for every child." She knew exactly where to go to find someone who cared about her and would listen to and support her. To me, this is the most fundamental part of the middle school concept. It's great to talk about curriculum, but this must be in place first. I wonder if every child on the Gold Team... or the school... feels she/he has someone like that in the school? On a larger scale, I wonder how our current issues of violence in schools would be effected if every child had a relationship like Wendy's with an adult in their school.

My Role as a Researcher/Participant

I spent more than seven weeks at Green Lake Middle School during April, May, and June of 2000. Nearly all this time was spent with the Gold Team, mostly with Shelly and Tina's classes and at team meetings. As I observed, I was often drawn into activities.

This seemed typical for visitors to these classrooms. Visitors were common and were usually drawn into activities by the students. In the seven weeks I spent there, I saw the wrap-up of one unit and the entire closing unit of the year. This final unit was intended to be an attempt at involving the full team in an integrated fashion. Details of this unit follow.

In addition to my observations, which included interaction and informal conversations with nearly all the students, I collected curriculum-related documents and formally interviewed five students, three parents, Shelly, Tina, the school principal, and two of the three other teachers on the Gold Team. I did not interview the interim social studies teacher.

Students and parents who interviewed were volunteers. While the students were not scientifically selected, I was assured by the teachers that they represented a cross section of the students on the team, both academically and socioeconomically. They included one of the top students in the class, a special needs student with serious reading/writing disabilities, and a range in between.

The Teachers

Tina Kimball

Tina began her teaching career as a first grade teacher. In talking about her decision to teach at this level, she said:

> I decided that I loved first grade. I did a lot of volunteering in elementary classrooms when I was in college, trying to figure out

> what grade level **I** would like to work at. **I** ended up doing my practicum with a kindergarten teacher because I had observed this teacher many times and **I** was amazed at how she could observe what was going on around the classroom. That was why I chose her. I wanted her to help me develop some of these skills. She was excellent and I learned a lot from her.

Three of the four first grade teachers at Tina's first school were first-year teachers. The fourth teacher had been there for several years, but she immediately made it clear to the new teachers that she didn't want to be bothered with their questions. **So** Tina found herself on her own. She also found that, being the last teacher hired, her classroom was depleted of most supplies, including books.

Tina started out that year trying to keep her twenty-four students at the same place, doing the same things. She quickly realized, however, that her class included several students who were more advanced than the others. To meet the needs of these students, she began to develop individualized reading and math programs.

At the beginning of her second year, Tina immediately implemented individualized reading and math programs. She talked about early writing classes:

> **I** was one of the few people who did writing workshop. Of course, this was over twenty years ago. And I would hang the students' writing out in the hall and **I** got a lot of flack from other teachers about displaying student writing with misspelled words. I was so excited because the kids would write five or six lines and illustrate their writing. I thought it was soooo neat, but the other teachers

> couldn't get beyond the misspelled words. To me, that wasn't important at first grade.

After three years of teaching, Tina stayed home with her children. But she loved teaching first grade and fully intended to go back to that level when she returned to teaching.

When Tina decided to return, she took a job teaching at a private Christian school where her husband worked. She described the school's structure:

> It was a multi-aged structure. The first year it was grades three, four, and five. But even though it was multi-aged, they made it very clear that I had to teach each grade separately. **So,** it was a lot of work. They did give me permission to combine fourth and fifth social studies. That was the first time I worked with multi-aged groups.

Tina worked at this school for three years. She described the reasons why she left: "When my husband and I left, we were making $10,000 each working in a private school. We had three children and we had no retirement - no security. I decided I couldn't worry all the time. We needed *to* do something else."

At that time, Tina's husband got a seventh and eighth grade social studies position at Green Lake Middle School. When he interviewed, he mentioned that his wife was also applying for jobs and the principal said that they had an opening in the fifth grade. Tina talked about her interview:

> When I graduated from college, I put together a portfolio. It was nothing the college teachers had us do at that time. But anyway,

> when I came to apply here, **I** brought a packet of stuff I had done. But **I** told my husband that I really didn't want the job. I told him I'd go talk to the principal and see what she had to say, but I really thought I didn't want to teach fifth grade. **So** I went into the interview not really caring if I got the job. But they hired me. And I told her right off the bat that I believed in heterogeneous grouping. At that time, the whole school was tracked. **I** told her that homogeneous grouping produces cliques and it sends the message that some people are better than others. That's not the way I want to teach. I also told her that I do a lot of group work and hands-on activities. And the principal said that was just the kind of things they wanted. **So I** took the job. That was twelve years ago.

From this brief summary of Tina's early experiences as a teacher, it is clear that her philosophy has always been a little out of the mainstream. Her commitment to individualized curriculum, heterogeneous grouping, hands-on activities and experiential learning, and relationships with students also seem to be a natural fit with middle level philosophy.

Tina talked about her first days at Green Lake:

> I came in August to set **up** my room. I brought in a whole bunch of stuff for New Years. I decided that this was a new year for me so I was going to do this New Years celebration in September. **I** had streamers and signs. Well, I had less than positive reactions

> from people going by my door. But I didn't care. **I** came in and put the desks into groups and got all set up. I was really excited. Then, a few days before school started, my husband came in and looked around and said, "do you know you have the only room with the desks in groups?' I asked what he meant and he said that every other room in the school had rows. ***So*** **I** looked and he was right. **So** I thought, "OK, there's two marks against me.'' They didn't care for my Happy New Year stuff and now I was doing this. ***So*** that was the first year. The principal who hired me was hated by everyone. She was trying to implement changes, but without getting anybody on board first. But she was very supportive of me. ***So*** I closed my ears when they talked about her. No one gave her much of a break. But she told me they were trying to get away from tracking and stuff, but she also warned me that it wasn't going to be an easy road. But I had no idea how hard it would actually be.

Here again we see that Tina was never afraid to take risks and be different.

Tina's first assignment at Green Lake was as a member of a five-teacher, *fifth*-grade team. But the team functioned much differently than current middle level interdisciplinary teams. Each teacher taught all subjects, but to different groups of students. The students were tracked into five ability groups for reading, math, and language arts. For science and social studies, students stayed with their homeroom

teachers. As the "new kid on the block," Tina ended up with many of the "lower" groups. She discussed her "team" experiences that first year as a middle level teacher:

> By team **I** mean that we all had to do the same thing. We were all supposed to be on the same chapter at the same time. They would get so mad at me because **I** would do other things, like for instance, when we did the planets, we had the planets hanging from the ceiling of my room. **I** had some great math students and they figured out how to place the planets to scale. It was great because **I** had the "low" math group because I was the new teacher and probably didn't know how to teach math. Also, **I** could only have the middle language group because, as the rest of the team told me, they weren't sure how good **I** would turn out to be. And then I discovered from some of my homeroom students that the upper levels had beautiful literature books. So **I** went to the other teachers and said that there was a great story I wanted to read with my class. But they said no because I had the third group and those kids would not be able to understand the concepts in that literature book. Well.. .. I just about hit the roof! I was soooo angry. I had a basal reader while the others read novels. But because my students didn't have those skills, we couldn't. So **I** went to see the principal and asked her if it was written anywhere that my students couldn't read a couple novels. And she said of course not. She found me some money to buy books. But she warned me to cover myself

> and be sure to do those stupid end-of-the-unit skills things that were in our basal. And I had these cardboard things... well anyway, it took me hours, but my kids scored just as well as any others on those things.

The second year, Tina had the group that everyone called the "group from Hell." But she quickly found that they were quite successful doing hands-on work. But, again, this was frowned upon by other teachers on the team. Tina: "I'd see some **of** the older teachers go by and they would stick their heads in and say things like, "Tina, some day you're going to learn that spending all this time on projects and doing research is really just a waste of time.''

While the other teachers were nice enough to Tina, there was a complete lack of support for her philosophy of teaching and learning and the methods she implemented.

Given that this was the "group from Hell," the teachers were always struggling with behavior problems. Tina talked in detail about one of these students. Timothy was a chronic and severe behavior case. He also provided Tina with one of her most memorable experiences in teaching. Tina:

> His language was so sooo foul... it was awful. Coming from a Christian school, I tried to figure out how to deal with this. His name was Timothy. I'll remember him forever. I had him in math and language, so I saw him twice a day. He would do things like getting up on the desk and scream vulgarities. He would throw things. We had PETs on him. He was a very, very bright child. He was very bright, yet he was in the third language group and the

bottom math group. **So,** Timothy was quite a challenge for me. The principal would tell me not to take it personally because he had other issues to deal with. He was never suspended. I gave him detentions for a while but I started to wonder why I was punishing myself. I called home and all that kind of stuff. Well, in June I found out that they weren't sure if they were going to keep my position but I could go to sixth grade with this same group. I was worried because I hadn't even wanted to go as high as fifth grade. One of my first questions was about Timothy. They said that because he had such a hard time with new teachers, they had told him that if he wanted to, he could be in my homeroom. They said he was all excited about it. And I thought, "Oh, joy, joy." **So** I met with Laurie Blair from the Special Education Department. I asked her for everything she could give me so I could learn about how to deal with Timothy. **So,** that's what I did over the summer.

I was excited about my homeroom because I knew all the kids already. And I got moved up... I got to teach the second group for language arts. But I still had the bottom math group. The very first week of school, Timothy was right back to what he was doing before. On that Friday, I was in the principal's office. I was there with the brand new principal, the assistant principal, and the guidance councilor, all male, and I was in tears. I said we had to

> do something with Timothy. It wasn't fair to the other kids. So, within the next three weeks, Timothy had been suspended three times for three days each time. But, finally, he decided that he guessed he was going to behave. When I see Timothy today, he always gives me a big hug. Timothy taught me how to play chess. Timothy taught me everything about computers. Study halls became a time when he worked with me on this stuff. We ended up with a great relationship and probably it was the best thing that happened to me in education was my dealings with Timothy. And he will tell you that one of his best experiences in education was me.

Tina's willingness to keep trying different techniques to connect with Timothy expresses the commitment she has to her students.

It was at the beginning of this second year at Green Lake that Tina met Shelly Lincoln. Tina described their first encounter:

> So it was that second year... I came in to work in my room and I noticed I was missing a table. Well, Shelly Lincoln came by. Shelly had just been hired. She got my fifth grade position because they decided to keep it. Her room was right across the hall from me. So she came in this day and introduced herself and she said that she hoped I didn't mind but that she had taken one of my tables. I was thinking, "who is this new teacher and where does she get off coming in here and taking one of my tables?' I didn't

> have a table the year before and I was excited that I was going to have two! She said that another teacher had told her that it would be all right. ***So*** I said OK. I know I could have used one the year before. ***So,*** that was how we started.

Tina's experience with the sixth-grade team was different from the previous year. They met once a week and talked about students and more general things. Tina described it: "No one cared what page I was on or what I did as long as I didn't bother them during class. It was very different than fifth grade because they were trying to break me in to their style."

At the end of that year, Tina asked the principal about the possibility of getting some sort of self-contained classroom. She had been talking to Shelly throughout the year, and she wanted to do a fifth grade self-contained. When they described the atmosphere they wanted to create in their classrooms, they were granted permission to proceed. ***So*** it was that year, Tina's third and Shelly's second, that they were able to start implementing some of the changes that are now evident throughout the school.

While the self-contained structure offered many new opportunities, not everything was immediately positive. Tina's and Shelly's classes were considered the "experimental groups" and both students and teachers felt like outsiders. Still, it was the first step. Tina talked about a few of the highlights of that year:

> We did lots of neat stuff and we made sure everyone knew it. We hung lots of stuff up all over the place. We had a rain-Fred party... we ate together... we cooked. When we were doing a unit on China, I had a teacher come in and asked me how cooking

> Chinese food had anything to do with the social studies curriculum. I said, "aren't we studying China?" We read Year of the Panda. We read Homesick, by Jean Fritz. Why wouldn't you explore their foods. It's part of their culture. I learned a lot about Chinese vegetables. We had people come in and show us how to cut things and use the Chinese cooking tools. It was a great life experience for all of us. But anyway, it was that year that I felt I could start spreading my wings and do some things.

I asked Tina to talk about the development of her relationship with Shelly. She talked about the excitement she felt from the possibility of finding a colleague who shared her philosophy:

> During her first year here, I'd go home and tell my husband that I felt like I had found someone I could work with. She didn't believe in tracking and she was open to new ideas. Right from the beginning, she was very creative. I was so excited! But then she started working with the other fifth grade teachers and they were putting pressure on her. And I'd go home and say, "I think I'm losing Shelly." But anyway, once we both decided to do the self-contained classroom, we decided we would be our own team, even though she was fifth grade and I was sixth. We wanted our students to see other kids. ***So*** we started doing some things together. And we discovered that it worked! We found that the sixth graders accepted the fifth graders. They found they could

have fun doing things together. So we said, "Why don't we do a multi-aged team?' So we went and talked to the principal. We sent out a letter. We did all the work beforehand.

We didn't take a course until after our first year. It was funny because we kept saying that we were already doing everything in the course.

We had a great group of students that year and we had the most fun! We had base fifth and sixth grade homerooms because of the allied arts. The allied arts didn't feel they could teach multi-aged groups because of their curriculums. So we said OK. And we weren't comfortable with math, so we kept our homerooms for math. Other that that, we mixed the groups for everything.

The parent support was wonderful. At the end of the year we did a video of the kids and had the parents in. We had a special gift for every kid. We also invited fifth graders so they could see what would be happening the next year. We had parents crying. They hated to see the kids go.

We did that program for five years and every year it just kept getting better and better. We started going to workshops and doing our presentations and we always had positive comments. People looked at the student work we brought and said, "you must have gifted and talented?' They couldn't believe that much of that work was done by special needs students.

So, the multi-aged partner team was born. This was grassroots change, implemented by two dedicated teachers who were willing to push the envelope in the interest of doing what they believed to be best for children. They had yet to study the tenets of the middle level movement in the United States, but they were breaking new ground in their own way. Their multi-age partner team became a model for restructuring the fifth and sixth grades.

Tina and Shelly continued this partner teaming structure for five years. While the idea caught on in the fifth and sixth grades, seventh and eighth grades remained unchanged. I asked Tina why she and Shelly chose to make the move to seventh and eighth grade from their successful program in fifth and sixth. In Tina's words:

> We started to hear the seventh and eighth grade teachers saying things like, "Well, that's good for fifth and sixth grade, but that stuff doesn't work at seventh and eighth grade." **So** at one point, some openings came up in seventh and eighth grades and my husband, who still taught at that level, said that Shelly and **I** should apply. Right off the bat, I said, "No." **I** kept saying **I** didn't want to go up another grade. **I** love sixth graders. But Shelly and I were at a point where we were looking for different ideas and challenges.

The two seventh and eighth grade teams were (and still are) multi-aged, although all classes are by grade level (basically a looping). Within this organizational structure, however, instruction is departmentalized. The openings were reading/language arts and

science. Tina was certifiable in reading and language arts and Shelly was comfortable with science. They made lists of pros and cons of moving, and eventually decided to give it a try. The administration was very pleased with their decision. According to Tina:

> At the time, there were a lot of PR problems in the middle school because they had gone from separate seventh and eighth grade teams to two multi-aged teams. That was causing some problems because people thought kids were being separated and stuff. And they had just let a science teacher go because she left a lot to be desired. Now we were coming in with a pretty good reputation, so the superintendent was thrilled.

As part of their negotiation with the superintendent, Tina and Shelly asked for classrooms across the hall from one another so they could continue to make as many connections and collaborations as possible. In all likelihood, the administration was hoping that Tina and Shelly would help institute change in the upper grades. Interviews with the current principal indicate that this was the case.

Tina summarized their purpose and course of action:

> **So,** when Shelly and I moved to seventh and eighth grade, our purpose was to prove to ourselves that what we did and the way we taught could indeed be effective at the seventh and eighth grades. I was assigned to teach seventh grade language arts and eighth grade reading. We decided that we were going to sit right down at the beginning of the year at look at what the science units would look like and how we could blend the language arts into it. We knew

there would be some ruffled feathers we would have to smooth over. A big obstacle for us was going to be the other language/reading teacher on the team because she had been very critical of what we had been doing in our classrooms up until that point. And she was really mad at me because I chose to come upstairs and she wanted me to be across the hall from her so she could "guide" me and help me. **So** she was very reluctant, but as it turned out, she has been wonderful. She has discovered that I do know how to teach and I'm a pretty good teacher, and that I'm organized and my classroom is not a free-for-all, and all of those kinds of things. Of course my husband, who was also on the team, knew that I was a hard worker. He knew I would be OK. The math teacher was a little different simply because I had taken over her room to be across from Shelly. But she came around very well.

Tina and Shelly have been in this five-person team structure for five years. They continue to integrate much of what they do. The invitation is open for other teachers on the team to join the integration, and all have at times.

Shelly Lincoln

Shelly started teaching at Green Lake Middle School in **1989.** She was hired as a first year teacher on a one-year contract as a sixth grade teacher. The following year Shelly filled a void in the fifth grade. As reported by Tina, this was when they started to

make connection. Shelly's third year, they piloted the multi-aged partner team. I asked Shelly to describe their team structure and how their ideas affected the school. Shelly:

> The first year we weren't officially a team, but we did start mixing our kids for some activities. Then we asked if we could try a multi-aged program. *So* we were the only multi-aged team, K-8, in the district. After that, we were both involved in what we call the Restructuring Committee. We started doing all kinds of things. We were working with people from the University of Maine. That's when the Parent-Input Forms started. And our program was pretty successful. *So* our principal said, at the parent information night, that if we found more and more parents asking for multi-aged programs, then we would create them. *So* that's what happened. Now there are three multi-age programs, and only one single year at each grade level in fifth and sixth.

I asked Shelly to tell me about the Parent-Input Forms and how they affect team arrangements. Shelly:

> They are for placement. And the teachers' names are on them. They get them in the report cards at the end of the third quarter and we have an information night where parents come in and meet the teachers. The first year we met in the gym and we explained what the different programs... what a multi-year was... what a multi-age was... what a single-year program was like. Then they got a list and they got to go tour and visit the teachers in their

> classrooms. As it turned out, some teachers weren't getting visited while others were getting bombarded with parents. **So** we took all this information back to "Restructuring" and questioned if there was another way to do it. We tried several things, including a social in the gym. But it just started, each year, less and less attendance. But we still use the forms and always get a very good return on them. The parents are supposed to select whether they want a multi-year or a single-year program for their children.

Shelly explained that when the Placement Team sits down with the Parent-Input Forms, they try to group heterogeneously. They also try to consider socio-economic factors. Parents make two choices. If they don't get their first choice one year, the Placement Team tries to give it to them the next time. This works fine in the fifth and sixth grades, but there are only two choices in the seventh and eighth. According to Shelly, it was weighted toward their team for several years. But with the addition of some new teachers, things have evened out.

Shelly explained how the amount of mixing of grades differs on different teams:

> In the fifth and sixth grades, it all depends on the team and the program. When Tina and I had them, we mixed them for everything but math. And every time we changed units, we regrouped them. But now it varies… some don't mix them at all, others mix them for science and social studies, but keep them separate for everything else. But at seven and eight, it's basically a looping structure.

As Tina noted, at the time she and Shelly decided to move to the upper grades, there was a good deal of unrest among seventh and eighth grade parents. With science and language arts positions open on Tina's husband's team, he encouraged them to apply. Shelly and Tina met in July to "weigh all the options." Shelly: "So we came in here and looked at the materials. Science is my concentration and I love science. When Tina and **I** taught together, she taught the social studies and I taught the science. **So** I said I'd consider it."

When they met with administration, they explained how integrating curriculum was a big part of their program and that they needed to be close to each other. To arrange this meant moving another teacher. The superintendent said that "room assignments are not sacred" and took care of it. Unfortunately, this led to some tension in the early going.

I asked Shelly to talk more about her early years at Green Lake and the evolution of her teaming arrangements with Tina. Shelly:

> Tina was here from my first day and we've always been across from each other. So, she's always helped me out. She was here in the building the year before me. She's been teaching longer than that, but came here the year before me. **So** we've been teaching together for eleven years.
>
> When **I** came in, I was given my textbooks. And **I** was teaching on a team with four other teachers that had been my fifth grade teachers. **So** it was very hard for me to do things the way I wanted to. Tina says she could see them pulling me their way. And she'd try to pull me back. Finally... that's when we broke off. And Tina

> and I pushed very hard for heterogeneous grouping. That also caused a lot of friction. Now, even that has smoothed out a lot.

As mentioned above, these teachers continually emphasized the point that being agents of change in their school was not easy. A firm belief in their philosophy kept them going.

Evolving Beliefs about Curriculum Design

I asked both Shelly and Tina to tell me about how their feelings and beliefs about curriculum had changed through the years and what had driven these changes. Shelly responded:

> The biggest change, and this is probably the same for both of us, was when we started working with the Critical Skills program, which we started through the Math / Science Academy at Unity College in 1992. We did Critical Skills at Level One and Level Two, and then we went to the Master Teacher Program at Antioch College. That is an integrated style, giving the students the guidelines and then getting their input. Remember when I read you Kevin's evaluation when he talked about us giving them the guidelines and then letting them go in their direction, well that's how we've always taught. And that's what they have become used to. Basically, we type up a "challenge" with the "essential knowledge" piece and then the rubric. Then the students can go in

different directions with it. Our current step toward curriculum integration has just opened it up a little wider for me.

Shelly explained that the "challenges," which have been the learning centers of their curriculum, come from the "Critical Thinking" instruction (Mobilia, **1995).** Since that time, they have read and heard about "Education by Design," which they see as very similar.

Tina also mentioned "Critical Thinking." She also talked about how the State of Maine Learning Results fit into the mix:

> Our changes in curriculum have also been influenced by the Common Core of Learning and the Learning Results. And we've had several curriculum committees. We did curriculum mapping for a couple of years. So the curriculum has changed based on different guidelines I've been given. Of course, my curriculum changes all the time because I've changed my process so many times too. I kept moving around so much to different grade levels and stuff.

I asked Tina how much textbooks have driven her curriculum. Tina:

> Since I've been here at the middle school, the first year a lot was based on textbooks. On the team I was part of the expectation was that every child needs a textbook in each separate subject. But what I did was, I looked at what we were doing and brought in lots of extra things. But we always had a textbook. The team met once a week and we had to give an account of where we were in the

> textbook. After that, when I moved to sixth grade, the sixth grade teachers really didn't care. That's when I started pulling away more.

As Tina talked about the evolution of her philosophy on curriculum design, the power of a sense of ownership was a recurring theme. But this did not come from studying educational theory, it came from personal observations during her collaborative work with other teachers. Tina:

> I learned from working with staff and other teachers, if people have ownership in something, there seems to be lots more involvement, more enthusiasm, and better results. It was like… why wouldn't this work with kids? There's still that piece of wanting to make sure the students are prepared for life. I think that's the biggest thing. I don't even worry that much about high school. My thought is that I want them to be life-long learners. Of course, high school is part of their future life too. But that involves more than just academics.

