MONTANA STATE UNIVERSITY

Preservice teachers planning and preparation practices: a comparison of lesson and unit plans developed using the backward design model and a traditional model
by Lynn Marie Kelting-Gibson

A dissertation submitted in partial fulfillment of Doctor of Education in Education
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Abstract:
This study compared lesson and unit plans designed by elementary preservice teachers who developed their plans using the backward design model, with plans developed by elementary preservice teachers who developed their plans using a traditional model of curriculum design. The plans were evaluated using Danielson's Framework for Professional Practice by means of six components: (1) demonstrating knowledge of content and pedagogy, (2) demonstrating knowledge of students, (3) selecting suitable instructional goals, (4) demonstrating knowledge of resources, (5) designing coherent instruction, and (6) assessing student learning. The subjects who designed the plans were elementary preservice teachers enrolled in Educational Planning and Management (EDEL 401) either Spring Semester 2002 or Fall Semester 2002.

To compare the two curricular designs among all six components of planning and preparation the researcher utilized multivariate analysis of variance. To compare the two curricular designs within each specific component the researcher chose analysis of variances.

Results from the study included evidence that elementary preservice teachers who were taught curriculum design using the backward design model outperformed elementary preservice teachers who were taught curriculum design using a traditional model when developing lesson and unit plans. Similarly, preservice teachers who were taught curriculum design using the backward design model outperformed preservice teachers who were taught curriculum design using a traditional model on all six components of the framework for professional practice.

The researcher concluded that the teacher education program at Montana State University: 1) incorporate the backward design model when teaching curriculum design; 2) provide inservice on backward design for all preservice teacher educators who teach or require lesson or unit planning in their courses; 3) utilize Danielson's Framework for Professional Practice in courses for preservice teachers; and 4) use both the backward design model and the framework to help teacher educators improve upon the areas in which research has shown weaknesses in preservice teacher preparation practices.

PRESERVICE TEACHERS' PLANNING AND PREPARATION PRACTICES: A

COMPARISON OF LESSON AND UNIT PLANS DEVELOPED USING THE

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Lynn Marie Kelting-Gibson

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APPROVAL

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Lynn Marie Kelting-Gibson

This dissertation has been read by each member of the dissertation committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

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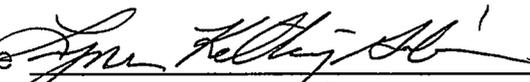
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ABSTRACT

This study compared lesson and unit plans designed by elementary preservice teachers who developed their plans using the backward design model, with plans developed by elementary preservice teachers who developed their plans using a traditional model of curriculum design. The plans were evaluated using Danielson's Framework for Professional Practice by means of six components: (1) demonstrating knowledge of content and pedagogy, (2) demonstrating knowledge of students, (3) selecting suitable instructional goals, (4) demonstrating knowledge of resources, (5) designing coherent instruction, and (6) assessing student learning. The subjects who designed the plans were elementary preservice teachers enrolled in Educational Planning and Management (EDEL 401) either Spring Semester 2002 or Fall Semester 2002. To compare the two curricular designs among all six components of planning and preparation the researcher utilized multivariate analysis of variance. To compare the two curricular designs within each specific component the researcher chose analysis of variances.

Results from the study included evidence that elementary preservice teachers who were taught curriculum design using the backward design model outperformed elementary preservice teachers who were taught curriculum design using a traditional model when developing lesson and unit plans. Similarly, preservice teachers who were taught curriculum design using the backward design model outperformed preservice teachers who were taught curriculum design using a traditional model on all six components of the framework for professional practice.

The researcher concluded that the teacher education program at Montana State University: 1) incorporate the backward design model when teaching curriculum design; 2) provide inservice on backward design for all preservice teacher educators who teach or require lesson or unit planning in their courses; 3) utilize Danielson's Framework for Professional Practice in courses for preservice teachers; and 4) use both the backward design model and the framework to help teacher educators improve upon the areas in which research has shown weaknesses in preservice teacher preparation practices.

CHAPTER 1

INTRODUCTION TO THE STUDY

Introduction

"To begin with the end in mind means to start with a clear understanding of your destination. It means to know where you're going so that you better understand where you are now so that the steps you take are always in the right direction" (Covey, 1989, p. 98). When the author wrote this statement he indicated that to varying degrees, people use this principle in many different aspects of life. When constructing a home, for example, one designs its every detail before he hammers the first nail. In business, one clearly defines what she is trying to accomplish before the business even opens. The same is true in parenting. If parents want to nurture self-disciplined, responsible children, they keep that end in mind as they interact with their children on a daily basis (Covey, 1989).

A parallel can be drawn to the field of curriculum development. Grant Wiggins and Jay McTighe have co-authored a book called <u>Understanding by Design</u>, which follows Covey's principle of beginning with the end in mind. Instead of using the phrase "begin with the end in mind" though, the authors use "backward design". The same principle is applied but is used specifically for planning curriculum.

The field of curriculum development is not static; new procedures are being suggested for changing existing curricula all the time, even though it may be a new name for an old or existing idea. However, if individuals look back over the history of curriculum development, they will learn that the backward design process is somewhat unique, not found in historical literature.