Middle level students have a keen desire to do adult-like things (National Middle School Association, **1995).** And many educators feel it is desirable to have them doing so (Zemelman et. al., **1998).** Shelly and Tina want their students thinking as scientists think, writing as real writers write, doing the things that social scientists do, and learning to think as mathematicians do. Tina is suggesting that these students' involvement in the curriculum planning process, a very adult-like model, stimulates a sense of ownership that can be motivational, just as it is for adults.

In another comparison of students to adults, Tina mentioned learning is enhanced when the experience is pleasant: "You want them to enjoy what they are doing. I want them to enjoy coming to class."

Overall, it appears that a combination of things have facilitated curriculum change for these teachers. Professional development, such as "Critical Thinking" training, was a factor. But instinct, careful observation and self-reflection were also important.

Previous Knowledge of the Theory of Curriculum Integration

I asked both Shelly and Tina to tell me about their knowledge of "curriculum integration," as defined by Beane and others and discussed in previous chapters of this dissertation. These were very interesting discussions, but in both cases their initial reactions were somewhat defensive. As we know, curriculum integration has become a generic term. Having been only recently exposed to the historic definition presented by Beane, they had been billing their program as curriculum integration all along. As Beane's definition became more widely accepted, it was pointed out to them that they were not, strictly speaking, doing curriculum integration. When I interviewed them, they were trying to figure out where they were on the curriculum continuum (Brazee & Capelluti, **1995).** Tina explained:

> The terminology is confusing. Shelly and I have been presenting on what we called curriculum integration for quite a few years. Then I took a course in "Middle School Curriculum and Organization" last fall. At one point I came back to Shelly and said, "Oh no, we're not doing curriculum integration. We're doing

> interdisciplinary units." And I was really upset. As I read Mark Springer and James Beane, the way they look at curriculum integration is a little different than the way I've looked at it. I feel that we did a lot of curriculum integration because when we had our multi-aged classes and we had themes. The students had a lot of choices in activities. Shelly and I did too... the content was built in. But the activities were different in different groups. And we tried to fit in different learning styles and all those pieces. We felt we were doing a good job. Math was included in all the units. We actually built around social studies themes, China or immigration or things like that. Then our science, math, language arts, and reading were all based around that. **So** I really felt that we did an excellent job on curriculum. Now I'm confused on this. After reading James Beane and Mark Springer, now I'm finding that their idea of curriculum integration is that it needs to be made "real"... that there needs to be "real problems" to solve... real world issues. **So** that's where I'm a little confused on curriculum integration.

As mentioned on page 11, Beane's definition of curriculum integration is based on historic references. As a curriculum design, it has been around since early in the **1900s.** At that time, it meant a certain thing. It meant that certain components were implemented in that curriculum model. One component was that there is a democratic process where students and teachers collaboratively determined the centers of study, or

themes, and that these themes arise from the intersection of the concerns young people have about themselves and the significant social problems in the larger world. **So,** the idea is to find out about the concerns of the students and use that as the basis of curriculum units. Another component is that the study of those themes will be without regard to separate subjects. The instruction will include whatever skills and knowledge it takes to become more expert in the topic and answer the questions that arise from the students' concerns. So, Beane's definition today is based on this historic definition of curriculum integration, which was laid out by progressive philosophers and teachers in the early part of the 20th century.

Since Tina was admittedly upset about the confusing and misleading terminology, **I** pointed out that there are many models of curriculum design. These are not necessarily good and bad, just different. **I** chose to use Beane's definition for the purposes of this research. But certainly this is not the only effective curriculum design model.

Tina said that while she had not understood the historical significance of Beane's definition, the model of curriculum planning he presents is very much the direction in which she wants to move.

I asked Tina about the disappointment in her voice as she talked about her realization that they weren't completely "doing" curriculum integration.

> Well **I** was. No, what I was upset about was that we had been going and presenting on what we were calling curriculum integration. **I** felt bad that we might be misleading people. Out of all the years we've presented... out of all the evaluations, last year was the first time that anyone commented that they thought we

were doing interdisciplinary, not integrated. I had completely forgotten about it until we went back over those evaluations. We go back to them to make sure we're improving each time. And when I came across that statement, I couldn't remember what I had thought about it originally, but I was probably disgusted that someone had said that. But now, because of all my recent reading, now I know what she was talking about. Unless you had read Beane, Brodhagen, and some of those people, you wouldn't know.

Shelly's reaction to my question about her understanding of "curriculum integration" was similar to Tina's:

> I guess I have to ask about the definition. When Tina started the middle level curriculum course at the University of Maine last fall, she kept coming back and saying that we weren't doing what we were claiming to be doing. As I listen to her, I said, "Well wait a minute. We've always taken our subject matter and planned around one theme.. ***.for the kids."*** The only difference I can see, according to Beane, is that it needs to come from the kids and what they want to do.

I asked Shelly to elaborate on what needs to come from the kids. She said, "The whole planning process. For me, it's always been just the reverse. We give them the main subject, and they do the planning. And I'm trying to see the difference between what we're doing and what Mark Springer does."

We discussed Mark Springer's Watershed Program (Springer, 1994) and decided that the curriculum implemented by Tina and Shelly was indeed similar in many ways. The Watershed Program is a very successful integrative learning program at Radnor Middle School in Radnor, Pennsylvania. The program involves two teachers and thirty-six seventh graders in the study of one of several watersheds in the Radnor area. **All** content and skills are learned within the context of this broad umbrella. The success of the Watershed Program over the past twelve years can be measured in many ways, including the fact that between 150 and 225 students and their parents apply for one of the thirty-six spots in the program each year. Through Springer's writing and personal appearance, and the hundreds of visitors to his classroom, the Watershed Program has become a model of curriculum integration across the country. Watershed starts with a preexisting theme and students engage in generating critical issues and questions around that theme. These issues and questions then become the focus of instruction and skills are taught within their context. Tina and Shelly start with themes from their science curriculum and proceed in a similar way.

I explained that I see their curriculum as very close to what Beane advocates. Beane suggests that the curriculum should be planned around the concerns of young people. He also suggests we involve them in a brainstorming process where they can tell us what those concerns are and then plan thematic units around them. Shelly and Tina also often plan around the concerns of young people, but with the teachers deciding the themes. Once a theme is presented by the teachers, students are involved in identifying their concerns around that topic. This curriculum, in many ways, is a small step away from Beane's definition of curriculum integration. The bigger steps, establishing a

democratic classroom and collaborating on curriculum planning with students, are in place.

Shelly talked about other aspects of curriculum integration:

> It's about making the learning whole, so the students don't go to classes where they are getting things that are totally off-topic or completely unrelated to the rest of their day. The kids pick up on that very fast. We were recently at a PET where the young man said he wanted to be in Mrs. Kimball's reading class because she helps them make connections. He said, "I don't want to come to the Resource Room for reading because I miss the connection with science and our units.

While the part of the curriculum shared by Shelly and Tina seems very close to curriculum integration, the rest of the team remains departmentalized, with occasional ventures into interdisciplinary units. Shelly explained how the way she collaborates with other members of the team differs from her collaboration with Tina:

> With the others, there are bits and pieces. For me, I have to go to each one to find out what they're doing. And then I can make sure my science fits. But with Tina and me, it's one big collaboration. Everything connects. Now, in this unit, the math teacher came on board. And it was so easy. She participated in all the planning and she's really excited about it!

I talked to Shelly about my view of her team being in a transitional step and asked her where she would like to see her team in the future.

> I would definitely like to move in the direction of generating themes with more student input - if I could be on a smaller team that is. Of course I'd worry about the Learning Results and our new curriculum, but I think that if we could generate that list of themes at the beginning of the year, then we could take it and match it up to our curriculum and make sure everything has been addressed.

Shelly suggested that this would be a very different process than what many people advocate for implementation of standards, which is to start with the standards and plan backwards. She, and the curriculum integration model, suggests planning with the students and then comparing the standards and seeing where the holes are to make sure everything is addressed. Shelly: "That's part of the teacher's role. The students aren't going to address everything in the curriculum. But many people would be surprised just how much they would address."

Tina's also recognized the obligation to address standards and mandated curriculum. And, like Shelly, she sees how performance indicators would easily fit in:

> I told Shelly that even if specific things don't come up, many of them will fit in. Like atoms. Probably there will be questions about the environment, and in concerns about the environment, things about nuclear energy will come up. But anyway, at the end of the year, if there was something we didn't cover, we could do that.

While it is clear that Tina's and Shelly's previous knowledge of the classical definition was somewhat limited, yet in actual practice they are very close. The biggest difference between their curriculum and Beane's curriculum integration is the source of the themes. Both teachers were clearly excited about involving the students in generating themes. They spoke of trying out the process with their seventh graders in the spring to see how it worked. As they talked about doing this brainstorming just between the two of them, they also discussed how they might draw other teachers into the process.

Advantages of Curriculum Integration

I asked the educators to share their thoughts on the advantages of a curriculum integration model for both students and teachers. Tina:

> All students have questions and concerns. In this model, they get the chance to answer some of their own questions. And, even more importantly, they learn how to go about finding the answers to their questions. Sometimes they say they end up with more questions than they had at the beginning. And that's a good thing. Another benefit is working with other kids. They learn very effectively from one another. One of the things we struggle with is how often you let the students choose whom they work with and how you assign them, and what is really the best way. And you always worry about the person that doesn't get chosen. In one of the eighth grade groups, all really good kids, but one person didn't get picked right away and he made a comment to me about it. And

> he is one that usually gets gobbled up right away. I told him that they probably thought that he already had a partner. But he was a little disappointed.

The benefits mentioned by Tina, the motivational value of exploring one's own questions, the research and literacy skills learned in the pursuit of answers to these question, and the effectiveness of learning from peers in the cooperative groups, were all things students pointed out in their interviews (see "Students Thoughts on Curriculum").

Shelly saw the benefits for teachers as directly connected to those of students:

> First of all, for me as a teacher, I don't think I've used the same unit from one year to the next, since I've started. Sometimes it's the same general idea, but I always redo the "challenge," and add something new. I don't want to get stale. So, for Tina and me, curriculum integration is a logical "next step." And now to see the kids, the way they're taking to it, that excites me. I can't wait to read the evaluations from the eighth graders. I'm very anxious to see what they have to say about it. But I think for them, it has given them much more ownership. That shows up in the pride they show in their presentations. They really wanted all three groups here for presentations because they were so proud. And they wanted to see what everyone else was doing. And to see the way the school has responded, with Mr. Shaw participating in the brainstorming session with the kids, and the excitement at the

> dance, it's carrying over from the classroom to the weekend and to the rest of the school. It's just really working.

It is interesting to note that "the logical next step" is exactly the same way Kathy McAvoy and Dennis Carr described their transition to curriculum integration documented in Student-Oriented Curriculum: Asking the Right Questions (Alexander, **1995).**

I shared with Shelly that the students' excitement was easily seen:

> As an outside observer, it was very easy for me to see that excitement because so many wanted to show me what they were doing. I've always used that as a gauge of the success of a program. When you walk in the door and there are kids who can't wait to show you their work, it says that the program is working.

Shelly talked about how this curriculum works for heterogeneous groups:

> When I talked to another teacher on the team about the upcoming unit, Hot Rods Café, she was concerned that we aren't going to get the same work from all the kids and that we won't get the quality work from the lower kids. My response is, "Well maybe not, but if you don't give them the opportunity, you'll never know what they can produce. For me, that's homogeneous grouping... if you don't give them the opportunity, you'll never know what could have gotten from them. Some great projects have come from very low students. They get a lot out of the process.

Shelly continued:

> I think people who don't understand middle school philosophy say that you have to teach to the middle. And that is so untrue. You teach to the individual... and you can teach to the top. That can offer a lot to those at the bottom. Dewey, our Assistant Principal, used the example that with the top group, they get presented 100% of the material and as you go down, it gets less and less. When you get to the bottom, they might be presented as little as 30% of the material. But what if you presented that same group with 100%of the material? They might not get all of that 30%, but they might get some of that 70% that they would have missed... or were never going to have the opportunity to see. Nobody is going to get it all, no Matter how it is presented. You've got to give them the opportunity.

A commitment to heterogeneous learning groups is clearly one of the reasons Shelly is attracted to curriculum integration as a curriculum design.

I nudged Shelly to be a little more specific about other advantages for students.

> I think it opens more doors for them. It doesn't restrict them in the classroom. I think they learn more. They are learning more and remembering more. Sometimes it might just be the experience more than the material, but I think that's the case with a lot of learning. At least they will remember that. If they get more in-depth into it, they are going to take more away from it. And I

> think it can really encourage kids to be risk-takers. And that's a major life skill for them.

When I asked Tina to talk about benefits for teachers, she hedged at first and started off talking about why it is difficult:

> Well, a problem is gathering up resources and materials on short notice. That's why we're thinking about doing some of the planning with students in the spring. Then we would have time to prepare for the next year. Another tough thing is giving up some of the control. Last week I was in the computer lab with some students and I felt bored. I wondered what I should be doing. I went around and checked in with the kids, but they didn't need me.

Even as I asked about teacher advantages, Tina was thinking aloud about some of the common problems noted by teachers. Being prepared with resources is always an issue. As Tina suggests, some teachers do plan the curriculum with students in the spring in preparation for the next year. An even bigger issue with teachers, as noted by Tina, is their changing role in a curriculum integration model. The teacher is no longer primarily that of an information giver. Facilitation, mentoring, coaching, and guiding become important. It takes time for teachers to get comfortable with this change of roles. Tina verbalized this: "It's a different role for the teacher. And that feels kind of strange. I need to be more of the facilitator and coach, which is going to be good, but I have to get used to it."

Like Shelly, Tina linked teacher advantages directly to the students. She also talked about the advantages of team teaching, which requires a closer relationship within

this model: "A benefit for teachers would be seeing the growth of the kids, and see how much they can really do. For me personally, another benefit is getting to work closely with Shelly."

Team-teaching is different than teaching on an interdisciplinary team. As mentioned in Chapter Two, interdisciplinary teams in middle level schools often become merely organizational structures. Team-teaching as implemented by teachers in a curriculum integration model, on the other hand, involved teachers working closely, on a day-to-day basis, with one another and students. Tina talked about her concerns for their current team structure:

> I really love being able to work closely with Shelly. Even though we're part of this five-person team, Shelly and I are really a team within a team. And it could be harder next year with two new team members being hired. But I'll be involved with the interviewing and I'll be looking for someone comfortable with heterogeneous grouping and all that. And I'll be considering the possibility of smaller teams, so I'll be looking for someone who would be comfortable with that.

The prospect of smaller teams keeps coming up at different levels of our discussion. Tina again voiced concerns with a two-teacher team at the seventh and eighth grade level. Her concern is math; in particular, algebra for eighth graders. For that reason, she and Shelly are talking about the possibilities of a three-teacher partner team. While they would like to add a math teacher, they would also like to keep the math as integrated as possible. Tina:

> Shelly would like to have the math integrated. And we integrate a lot of math skills now. It's the algebra piece that is so difficult. At eighth grade, it seems to become a big issue. But we really want to keep both seventh and eighth grades. I love working with the eighth graders. They are so different... mature.

Again, while trying to discuss teacher advantages within curriculum integration, Tina has returned to her reservations and fears. Math is another perennial pitfall to complete enactment. Learning and applying math skills within a thematic curriculum is not the problem. The problem is the scope and sequence approach to teaching math. Sometimes the sequence fits in with the theme, and sometimes it doesn't. In many cases this is addressed with a separate math class (Alexander, 1995; Springer, 1995).

Professional Preparation of the Studied Teachers

I asked Shelly and Tina to talk about how they developed their knowledge-base and comfort levels with the curriculum changes they had implemented in the past and were planning to implement. Both had already mentioned Critical Skills training. I was curious about what other professional development they had experienced and/or who had been their mentors or models. Shelly indicated that much of what they did was due to their own instincts and experimentation.

> We just decided that textbooks weren't for us. We spent a lot of time in the summer planning together. We picked new novels and planned around social studies and science themes. So we just started doing it on our own and it seemed very natural. And once

we started to see what the kids produced, we knew it was working. At the beginning, we got lots of comments from other staff people that a lot of "playing" was going on in our classrooms. And then, within a year or two, it changed to comments that we were giving too much homework, because the kids were working on the challenges both inside and outside of class. Now we are being influenced by the reading we're doing. But now we're starting to do a lot more reading through our going back to work on our masters degrees. This reading is support for the next step we're taking.

I asked Shelly about her knowledge of middle school philosophy before she started her masters program.

Two years ago Tina and I both did the New England League of Middle Schools Conference for credit, so we read <u>This We Believe, To Kiss a Frog</u>, and some of the other classic middle school books. We've been going to the **NELMS** Conference for seven or eight years. We presented there for seven years. And we've always had great support from our administration.

After one of our presentations at NELMS, there was a school in southern Maine that called our principal and said they had heard a lot of great things about us. They wanted to know how we got started and if we could present. At the time, our principal said, "Well, they had just been winging it." Tina and **I** were so hurt and

> upset. We had worked so hard and put in so many hours in the summer and planning a two-year cycle. That was totally different than any other program in the school at that time. We needed to plan fifth and sixth grade curriculum on a two-year cycle. As far as that goes, there wasn't a clear understanding of exactly what we were doing. This principal started coming with us to the **NELMS** Conference. The first year he came with us, he helped us set up, but he didn't stay. I think he may have been afraid he would have made us nervous. But then the following year he did stay. **I** was really glad because he got a better picture of just what we're doing.

Tina's version of their beginnings was similar: "When we first started doing this, there was nobody at all. We did some reading. After our first year, we took **a** course on teaching in a multi-age classroom."

I asked Tina what kinds of things they read in those early days and if it was specifically curriculum related. Tina:

> I've always read a lot of professional journals. This school has quite a collection and I've just always read. And going to conferences, of course. We've been going to **NELMS** since **1992,** so we could see some of the things other people were doing. But what we did wasn't based on any model because we took things back and picked what worked for us and our students. So it was really just things we learned and did. A lot of it was just instinct. It made sense.

According to Tina, even the Critical Skills training mostly reinforced what they were already doing. She also pointed to administrative support as important:

> Critical **Skills** mainly helped to validate what we were already doing. They gave us the term "challenges," but it was very much like what we were already doing. And they helped us put some things into different types of structure. And we had a very supportive administration.

As far as their more recent move toward curriculum integration goes, Tina pointed to her Master's program in Middle Level Education at the University of Maine:

> Our most recent changes are almost all due to the Middle Level Curriculum course I took last fall. And the Middle Level Education Institute last summer. Mark Springer was our team leader there. **So** we had some conversations with him. And I went to several different workshops on curriculum integration. And I've been reading a lot too.

It is interesting to note how the introduction of new material in their graduate school programs provided the information and initiative to push their thinking to another level. While much of their early evolution can be credited to intuition and experimentation, it took an outside force to nudge them to take the next step. Shelly agreed:

> I just started the Middle Level program this spring. Tina started last fall. ***So,*** we've really just got started. But it has had an influence. That's the main thing behind this whole jump for us. It

was inspired by reading about Beane's work. Also Mark Springer and others.

What Will it Take to Move to the Next Level?

Shelly and Tina made it very clear that they want to continue to move their curriculum along the curriculum continuum. Both they and their students are excited about the possibilities cumculum integration has to offer. At the time of these interviews, they were clearly in some transitional stage along the curriculum continuum. They were able to implement a high level of student involvement and curricular connections within their "team within a team." In doing so, they continued, at times, to draw their other teammates out of their departmentalization. But throughout the interviews, they spoke of their frustrations and their feelings of being held back. I asked them to talk about where they would like to see their curriculum in the future and what they viewed as obstacles to enactment of their goals. Shelly responded:

> 1can answer that easily. I'd like to be on a three-person team. Four, if that's what it had to be, but I'd like to be on a three-person team with the rooms all in the same area so we could make it more unified. We could start our year with a brainstorm with all the kids. We would have a smaller number of kids. That would help us make the next step.

I asked Shelly if she would consider a team of two.

> The only problem is that I never want to give up Tina and neither one of us would be completely comfortable with the math at this

> point. That's the hardest area to integrate, to cover what needs to be covered at this level. Actually, it comes down to making sure they score on the MEAs. That and teaching algebra.

So, in that ideal world, Shelly would have a three-person team made up of herself, Tina, and a math teacher. I asked her what she saw as obstacles to making that happen.

> It's just been done this way for so long. Tradition. Tina and I are looking at the potential turnover on the seventh and eighth grade teams this year. It might be a great time to rearrange. We already know that it's a problem at this school for kids at this level seeing too many teachers. They go from fifth grade seeing two teachers, plus one exploratory a quarter, to five core teaches and five exploratory. That's a lot of adults to deal with. And as much as we are a team, and try to make our rules consistent, it's hard. What we expect and tolerate is different. Yes, maybe that's like the real world, but it's a lot for seventh graders to deal with.

Another problem is that in order for Shelly and Tina to reorganize, all the other seventh and eighth grade teachers would have to restructure too. Shelly talked about the possibility of breaking the two five-person teams into two teams of three and a team of four. This would allow one team to maintain a departmentalized structure. Most of the teachers have K-8 generalist certification. **As** we talked about certification issues, Shelly wondered why Maine doesn't have a certification level for middle level teachers: "I think a middle level certification would help because being trained to teach high school or

primary grades does not prepare you to teach at this level. It is very different. The kids are very different. Their needs are very different."

Tina's interview followed a similar track.

> I see us on a smaller team. We were thinking about three people for a couple reasons. But two may be a possibility too. I'm a person who needs lots of reflective time. And then, some people don't want to go to smaller teams. But I sometimes feel overwhelmed working with more that a hundred students like we have now. I would like to have a smaller group of students. A big piece of that is the opportunity to get to know the students better. Sometimes in my study hall I just go around and sit and talk with kids. They need that adult contact. Some of them have very little interaction with adults.

Again, Tina's commitment to quality student-teacher relationships comes out. I asked her to talk specifically about how she would like to see the curriculum change and how smaller teams would affect this. Tina:

> I would like to continue to move more toward the "James Beane model." Ideally, I think we need to find a third person, someone who would be willing to put in the time. Someone who would not be afraid of letting the kids be totally involved in what they were doing. But at the same time, I still would like to have some sort of control over the themes and topics. But I think we could do that. If we looked at our curriculum in the spring and throughout the

year, if there is a piece missing, we can do a mini-unit or something. That's one of the things I still worry about.

Tina again voiced her concerns about issues and control and coverage. I think these would be concerns of most teachers contemplating this step.

Tina also mentioned parents as potential obstacles. She realizes that success of the program would hinge on support of the parents.

Intermediate Steps

As Shelly and I were finishing up her interview, she talked about her experiences presenting their curriculum at conferences and workshops. When she and Tina were a two-person team, it was common for them to receive comments like, "well that's nice for you, you have just two teachers and everything in place." The level of integration of the curriculum was often credited solely to the small team size and most people couldn't see that it's possible to do it with four or five people teachers, or within a team.

Shelly's and Tina's current work provides us with a few interesting things. First of all, we see how part of the team can enact a high level of integrated curriculum within a large-team structure. Shelly and Tina have continued to involve students in curriculum planning, even when the rest of their teammates were not involved. Not only have they maintained their level of student involvement, but they have increased it. They are currently planning to take the next step and involve the students in the process of generating curriculum themes, as suggested by Beane.

Also, even though this team has made a lot **of** progress, Shelly and Tina feel that the five-person team is too large for a number of reasons. **A** high level of curriculum

integration requires constant close contact among participating teachers. This is much more feasible within a small team structure. It also requires close and sustained contact between the students and teachers. Teachers and students need to be together for larger blocks of time. Shelly and Tina now know they can integrate curriculum together within the structure of the five-member team. They also know they can draw other teachers into their units at times, and they believe that with time and work, they can probably get the whole team involved in a true curriculum integration model, at least part of the time. Still, they see all this work as transitional. They see a breakdown of their traditional interdisciplinary team structure facilitating total enactment of curriculum integration.

Students' Thoughts on Curriculum

I opened each student interview with a question about the thematic, project-based curriculum in Mrs. Lincoln and Mrs. Kimball's classes: "Is it different from other classes you've been in? How is it different?' Interestingly enough, some didn't see it as being all that different. Monica said, "It seems pretty normal because that's what I've always had." Fawn agreed:

> It's not really that different. I moved here in fifth grade. Before I moved here, in my other school, we had always done "challenges." Even from first grade up. So it was always hands-on activity. And when I was in fifth and sixth grade, I was with Mr. W. and Mrs. L., and they do a lot of "challenges" too.

Monica and Fawn are experienced in the challenge-based curriculum from their fifth and sixth grade teams. It seems very natural to them at this point. This is also more

evidence of the impact Tina and Shelly had on the school. Fawn continued and pointed out that not all of her current classes operate like this, and how this affects her learning:

> My fifth and sixth grade team was multi-aged and we did challenges all the time. And then I came up here and, other than Mrs. Kimball and Mrs. Lincoln, we really don't do challenges, unless it's like the energy unit where all the classes are involved. But in, like social studies, we usually just take notes... and study them and take a test. But I really like the hands-on activity because it helps me learn a lot better.

I asked Fawn to describe what these "challenges" were like. Fawn:

> Usually it's just like, well, we have a lot of freedom within the challenge. There is a lot of free choice and independent work. For instance, a project we did earlier was about genetic disorders and we just had to create a visual of our choice. Some people did posters, some people did videos, some people did other things. I did a game, a Jeopardy-style game with all the information in it. ***So,*** it varies, but we're usually working on a challenge. We usually do a challenge for whatever we're studying. And it always fits in. Like we built bottle rockets. But before we started, we took notes on everything about rockets - how they work, thrust, trajectory, friction and stuff like that. And then we got our bottles we could design and decorate them any way we wanted. She wanted us to try to design them to higher up in the air and not

> explode. And then we got to shoot them off out on the soccer field.

Fred also talked about choices, decision-making, and his learning process:

> As long as I've been in their two classes, it's always been kind of the same. They do a lot of hands-on projects and allow us to make a lot of the decisions. I think this helps the learning process. We have to figure out things for ourselves... instead of the teachers always telling us what to do and giving us the answers.

Fred was also on a multi-aged fifth and sixth grade team. He said that he had done some project-based, integrated work, and occasionally in his other classes at this time, but not at the level of Tina's and Shelly's classes. I asked him how he felt about the different curriculum approaches he has experienced. Fred:

> I think it's an improvement. You get to go out and do stuff and learn about it that way, instead of just sitting there and reading about it. You forget a lot of stuff when you just read about it. But you remember more about something fun. Fun is important. It helps you remember better.

Fred has hit on a key point here – fun is commonly listed as a characteristic of memorable learning experiences. Over the past several years, I have done a "Shining Moments" activity with over forty groups of students from all levels, educators, and parents. In this activity, I ask them to reflect on truly memorable and effective learning experiences in their pasts. After we hear their stories, I ask them to generate a list of characteristics of these experiences. The responses are quite predictable and include such

things as choice, a relational teacher, real-world relevance, teacher enthusiasm, etc. But the only characteristic that has appeared on every list is "fun."

As **a** student who struggles with reading and writing skills, Jimmy appreciated the opportunity to use other modalities, at least some of the time. Jimmy:

> In other classes, when we do projects, it usually has to be a report or something like that. That's OK I guess, but this is different. It's actually hands-on. We get to build things. You get to actually make what you see in your mind when you think. Like if you read a book, you can actually put your understanding and what you learned on paper if you want, or you can put it into a working machine or whatever comes to mind. I like it because I like to do things that use my hands. I like to build things. I like to create different things. To me, it helps me learn.

These young people know a lot about what they need to learn effectively. This curriculum allows them opportunities to demonstrate this. Allen also knows how he learns best. While he loves the challenge of individual research and projects, he cautions that it can be taken too far. Allen is very perceptive. He recognizes a danger of project-based curriculum. While the individual inquiry and project work is important, it is also important that it be preceded by front loading of a common base of background knowledge. Allen suggested that he felt this piece was neglected in their last unit. Allen:

> We've been doing even more with projects lately. Like last time we kind of bypassed notes entirely. And it wasn't exactly the best thing. We ran into the problem of either getting conflicting

> information or the information we got would be either too simple or too complex. ***So*** a lot of things didn't make sense immediately. The last unit was research-based and it really helps to have some baseline information and notes and then to go on to researching.

Allen proceeded to tell me that some of his classes are completely "book work." While he does very well in these classes, he believes projects and integration of the curriculum helps his learning. He also acknowledges that projects are not an easy way out for students and often require more time and effort: "I like projects better than bookwork. It's more interesting. I think I learn more. Often, it can be more work, depending on how things are scheduled. It's definitely time intensive. And more work. But I think it produces better learning."

The students also responded to the following prompt, "Besides the content of the subjects, what other kinds of things are you learning in this class?' Again, they had no trouble articulating their thoughts on their learning, and why it is important. Monica spoke of the importance of being able to get along with others: "I think we learn to get along with people. And how to group work – to work as a team. We learn how to share and balance the work."

Allen reinforced this point and also mentioned issues of time management: "You learn about working with other people. You also learn about planning things out in advance. Time management is a major thing we deal with. We have to schedule everything out in advance."

Fawn pointed out that there are important lessons to be learned even when you have to work with people you don't especially like. This certainly seems like a real-life scenario. Fawn

> We work a lot in groups, and I definitely think it teaches us a lot about dealing with people we may not like. Although we have a lot of freedom to choose our own groups, the teachers encourage us to choose people that we don't work with all the time, so we get a chance to experience different people and things. So, I think it helps that way. If you have to deal with people you don't like, and you're stuck with them for the whole project, then you deal.

Fred pointed to the interdisciplinary nature of the projects and the built-in acquisition of skills. Fred:

> Well, in science, we do more than just science. Sometimes math comes in. Like we did something where we had to figure out the distance. First we learned it in math, then we brought it to science to use it. That helps it stick. Other times we're bringing in social studies things. And we're always working on our reading and writing. And technology stuff too. I think we learn a lot of different things. For instance, the Rube Goldbergs… when we did the Rube Goldbergs, we didn't just build these contraptions. We also studied about Rube Goldberg and his cartoons and what was going on then.

Finally, I asked the students to tell me how they felt about having to make so many choices on their own and the level of individual responsibility that is expected of them. In all cases, their responses were very positive. They realize these are important life skills and they feel this will help them as they move to the next level. Monica said she felt that having choices made it possible for her to make her work "special and different." Fred saw these skills as affecting his life outside school: "I think it helps us. Instead of making the decisions for us, it teaches us to be responsible and how to conduct ourselves out of school, and how to make good decisions.''

Allen agreed, stating that, "taking responsibility for planning, doing, and presenting our projects prepares us to be responsible when we get out on our own." Fawn saw this as important preparation for high school, as well as life later on:

> I think it's good because when we go to high school, there's going to be a lot of decisions we will have to make. And I think it's good because it teaches us how to make good decisions. And I don't really consider that extra work.
>
> When we start a challenge, we usually do notes in the beginning, so we learn a lot of the stuff we will need to know. And then the responsibility is left to us to do extra research to make our project even better, and then to include more than just the information we know because of the notes. But I think the responsibility is good because it teaches us to accept responsibility for the rest of our lives.

Jimmy perhaps summarized the students' thoughts on responsibility: "Responsibility is a quite good thing. Mrs. Lincoln and Mrs. Kimball are responsible for us, but we're responsible for what we do. That gives us a chance to learn how to take on responsibility."

Students do not always have a clear idea of how their school activities differ from those of children in other schools. In the case of these students, they are quite comfortable with the design of their curriculum and do not see it as strange or radical. They do, however, have experience with different approaches to curriculum within their current team. They know the advantages and disadvantages of the more project-oriented classes. They know how this affects their learning. Choice of products allows them to more effectively demonstrate their learning in ways that they consider "special and different." And they acknowledge that the decision-making and high levels of responsibility expected of them are important preparation for their futures. After all, "Responsibility is a quite good thing."

Teammates' Thoughts on Curriculum

Two of Shelly and Tina's three teammates were also interviewed and responded to questions about their individual and team backgrounds, their evolving views on curriculum, professional development that had led to curriculum changes, their understanding of curriculum integration, and where they would like to see their curriculum going in the future.

Jessica was the math teacher on the team. She had taught for eleven years, all at Green Lake. Susan was in her twenty-eighth year of teaching. She started as a second

grade teacher before she became a reading specialist at Green Lake from the mid-seventies to the mid-eighties. Since then, she has taught language arts and reading.

Jessica talked about the changes she has seen since she began teaching:

> There's a lot more going on now in education than there used to be. It used to be that I would just come in to teach and what was expected was drills. There wasn't much hands-on in math, not many projects or manipulatives. Now it's going toward hand-on projects so it all relates to the outside world.
>
> Teaming has changed in this school too. When I started, there were two seventh grade math teachers and we also taught computers. ***So*** we didn't have any common planning time or that sort of thing. Our free periods were different from the rest of the team. Eventually, once we moved to heterogeneous grouping, that's when the teams changed to multi-aged and we started having common time to plan and coordinate the curriculum.

The link between common planning time and curriculum coordination is clear to Jessica.

I asked both teachers about curriculum integration and their understanding of what Shelly and Tina are trying to do with their curriculum.

> Well, they are integrating both their content areas in the learning experiences of the students. We, the rest of the team, don't do that as much as they do, but we do some of the major projects. And there have been times where we just link two subjects. It's easier

> to plan that way. Sometimes the time just isn't there to plan around five different content areas. But hopefully kids are seeing the connections and it is helping make the learning clearer over all.

Even though this team has two common planning periods each day, Jessica sees time as a critical issue in integrating curriculum. It can be a time-consuming process, especially with five teachers. Jessica continued to say that she often has students doing projects in math class, but they don't always connect to the rest of the curriculum. But at times, the connections are made. Jessica:

> Sometimes math connects with other content areas. Like one time, I happened to be teaching scientific notation. It didn't connect with what Shelly was teaching in science, but Mrs. Kimball's class was studying populations. So I had them take the values of the population and put it into scientific notation and they could see how it made the numbers easier to look at and compare. We've done a lot of different little things like that.

I asked Jessica how else her teaching had changed over the years. She responded:

> It's changed drastically. The whole idea of accelerating through the curriculum with a lot of practice on concepts without relating them to anything is kind of out the window. But it's hard to change. You tend to start teaching the way you were taught growing up. At the same time, some drill and repetition is good. So I would never take that completely away.

When I asked Jessica what had inspired these changes in her practice, she mentioned workshops and other staff development activities. But it went much deeper that this. Jessica:

> It was also just being in the classroom and seeing that, "Hey, they're not remembering with just the drill and practice." ***So*** I started asking if there was something **I** could do so they would keep the new learning for a longer period of time. They really need these basic skills. It took me a while.

As with Shelly and Tina, a large part of Jessica's change process came from reflecting on her own practice.

In curriculum integration, as it is classically defined, there is more than just connecting content areas. There is also strong student participation and collaboration elements… an element of student-voice in what questions and themes they will study and what activities they will do to gain this new knowledge. I asked Jessica her thoughts on this. Her response:

> I think that having them involved makes them more interested and they work harder. But the hard part of all of this, for me anyway, is that I feel **I** have to get to a certain point of eighth graders *to* have them ready for algebra. **So,** how much time do you take for brainstorming with a class **–** even though **I** think it's important even for communication skills and to have the child thinking and verbalizing what they want to learn **–** but there has to be some sort of a balance there. ***So*** I keep trying to accomplish everything.

Math is often mentioned as an obstacle to curriculum integration. It's not that math concepts don't fit into the themes. It is that the traditional scope and sequence of math often doesn't always fit, especially when it comes to the Algebra 1 book.

The issues of time and balance are important considerations as well. Teachers need strong faith that the time you give to involving students will pay benefits because they will be more motivated and engaged.

While Jessica struggles with these issues, she sees clear benefits for students in project-based, integrated curriculum:

> Hopefully, they take more out of it. They see how things are connected. Like right now on the car projects, maybe they will see how math is part of the engineering. Maybe they wouldn't see that otherwise... if we just used the textbook. I think they just become much more familiar with everything when it's all connected. It makes more sense.

Susan pointed out that teachers' personalities influence the extent to which teachers can cooperate and correlate curriculum. With a curriculum integration model, teachers must work together very closely. She also mentioned advantages for students. Susan:

> It can be very comfortable and enjoyable if you have the right personalities and you're all working for the same goal. We do a lot of planning together. Sometimes we don't, but usually we do. And we're all aware of one another's pieces and how they fit into the puzzle. We plan by the year, but we also plan by the unit. It

> helps the kids understand that what we do doesn't stop when they leave our door. It all fits together... most of the year. There are some isolated pieces, but most of the time we're working toward the same ends.

I asked Susan if she thought the students appreciated the times when the curriculum was connected. She indicated that they usually do but that it takes time for some to get used to it. Some students, however, feel that they are expected to do more work on this team. Susan:

> Sometimes the kids say... in fact one said they were going on another team because our team gives too much work. But in the end it really isn't. It's just that they feel like they have challenges and long-range projects a lot more than the other team. But the day-to-day homework fits in and everything works into critical thinking and independent work. They have to make transfers with their knowledge. **So** that mindset is a little different than when everything is isolated.

Susan feels that even though it takes students some time to get used to the culture of their team, the two-year program makes it worthwhile. She continued to talk about how her approach to curriculum has changed over the years:

> I've always developed units and built in culminating activities and objectives and that sort of thing. But now we try to stay attuned with the needs of the entire curriculum across our team. So sometimes we're waiting for one another and trying to stay in sync

with one another. But that's really a positive. We support one another throughout the year.

When **I** asked Susan about the evolution of teaming at Green Lake, she said that it was originally a top-down movement. The School Board's vision of a "middle school" was that it should be organized around teams. Other factors, however, also pointed the way toward interdisciplinary teaming.

> Well, the School Board wanted this building to become a "middle school." ***So,*** to begin with, some of it was top-down as far as organization goes. But many of us were involved in the curriculum anyway. And we were in the Antioch program, Critical Thinking, and integration anyway. **I** was involved in the integrated institutes at Orono twice, first in the late eighties. **So I** brought that back. And a lot of our personnel went to conferences and worked on various projects. It all seemed to come together to promote interdisciplinary connections. But the organizational configurations in the building were certainly top-down because the Board and our principal wanted it.

The School Board and administration, according to Susan, were very supportive throughout the transition to teaming and provided various staff development activities.

I asked Susan about her understanding of curriculum integration as defined by Beane. She had heard of Beane and was aware that he was the author of books on curriculum, but she had never read any of his work. As a point of reference, I offered the following summary of the theory of curriculum integration:

Beane uses a classical definition of this idea of curriculum integration design. He builds on the definition of the term from back in the 1920s and 1930s. By that historic definition, there are a few major components of curriculum integration. One of these is that instruction is delivered in such a way that it disregards separate subject areas. Also that it is organized around themes that arise from the concerns of young people about themselves and the world around them. Not just their interests, but what they really care about. And that these themes and the activities around these themes are identified by some kind of a collaborative effort between the students and the teachers. A critical piece is that students have input and the things they are concerned about become a focal point of the curriculum. And of course, the disciplines of knowledge are closely connected. Where would you see your team fitting into that kind of a definition?

Susan's response:

I see this model as being very idealistic. We teach in themes but the themes are driven by the curriculum. And then the choices come with options for the students to get to those points. We don't ask the students to organize their year. The year is set up because of curriculum development in the district and what needs to happen at each grade level. But the themes we use over the two years we have the students come from the curriculum that is in place.

It was very clear that Susan would be resistant to moving the curriculum in the direction of student involvement in generating themes. This had already been reported to me in informal conversations with Shelly and Tina. I asked Susan to elaborate on the current level of student input in the umbrella themes. Her response:

> It varies with the teacher and team ... also the particular theme that's going on. I do a lot of contracts where a certain number of things, but there are many options to chose from. And some of the options are so open that they develop their own ideas. But I think it depends on the individual, and the academic area. Some areas lend themselves to choices.

I was interested to hear how Susan saw some areas of the curriculum as more conducive to choices. I thought she was talking about subject areas. As it turned out, however, she was thinking about her own area of language arts: "For instance, in literacy, literature allows for choice, but there isn't much choice in the grammar. There are ways to make it interesting, like I use a writing process approach, but the conventions of writing must be addressed."

I asked Susan whether or not she saw benefits for students in a curriculum where they have choices and input. Her response immediately moved to the dangers:

> Many students thrive on it. Some have trouble with the open-endedness. They struggle with being independent and the fact that they are expected to work on their own. There has to be a lot of support for the at-risk student. It may even be necessary to offer

different options for them along the way. Not all students are self-driven. It would be nice if they were, but they're not.

Susan was very cautious here. She seems to be suggesting that high levels of student choice and input are beyond the reach of some students. This notion resurfaced again at the end of our interview.

While Susan has reservations about moving the team's curriculum toward curriculum integration, she spoke clearly about the teacher benefits of interdisciplinary teaming:

> I think there are wonderful benefits for teachers. You can support one another with materials. When you work on a unit together, you share materials, you share ideas, you support each other. Sometimes I come to a point where I'm not sure what direction I'm going to go in and then along comes one of my teammates to help out. You're never left hanging. There's always something that you're working to get to because there is a need in some other part of the curriculum. Then it all fits together. We share resources, books, even some of our budgeting. Of course, it depends on the team. We have a team that respects each other's expertise. It just makes it all much more pleasant.

Susan had mentioned that Critical Thinking training and university programs had contributed to her curriculum knowledge-base. I asked her what else had influenced the changes she had made over the years. Like all the educators interviewed, she mentioned that much of it came from experience and being a reflective practitioner. Susan:

> I think much of my knowledge goes back to those years I worked in the elementary school. And also my experiences as a reading specialist working with LD students and kids that just couldn't engage. So, after years of working with at-risk students, I learned lots of ways to get them engaged in literacy. In our classrooms today, with students of all levels, that really helps. And my Master's program was very helpful.

At the end of our interview, we looked at the curriculum as a continuum, with departmentalized separate subjects at one end and Beane's definition of curriculum integration at the other. She said that, overall, she saw her team somewhere between interdisciplinary and integrated, but with different individuals in very different places. Finally, I asked her about her interests in moving team's curriculum along the continuum in the direction of curriculum integration. She made it clear that she does not think this would be in the best interest of the students. She pointed to socioeconomic factors as barriers and suggested that only certain, upper class and above average students could benefit. This view is in extreme opposition to Shelly and Tina's, who see special needs students and under-achievers as being among the biggest gainers. Susan's response:

> I think there is much more we can do to make the curriculum richer and stronger, but I do not see - with the students coming to us the way they are today, with many coming from non-supportive homes - I do not see us going to the totally integrated model with students creating their own curriculum. I would see a lot of time that would be redundant time. I think the interdisciplinary model

> is really where it's at. I really think that serves more needs. I think that's as far as I'd want to go.

I wanted to be sure of what her position was, so I asked, "And you see one of the obstacles to pushing beyond that is the socioeconomic level of your students?" Her response:

> We have kids who come to us not even ready for the day. Their more basic needs haven't been met. Although we have a supportive community, we still have many kids with real needs. ***So,*** I think continuing through and improving on the interdisciplinary model is where I'm at. And I've seen so many models over the past twenty-eight years, but I think this model offers the most good for the most students.

It is clear that Susan would not favor whole-team enacting a curriculum integration model. At the same time, however, she recognizes the benefits of teaming.

Interviews with these two teachers help clarify the situation Shelly and Tina face as change agents. Their work has clearly influenced Jessica. She sees the positive motivational influence these two teachers have had on students. She would like to see the curriculum continue to evolve and move toward curriculum integration, but she feels restricted by the nature of her content area and time restraints. Susan, on the other, would strongly oppose whole-team curriculum integration. She tolerates the work that Shelly and Tina currently do, and enjoys interactions with the teachers on the team. But, citing socioeconomic factors of the students and their families as obstacles, she has no interest in moving beyond her current mix of departmentalized and interdisciplinary approaches.

Principal's Thoughts on Curriculum

Mr. **S.** is a first year principal. Previously, he was a math teacher and then an assistant principal. In his interview, **I** asked him many of the same questions **I** asked students, teachers, and parents. First of all, **I** asked him if he saw the curriculum and activities in Shelly and Tina's classrooms as different from others in the school and district. Mr. S.:

> It's different to the degree of integration that's happening there. There are other examples in the school, but to a lesser degree. And I'm not sure if it's truly curriculum integration or multidisciplinary. For example, probably because of Shelly and Tina, the Gold Team now do the Rube Goldberg unit that their Green Team has done. So every year at this time of the year, the Gold Team centers their instruction on a science theme. They had one earlier in the year centered around a social studies theme. But, after going to the Institute (MLEI) this past summer, I guess we can't call what we're doing curriculum integration. I guess it's more of a multidisciplinary approach, whereas programs like Mark Springer (Watershed) are truly integrated. But anyway, there are other attempts, but not to the degree on Shelly and Tina. There is a fifth and sixth grade team who does a lot of integrated stuff. Then what the rest of the folks do depends on the team.

Again, the issue of terminology came up. It was also clear from talking with both teachers and the principal that they have been influenced by Mark Springer's Watershed Program (Springer, **1994).**

While Mr. **S.** is very supportive of the idea of integrating curriculum, he very quickly brought up some of his concerns:

> When you have these Maine Learning;Results, these standards, and you are being held accountable for these benchmarks, it's worrisome, especially in math, because I've taught math for many years, that you may miss something. And math tends to be sequential. You build on a foundation. *So* I always wondered how they did that.

Sequential math instruction again surfaced as an obstacle to curriculum integration. Math has traditionally been presented as a sequence. By organizing math curriculum around thirteen broad math concepts, the National Council of Mathematics Teachers' Standards (NCTM, 1989) suggest that it doesn't have to be. Mr. **S.** suggested, "To change it, you would have to 'step outside the box.' You have to let go of some things." Of course, another way around this issue is to continue an isolated, sequential math class, as a pull-out from the thematic curriculum. While Mr. **S.** didn't realize this, this is exactly what happens in Springer's Watershed Program. The pressure can be great to retain sequential textbook math. Standardized test schools have become all-important, and many people see drilling students for the tests as the only way to ensure high scores. While Springer, and others, would debate this, he sees it as a battle he can not win at this time.

Bringing the discussion back to Shelly and Tina and their curriculum, I mentioned that it appears they have indeed blurred the lines between subjects and, even though the themes are science-based, what the kids are doing brings in all disciplines, without regard to subject area. Mr. **S.** agreed:

> Yes. That's true. I'd say they are the closest thing to curriculum integration we have. They probably are integrated. And they are certainly responsible for moving their team in that direction. For example, our math teacher has really come a long way. But it takes a long time to get teachers to that point. Unfortunately, she's now taking a job much closer to her home.

Mr. **S.** made several important points here. First of all, he pointed out the need for internal leadership from teachers in addition to top-down leadership. He acknowledged that Shelly and Tina have helped move the rest of the team forward along the curriculum continuum. As noted in Chapter Two, Fullan emphasizes that important changes can not be mandated and points out that important changes require "skill, motivation, commitment, and discretionary judgment on the part of those who must change" (1995, p. 204). A full discussion of leadership in the process of curriculum change appears in Chapter Six.

Another important point made by Mr. **S.** is the effect of turnover for teams who have gotten to that level. It takes time and hard work to build effective teams. Turnover of team members usually means stepping backward.

Mr. **S.** talked about his understanding of where Shelly and Tina would like to take their curriculum in the future and what would be the next step:

> If we're really serious about curriculum integration, we need to look at established programs and see what they're doing, like Mark Springer's, for instance. The focus needs to be on experiential learning around a theme and addressing all the standards around that theme.
>
> The other things we might be heading toward, to help us get to the next level, is smaller teams. We've done some schedule changes to help the students out a little bit but we're still in that traditional big, five-teacher team structure. We're looking, down the road a couple years, at the possibility of teams of two and threes.

Again, the suggestion that smaller teams might facilitate curriculum change came up. The two-teacher team structure already exists in the fifth and sixth grades in this school, so they know it works. Like Shelly and Tina, Mr. **S.** sees this as a logical next step:

> We could easily make the change to smaller teams. We've done a lot of discussing this year, especially coming from the Institute at the University **of** Maine. There's been a lot of talk. And of course you have some people who are against it. But we're talking more and more about that kind of change. I think to provide the best opportunities for kids, we need to move in that direction. I'll tell you one thing, in our situation with the two large teams, no Matter what, there will be competition between them. Not only in the community, but within the school. It seems to be human nature.

> **So** that's another reason I'd like to reorganize and break that paradigm and have three or four smaller teams. **So,** breaking down those teams is one of my long-term goals. There's no question that for integrating curriculum, smaller teams are better. That's why Shelly and Tina are able to do that. When you introduce more people, you get more personalities and it becomes harder.

This is a very strong statement in support of smaller teams. Mr. **S.** also mentioned close student-teacher relationships as a benefit of smaller teams. When you have 40-50 kids with the two teachers all day, the relationships can become a natural part of the day.

Responding to a question about benefits for students in this curriculum integration approach, Mr. **S.** offered:

> The main benefit is that they are not just an isolated act. They can see the applications of what they are doing immediately, so there's more motivation. Instead of just conjugating a verb, they actually see the usage. The transition math, since I was a math teacher, works on that premise also. It's all application. It doesn't just give you rows of problems. It's always application. **A** lot of it is gathering statistics and information and applying them. ***So,*** that's similar to what curriculum integration does, it's actually motivating because it shows "why" you learn it. Particularly at this age level, of course, that's very important.

When asked about potential obstacles, Mr. **S.** again returned to math:

Again, my own thinking gets in the way. There's a lot of anxiety, especially in the math. Talking to Tina and Shelly, neither one of them is completely comfortable with the eighth grade math. That's getting into algebra. Personally, **I** think a good teacher could teach anything. But, at this level, with pre-algebra and gearing up for high school, that's an obstacle people are running into.

This school has historically been low in math. Recently, we sent people out to the showcases across the state and one that we're looking at is this "every day math" thing which is a nice unit but it requires the use of a workbook that you have to buy every year. So we concluded that we can build our own units. We already have textbooks for the drill component. Then we could bring in hands-on, concrete math. **So** that's a goal for us. Now we need the money and time for teachers. They're all willing to do that. **A** stumbling block is the five/six where they teach all the subjects. For them to dedicate the time for math, a lot of them already have math anxiety themselves. **A** lot of them are reading teachers. They don't dedicate the time to build the kind of math units we're talking about and they want a nice canned thing they can pull out to do their math lesson. The seventh and eighth grade teachers, on the other hand, are willing to put in the time. They're saying, "We don't need that stuff, we can do this ourselves.

Time to develop curriculum materials and expertise in mathematics – these are among Mr. S.'s primary concerns.

I asked Mr. **S.** how he saw himself as a principal supporting the work of the teachers who want to push toward curriculum integration. His response:

> You have to help them by providing the time to do it, and the resources to do it. It takes time to cultivate the ideas. You have to watch out for roadblocks and don't let them build up and stall the process. Even modeling is important for the administration. I was involved in the earlier project and I just loved it. I miss teaching and I like to model. 1went to Critical Skills training with those folks too. That changed my thinking about education a great deal. And that's exactly what we're talking about in dealing with students – ownership in the process – brainstorming – having the students set the standards. **I** even applied the same philosophy to my coaching. It's something I truly believe in. ***So,*** I have to make sure the atmosphere and environment are there for them to grow. I can also help provide resources. These teachers do a lot of in-service. I try not to say "no" to them.

Mr. S. is clearly supportive of cumculum change. This is a critical ingredient for the teachers on the front lines of the change process. This is important in the early stages of the process, but maybe even more important when it comes to sustaining change. Having to defend your practice on a daily basis is a sure recipe for burnout.

Mr. **S.** is also knowledgeable. He understands what Shelly and Tina are trying to do and has taken the time to be directly involved. He has attended classes, workshops, and institutes with these teachers. He has participated in their classroom brainstorms with students, and has tried to be a "model."

Finally, Mr. **S.** has a vision for curriculum integration in his school. He sees structural changes as facilitating the process, in particular, smaller team configurations. He realizes the importance of models and supports his teachers in their professional development.

Parents' Thoughts on Curriculum

Parents who were interviewed had had six children attend Green Lake Middle School over the past twelve years. One mother talked about her daughter who attended a Montessori school through grade four and was then home schooled for two years. At that time, the child decided that she needed more of the social aspects of public school. The mother admitted that she was reluctant to send her to Green Lake Middle School because her older brother had less than favorable experiences there in seventh and eighth grade several years previous. But other parents informed her that positive changes had taken place, so she decided to let her daughter give it a try.

As it turned out, this mother found the changes to be dramatic. Her daughter was assigned to the Green Team and had wonderful experiences, especially in Shelly's and Tina's classes. Her independence and creativity were nurtured and she was very successful, both at Green Lake and in high school.

I asked parents about their expectations for their children as they left eighth grade. All three said they had high expectations and wanted their children to be challenged. One parent said:

> I would think that by the end of eighth grade they would know how to find information for themselves. I think that's really important. **So,** if they are faced with a problem, they don't have to get all whiney and say, **"I** don't know where to get that." They should know where to learn and how to teach themselves. They need to be taught how to do this by both parents and teachers. They need to learn how to use **a** library, how to use indexes and computers. They need to learn how to talk to the right people and locate resources to answer their questions.

This parent was obviously interested in skills, not just acquisition of information. She went on to say that she felt Mrs. K's and Mrs. L's curriculum did exactly these things and that many parents want these experiences for their children. Consequently, there was a "mad scramble" to get their kids onto this team.

One parent reported that she wasn't aware of just how different the two teams were until her daughter was assigned to the Green Team in seventh grade: "She would come home and say that her friends who weren't on this team weren't doing this 'good, neat stuff."'

Parents also talked about the relationship these teachers build with parents:

> Parents are encouraged to be involved. Last year, during the Rube Goldberg unit, parents were invited to come in at specific times to

> work with the kids. We were encouraged to bring in our ideas. We could bring our tools if we wanted. Some parents got involved in a big way. It was great for the parents, and the kids.

Another parent talked about how the school curriculum found its way home, for kitchen table conversations:

> She would come home with these projects and we would brainstorm around the supper table at night. She would fill us in on her progress and we would talk about the possibilities. We came up with some really good ideas around her different projects.

Parents also commented on how easy it is to communicate with teachers in this school. The school is set up so parents can leave e-mail messages for teachers. All parents reported that teachers and administrators always honored their requests for information.

Chapter 5

CURRICULUM INTEGRATION AND THE STATE OF MAINE LEARNING RESULTS

As part of each interview, I asked students, teachers, the principal, and parents to comment on how they saw integrated, project-based curriculum addressing the Guiding Principles of the State of Maine Learning Results. I began this portion of the interviews by asking about their familiarity with this document. Since the faculty had done significant work aligning their curricula to the Learning Results, my interest was in understanding what students and parents knew. All parties were familiar with the Learning Results, the state standards. They understood the importance of standards and the school's obligation to address them. One of the most interesting things about this part of the interviews was the consistency of the responses

A Clear and Effective Communicator

The questions concerning the Learning Results were introduced as follows:

> At the beginning of the Learning Results there are six main ideas called Guiding Principles. These are the most basic things that schools in Maine should expect of its graduates. What I'd like you to do is to tell me how you think working in the project-based, integrated curriculum might be helping you/your child/your students) learn these things. For instance, number one says that each student in the state of Maine need to learn how to become a

> "clear and effective communicator," using written and oral language, visual and artistic expression, and technology. This includes reading, listening, and interpreting messages from various sources. **My** question is, what kinds of things are you (your students / your child) doing in these projects that you feel are helping you(them) become a "clear and effective communicator?"

The students saw the group aspects of projects and presentations as fostering communication. Fred said:

> I think we do a lot of communication because we're working in groups a lot. Working in groups, there has to be good communication. Like, who is going to do what part of the work? And we also do a lot of oral presentations. We have to present our projects and learning in front of the classroom... sometimes in front of more than one classroom. When we do this, we have to do more than just talk. In a good presentation, you have to use visuals. So you have to connect the oral and the visual.

When I asked Fred if technology was usually a part of their group projects and presentations, he mentioned the integration of recording equipment, videos, and Power Point:

> Yes. I was just in a group for our unit on the endocrine and nervous systems and we made a video. That took a lot of technology. We recorded a song we wrote about the systems and then produced the video. Sometimes we all use technology in our

> presentations. In fact, Power Point is being incorporated into the project we're doing right now.

Other students mentioned how group projects help hone communication skills, and how this process challenges them. Allen, for instance, said:

> Definitely, there's lots of oral communication involved trying to talk to group members about things. It's very complex trying to explain things to people who may not know what you're talking about. This is very important. You learn to bring things to different levels for different people to understand. Sometimes you have to use diagrams and stuff. We also keep logs to document and explain what we're doing.

In a similar vein, Jimmy said:

> Well, when we're working in groups, like we are now, you can actually talk to other students and give your opinion and then ask them what they think. You can work together to plan and draw out what the group wants to do. Then we get to do it and show other people.

The open-ended nature of the projects and the level of student-choice in presentations promoted creativity in their means of expression, while also allowing students to work within their strong modalities. Allen, for instance, said, "This gives an opportunity to try out different ways to communicate."

Fawn, on the other hand, offered that: "We have the freedom to choose any visual we want. They can choose to do a typewritten report and read it aloud. Some kids

feel more comfortable with that than drawing a poster. And I think that's good because it lets kids choose their strongest thing."

But as Fawn continued, she pointed out that another important part of this curriculum is teacher-mandated products. This requires students to try new things and learn new skills:

> … But I also like it when they kind of tell us, well you're going to draw a poster for this and you're going to write a paper for this, because then it encourages you to try different methods of expressing. And then, when you do this, sometimes you find ways you like better.

This is an important point. While student choice and student involvement in decision-making are basic elements of curriculum integration, some things are non-negotiable. Certain skills and content have to be addressed. State standards and curriculum mandates can not be overlooked. Individual teachers often have their own list of "givens" as well. And as Fawn indicates, students who are used to having considerable freedom of choice are understanding and are open to this.

Monica summed up how the project/presentation process touches on various forms of communication:

> Well, we have to do a proposal of our project. And at the end, like right now, we work on an input form of what you did and what you learned. And that helps with the writing. And we have to present... so that helps with talking. And we have to have some kind of visual for our project.

When teachers were asked about students becoming "clear and effective communicators, they also saw benefits from the group projects and presentations. Tina said:

> The students, when they work in small groups and they divvy up the responsibility, have to come back and explain to the rest of the members in their group the things they have learned. That is clearly working on communication skills. Also, everything we do has some sort of oral presentation where students have to stand up and deliver explanations in their presentations. Even if students aren't always involved in the oral piece, they have to stand up and be part of the presentation. And if you think back on the last couple projects, the web sites they developed and the Power Point, the newsletters, etc... that's all communication. Also, there's always some sort of a written piece as well. Sometimes they have to write and revise proposals.

Shelly reinforced the point that opportunities to revise work are critical to the learning process. She also spoke of the motivational aspects of working with real people as primary sources of information and about being able to address different learning styles and intelligences:

> Yes, that's a key. We don't do that enough... have them do something and continue to do it until it reaches perfection. Teaching this way has allowed us to do that. And also, the kids come to realize why that is important. When they write letters to

> send to real people... all the connections to real-world situations... that's when they want to work to perfection. We also try to hit all the intelligences and make sure we are appealing to the kids who are musical or artistic.

Shelly's statement immediately brought to mind Anne Wheelock's, Safe to Be Smart: Building a Culture for Standards-Based Reform in the Middle Grades **(2000).** Wheelock makes a strong case for the importance of revision. But often we don't do a very good job teaching this in our schools. Where else are you expected to do things perfectly the first time? Everywhere else, you learn from your mistakes. These teachers see learning from mistakes and revising accordingly as a life skill:

> Even a simple thing like these project proposals can make a difference. Just to get them to see what they didn't do correctly in a certain step or how their work fails to do what the directions say. And they are going to have to do that when they go out into the work force. They are going to be expected to do that.

Group presentation of findings brings up issues like audience, social responsibility and pride in one's work. In speaking of motivational value of peer presentations, Shelly said, "And they take a lot of pride in their work. Presenting to their peers drives their work to a higher level."

While this discussion focused on communication skills, these teachers were also very clear that content knowledge is what drives the projects and presentations. For many students, preparation for presentations and the sharing of information lead to very

effective learning. And as Shelly pointed out: "That may be even more true for students who have disabilities in literacy areas."

Tina added, "And it helps them make sense of information. They may have downloaded a bunch of information off the Internet, but then they have to figure out what it says so they can explain it to the others. They have to work on their reading skills."

Jessica, another teacher on the team, pointed to issues of creativity and curiosity as she commented on communication skills:

> Certainly they have to present themselves orally and visually when they are generating ideas and brainstorming. They have to use language. They have to communicate. It's all in there. They have to come up with their own ideas on these projects. And that enhances creativity. Hopefully, we're also stimulating curiosity.

The principal of the school, Mr. **S..** echoed the comments of students and teachers. When asked how the work the students do within this integrated curriculum builds the skills to become clear and effective communicators, he responded:

> At many levels, I think. For instance, on the group level they have to clearly communicate with one another during the process. Of course, it's up to the teacher to set up the learning community so everybody knows the rules. Then they all communicate through the presentations. All, or most, of the projects involve some sort of presentation at the end. ***So*** they use many different forms of communication during the presentations, such as Power Point, oral

> speaking, writing, journals, visual representations, role play, art, etc. These skills are just interwoven through the whole process.

Parents also articulated similar benefits of this type of curriculum in enhancing communication skills:

> They give oral presentations of the results of their projects. They also do a lot of writing. My daughter wrote quite a few stories when she was on this team. She was also very successful on the Rube Goldburg unit. That definitely promoted use of technical means of expression. She learned and used a variety of computer skills.

Another parent spoke of the relationships between communication skills and self-esteem: "In oral communication, kids make telephone calls to real people to get information, interview and video taping. Besides the communication skills, these things can help build self-esteem."

The patterns of key issues that run throughout these interviews appear clear. **All** involved parties saw distinct advantages to the development of communication skills within the project-based, integrated curriculum. The group aspect of the projects came up in nearly every interview. The success of the team depends on effective communication within the group. The emphasis on primary resources also necessitates reading, writing, interview, and technological skills. And these students have multiple opportunities to practice and hone their skills. Teachers teach general skills to all students and specific skills to groups and individuals as needed. The skills are learned within the context of immediate application.

The presentation aspect of these projects requires students to communicate their knowledge to a larger audience. The pride they take in sharing their authentic research with peers is highly motivating. For many young people, this drives their work to a higher level than simply taking a test over certain content.

Choice is also highly motivating. The choices and input students have within the projects leads to a sense of ownership in their learning.

The growth of self-esteem as students expand communication skills is a fringe benefit. These students feel that they are learning skills that will help them access and apply whatever information they need.

A Self-Directed and Lifelong Learner

The second Guiding Principle of the State of Maine Learning; Results **(1997)** states that students should leave school as "self-directed and lifelong learners." Students should be learning to create career and education plans that reflect personal goals, interests and skills. They should also demonstrate the capacity to undertake independent study and to use information from libraries, electronic databases, and other resources.

When this Guiding Principle was presented to the students, they immediately spoke of the independent research they do during their projects. Monica said. "This is built into the projects, because you have to research. So you have to use all the resources. And you have to actually find the information. And that... finding your information is kind of individual. And that's where you learn the information."

It is interesting to note that Monica not only recognizes that she is learning how to "find" information, which is preparing her to become **a** "self-directed learner," but she

also realizes that she is "learning" the information. This approach to teaching is not merely about learning **a** process, it is also about learning information and content in a context that makes sense to students. I asked Monica if she thought it was up to her to figure out and learn the information. She responded: "I think it mostly is. The teachers help. But if you don't want to learn, then you just don't.''

Fred mentioned the importance of student-choice in the process of learning to be an independent learner: "Well, they let us make a lot of our own choices, which lets us feel responsibility and teaches us that we can do things on our own."

Allen felt he is learning to plan his own learning, both independently and with the groups he works with: "There's a lot self-dependence, even when you are working with groups. You have to be able to plan things for yourself."

This question was also one of several places where students mentioned the negative side of group work. Fawn:

> Well, we definitely have the option to work independently much of the time. And I think that's good because sometimes kids like to work independently, and other times they like to work in groups. But it definitely is important to learn to work independently because you're not always going to have a group to help you out. And sometimes even when you're in a group, most of the work falls on you anyway.

I often hear this response from students in my undergraduate education classes. Many of us have had similar experiences. I asked Fawn how often she felt she was in these situations. She responded:

> It doesn't happen that much to me because we often get to pick our own groups. I know the people I can work with. I know who I can count on, and who I can't. I think I always do a sufficient amount, and there are others I've worked with who don't. But I like the way Mrs. L. and Mrs. K. don't just do group grades. They do individual evaluations. *So* if somebody doesn't do work, the others don't get marked down for it.

Fawn is aware that individual accountability measures are important to the success of group work. As she continued, she also talked about the division of labor in her groups:

> A lot of times, we split things up. Like this week, you two will do research and you two will start designing, and the next week they'll switch, or something like that. As long as everyone does their part... then we can show each other what we did and work as a group to pull it all together.

Like the students, the teachers also saw the research/inquiry component of the projects and addressing the goal of students becoming "self-directed and lifelong learners." Shelly also spoke of how high expectation, trust, and student-responsibility help develop this:

> That has always been a major part of our program... teaching them to work independently. That's something visitors always mention. They comment on how these students focus on what they need to do and help each other. They often ask how we train kids to do

> that. Train them... at first that caught me off guard. It's just the way things go in here. You give them responsibility and show them that you know they can do it and then they just respond and do it.
>
> Also, there's the research piece. They are learning where to find information... primary sources, people, electronic databases, etc. But then they have to be taught how to process the information. Our computer teacher is a great help.

Tina sees the research process as a natural venue for developing the habits of lifelong learning:

> They are always going to need to access new information. So it's important for them to learn where to go to find answers to their questions. They come to us for answers and we don't have all the answers. So we tell them that. Some teachers don't like to do that, but we see it as an opportunity to discuss research strategies.

This thought was echoed by Jessica: "Yes. That's exactly what these projects do. They have to make choices and have the opportunity to run with things that they want to."

The school principal spoke of students' voices in the planning of projects, setting standards, and becoming experts:

> Self-directed comes from allowing the students input into the process. The students are basically making their own projects. They are also setting their own standard. For development of

> lifelong learners, instead of the teachers always being the experts, the students become the experts. So they are the ones generating the learning, not the teacher. The teachers facilitate the whole process.

Parents made note of teachers' high expectations and the open-ended nature of the projects. One parent said: "The way the assignments are given, there's no ceiling on what the kids can put into their work. They can attack it from their current level and just keep going as long as they want to... and absorb as much as they want to. I saw that often with my daughter."

Other parents offered: **"I** remember one boy who was digging into his father's medical books to find information about insulin and the glucose breakdown. His understanding went well beyond what any textbook would offer." "The open-ended assignments are important because you have such a variety of kids... so many different levels in one classroom. There has to something to challenge all of them."

As with the first Guiding Principle, there was much agreement among all parties interviewed as to the benefits of this project-based, integrated curriculum. Everyone agreed that the independent research component of each project nurtures the skills needed for lifelong learning. These students use a variety of resources on a daily basis. Figuring out where to find, and how to access, information has become second nature for them.

Choice, responsibility, high expectations, and student-input were also terms that came up repeatedly in response to this question. Students learn to make good choices and assume responsibility for their learning and behavior when they have opportunities to practice these things in a save environment. Support of adults who care about them is a

prerequsite. It is clear to anyone who spends time in these classrooms that high expectations for all students is the rule. The teachers sent the message that they truly care about the students and that they believe in their capabilities. They also send the message that serious work and responsible behavior are expected. And the students usually respond.

A Creative and Practical Problem Solver

The Third Guiding Principle of the State of Maine Learning Results states that each student should become a "creative and practical problem solver." They should be able to "observe situations objectively to clearly and accurately define problems." This includes framing questions, as well as collecting and analyzing data from all disciplines. They should be able to "identify patterns, trends, and relationships that apply to solutions to the problems." With this information, they should be able to generate a variety of solutions, build a case for the best answer, and critically evaluate the effectiveness of the response.

Nearly everyone interviewed, connected this Guiding Principle to the previous one. The same research components that lead students to become self-directed, lifelong learners also prepare them to **be** creative and practical problem solvers. After all, each new unit and project is a new problem to be dealt with. Monica and Allen saw this clearly. Monica: "I think basically that doing the project is solving the problem. You have to figure out how you're going to do it, and you're bound to run into some kind of problem before you're finished. Each new problem needs solving." Allen added, "The engineering projects, especially, do this. The whole process in those units is about

problem solving. And most of what we do is hands-on stuff... using models... doing research... all require problem solving."

Fawn and Jimmy echoed these thoughts and added that the front-loading of information sparks interests and equips them with the background information needed to define their own problems. Fawn:

> As I said before I think the freedom we have to choose helps because the teachers are not just giving us all the information. We have to go out and find some of it. That involves problem solving. What do we need? Where do we look? What does it mean? I really think having the independent projects helps a lot. They're all about solving problems.

Jimmy:

> We're always identifying and solving problems throughout the projects. The teachers give you some information before you start the projects. ***So*** you get your mind going and it makes you curious. And so when you get to your project, your mind is working and you're excited about the project. Then you're ready to attack the problems.

The teachers felt that for students to learn problem-solving skills, teachers need to provide time for them to experiment. Students need time to explore and figure things out. They need to try out different techniques, and learn from their mistakes; to try things out and back up do things a different way. Shelly verbalized it like this:

> I think we give the kids plenty of time to explore. Like in this unit where they are building the cars, I wonder if maybe I should have shown them how to do certain parts. But then as I watched, it was interesting to see how they experimented and tried so many different approaches. ***So,*** yes, I could have showed them how to do it, but I really wanted them to learn. We don't give them enough time to explore with different things in school. We need to do more of that.

I mentioned that I had heard some wonderful discussions of why certain things would or wouldn't work. The group who wanted to connect the motor directly to a wheel was a good example. The ensuing discussion of gearing down the motor was wonderful. Tina added, "Sometimes when you show them, they see that as the one right way. By letting them experiment, they see that there is a lot of different ways to solve a problem."

Jessica, the math teacher, applied this Guiding Principle directly to her discipline:

> Problem solving... that also along with what we just said about self-directed and lifelong learners. In the math part of these projects, which is where I'm focused in on, they are solving problems and answering questions. Creativity comes in when they have to design their own demonstrations of their learning. I'm not always telling them specifically what to do.

The principal reinforced the point that these students are expected to find their own answers. He thought it very important that teachers support and help the students

without giving them all the answers. He also mentioned the group-dynamics problems that can develop when students are required to perform as a team:

> Again, problem solving is part of the process at many levels. As they work in their groups, problems arise and they have to figure out how to deal with them. And of course you have the problems of the project itself... the problems presented in the project. And again, the teachers are not directly answering the questions. They are providing the resources so the students can find the answers. Or at least they should be. The teachers you are talking about, I don't see them just giving out answers. They help the students find the answers.

Parents also pointed to the problems that turn up during projects and the importance of having time to try out various solutions. One parent talked specifically about her daughter's experience during the Rube Goldberg designing project:

> I remember when her group set out to create their Rube Goldberg project. It was going to be a Kool-Aid mixer. The water had to flow through the container that held the Kool-Aid, and so on. And, of course, problems were created... like there was leakage... the crystals wouldn't dissolve right... you know. It was one thing after another. They had to use a motor. And it had to include a pulley and a fulcrum. ***So*** they had to figure out exactly how to do each piece. When problems came up, the kids would brainstorm and say, "Well let's try this or that."

Another parent talked about watching her child working with her group at home:

> I love to watch the kids. They get hit with these unforeseen problems. Then one will say something and then another will say something... and then it's almost like there's this little electricity thing going on. One idea will waken up somebody else's idea. And all of a sudden, they all have all these ideas.

The project-based curriculum is a natural place to learn problem-solving skills. This is especially true in units that include design components. After a certain amount of informational background is laid, students define their questions and write proposals for their plans of attack. Teachers guide, coach, and facilitate, but it is clear that students are expected to figure things out on their own. At the end of the project, they are expected to use their information to support their conclusions. Teachers assist, support, and encourage students without giving them the answers.

A Responsible and Involved Citizen

Guiding Principle number four states that students need to learn how to become "responsible and involved citizens." Students should recognize the importance of personal participation in the community and develop participation skills. They should understand the "importance of accepting responsibility for personal decisions and actions." They should know how to achieve "personal and community health and well-being" and "recognize and understand the diverse nature of society." This Guiding Principle obviously relates directly to the emphasis on group work on this team. Again, students saw negative aspects to this, as well as positive. But they clearly saw this as

developing a sense of community and social responsibility. Monica began, "Well, it goes back to the group thing, with the different people and the responsibility that's built in. If a member of your group isn't working, it's your problem. You have to talk to that person and tell them that they are not doing what they should be."

I asked Monica if that usually worked, or if the teachers helped in these cases. She added, "Sometimes it does. Most people don't want to let you down and want to do their part when you remind them. But some people just don't do it anyway. The teachers will help... if you go to them. But I'd rather take care of it myself... if it's possible."

While Monica is pointing out a commonly mentioned problem with cooperative groups, she is also telling us that the students usually deal with the problem on their own, and learn from doing so. She is also telling us that most people do indeed feel a responsibility to the group, even if they have to be reminded of it once in a while.

Fred also sees working in groups as important to learning a sense of individual and social responsibility:

> Again, we do a lot of group work. The teachers often let us choose our own groups. This gives us the responsibility of choosing people we can work with. Even it they know it might not work out, they let us make the choices to try to make it work. They let us make our own choices... and our own mistakes. I think you learn from that.

I asked Fred if he thought most people took this responsibility seriously. He continued:

> It all depends on the individual person. Some people take it very seriously and some people just choose their friends. Sometimes it works out with friends, and sometimes it doesn't. If I'm in a group where someone isn't doing their share, I talk to them. It depends a lot if you're getting graded as a group or as an individual. With a group, it's hard to grade individually because you get graded on the finished product. And sometimes you don't know who did what.

Fred has once again brought the discussion to the need for individual accountability measures. When I asked Fred if he thought the teachers were aware of this, he said: "Oh yes. There are the individual evaluations. That usually ends up showing who did what and who knows what."

Allen also mentions responsibility to the group and the importance of knowing whom you can work with: "A key to the success of group work is that you have to be responsible enough to do your part in whatever it is. It's also about not having one person doing everything."

Allen is a very conscientious student. I asked him if this situation happened to him often and how he handled it when it did happen. Allen's response:

> It depends on the group. I try to avoid the people who don't want to work seriously. But when it happens, I generally just do the work. Occasionally, I try to put some pressure on them and try to get them to do some work. There are many ways to do that. Like, I may say, "you do that part while I do this.'' That often helps.

> But it depends on who it is. And it's important when you do that that everyone gets to do something that Matters... not just some trivial stuff. I try not to do that. But anyway, there are lots of opportunities to practice being responsible.

Even though Allen has had some negative experiences in these groups, he still sees his struggles with group dynamics as a learning process. He also sees the significance of all group members feeling that their participation is critical to the success of the group. Everyone needs to feel that his/her work is important.

Fawn sees whole-class projects as important to community building. She also points out the advantage of a multi-year program in this regard:

> Sometimes we do whole-class projects where everyone contributes. I think that helps us work as a community. I mean, our class by now... we've been together for two years, so we're all pretty close. There's not as much fighting as there was when we just got thrown together at the beginning of the year. We definitely get along pretty well.

Fawn also mentioned individual accountability measures:

> And I think the individual grading also helps us become responsible because the kids who aren't responsible don't drag down the rest of the kids who are responsible with them. And just the individual projects... if you don't have the responsibility, you don't get it in on time, you don't get the good grade ... it's like a domino effect.

I asked Fawn to elaborate on the benefits she saw in the multi-year program. She responded, "Yes, we're together as a team for two years. I like it a lot. In fifth and sixth grade we did that too. I like it because you really get to know your class."

The teachers began by speaking of the vulnerability of children at this age. Little things can have a major impact. For some students, the hands-on components of the projects offer opportunity to be appreciated and to be seen as smart. Part of the intellectual development of young adolescents is the strong need for approval. They are also easily discouraged. It is critical that each child experience success. Shelly began: "This is so important at this level. Middle school kids can be so hard on each other. From day to day… you're in one day and out the next."

Tina continued:

> But think about what Jimmy must have thought as he became a respected member of the community… by allowing him to show his strength. When Jimmy had the opportunity to share his knowledge with Brian.. . Brian's the man… for Jimmy to be able to help him was wonderful.
>
> The teamwork also teaches kids to be responsible for their actions. **A** couple students mentioned that they didn't want to work with so-and-so because that person doesn't do the work. ***So*** for us, we knew this up front so we can try to help.

I told the teachers that every student I interviewed on this question said that they have concerns about working with kids who don't do their share of the work. But they all said they learn about working with others and that individual grading helps with the

problem. Shelly spoke about individual assessments and the students' role in development of assessment tools:

> Sure. We have always felt strongly about individual assessments. I think that's missing in a lot of classrooms where you get a group grade. And that's always on their minds when they come to us as seventh graders. It takes a few projects for it to really sink in. When we did the Rube Goldberg projects last year though, Mr. **S.**. wanted to work in a group assessment on a daily basis. We worked it in as a safety issue. He went in and brainstormed with them on how they would be assessed... what things should I be looking for as they worked in their groups. Then we made a rubric. It really worked well. It was important because of all the tools... we worked in the safety aspects. But there were other things the kids came up with that I should be able to see as I came around. They had that rubric in their hands and they knew what I was looking for.

Mr. **S.** commented on the community building that takes place early in the school year, the involvement of students in the decision-making process, and individual and social responsibility:

> I think it again goes back to the community they establish right in the beginning. There are rules established by the learning community and they have to live by those rules. They also set the boundaries themselves. So again, you don't have the teachers

> making all the decisions. The students are given a lot more freedom. The responsibility of being on task and working at being a good teammate falls right on the student. Very rarely is it completely directed by the teacher. It's kind of like... to use an analogy, my brother went to West Point. There, the institution set the rules for him. *So* now, he doesn't have a lot of self-discipline. Whereas my other brothers and myself, we went to college and had much more freedom. And of course, to do well in college, we had to figure out our own self-discipline. My brother at West Point, however, relied on all that structure.

As Mr. **S.** suggests, we can sometimes do children a disservice by doing too much for them. As mentioned previously, we learn to make good decisions and assume personal responsibility by practicing these skills in a safe environment.

Parents noted that students are visible in the community, through fund-raising, community service projects, and data collection. One parent also mentioned that she felt her children drew her into the school's community:

> My daughter drew me into the school, and actually got me more involved in the community. It was like all of a sudden, the whole town opened up for me. I made new connections from my involvement with the kids. And they showed me that it's important to give back to the community.

It was clear to all parties that the group work that takes place around curricular projects allows students opportunities to learn to be "responsible and involved citizens."

But it is also clear that to be effective, these groups must be much more than organizational structures. All parties talked about the hard work that goes into the success of these groups. It starts with breaking down students' traditional paradigms about students and teachers as they join this team. It is critical that teachers and students develop mutual trust and respect. Teachers must make it very clear that they take this process seriously… and expect students to do likewise.

As all students and teachers said, it takes hard work by all involved to pull this off. This is not an easy way out. But clearly there are powerful lessons to be learned through this process. The way these young people learn to be "responsible and involved citizens" is by living it in their community of learners.

A Collaborative and Quality Worker

The fifth Guiding Principle points to the importance of each student becoming a "collaborative and quality worker." This involves knowledge of the structure and function of the labor market. It also includes the ability to assess "individual interests, aptitudes, skills, and values in relation to demands of the workplace" and the ability to demonstrate "reliability, flexibility, and concern for quality."

The students all talked about the ownership they felt in their projects, and how this motivated them to produce work of high quality. Monica began by talking about how the pride she takes in the final products relates to the quality of her work: "Well, it goes to the final product. If you are not proud of it, it's not good quality work."

Fred saw the experience of working with others as a way to get a clearer sense of, and work toward, quality work: "That, again, ties in with the previous question with the

individual and group work. Some people have improved by being in a group. There are some people who just work, but others learn from them and gradually pick up on what's going on."

I asked Fred to tell me more about how people can "improve." What causes that? He responded: "Sometimes it's being able to choose what you want to do for a final product. Then you may have some initiative to do it right. You want it to look good."

I continued to nudge Fred to tell me more about the relationship between choice, a sense of ownership, and quality work. He continued: "You feel like it is yours. No one else is doing exactly what you are doing and you feel like you are doing something unique. ***So*** you want it to be good."

I also asked Fred to tell me more about his comment about peer learning in the groups. I asked, "In these groups, do you think you often learn things from other students?" His response:

> Absolutely. And not just me. I see that happening in a lot of groups. People in the groups have different experiences. And from these experiences, they learn. Another person may not have that same experience, but by being in the same group with that person, it creates a new experience that they can work from. ***So,*** we don't learn just what we are supposed to learn from doing the project, but we learn a lot of other stuff too. Like maybe one person may not know how *to* use some tool or do a particular skill, but another person did. You have the chance to learn skills from the other person.

Fred sees the group work as facilitating learning, skill development, and ultimately, "quality work."

Allen also picked up on the importance of a sense of ownership: "I'm always pretty conscientious, but when it's your own project, you want it to work out well. For some people, the presentation and public display of your work helps. When it's your project, you want it to be good quality."

Jimmy agreed. Like Fred, he also linked quality work to skills acquisition and use:

> Quality work has to do with learning skills. We learn skills, how to use tools and do different things, so that when we get a chance, we can do it well. And our presentations make me want to get everything just right. It's my work and I want it to be the best I can do.

Allen also talked about the ongoing discussion about what quality work looks like that is part of the culture of this team. The students are always involved in identifying criteria of quality work and development of assessment rubrics and scoring guides: "We do a lot of rubric writing and assessing stuff, where we have to decide what we want to have to make this particular piece be good. So we think through this and come out with a checklist. We spend a lot of time talking about quality work and what it looks like."

Allen indicates that the ability to recognize and assess quality work is prerequisite to producing it.

Fawn also talked about rubrics and, more specifically, how the teachers individualize assessment based on their knowledge of students' personal capabilities:

> Well, with the rubrics, creativity will usually be a factor worth so many points, and effort is a big one. If the teachers see you not using your class time or if you are not working up to your ability, they mark you down. By now they know our abilities. If I turn in a project that is not good quality, they can mark me down in effort because they know what kind of work I can do. I think that's good.

I asked Fawn, "You wouldn't have a problem with that even though your product might still be better than another student, but you and the teachers know that you are capable of better work. Would you have a problem with that person getting a better grade than you? Fawn:

> I don't think so because if I got marked down for effort, and I knew I hadn't put the best effort I could into the project, then I just say, "well I've got to do better next time." Because if that other person is putting forth their best effort, then I think they deserve the best grade they can get.

This awareness of individual expectations is critical to the success of heterogeneous classrooms. Students are not assessed in comparison to the other students, but to their own individual abilities and their own personal bests. When this is discussed openly with young adolescents, it makes perfect sense and is accepted. This is part of students assuming responsibility for their own learning.

The teachers saw the sense of social responsibility that develops in the cooperative groups as affecting the quality of work. The students come to rely on one another and don't want to let the group down. Tina:

> By working in groups, when they leave something at home they aren't just letting themselves down. They are letting the whole group down. That was something they had to learn. And then there were the students who didn't care much about the quality and just wanted to get it done, **So** there were many discussions about personal responsibility. Like, just because you're having a bad day you still have a responsibility to the group. Some kids feel bad when they have to miss a session. They feel like they are letting the group down. That's good for them.

Shelly brought up the idea that a real audience helps motivate students to produce quality work, "The audience can be a strong motivator."

Tina continued on this theme: "And it can be motivating to do quality work when it is going to be shown in public. Like the kids know we take their things to NELMS (New England League of Middle Schools Annual Conference). They knew that there may be hundreds of people looking at their work. And they take great pride in it."

Like the students, these teachers see ongoing dialogue about quality as critical to students' success. Students' awareness of the quality of their work is the result of hard work starting on the first day of school. Shelly talked about how this develops and the relationship between shared expectations, student input and ownership, and motivation to produce quality work:

> Our students are no different from other kids. Motivation comes from the work on expectations and rules that is done together early in the year. We start our discussions every year with, "What's a quality conversation and a quality audience look like." And those are posted and reinforced. And since the kids come up with them, they know they have to live by them.

Shelly and Tina believe a sense of ownership and responsibility translates into higher quality work from the students. Tina again mentioned how visitors to the classrooms are impressed by the level of responsibility displayed by the students: "Visitors are often surprised that the students stay on task. But why wouldn't they. They have time limits and they want to follow their timelines. But visitors are often surprised that they keep themselves on task."

The fact that students have input into the themes and activities also affects motivation, and ultimately quality. Shelly: "And it makes a difference that they are actually engaged and interested in what they are doing. If we just gave them a packet of worksheets to do when we have guests with us, it would be very different."

In this short exchange about "quality work," these two teachers mentioned all three of Alfie Kohn's "Three C's of Motivation:" Collaboration, Content that is meaningful and relevant, and Choice **(1993).** Like Kohn, these teachers believe that the motivation to produce truly high quality work is intrinsic and does not result from a system of punishments and rewards.

Both teachers also felt that it is important to get regular feedback from students on their work. As Fawn told us, these students develop a sense of what good work is and

know when they are working up to their abilities. Shelly: "The self-assessment piece is important too. We get some very valuable feedback and insight into the students and what they are thinking."

Tina agreed and expanded on how important it is to them to have time to share this information:

> And it's important for us, Shelly and me, to read those together and discuss them together. That's one of the things I miss most for our years as a two-person team. We could do that a lot more. It's hard now with our numbers. But we try. When we ride places together, one of us will read aloud and we get some done.

As with most teams who are committed to this type of curriculum, Shelly and Tina look for any opportunity to discuss student work. I asked them about the time issue, ***"So,*** part of why that sharing of the self-assessments from students is so overwhelming now is because you have such a small piece of time with each group, and so many kids? Sherri agreed and related the problem directly to team size and configuration, "Right. Exactly. It all points to smaller teams, doesn't it?'

The issue of team size is a recurring one.

Jessica and Mr. **S.** also picked up on the collaborative nature of the group projects that make up a large part of the curriculum for these students and the motivational value that results from a sense of ownership and social responsibility. Jessica: "Again, the groups promote collaboration. And the ownership they feel in their projects makes them want to produce quality products. The presentations in front of their peers motivates them to want to do quality work too."

Mr. **S.:**

> The whole process is about collaboration. Of course, there is a difference between collaboration and cooperation. We strive for collaboration. That's just total teamwork. When you get that, it involves everything, communication, the community working together, truly producing a team effort... instead of saying that I'm worried about my own grade, so I'll have to do the bulk of the work. You try not to get to that point.

He continued with thoughts about "quality work": "Quality, again... the students set the quality standards. They have a rubric right in front of them. Because they are involved and have ownership in the whole process, they know they have the ownership of the quality and what it should be."

One parent mentioned that high quality student work is promoted when teachers clearly define the minimum expectations and standards: "I think that when students are given the "bottom line" clearly, as these students are, they have a basis to build on. They know that the expectation is that their work will be above that level.''

Echoing students and teachers above, another parent talked about the emphasis on collaboration, as well as individual accountability measures and individual assessments: "These kids are taught to work together. Yes. Big time. They do a lot of group projects. But each child is assessed individually. That's an important part of successful collaboration for these kids. They know if they work hard, their work will be recognized.''

As with the other Guiding Principles, the similarity in the responses from students, teachers, administration, and parents is striking. Quality work results from a combination of skills and motivation. Within the project-based curriculum, skills are learned within the context of immediate need. These students learn skills as they are needed to find answers to immediate questions.

Motivation to produce quality work, according to these interviewees, comes from several sources. First and foremost is the sense of ownership that results when the curriculum addresses relevant issues and input from the students is elicited and honored. Nearly every party interviewed mentioned that students want to produce quality work when they feel the project/curriculum is theirs. This sense of ownership develops when students are given choices and involved in the decision-making process on a regular basis.

A sense of social responsibility also motivates many students. **As** they work in cooperative groups, they develop a sense of responsibility and feel an obligation to do their share and not let others down. The support and sharing of skills and information within these groups helps these students raise the quality of their work.

An audience the students care about to share their work is also a strong source of motivation. For these students, this audience is often their classmates. Class presentations are part of most units/projects. The students take pride in sharing quality work with their peers. In some cases, the audience includes other classes in the school and/or parents and community members. And as Tina mentioned, examples of students' work is often shared with other educators at conferences, workshops, and institutes. This

is a source of great pride for these students. They want the work shared in this way to be of the highest quality.

If students are expected to produce quality work, it is important for them to learn to distinguish what good work looks like. The ability to recognize and assess quality work is an integral part of the culture of this team. Class brainstorms on the characteristics of quality products and behaviors begin early in the year and are ongoing. Students' self-assessment is also an important part of this process. It is important for students to reflect on the quality of their work. It is also important for the teachers to see students' perspectives on quality

Collaborative work is also ingrained in the culture of this team. The teachers make it very clear that this is expected and show the students why this is an important life skill. Students indicated they learn various skills useful in group settings. They see these as skills that will help them succeed in the labor market that awaits them in the real world.

An Integrative and Informed Thinker

The sixth and final Guiding Principle of the State of Maine Learning Results calls for students to become "integrative and informed learners." This includes students making connections among all the different subjects and sources of information and using them all together in their schoolwork

As with the first five, connecting this Guiding Principle to the project-based, integrated curriculum seemed like common sense to the students. Monica was certainly conscious of this: "I think working on the projects does that. Because when we're

planning and researching them, we're thinking about everything and what we need to do it. We're thinking that way, so we learn to recognize it."

Fawn saw this as especially true in science (Shelly's class):

> I think we do this, especially in science. Like if we're studying Newton's Laws, we have to study the history behind that. So that connects with social studies and history. And when we do our research, that connects directly with reading and writing. And we use technology in our research in science class too. All the subjects connect in some form or another.

I asked Fawn if math connected at all. She responded: "Math definitely connects with science. There's a lot of formulas and stuff. Like if you want to figure out how fast something falls, or numerous other things. We use formulas and solve equations all the time."

Fawn perceived science as more conducive to integrative thinking than her other classes. I wonder if this perception is related to the nature of the discipline of science or is a result of the fact that Shelly, her science teacher, is committed to making this happen in her classes.

Allen saw this happening in other subject areas as well: "In much of what we do, all the subjects get pretty well connected together. Like we make a lot of connections with social studies and language. We might do a report for both of them where we do the research in social studies and write the report in language."

Fred felt that connections among the subjects facilitated his learning: "It makes it very hard when you have subjects that are split up. It helps when you can make connections in different classes."

Jimmy agreed. He also pointed out that it helps when he has the opportunity to use his strong intelligences and skills across the curriculum. Being able to do so allows him to use his creativity: "With Mrs. Lincoln and Mrs. Kimball, I can mix everything together. I can bring in my math and computer skills to their classes and use them to actually create things that are different… maybe something that no one has ever thought of."

These students seemed very aware of connections among the subject areas. It seems realistic and makes sense to them. Also, they feel it benefits their learning across the curriculum.

The teachers immediately emphasized the importance of "real-world" connections. Learning in the real world has always been integrative. And real-world problems are always addressed in an integrative fashion. Shelly said, "I think the biggest thing is that we try to make the real-world connections with them. Not for them, but with them. In a lot of what we teach, we try to bring in what is happening in everyday life and how it works."

Shelly's point of emphasis on the importance of helping the students see these connections should not go unnoticed. This is not something that can be done "to" or "for" them. It is done "with" them. Tina continued with this theme and suggested that connections to the real world can be made with nearly any topic:

> Yes. Even when we did Frankenstein. All the articles the kids found had connections to today's world. Frankenstein is, or was, science fiction. But many things that happened in the book are now real... blood transfusions, the hand transplant, etc. Look at the genetics. The kids just kept finding articles in the paper, Time Magazine, the news, whatever. All this was generated from reading a book written 150 years ago!

Shelly suggested that they could have done a much better job of making these connections during their last unit on building cars:

> I would have liked to have had more time in the last unit with the cars to take more of a look at what's happening in the world right now. Had we had more of our team participating, we could have done that... the gas crisis, the car industry, the conditions in the rest of the world... and just look at the whole picture.

Shelly and Tina were disappointed that the unit did not take more of a whole-team emphasis. They had tried to help their teammates see how this could happen. And it seemed to be off to a good start. Tina talked about what she thought happened: "I thought that it was going to happen after our early brainstorms with the whole team. But I guess it was just too overwhelming for some of them."

Tina's comment triggered thoughts about an article I had recently read about Richard Powell's research on integrative thinking/teaching. Joining in the discussion about their teammates' discomfort with a totally integrative model, I shared my thoughts on helping others see this curriculum as we do. My comments:

> It's hard, if not impossible, for people who aren't integrative thinkers to teach in this way. That's certainly clear from Richard Powell's new research about this. There's a nice article about this in the Spring, 2000 NELMS Journal. Hopkins (L. Thomas) was clear about this too... unless you think in an integrative fashion, you can't teach that way. But too many people today are sending the message, "Just try a unit and you'll see it works and you'll like it." There's got to be more to it that that. It's not about trying a unit, it's about learning to think in an integrative fashion.

Shelly agreed and continued to talk about their frustrations with the large team structure. She and Tina found their integrative curriculum very easy and natural when they worked as a two-teacher team. The extra work required to bring others along is tiring. Shelly:

> Yes, I agree. It's a process... a thinking process. It was hard for us to have to go backward... coming from our small fifth and sixth grade group, where that was the only way to think. Everything connected, all the time. It's hard now to think about teaching a single subject and relying on others to connect their subjects.

Tina agreed, "Yes. Back then everything was always integrated."

Shelly continued with the discussion of the importance of pushing the change process beyond the level of 'try it, you'll like it': "But you're right. Just trying it isn't enough. It won't work until you believe in it."

Shelly is talking about moving beyond first order change, which deals with structural and relatively superficial issues. But significant and lasting change requires higher order changes, dealing with individuals' personal beliefs about teaching and learning (Fullan, 1993, 1995). This is a much more difficult process. I mentioned the adage that "you have to be Dewey to do Dewey." I don't think that's true, but maybe you have to think like Dewey to do Dewey? Shelly responded:

> Yes. That's why I keep pushing the discussion of different ways to do it and get to the same point. There's the way you did it, then there's Mark Springer. There are several models out there. But the common piece is that you have to believe and think that way. When you start talking to people, you know what they can do by their mindset. And if your mindset is that curriculum is linear, you can't get to the next level.

Tina suggested that curriculum coordinators often fail to reach this level of the change process: "I'm not sure curriculum coordinators are helping with this aspect. They seem to be stuck linking curriculum to standards. This doesn't really get at beliefs about curriculum."

This is definitely an area worthy of further inquiry. My observations are similar to Tina's. More and more Maine schools are creating curriculum coordinator positions for the purpose of aligning curriculum to the State of Maine Learning; Results. This may be an appropriate place to start, but at some point we need to move to an enactment/implementation phase. It is here that individual educators' personal beliefs about teaching and learning become critical issues. This is where the real work begins.

Mr. S. talked about reasons why many educators are uncomfortable with an integrative curriculum model:

> That's probably the biggest challenge, especially at this level. You have to trust that the students are going to get the information without the teacher being the information-giver all the time. You provide the middle level students the opportunity to get the information. Sometimes it seems some middle schools just want to do all the fun, glitzy stuff. For me, that's the part I have to work through in regards to this curriculum integration stuff. As a teacher, I would be worried all the time about students missing this or missing that. My instincts would probably be to step in and control the situation.

Mr. S. makes it very clear why teachers' beliefs and comfort levels are so important when enacting curriculum integration. If we assume that the route to teaching students to be "integrative thinkers" includes involving them in decision-making, helping them make cross-curricular connections, and allowing them to figure out how to use their skills to solve problems, we immediately see where educators run head-first into the issue of coverage of material versus depth. Helping young adolescents become "informed and integrative thinkers" requires a time commitment. Mr. S. recognizes this. He also recognizes that it is very hard work:

> Well, I'll tell you one thing. To do this and do it properly, it takes much more work than standing in front of the class giving out information and directing every move the students make. You

> have to design the units and projects so they can find and discover the information themselves. This is how they learn to be "thinkers."

I suggested that the students would probably agree that this curriculum is the more challenging curriculum. Mr. **S.,** drawing on his own experiences as a student, concurred, "Absolutely. When I was still teaching, Critical Skills training really changed my thinking and instruction. I went to a lot of projects and portfolios. But still, when I take a class, I'm just as happy with a test … because it's so much easier and less work."

Parents, also, saw thematic units and the project-based curriculum as conducive to children becoming "integrative and informed thinkers." One parent said:

> Yes. I think that has been done to some extent with the thematic units they do. But it wasn't always great for my daughter. She found history and social studies very boring. But this wasn't exactly the fault of the thematic units or these teachers. It's just that it might have been done better across the curriculum. After leaving Mrs. Lincoln's class, other classes can seem mundane. They like the spice. If you give them a spicy teacher and than take it away, motivation goes down.

On a similar vein, another parent: "When the kids do their projects, they use **all** the subjects. No one looks at what fits into what subject. I think this helps them see how it all fits together."

Another: "Some of the teachers make it all fit together so well. I know Mrs. Kimball and Mrs. Lincoln make their plans together so they fit, That doesn't happen as much with the other teachers."

While a curriculum integration model seems to make so much sense when addressing this Guiding Principle, it is clear that there are issues of enactment to be addressed. It makes sense to all parties for several reasons. First of all, the nature of the research and projects necessitates the use of various disciplines. Students see how skills and knowledge learned in different classes can be applied in a broader context. Drawing real-world connections into the curriculum adds relevance and helps students see how the knowledge and skills fit together beyond the classroom.

Also in a curriculum integration model, students are actively engaged in an ongoing dialogue of issues and problems that require "integrative thinking." It is important that they have opportunities to grapple with this. This is about developing a thinking process. Students need to be actively involved throughout the process.

The frustrations of educators trying to become change agents in this area are also clear from these interviews. Many believe that for teachers to teach students to be integrative thinkers, they must first be integrative thinkers themselves. At the very least, they must believe in the merits of teaching within an integrative model.

What happens to teachers who are teamed with others who just don't see it and aren't believers? In this particular case, they can work to bring their teammates along. This may include setting up situations where everyone has the opportunity to use an integrative process to deal with actual issues and problems – within the teaching team, for instance. But even though Shelly and Tina are committed to making this happen, we hear

the frustration team structure and number of students in their voices. One wonders how long teachers like this can sustain their passion.

In closing this section, I once again mention the consistency of the responses from the various groups interviewed – student, teachers, administration, and parents. There was no hesitation from any of these people when asked to articulate how the project-based, integrated curriculum helps meet the Guiding Principles of the State of Maine Learning Results. The benefits were crystal clear to all. To the students in particular, it seemed like common sense. But even as I say this, I know that it was also made clear that there are obstacles to successful enactment. Many issues of change come into play, including fear of new things, concerns about making sure all the old content finds its way in, issues of time and hard work, insecurities, and organizational structures (team configuration in particular), to mention a few. These issues are further discussed in Chapters Two and *Six*.

Chapter 6

REFLECTIONS, FINDINGS, **AND** CONCLUSIONS

The purpose of this study was to explore how and why teachers choose to enact a curriculum integration model in their classrooms. The "why" part of this question is complex and was addressed from the viewpoints of key stakeholders, including students, parents, teachers, and the school administrator. While some elements of the "why" were universal across the groups, others varied. The "how" issues also varied, with changes in roles required of all stakeholders. Related to these were other questions that helped define the study, including: What are the philosophical beliefs and guiding principles of these teachers? How did their backgrounds and professional development prepare them to enact this curriculum? What transitional steps occurred in their change process? What advantages and disadvantages were identified by different stakeholder groups? How did teachers, principal, and students assume leadership roles in this process?

Four teachers were involved in this study: the two primary participants, Shelly Lincoln and Tina Kimball, and two of their teammates. These teachers were interviewed and observed. Five students, three parents, and the school principal were also interviewed. On site visits allowed me to observe the school, and Shelly and Tina's classrooms in particular, for more than seven weeks. This also allowed me to interact and enter into informal conversations with nearly all the students on the team. My research included an analysis of a number of curriculum-related documents, including curriculum unit guidelines, assessment tools, and lists generated in student brainstorming sessions.

This chapter provides a summary of the findings of this study, the results of which suggest some clear conclusions. The first section of this chapter includes a discussion of the evolution of the two primary teachers' beliefs about involving students in the curriculum planning process, project-based curriculum, and curriculum integration. This is followed by a summary of their progress toward enactment of these beliefs, and finally, a discussion of what they would like to do with their curriculum in the future and their vision of change that would facilitate these goals.

The next section includes students', parents', teaching teammates, and the principal's thoughts and feeling about curriculum integration. This includes an overview of how all stakeholders understood curriculum integration to address the Guiding Principles of the State of Maine Learning Results.

In the final section, I discuss shortcomings of the study and things I would do differently if I did this study again and suggest possible areas for future research on this topic.

Teachers' Beliefs and Guiding Principles

Several themes emerged related to the philosophical beliefs and guiding principles of the two teachers in this study:

1) Cornerstones to Enactment **–** Commitment to trusting student/teacher relationships, student involvement in curriculum planning, and democratic process in the classroom are cornerstones to enacting curriculum integration.

2) Integrative Thinking **–** This curriculum requires teachers to think in an integrative manner.

3) Learning Integrative Thinking – Integrative thinking and child-centered teaching can be learned.

4) Multiple Leadership Levels – To bring about significant curriculum change, leadership is necessary at multiple levels.

5) Team Configuration – Team configuration can facilitate or complicate curriculum integration.

Cornerstones to Enactment

Jackson and Davis, in Turning Points 2000: Educating Adolescents in the 21st Century, say, "Middle school educators have long recognized an essential truth about children's learning: relationships matter. For young adolescents, relationships with adults form critical pathways for their learning; education 'happens' through relationships."

Shelly and Tina's compassion for children was evident throughout my interviews and observations in their classrooms. They were always available to students before and after school and during lunch. Shelly regularly had groups of students in her classroom during lunch for planned activities or informal chat sessions. The atmosphere in these classrooms was one in which students felt safe and comfortable. Students also came to talk to Shelly and Tina during study halls and other free time. Sometimes they came to discuss schoolwork; sometimes for advice on more personal issues. Whatever the issue, it was given serious consideration by the teachers. Teaching for Shelly and Tina is much more than delivering information. The accounts of Wendy and Timothy in Chapter Four are just two cases that exemplify this. At one point, Tina said: "Sometimes in my study

hall I just go around and sit and talk with kids. They need that adult contact. Some of them have very little interaction with adults."

Shelly and Tina's commitment to close, meaningful student/teacher relationships was also evidenced by their leadership in starting an advisory program at Green Lake Middle School. They researched the advantages of advisory programs and initiated discussions with teaching colleagues and administrators. They also modeled student advocacy by always being willing to stand up for their students in team meeting and meetings with parents and administrators.

While significant relationships between students and teachers can exist within any curriculum design, they are inherent in curriculum integration. **A** focus of the May, 2001, meeting of the National Forum on Curriculum Integration was to describe and define curriculum integration as it is practiced by educators today. In a brainstorming session on characteristics, Dr. Gert Nesin said that curriculum integration is, first of all, about "cultivating life-changing relationships" between students and teachers, and students and students. She continued by saying that fundamental to enacting curriculum integration is "caring about kids before academics'' and "accepting who they are, but asking them to become better people" (2001).

For those who use curriculum integration, these relationships come from building curriculum together. Involving children in the curriculum planning process is also fundamental to the work Shelly and Tina do in their classrooms. This is an idea that has been associated with curriculum integration for many years (Hopkins, 1941; Beane, 1997). Shelly pointed out how, for her personal self, active involvement produces a sense of ownership, which leads to motivation and quality work: "I learned from working

with staff and other teachers, if people have ownership in something, there seems to be lots more involvement, more enthusiasm, and better results. It was like... why wouldn't this work with kids?'

Tina mentioned how focusing on their own questions inspires children to learn new skills in pursuit of answers

> All students have questions and concerns. In this model, they get the chance to answer some of their own questions. And, even more importantly, they learn how to go about finding the answers to their questions. Sometimes they say they end up with more questions than they had at the beginning. And that's a good thing.

While Shelly and Tina have involved students in curriculum planning throughout their careers, the level of this involvement has increased. Originally, they organized curriculum around teacher-generated themes and guidelines. Once the themes were presented to students, they designed individual or group inquiries related to the theme. More recently, students have been involved in brainstorming their own questions around the theme and have collaborated in designing the units. Shelly spoke of the results of this evolution:

> First of all, for me as a teacher, I don't think I've used the same unit from one year to the next, since I've started. Sometimes it's the same general idea, but I always redo the "challenge," and add something new. I don't want to get stale. ***So,*** for Tina and me, curriculum integration is a logical "next step." And now to see the kids, the way they're taking to it, that excites me. I can't wait to

> read the evaluations from the eighth graders. I'm very anxious to see what they have to say about it. But I think for them, it has given them much more ownership. That shows up in the pride they show in their presentations. They really wanted all three groups here for presentations because they were so proud. And they wanted to see what everyone else was doing.

While Shelly and Tina did not talk specifically about democratic process in their classrooms, it was easily observed. An understanding of what it means to live in a democratic society is conveyed to young people through the collaborative curriculum planning process. As students plan collaboratively, negotiate, and share responsibilities, they come to understand the principles of democratic life. The importance of this was outlined by Hopkins:

> The curriculum of the school should be designed by all of those who are most immediately concerned with the activities of the life of the children while they are in school. This, of course means the children themselves, together with their teachers, parents, other educators, and citizens of the community... This means that a curriculum must be as flexible as life and living. It cannot be made beforehand by adults and given to pupils and teachers to install. It must find its scope, sequence, continuity in the intelligent pursuit of democratic process goals **(1941,** p. 12).

Integrative Thinking

Interviews with Shelly and Tina indicated that both were "non-traditional" teachers from the beginning. Twenty years ago, Tina was the only teacher in her school using "writing process" and individualized curriculum. When she applied to teach at Green Lake Middle School, then a completely tracked school, her comment to the principal was:

> … I told her right off the bat that I believed in heterogeneous grouping. At that time, the whole school was tracked. I told her that homogeneous grouping produces cliques and it sends the message that some people are better than others. That's not the way I want to teach. I also told her that I do a lot of group work and hands-on activities.

Tina's commitment to a project-based, integrated curriculum often set her up as an outsider in the school: "I'd see some of the older teachers go by and they would stick their heads in and say things like, "Tina, some day you're going to learn that spending all this time on projects and doing research is really just a waste of time."

Shelly, also, was an independent thinker from the beginning of her career. She and Tina piloted the school's first multi-aged program, a program that became the model for the entire fifth and sixth grades, in her second year of teaching. As an integrative thinker, Shelly understands the importance of integrating curriculum: "It's about making the learning whole, so the students don't go to classes where they are getting things that

are totally off-topic or completely unrelated to the rest of their day. The kids pick up on that very fast.''

Guiding Principal #VI of the State of Maine Learning Results calls for students who are "Integrative and Informed Thinkers.'' While the "Informed" part of this statement indicates acquiring information, "Integrative" speaks to a thinking process, a process that allows us to understand how information fits together and interrelates. Powell believes this requires teachers to, "move successfully from linear to nonlinear teaching; namely from subject-centered to child-centered, integrative learning" (2000, p. 22). Hopkins suggested that teachers can facilitate integrative learning only if they themselves possessed "an integrating personality'' (1937, p. 245). If they do not themselves think integratively, they tend to revert to being presenters of predetermined subject-matter.

Teaching children to be integrative thinkers requires more of teachers than delivering linear textbook curricula and planning backward from state standards. Few state standards are organized in an integrated way. To teach children to think like a scientist, we must first think as scientists ourselves. To teach children to think like mathematicians, we must first think as mathematicians ourselves. And so it goes. Teaching children to be integrative thinkers requires teachers to first think integratively themselves. Interviews with Shelly and Tina indicate that integrative thinking was natural to them and influenced their teaching from the beginning of their careers. Hopkins, Powell, and this research indicated that non-linear, integrative thinking is indeed natural to some teachers. The next question is, "Can teachers who have always seen learning and curriculum as linear learn to think integratively?"

Learning Integrative Thinking

Shelly and Tina moved from the fifth and sixth grades to seventh and eighth grades to bring their ideas about planning curriculum with students to that level. While they had been very successful in the lower middle level grades, Tina reported that seventh and eighth grade teachers were openly critical: "We started to hear the seventh and eighth grade teachers saying things like, 'Well, that's good for fifth and sixth grade, but that stuff doesn't work at seventh and eighth grade."'

As risk-takers throughout their careers, they decided to find out first hand how their ideas would work in the seventh and eighth grades. The school's administration supported the move with the same hopes.

As reported in Chapter Four, Shelly and Tina continued to integrate their portions of the curriculum after the move, working with science-based themes, they continued to involve students in planning curriculum. They also left the door open for the other teachers on the team to join in the units. Even more importantly, they talked about and modeled integrative thinking in their team meetings. And other teachers did join in at times, although both teachers and the school's principal reported that progress was slow. This makes sense given Powell's (2000) findings. After six years of research with six different "integrative teacher development projects," representing teachers from all grade levels, Powell concluded that, even with experienced facilitation, integrative thinking is a gradually learned process:

> Integrativeness, as a way of understanding the world and as a personal philosophy, was not learned be participating in one year

> of the project.. . Many found the progressive nature of integrative teaching to be personally threatening and professionally problematic given middle school teachers' current subject orientation within their interdisciplinary schools. However, middle school teachers who were in the project for two or three years began to understand the complexity of integrativeness, and some are beginning to transform their personal classrooms, in part, to integrated centers of learning (Powell, **2000,** p. **24).**

Even Shelly and Tina, for whom many aspects of curriculum integration have been a natural part of teaching, acknowledge that the level of their integrative thought has increased due to various conference experiences, university classes, and exposure to progressive programs. **And** they have shown, as has Powell, that teachers who have spent years locked into their separate subject areas can learn to think and teach integratively.

Two points concerning Shelly and Tina's move to the five-teacher seventh and eighth grade team are of major importance:

1) They were able to continue to integrate the curriculum and involve students in curriculum planning within their part of the school day.

2) They were able to stretch their other teammates and help them move toward integrative thinking and teaching. The full participation of the math teacher during the unit on Hot Rods Café is an example of the progress they made.

Multiple Leadership Levels

Change requires leadership. Mr. **S.,** the principal at Green Lake Middle School, was quick to acknowledge Shelly and Tina as change agents and leaders, "I'd say they are the closest thing to curriculum integration we have. They probably are integrated. And they are certainly responsible for moving their team in that direction." At the same time, he was aware of the support and leadership these teachers need from the school's administration:

> You have to help them by providing the time to do it, and the resources to do it. It takes time to cultivate the ideas. You have to watch out for roadblocks and don't let them build up and stall the process. Even modeling is important for the administration. I was involved in the earlier project and I just loved it. I miss teaching and I like to model. I went to Critical Skills training with those folks too. That changed my thinking about education a great deal. And that's exactly what we're talking about in dealing with students – ownership in the process – brainstorming – having the students set the standards. I even applied the same philosophy to my coaching. It's something **I** truly believe in. So, I have to make sure the atmosphere and environment are there for them to grow. I can also help provide resources. These teachers do a lot of in-service. I try not to say no to them.

The type of administrative leadership to support significant curriculum change can be summarized as providing:

1) Support – The principal/leader needs to be supportive, as well as resourceful, in efforts to locate and acquire curriculum materials.

2) Flexible organizational arrangements – The principal/leader needs to be creative with scheduling and assigning staff.

3) Ongoing staff development – Staff development is necessary throughout the process, but needs change according to the stage or level of implementation.

4) Consultation – Principals/leaders need to help provide personalized information for individuals.

5) Reinforcement – Principals/leaders need to actively reinforce gains teachers make.

6) Monitoring – Principals/leaders need to monitor progress in order to provide support services to enable continual growth.

7) Evaluation – Principals/leaders need to periodically evaluate the success of the program.

Shelly and Tina have been change agents and provided leadership for fifth and sixth grade teachers as they reorganized their teams and began to integrate curriculum. More recently, they have brought new ideas to the seventh and eighth grades. Throughout this process, however, they have acknowledged the support and leadership of administrators as critical to their success.

Team Configuration

Shelly and Tina have been successful in their current five-teacher team format. They have been able to involve students and integrate curriculum to a high level in their portion of the schedule. They have also been able to generate interest in other team members and involve them in their integrative units at times. Still, both expressed interest in pushing their curriculum to the model of curriculum integration Beane describes, and they see a number of obstacles related to their current team configuration.

First of all, they have a teammate who is openly critical of the philosophy, at least as a curriculum model in their school and community. And even when other teammates participate in their units, Shelly and Tina end up helping them plan their part. This extra work is draining. It is the kind of thing dedicated teachers may do for a short time, but it is difficult to sustain. Curriculum integration requires constant communication among participating teachers, as well as commitment to a common philosophy. Perhaps the biggest obstacle to curriculum integration in the five-teacher team structure, however, is limited contact with a large number of students. Caring and sustained relationships among students and teachers are critical. This is difficult to accomplish with over a hundred students. And the teacher time necessary to offer this many students quality feedback and reflective narrative assessment can be overwhelming. So, as I asked these teachers and their principal what would be needed for full enactment of curriculum integration in the seventh and eighth grades, it was no surprise that they pointed to restructuring the teams. Tina:

> I see us on a smaller team. We were thinking about three people for a couple reasons. But two may be a possibility too. I'm a

> person who needs lots of reflective time. And then, some people don't want to go to smaller teams. But I sometimes feel overwhelmed working with more that a hundred students like we have now. I would like to have a smaller group of students. **A** big piece of that is the opportunity to get to know the students better

Tina felt a need to work with a smaller number of students and saw reducing the number of teachers on the teams as a way to do this. Shelly's response was similar. She, too, was concerned with relationship building with more than a hundred students, but was also concerned with the logistics of whole team brainstorming:

> I can answer that easily. I'd like to be on a three-person team. Four, if that's what it had to be, but I'd like to be on a three-person team with the rooms all in the same area so we could make it more unified. We could start our year with a brainstorm with all the kids. We would have a smaller number of kids. That would help us make the next step.

For most people who use curriculum integration, it is important to meet as a whole team on a regular basis. This is difficult for teams made up of more than a hundred students.

Mr. S.. saw the situation the same way:

> If we're really serious about curriculum integration, we need to look at established programs and see what they're doing, like Mark Springer's, for instance. The focus needs to be on experiential

> learning around a theme and addressing all the standards around that theme.
>
> The other things we might be heading toward, to help us get to the next level, is smaller teams. We've done some schedule changes to help the students out a little bit but we're still in that traditional big, five-teacher team structure. We're looking, down the road a couple years, at the possibility of teams of two and threes.
>
> We could easily make the change to smaller teams. We've done a lot of discussing this year, especially coming from the Institute at the University of Maine. There's been a lot of talk. And of course you have some people who are against it. But we're talking more and more about that kind of change. I think to provide the best opportunities for kids, we need move in that direction.

The responses of these educators align with the literature on team structure for curriculum integration. Recent research limits the size for effective interdisciplinary teams to less than ninety students (Flowers, Mertens, and Mulhall, 2000; Felner, Jackson, Kasak, Mulhall, Brand, and Flowers, 1997). Teams effectively enacting curriculum integration call for student numbers in the 40 – 60 range, suggesting the need for partner teams of two or three teachers (Jackson and Davis, 2000; Arnold and Stevenson, 1998; Alexander, 1995b & 1993).

Benefits of Curriculum Integration for Students

Historically, the research on progressive programs such as curriculum integration says students from these programs, when compared to students from traditional programs, do about the same or slightly better by traditional academic measures such as GPA and standardized test scores (Aikin, **1942;** Chamberlain, **1942;** Vars, **1996).** At the same time, curriculum integration advocates claim other benefits. As part of this study, I asked students, parents, teachers, and the school's principal to comment on what they saw as advantages to curriculum integration. In most cases, there was a great deal of constancy across the responses form these groups. In the first part of this section, **I** will summarize their general comments about the advantages of curriculum integration. That will be followed by commentary of how all parties saw curriculum integration as addressing the Guiding Principles of the State of Maine Learning Results.

As students, parents, teachers, and the principal talked about the advantages of curriculum integration, their responses fell into four categories: the motivational value that results from the ownership students feel when they are involved in curriculum planning, the constructive nature of learning which is enhanced by emphasizing connections across the curriculum, the need for students to become responsible and accountable for their own learning, and the effectiveness of cooperative learning and peer teaching.

Ownership and Motivation

All parties felt that involving students in curriculum planning and offering them choices leads to a sense of ownership, which in turn acts to motivate students. Student

comments included: "You feel like it is yours. No one else is doing exactly what you are doing and you feel like you are doing something unique. ***So*** you want it to be good." "I'm always pretty conscientious, but when it's your own project, you want it to work out well. For some people, the presentation and public display of your work helps. When it's your project, you want it to be good quality."

As these students indicate, ownership motivates us to produce quality work, especially when the expectation is that we will share that work with an audience we respect and care about.

Mr. **S.** also mentioned student ownership: "… the students set the quality standards. They have a rubric right in front of them. Because they are involved and have ownership in the whole process, they know they have the ownership of the quality and what it should be."

Mr. **S.** suggests that when students are involved in planning curriculum and assessing their own work, they are willing to assume ownership of the quality of that work. Jessica, the team's math teacher agreed: **"I** think that having them involved makes them more interested and they work harder."

For Shelly and Tina, it is also important for student involvement to carry over from units of study to behavioral norms. Shelly:

> Our students are no different from other kids. Motivation comes from the work on expectations and rules that is done together early in the year. We start our discussions every year with, "What's a quality conversation and a quality audience look like." And those

are posted and reinforced. And since the kids come up with them, they know they have to live by them.

The bottom line is that students who have input in their activities in school tend to feel that their work belongs to them. When this happens, they feel that their work is an extension of their selves and take pride in producing quality products. This is backed up be research in motivation (Kohn, **1993).**

Connection of Content and Skills Across the Curriculum

Another advantage of curriculum integration is the connection of content and skills across the curriculum. Educators have long claimed that students understand and retain content and skills better when they are presented across the curriculum in an integrated manner (Hopkins, **1937;** Dewey, **1938;** Beane, **1993;** Vars, **1996).** National education associations, including the National Association of Secondary School Principals **(1985),** Carnegie Council on Adolescent Development **(1989),** National Commission on Social Studies in Schools **(1989),** National Council of Mathematics Teachers **(1989),** National Middle School Association **(1995)** have reinforced this over the past fifteen years. The point that cross-curricular connections lead to effective learning was not lost on the people in this study. Mr. **S.** said:

> The main benefit is that they are not just an isolated act. They can see the applications of what they are doing immediately, so there's more motivation. Instead of just conjugating a verb, they actually see the usage. The transition math, since I was a math teacher, works on that premise also. It's all application. It doesn't just give

> you rows of problems. It's always application. A lot of it is gathering statistics and information and applying them. **So,** that's similar to what curriculum integration does, it's actually motivating because it shows "why" you learn it. Particularly at this age level, of course, that's very important.

Students agreed: "Well, in science, we do more than just science. Sometimes math comes in. Like we did something where we had to figure out the distance. First we learned it in math, then we brought it to science to use it. That helps it stick."

New learning is most effective when it is reinforced and immediately applied. This is a basic tenet of curriculum integration. Content and skills are learned under an umbrella theme. New information always connects to the theme. Skills are learned as they are needed and are immediately applied.

Responsibility and Decision-Making;

Thirdly, educators who advocate for curriculum integration believe that it is important for students to learn responsibility and become accountable for their decisions. While many educators demand responsibility and accountability, those who use curriculum integration provide students with a safe environment where they can practice and learn the skills needed to do so (Beane, 1997; Alexander, 1995). Shelly and Tina's emphasis on student responsibility was clear to the students, as these comments from four students indicate:

> When we start a challenge, we usually do notes in the beginning, so we learn a lot of the stuff we will need to know. And then the

> responsibility is left to us to do extra research to make our project even better, and then to include more than just the information we know because of the notes. But I think the responsibility is good because it teaches us to accept responsibility for the rest of our lives.
>
> Responsibility is a quite good thing. Mrs. Lincoln and Mrs. Kimball are responsible for us, but we're responsible for what we do. That gives us a chance to learn how to take on responsibility. Instead of making the decisions for us, it teaches us to be responsible and how to conduct ourselves out of school, and how to make good decisions.
>
> I think it's good because when we go to high school, there's going to be a lot of decisions we will have to make. And I think it's good because it teaches us how to make good decisions. And I don't really consider that extra work.

These students welcome responsibility and feel that their experience with decision-making has prepared them for their future education, as well as their lives outside of school.

Collaborative Work

Finally, students spoke of collaborative work that is a cornerstone of curriculum integration and how that facilitates their learning. **As** Tina talked about benefits to

curriculum integration, she said, "Another benefit is working with other kids. They learn very effectively from one another." Fred agreed:

> I see that happening in a lot of groups. People in the groups have different experiences. And from these experiences, they learn. Another person may not have that same experience, but by being in the same group with that person, it creates a new experience that they can work from. ***So,*** we don't learn just what we are supposed to learn from doing the project, but we learn a lot of other stuff too. Like maybe one person may not know how to use some tool or do a particular skill, but another person did. You have the chance to learn skills from the other person.

And beyond the effectiveness of learning subject area content and skills from peers, these students felt that it is important to learn to work with others. Students' comments on this included:

> I think we learn to get along with people. And how to group work – to work as a team. We learn how to share and balance the work. You learn about working with other people. You also learn about planning things out in advance. Time management is a major thing we deal with. We have to schedule everything out in advance. We work a lot in groups, and I definitely think it teaches us a lot about dealing with people we may not like. Although we have a lot of freedom to choose our own groups, the teachers encourage us to choose people that we don't work with all the time, so we get

> a chance to experience different people and things. ***So,*** I think it helps that way. If you have to deal with people you don't like, and you're stuck with them for the whole project, then you deal.

As with personal responsibility and decision-making, these students feel that being able to get along with others and work collaboratively are important life skills. And beyond learning these important, they find their work in cooperative groups leads to effective peer teaching and learning.

As Shelly reflected on her experiences with middle level students, she drew all of the points mentioned above into a summarizing statement about curriculum integration:

> I think it opens more doors for them. It doesn't restrict them in the classroom. I think they learn more. They are learning more and remembering more. Sometimes it might just be the experience more than the material, but I think that's the case with a lot of learning. At least they will remember that. If they get more in-depth into it, they are going to take more away from it. And I think it can really encourage kids to be risk-takers. And that's a major life skill for them.

Curriculum Integration and the State of Maine Learning Results

All parties interviewed for this study were asked to comment on how they saw curriculum integration addressing the Guiding Principles of the State of Maine Learning Results. The following is **a** brief summary of their thoughts:

1. **A** Clear and Effective Communicator

• In the group aspect of the projects, the success of the team depends on effective communication within the group.

• The emphasis on primary resources necessitates reading, writing, interview, and technological skills. Students have multiple opportunities to practice and hone their skills. Teachers teach general skills to all students and specific skills to groups and individuals as they need them. The skills are learned within the context of immediate application.

• The presentation aspect of the projects requires students to communicate their knowledge to a larger audience. The pride they take in sharing their authentic research with peers is highly motivational. For many young people, this drives their work to a higher level than simply taking a test over the content.

• Choice is also highly motivational. The choices and input students have within the curriculum leads to a sense of ownership in their learning.

• The growth of self-esteem as students expand communication skills is a fringe benefit. Students feel they are learning skills that will help them access and apply whatever information they need.

2. **A** Self-Directed and Life-Long Learner

• The independent research component of each project nurtures the skills needed for lifelong learning. Students use a variety of resources on a daily basis. Figuring out where to find and how to access information becomes second nature for them.

• Choice, responsibility, high expectations, and student-input are terms used by students and teachers in this curriculum. Students learn to make good choices and assume responsibility for their learning and behavior when they have opportunities to practice these things in a safe environment. Support of adults who care about them is a prerequsite.

3. A Creative And Practical Problem Solver

• The project-based, integrated curriculum is a natural place to learn problem-solving skills. This is especially true in units that include design components. After a certain amount of informational background is laid, students define their questions and write proposals for their plans for attack. Teachers guide, coach, and facilitate, but it is clear that students are expected to figure things out on their own. At the end of the project, they are expected to use their information to support their conclusions. An important skill for the teacher is the ability to assist, support, and encourage students without giving them the answers.

4. A Responsible And Involved Citizen

• The group work that takes place around curricular projects allows students opportunities to learn to be "responsible and involved citizens." But it is clear that to be effective, these groups must be much more than organizational structures. Hard work goes into the success of these groups. It starts with breaking down students' paradigms passiveness in school at the beginning of the year. It is critical that teachers and students

develop mutual trust and respect. Teachers must make it very clear that they take this process seriously and expect students to do likewise.

• There are powerful lessons to be learned through this process. The way these young people learn to be "responsible and involved citizens" is by living it in their community of learners.

5. **A** Collaborative and Quality Worker

• Quality work results from a combination of skills and motivation. Within the curriculum integration model, skills are learned within the context of immediate need. Students learn skills as they are needed to find answers to immediate questions.

• Motivation to produce quality work comes from several sources. First and foremost is the sense of ownership that results when the curriculum addresses relevant issues and input from the students is elicited and honored. Students want to produce quality work when they feel the project/curriculum is theirs. This sense of ownership develops when students are given choices and involved in the decision-making process on a regular basis.

• **A** sense of social responsibility also motivates many students. **As** they work in cooperative groups, they develop a sense of responsibility and feel an obligation to do their share and not let the others down. The support and sharing of skills and information within these groups helps students raise the quality of their work.

6. An Integrative and Informed Thinker

• The nature of the research and projects within a curriculum integration model necessitates the use of various disciplines. Students see how skills and knowledge learned in different classes can be applied in a broader context. Drawing real-world connections into the curriculum adds relevance and helps students see how the information and skills fit together beyond the classroom.

• Also in a curriculum integration model, students are actively engaged in an ongoing dialogue of issues and problems that require "integrative thinking." It is important that they have opportunities to grapple with this. This is about development of a thinking process. Students need to be actively involved throughout the process

Changes and Additions If I Did This Study Again

The research methods used in this study were appropriate for my purposes. Interviews presented a window into the thinking of all major stakeholders in students' education: teachers, parents, administrators, and the students themselves. Observations and documents analysis provided data as to how the teachers' practices align with the tenets of curriculum integration. Interviews with teachers and the school's principal also provided information about the change process of the teaching team. I would use these same methods if I did this study again. But there are changes and additions that would have added to this study, including the duration of the data collection and the collection of student data.

While Shelly and Tina have functioned for three years in their five-teacher team structure, we do not know how long they will be able to sustain. The data in this study

tells us that they have been able to involve their students in curriculum planning during their part of the school day, and move toward Beane's definition of curriculum integration. While doing this, they have been able to involve and generate interest in other members of their teaching team. At the same time, they expressed frustration with several aspects of their current situation, including the number of students, extra time and work to involve other teachers, and general feeling of being held back. It is impossible to say at this time if the end result of the work of these teachers will be whole-team enactment of curriculum integration or what the ultimate team structure will look **like** if they do accomplish this goal. A full understanding of their transition would require follow-up with these teachers, a process that is beyond the time restraints of this dissertation.

Data collected from students was critical to this study. Individual interviews were the most effective way to get this information, but maybe not the most efficient. Even though I was assured by the teachers that the students who volunteered to be interviewed represented a cross-section of student body, both academically and socioeconomically, more data from more students would be helpful. If I were to do this study again, I would add a survey of all the involved students. This would undoubtedly provide a fuller picture of the students' thoughts and feelings about curriculum integration.

Suggestions for Future Research

Recent research on curriculum integration has been scarce. The research that exists is mostly in the form of case studies of successful programs, usually involving partner teams of two teachers. Information on alternative team structures and transitional

steps toward enacting curriculum integration is rare. Suggestions for future research could include: ethnographic studies, research based in cognitive science, longitudinal studies on the continued transitions of teacher teams, investigation of curriculum integration in different team structures and at different grade levels, and follow-up on students from these programs.

Much of the recent literature on curriculum integration focuses on the mechanics and nuts and bolts of enacting curriculum integration. The collaborative, brainstorming process is presented at conferences and institutes and appears in numerous articles and books. But curriculum integration is more complex than this in both theory and practice. Ethnographic work focusing on the thoughts, beliefs, and procedures of practicing curriculum integration teachers and teaching teams is needed to better understand the underlying principles and instructional practices that follow unit planning around students' concerns. This work should include careful observations of the interactions among students and teachers, documentation of communications involving students, teachers, and parents, and analysis of practicing teachers' beliefs about teaching and learning.

This information could be used to frame, in terms that can be understood by other educators, politicians, and the general public, what has driven progressive educators to strive for curriculum integration for nearly a hundred years.

A second important area of research would focus on curriculum integration in terms of cognitive science. Much of the current defense of curriculum integration is in humanistic terms: democratic process, social skills, life skills, community building, and citizenship. Still, research tells us that students from curriculum integration programs

excel in problem solving and critical thinking (Aikin, **1942;** Chamberlain, **1942;** Vars, **1996).** Study of the relationship between curriculum integration and recent brain research could help us better understand how curriculum integration nurtures cognitive development.

As mentioned in the previous section, a shortcoming of this study is that it does not follow the transition to curriculum through to complete team implementation. We see transitional steps and progress for Shelly and Tina, as well **as** their teammates. We also hear their thoughts on next steps. But we have yet to see final results. Longitudinal studies on the transition to curriculum integration are needed. With this information, we can help other educators find their way into the process, especially those who are unable to make the leap all at once.

We also need investigation of curriculum integration in different team structures and at different grade levels. As mentioned above, much of the recent research on this topic has focused on small partner teams. While the findings of this study indicate that the smallness of these teams facilitates curriculum integration, the question remains as to whether this is the only way to do it. We need to identify teams in other team structures and analyze how they work.

We also need research investigating curriculum integration at other grade levels. This study focuses on curriculum integration as a curriculum design for middle level schools. And it makes a case that it is especially well suited for the developmental level of this age group. But there is no reason to believe that the benefits of curriculum integration would not be experienced at other levels as well. It would be interesting to find teachers at the elementary and secondary levels who use this practice. Does

curriculum integration **look** different in elementary school or high school? How are issues of transition and enactment similar and different from those in cases studied at the middle level?

Finally, we need follow-up research on students from curriculum integration programs. We need to find out more about what happens to these students during and after their experiences in these classrooms. Are students' perceptions similar to teachers'? What are the social implications for students, both during their experiences with curriculum and when they move on? How does the experience effect them intellectually? Is there a connection with academic success? Are there emotional implications for these students? What are the effects of multiple years of curriculum integration? These are questions that can only be answered from ongoing contact and longitudinal research with these students.

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Appendix

Hot Rods Café

Traditionally Shelly and Tina teach a design unit at the end of the year based on energy and transportation. Part of this unit includes students designing and building vehicles, most of which are propelled by small electric motors. Students experiment with construction materials, wheels, axles, pulleys, and gear rations. This year, Shelly and Tina tried to get the rest of the teaching team to join in and make this a whole-team, integrated unit. The following is an early brainstorm of possible activities and topics that might fit into subject area classes. This brainstorming session flowed quite freely at a team meeting several days before the unit was to start.

Math:

Learn about diameter of Maine

How much gas does a gas tank hold?

How much fuel does a car use?

How big is Maine in km?

Race cars – calculate speed and distance

Check safety issues

Science:

Build a vehicle – individual or partner – maybe solar?

What is nuclear energy?

Different types of transportation - How do they work?

Investigate sun's power - Where does it come from? How do we study it?

Aerodynamic of cars

Study engine sizes

Make models of how solar energy works

Reading:

Study Maine authors

Maine **books**

Early Maine inventors related to transportation

Discovery of fossil fuels and how they came to use them

The Mouse and the Motorcycle **(book)**

Read history of cars

Language arts:

Write paper or story comparing energy sources and/or transportation

Transportation now and 200 years ago

Maine poets

Design a poster that explains how a car works

Write reports

Research cars and how they work

Social Studies:

Energy sources in Maine

Are cars made in Maine? Where?

Make a road map

Find out about public transportation in Maine

History of Maine Yankee

The plan was to brainstorm with students the following week to add their thoughts to this list. The teachers also discussed possible products, as well as deadlines and connections they might make:

1) Science/Reading – Energy Brochure

2) Science/Math – Time trials – Speed and velocity

3) Social Studies/LA – Reports

Unfortunately, something happened between the time of this brainstorming session and the next team meeting. **All** five teachers participated in the brainstorm and it appeared that everyone was committed to the unit. When the team met again, however, it became clear that two of the teachers had already started activities unrelated to this unit. Shelly and Tina encouraged them to participate, but ultimately had to move ahead with the unit with the math teacher on their own. Shelly and Tina were disappointed, but not surprised, that the unit did not come together as a whole-group activity.

As a step toward even more student involvement in the planning of the unit, these three teachers decided to ask students for feedback prior to the beginning of the unit. Seventh grade students were asked to individually to web possible activities for **a** new unit on transportation, energy, and Maine (see Figure **A.l** for the framework of the web).

Activities were webbed by subject area – math, language arts, reading, social studies, and science. Ideas from the webs were compiled.

Eighth graders were brought together to brainstorm ideas for the new unit. Shelly and Tina thought this was a step toward whole-team brainstorming sessions usually associated with curriculum integration. This session involved fifty-seven eighth grade students. Shelly facilitated while Tina recorded, while Jessica, the math teacher also participated. The brainstorming session followed the same format as the seventh grade web.

Shelly started the brainstorm with, "We haven't planned for the next unit yet and we would like your help. The major focus will be on reading, science, and math, but the brainstorm will include all questions and concerns."

Students were grouped in threes, one from each section of grade eight. Groups spread out in the science room and across the hall in Tina's room and discussed possibilities for the unit. Shelly reminded them that everything said in a brainstorm gets written down, "Don't disregard anything." She asked them to, "Think outside the box." The groups worked for **20-30** minutes as teachers circulated and jumped in here and there. At that time, all the students were brought back into the science room to share ideas and formulate a master list of possible activities.

It was very difficult keeping the room quiet enough to brainstorm. Shelly kept working to refocus them. While these students were used to brainstorming, they were not used to groups this large. Shelly kept mentioning that they know how to be a "Quality Audience," drawing their attention to the classroom poster that said:

4 Rules to a Quality Audience

1) Don't speak when others are

2) Pay attention when others are speaking

3) Raise your hand to speak

4) Be respectful

After twenty minutes of brainstorming, students produced the following list:

Science:

Safest car contest

Individual study of some part of the automobile

Electric, solar, gas, battery powered boats

Solar powered scooters

Best looking/wackiest car

Crash tests – cars with eggs

Demolition derby

Stunt-mobiles

Car with remote control

Wagons and race them

Go carts (gas – solar)

Push cart derby

Build any vehicle

Swamp buggies

Reading:

Mobil of information

Web quest on vehicles

Books – before and after new energy sources

Maine car companies

Books about people dying in accidents

Stories about haw cars work

Math:

Safest car contest

Aerodynamics

Compare quality and prices of cars

Speed contests

Hold most weight contest

Angles in building cars

Statistics – car efficiency – accidents

Visit racetrack – learn about turns – maybe do races there

Scale models of Unity Raceway

Dimensions of cars

Social Studies:

Guest speakers – cars in their days

Grandparents – talk about before cars

Maine car companies

Limit notes!

LA:

Poems about transportation

Timeline on cars

Information posters

From the discussion of possible activities, the group moved to process issues of the unit – project proposals, documentation, and assessment. Several students said that they felt it important to have clear guidelines up front. The previous unit had not done a good job of this and they were uncomfortable with the complete open-endedness.

The brainstorm of possible required elements of the unit included the following:

1) Keep a journal

2) Write a short proposal and rubric - changes are OK as long as it fits the rubric

3) Journal done as homework only – not during class time

4) Design your own rubric (individual) – in either journal or proposal

5) Cooperative journal for a team

6) Teachers make a rubric about the vehicle, and give a set of materials and/or list components that would be in it

7) Groups form and design/decide guidelines

Even though the whole brainstorming session seemed a little diorderly , there were some great ideas generated. There seemed to be two major suggestions from students: a journal documentation or a proposal/rubric. Most ideas were variations on those two. Teachers suggested that individuals and/or groups might have the option of choosing the one they liked best.

The "Menu"

As Shelly, Tina, and I discussed the brainstorm after school, I mentioned that it sounded like the kids were asking for a menu of things to choose from. At the time, I didn't realize the spark this simple comment ignited. When I returned to the school two days later, Shelly unveiled the menu for "Hot Rod Café" (Figure A.2).

The Menu offered students choices of tasks and assignments in several categories and subjects. Appetizers were computer assignments. Everyone got a "Small Bytes – Teacher Approved Rubric" appetizer that required them to create a rubric to be used in assessing their project. In addition to their rubric, each student could choose from a "Sampler" of computer products to present information on energy efficient cars. The selections in the Sampler included: using Publisher to create a newsletter, PowerPoint, Hyperstudio, or Excel.

The salad course of the Menu allowed students to choose from a selection of three math activities. The "Side Salad" required them to use percentages to compare cost, quality rating, and other statistics of five different brands of automobiles. The "House Salad" involved figuring out the gasoline mileage of their family car and calculating the cost of driving the car the length of Maine. The required poster used to display this information needed at least two scale drawings. The third salad choice, the "Chef's

Salad," involved a statistical study of automobile accidents and required the use of graphs.

"Meat Dish" entrée selections on the Menu offered choices in the engineering component of the unit. All students needed to be involved in designing and building a vehicle. Several possible choices were listed on the menu, but students could also use their own ideas. "Side Dishes" to go with their entrée offered an assortment of energy-related topics. From this list, students could choose a topic to research and report on.

The "Dessert" section of the menu allowed students to choose for a selection of four novels to be shared in reading groups.

To build their unit, students chose one item from each section of the Menu.

Even as Shelly and Tina were showing me the "Menu," they were thinking about ways they might improve it next time. They following is a comment from my journal that day: **"As** we were looking over the "Menu" before school, both Shelly and Tina were a little concerned about some of the choices. Shelly said she wishes all the Side Dishes had an "energy" focus. Already they are reflecting and looking how they might make the unit stronger."

The same morning that the "Menu" was unveiled to me, Shelly shared it with her homeroom and asked for feedback on how well it incorporated the ideas from the brainstorms.

New group formation

The teachers decided that the grade-level groups would be mixed for this last unit of the year. The three eighth grade sections met in one room and the two seventh grade sections in another. Students were allowed to formulate their own groups. Teachers

made the point that picking partners is important. They recommend pairs, but singles and threes were accepted. As it turned out, there were no singles. After they found partners, each team reported out.

Mixing the various sections meant making some changes in the schedule. Shelly and Tina took care of this. All teachers agreed that there would be benefits from mixing the groups. The students were very excited about the idea as well. It gave them the chance to work with some different people. At the next team meeting, however, one teacher on the team said that she was very unhappy with some student combinations. She referred to a couple combinations as "doomsday." This teacher also referred to a student as a "cancer!" I could see Shelly and Tina visibly cringe at this remark. They made a strong case for keeping the teams as they were in the hopes of motivating these reluctant learners.

Order Forms

Classes early in the unit also found students discussing "menus" and "Order Forms" (Figure A.3). Students used Order Forms to choose their options. They could combine a Side Dish with an Appetizer if desired, to produce a single product. Two days a week were scheduled to be "Side Dish" days and two days will be "Meat" days. The Meat Dish is a group project. The Appetizer is individual. Salad, Side dish, and Dessert can be either/or.

Background Information

While groups of students began making their menu choices and planning their projects, both Tina and Shelly presented some background information in their classes. Tina gave them a short article about different types of energy and had them **1)** read, 2)

discuss with a partner, and 3) web the information. Completed webs were shared with the whole class.

Shelly showed a short video clip about electric and hybrid cars. After viewing the clip, students were asked to respond to the following prompts as homework:

1) What design techniques did you hear about in the video that might be important to consider as you plan your can? Explain.

2) What types or forms of energy did you learn about in the video?

3) If you had to explain the concept of energy conservation to someone based on what you know from seeing this video, what would you tell them? Please try... think about the two words – energy and conversion.

All students were provided with a binder with all schedules, forms, etc. Shelly often emphasized the importance of keeping it organized. Organizational skills are important and middle level students often need help in this area. Several times, I watched Shelly help students conduct "notebook searches'' where she helped them find lost papers and organize their materials.

Other science classes included the use of a textbook titled, Motion, Forces, and Energy. These books were used for in-class shared reading. Student volunteers read, followed by class discussion. **As** this process began, I was skeptical. **My** experiences with round-robin reading have often been negative. But in this case, it worked well. The thing that most impressed me was the discussion following each section of the reading. All students were involved and made wonderful connections with their previous curriculum units and with the outside world. Shelly also pointed out how this book could be used by students as a resource for projects/side dishes. Topics discussed and related to

previous units and knowledge included: friction, atomic structure, Newton's Laws of Motion, protons, Mingle Matter (an activity Shelly uses to model movements of particles inside atoms), photosynthesis, and potential. At the end of this lesson, Shelly made a point of congratulating the class for remembering information from previous units and making connection. The kids clapped! There were clearly multiple objectives for this lesson. New information was introduced, but always connected to previous learning. Reflection was a key ingredient.

Tina used a similar round robin reading of Hiroshima, (Laurence Yep, 1995, Scholastic), a novella of about fifty pages. As in the case of Shelly's science text, good readers volunteered to read as other followed along. This book does a nice job as it briefly describes how the atomic bomb works. Tina's students began at the end of the book with the Afterword, which explains where the information for the book comes from. It is fiction, but based on fact. Tina set up the book, asking how the students think the pilots who dropped the bomb felt. They read the book over the course of two class periods. Tina provided questions for discussion by pairs of students. Figure A.4 shows the questions for the reading on the first day.

As in Shelly's class, connections to previous curriculum units were free-flowing. When the discussion came back to the whole group from the pairs, it spiraled to Pearl Harbor and other events related to WWII. Students seemed very knowledgeable of this time period. They handed in written responses to the questions. The discussion then turned to "energy conversion" in the bomb... and other things. This lesson was clearly an extension of the discussion in Shelly's room. They then moved to a discussion of radiation, radiation for cancer treatment, and X-rays.

The Vehicles

Groups had about three weeks to design and construct their vehicles. All began by drawing sketches. Most were powered by small electric motors. Two groups planned rocket-powered vehicles and one used a steam engine. Teachers encouraged students to try things out. They let the students experiment and discover the effects of gear ratios, pulleys, and axles. As I observed this process, the vocabulary of energy, building, and vehicles was used fluently. Students teaching students was part of every team's process. **A** journal note on the steam engine group said:

> In the steam engine group, Allen is explaining the operation of a steam engine to the rest of his group. He understands the operation of the steam engine and explains it very clearly to the others. This is the only group of four, with two boys and two girls. The boys, Allen and Paul, are a contrast of energy levels. Paul is hyper and Allen is cool and collected.

It was interesting to see how different individuals and teams functioned and excelled. A journal entry on Jimmy's group said:

> Jimmy is a resource room student with very poor literacy skills. But what a thinker! His sketches are wonderful and his vehicle is very well-planned. He is working with another resource room girl. I talked with Shelly after school about his future in high school. She said his home life is terrible and he is very much at risk of dropping out. The hope is that he can survive long enough in high school to get to Vocational.

Later in the unit, I observed Jimmy again and commented on what he gets from this class: "Jimmy (resource room student) has the first running car. Many other students are coming to him for advice and help. Jimmy has extremely poor writing skills, but a real mind for science… a real thinker. He gets so much from this class!"

As the unit progressed, "Dessert" books took over much of Tina's reading classes. Students chose from four books (see Menu) and shared them in literature circles. Shelly kept track of students' Building Logs.

As the teams of students progressed on their vehicles, new problems turned up. As much as possible, teachers let the students experiment and explore answers to their questions. The following journal excerpt is an example:

> Teams are in various places on vehicle projects. Steam engine group has the engine mounted to their chassis and are beginning to work on attaching wheels. It's interesting to watch as the students experiment with hooking the motors to the wheels. They are not sure what turns… the wheels or the axle. As they try it out, they discover how to do it.

New learning spread quickly through the classroom. Jimmy was always a couple of jumps ahead of the others and became valuable as a consultant. After axles, wheel mounts became the issue!

By the second week of the unit, most students had drafts of their rubrics for Side Dishes. They had had much experience doing this for previous projects and had become very adept at it. It was interesting to listen to their discussions about what parts were

most important and should be worth more points. All rubrics had to be approved by Shelly and the computer teacher.

These young people were also very adept at keyboarding and PowerPoint. They all had several years of keyboarding classes and instruction in the use of PowerPoint.

As the work on the vehicles progressed, the vocabulary used in the student dialogue became much more sophisticated, including learning about connecting motors to wheels, traction, and friction. One group experimented with the motor attached directly to the axle and generated a new discussion on gear ratios. A typical class period found Shelly circulating and answering questions. The variety in the vehicles was amazing. According to Shelly, in past years she had given students explicit examples, but the result was vehicles that all looked alike. Without the examples, students were slow getting started, but ultimately were in many different directions. The result is more exploration and experimentation – checking and redesigning. This looked like the scientific process in action. The following journal excerpt illustrates the level of thinking stimulated by this project: "A seventh grade student in study hall is working on gear rations. He used circumference and radius of pulleys and wheels and RPMs of the electric motor to calculate the potential speed of his car. He figured this out on his own using algebra."

The short timeline (3 – 4 weeks) started to catch up to both students and teachers later in the unit. The classes of the participating teachers overlapped and removed all lines of content areas. I heard a student ask, "What class are we in?" When groups came to Shelly, she often gave the advice to "Divide and conquer." They had to think through their process, prioritize, and divide the labor. Groups of students regularly brought their

lunches to the science lab, so they could work on their vehicles as they ate, munched their sandwiches as they discussed new ideas. Study halls were also very busy and focused.

The Raceway

The culminating event for this unit was a trip to a local Raceway, a local 1/3 mile stock car track. The day included various running and racing of the student-built vehicles. There were prizes for various categories of design and speed. The math teacher also had activities planned using distance, speed, and metrics. (see Figure A.5).

Two busses transported students and teachers to the racetrack about *25* minutes away. The school provided bag lunches. When we got to the track, we unloaded and started off with everyone walking three laps of the 1/3 mile track, mainly to burn off a little energy and let the teachers get set up. Students were picked to be "pace cars." The vehicles were lined up along the edge of the track and teachers took pictures and marked off lanes for the races while the students walked. Teachers also judged cars in stylistic categories.

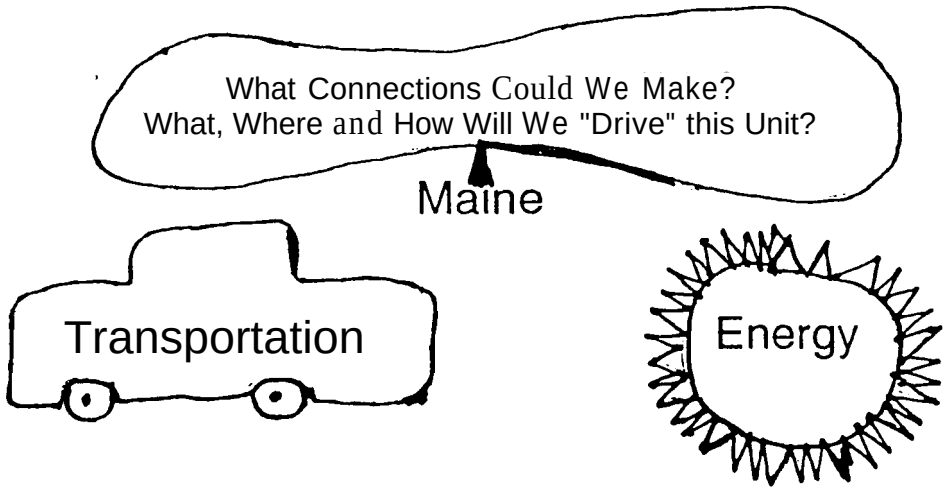
After the walk, teacher presented the stylistic awards and the races began in heats. Some cars were great, while others died half way to the finish line. Teachers timed each car and students calculated their speeds. From time to time, teachers had the students sit on the track for instruction and writing and math activities.

This was the first true test for some of the vehicles. In some cases, students were adding finishing touches to their vehicles just prior to the trip to the racetrack. The discussion at the track focused on design issues: what worked and what didn't. Before heats, students predicted which designs would be fastest. Later in they day they analyzed

design features of different vehicles to try to determine what made some faster than others.

Finish The Web

Science **Language Arts**



Math **Social Studies** **Reading**

Figure A.1. The Web

CURL UP WITH A GOOD *DESSERT*

Choosc one of the following good books:

Phoenix Rising –

- **a 14 year old survives a nuclear accident**
- **living with survivors**
- **putting the pieces back together**

Z is for Zachariah-

- a 16 year old **survives** a **nuclear** disaster
- left alone
- learning to trust again

Whirligig-

- **a sixteen year old drinks, drives and guess what?**

Fahrenheit 451-

- **firemen of the future**
- **starting instead of stopping…**

ENERGIZE YOURSELF AND DINE WITH MAINE PERSONALITIES

A plethora of **personalities awaits you in this complimentary webquest deliciously served up by** your **social studies' and language arts' chefs.**

ENJOY!

HOT RODS CAFE

YOUR GREEN **TEAM TEACHERS AND ASSOCIATES**

Figure A.2. Hot Rods Café Menu

COMPUTE YOUR APPETIZER

Small Bytes-Teacher Approved Rubric

Rubric created in Microsoft Word to assess your project. This rubric must be sampled by Ms. LaBrie and approved for creation.

The Sampler — The Choice of Topics

- Publisher — Newsletter on Energy Efficient Car
- PowerPoint—Slide show on Energy Efficient Cars
- HyperStudio- Stack of Cards on Energy Efficient Cars
- Excel- Comparison of Energy Efficient Cars and their Costs with a graph
- Create your Own Appetizer Plate

CALCULATE YOUR SALAD

Choose one salad

Side Salad – The Automotive Exposure (What's the difference?)

A study of five different brands of cars, their cost comparisons, imports, quality (ratings). percent increases. All will be displayed on a poster.
cost $ .95

House Salad-As the Wheels Go Round and Round (Capacity at your fingertips!)

Calculate miles per gallon your family gets and what is the cost if you were to travel from the southern tip to the northern tip of Maine. Poster will include two scale drawings. explanation and illustrations of miles per gallon and the length of the state of Maine.
cost $.90

Chef's Salad-Road Safety (Is it a random or a probable event?)

An extensive study of statistics involving car accidents. Includes accidents, speed, age, quality, and much more. Poster will include at least 2 graphs, scale drawing. statistic table to share all of your findings.
cost 41.00

ENERGIZE WITH AN ELECTRIFYING ENTREE

Radiated Meaty Vehicles (Choose one meat selection)

- Go Carts
- Race Cars
- Scooters
- Swamp Buggies
- Special of the Day

Side Dishes (Choose one side dish to go with your entrfe)

- Research Any Aspect of Auto Mobile Design
- Jndependent Study of Any Maine Power Company
- Conduct Interviews With People 65 or Older With A Focus On Changes In Transportation or The Use of Energy
- Design a How-to Book On Automobile Assembly Line
- Design and Build a Compare and Contrast Model of Transportation Then and Now
- Visual of Energy Types

Figure A.2. Continued

Hot Rods Café

Order Form **Name** _____

Please Select One From Each Category and Circle

The Sampler—The Choice of Topics

Publisher—Newsletter on Energy Efficient Car

PowerPoint—Slide show on Energy Efficient Cars

HyperStudio– Stack of Cards on Energy Efficient Cars

Excel– Comparison of Energy Efficient Cars and their Costs with a graph

Create your Own Appetizer Plate

Radiated Meaty Vehicles (Choose one meat selection to build)

Go Carts

Race Cars

Scooters

Swamp Buggies

Special of the Day

Side Dishes (Choose One side dish to go with your entree)

Research Any Aspect of Automobile Design

Independent Study of Any Maine Power Company

Conduct Interviews with People 65 or Older with A Focus on Changes in Transportation or The Use of Energy

Design a How-to Book On Automobile Assembly Line

Design and Build a Compare and Contrast Model of Transportation Then and Now

Visual of Energy Types

Choose one Salad Selection

Side Salad The Automotive Exposure

House Salad As The Wheels Go Round and Round

Chefs Salad-Road Safety

Choose One Sweet Reading Selection To Complete Your Meal

Phoenix Rising

Z is for Zachariah

Whirligig

Fahrenheit 451

Figure A.3. The Order Form

Assessment Plan
With Some Options Available

Appetizer ..... Rubric created in Microsoft Word to assess your project. This rubric must be sampled by Ms. LaBrie and approved for creation.

Salad ..... Teacher and Student Designed Rubric to Appropriately ad "dress" your salad selection.

Entrée ..... Some type of a building "log" (I didn't use the word journal) with a minimum of *5* entries along the "road to construction" and a presentation of the final product you design.

Side Dish ..... Student Created and Teacher Approved Rubric (Rubric must be submitted by **5/24** for approval)

Dessert **(8th grade only)** All Assessment Components Required

Weekly Letter
Group Literature Discussions
Oral Book Share Upon Completion of Novel

Figure A.3. Continued

Hiroshima

Day 1 Read the first **25** pages. Answer the following questions. Be prepared to discuss the responses with your group. Questions will be collected.

1. Read the afterword on page 50. Is this a true story? How was the main character, Sachi, developed?

2. What happens?

3. Why **did** it happen?

4. Where did it happen?

5. What kind of **energy** was used in the bombing?

6. How does this kind of energy work? (Yes, it is in the reading.)

7. What was the *Enola Gray*?

8. How do you feel about what happened?

Figure A.4. Hiroshima

ORDER OF EVENTS
UNITY RACEWAY

1. When arriving at Unity raceway students will walk around the raceway three times. They may not run.

2. All students will complete work sheet #1. Please show a teacher when it is completed. Show all your work. Races will not begin until all of worksheet #1 is completed.

3. Races will begin in the order posted on the attached sheet. Please stay off the track when you are not racing. When you race please be sure you heard the time that your car took to go the distance of 30-ft. Write this time down.

4. Once the races are complete please complete work sheet #2. When this is done please show a teacher you have it completed. Be sure you show all your work.

TYPED BY: HOLLY MERRITHEW

Figure A.5. Events at the Raceway

Rev Em Up
Unity Raceway here we come!!

YOUR VEHICLE

All students will race their vehicle a distance of 30 feet. This is 5/88 of a mile. Be sure your car is ready to go. If you are not involved in a race you must stand on the sideline as a spectator and please be a supportive spectator.

Race one will start about 30 minutes after arriving. Please have worksheet number one done before the first race. You must show a teacher worksheet number one with all your work showing before you can participate in the race you signed up for.

CALCULATING RATE

Distance = Rate * Time

Here is an example to help you determine the rate of your vehicle.

Example #1

The race is **30** feet for all, so the distance is **30** feet. D=30 feet
When you race and your vehicle makes it to the finish line a person will give you a time that your car traveled 30 feet. Let's say **2.3** seconds. So t=2.3 seconds.

You now have enough information to calculate rate or the speed of your vehicle.

1. 30 = 2.3r take the reciprocal of 2.3 to solve algebraically and multiply on both sides.

2. 30/1*1/2.3 = 2.3r * 1/2.3 so 30/2.3=r. now divide. This is very close to **13.03** That is **13.04** feet /second.

3. **But** we need to change this to miles per hour. To change seconds to minutes you multiply by 60 and to change minutes to hours you multiply by 60, so seconds to hours you simply times by 3600 which **is** 60 to the 2^{nd} power.

4. This means your car travels **46,914** feet/hour. But we want to know how many miles this is. So take 46,914 feet and divide that by **5,280** because there are that many feet in one mile. Finally we arrive at about **8.9** miles/hour.

Have a great day!

Figure A.5. Continued

Worksheet # 1

Name_____

Unity Raceway is 1/3 of a mile once around the track. Given this fact, compute the following. Show all your work.

1. How far did you go when you walked three laps at Unity Raceway?

2. How many feet is one complete lap at Unity Raceway?

3. How many inches is this?

4. Estimate in miles/hour the speed you think your vehicle travels.

5. About how many tenths of a mile is one lap around Unity Raceway?

6. About how many tenths of a mile is two laps around Unity Raceway?

Figure A.5. Continued

Worksheet #2
Show all of your work! !!!
No work, No credit.

Name_____

1. What race did you enter?

2. What was the time it took for your car to travel 30 feet?

3. Calculate the speed of your car using feet per second.

4. Calculate the speed of your car using miles per hour. Be sure you show all of your conversions.

5. How long to the nearest second would it take your car to complete a lap around Unity raceway?

6. How long to the nearest second would it take your car to complete 6 laps around Unity raceway?

7. Write a paragraph explaining how to calculate unit rate.

Figure A.5. Continued

BIOGRAPHY OF THE AUTHOR

Wallace Alexander was born in Lincoln, Maine on November 9, 1950. He was raised in Winn, Maine and graduated from Lee Academy, in Lee, Maine in 1969. He attended the University of Maine and graduated in 1973 with a Bachelor's degree in Biology. He returned to the University of Maine and graduated with a Master's degree in Education in 1993. Wallace worked as a teacher in public schools at the middle and secondary levels and serves as Executive Director of the Maine Association for Middle Level Education.

Wallace is a candidate for the Doctor of Education degree (Individualized Program) from The University of Maine in August, 2001.