Curriculum development has been in existence since the mid-1800s when William Harvey Wells divided all students in the city of Chicago into grades and established a distinct course of study for each subject at each grade level (Tyack, 1974). In 1892, the National Education Association's Committee of Ten was charged with developing a plan for standardizing the high school curriculum. The plan was to prepare secondary school adolescents for the entrance requirements of college by using subject differentiation at public schools. Subjects recommended included history, geography, mathematics, modern languages, grammar, literature and art, physical science, and natural history (Kliebard, 1995). This central, discipline-oriented, college preparation curriculum survives to this day, as does the idea that curriculum planning is, for the most part, subject naming, specifying content, and ordering the treatment (Walker & Soltis, 1986).

These pragmatic intentions were given philosophical validation by educational theorists who believed "the task of the school was to deliver a prescribed body of subject matter, based on idealist and/or realist views of knowledge" (Dittmar, 1993, p. 6). Adding to the philosophical justification for

curriculum according to individual subject areas were those educational philosophers who favored technical approaches to curriculum development.

The technical-scientific approach is a way of thinking, a planning of curricula to optimize students' learning. "According to this point of view, curriculum development is a plan or blueprint for structuring the learning environment and coordinating the elements of personnel, materials, and equipment" (Ornstein & Hunkins, 1998, p. 196). In contrast, those in the nontechnical-nonscientific group stress "not the outputs of the production but rather the learner, especially through activity-oriented approaches to learning and teaching. Those favoring this approach note that not all ends of education can be known nor, indeed, do they need to be known in all cases" (Ornstein & Hunkins, 1998, p. 196).

The dominance of the organization of curriculum using the technical-scientific approach was apparent among public schools in the United States (Dittmar, 1993; Orstein & Hunkins, 1998). Since the 1920s, curriculum development was driven by the technical-scientific approach. Influential models developed by Charters (1923), Tyler (1949), Taba (1962), and Hunkins (1980) directed curriculum developers and teachers in their planning processes for years. All models noted similar steps in curriculum construction (see appendix B): (1) define the goals, purposes, or objectives, (2) define experiences or activities related to the goals, (3) organize the experiences and activities, and (4) evaluate the goals.

In 1998, Grant Wiggins and Jay McTighe presented a similar model but changed the order of the steps familiar to the previously mentioned curriculum developers. Wiggins and McTighe included these steps: (1) identify the desired results, (2) determine the acceptable evidence, and (3) plan learning experiences and instruction (see appendix C). The authors expected that by designing curriculum using their approach, educators would use more standard-based teaching as opposed to activity-based instruction. The latter was mostly hands-on without being minds-on. Wiggins and McTighe also expected educators would use more standards-based teaching as opposed to coverage-oriented instruction, where the teacher merely checks off topics that were covered and moves on (Wiggins & McTighe, 1998).

Typically, many teachers begin with textbooks, time-honored activities, and favored lessons rather than obtaining those tools from standards or targeted goals. The authors promote the reverse: "One starts with the end – the desired results (goals or standards) – and then derives the curriculum from the evidence of learning (performances) called for by the standard and teaching needed to equip students to perform" (Wiggins & McTighe, 1998, p. 8). The backward design the authors are advocating is "logically forward and commonsensical but backward in terms of conventional habits, whereby teachers typically think in terms of a series of activities or how best to cover a topic" (Wiggins & McTighe, 1998, p. 8). This backward approach to design also departs from another common procedure, thinking about assessment as something to do at the end of

a lesson. Backward design promotes choosing goals and standards in terms of assessment evidence as one begins to plan a course or unit (Wiggins & McTighe, 1998).

Statement of the Problem

It was not known whether the backward design approach and the traditional approach to curriculum design differed in terms of demonstrating knowledge of content and pedagogy, demonstrating knowledge of students, selecting suitable instructional goals, demonstrating knowledge of resources, designing coherent instruction, and assessing student learning when used during elementary preservice teacher education. Traditionally, preservice and inservice teachers design curriculum by writing objectives, developing experiences related to those objectives, and then deciding how to assess those experiences, in that order. Assessment often became an afterthought and was not integral to the planning. Wiggins and McTighe (1998) presented a different curriculum planning process for educators called "backward design". Backward design calls for teachers to reverse the order and determine how students are to be assessed before designing the instruction itself. Wiggins and McTighe believe this process allows for greater coherence among instructional objectives, key performances, and teaching and learning experiences.

Statement of the Purpose

The purpose of this study was to determine if variations in cultivating knowledge of content and pedagogy, demonstrating knowledge of students, selecting suitable instructional goals, demonstrating knowledge of resources, designing coherent instruction, and assessing student learning existed between lesson and unit plans designed by two groups of former Montana State University elementary preservice teachers; those from a traditionally taught Educational Planning and Management (EDCI 401) class and those from an Educational Planning and Management class taught using the backward design technique. At this stage in the research, designing a curriculum "backwards" means, "one starts with the end – the desired results (goals or standards) – and then derives the curriculum from the evidence of learning (performances) called for by the standard and the teaching needed to equip students to perform" (Wiggins and McTighe, 1998, p. 8). The traditional approach to curriculum design often includes these four steps: (1) selecting objectives or purposes of the school, (2) selecting educational experiences related to the objectives and purposes, (3) organizing these experiences, and (4) evaluating the purposes (Ornstein & Hunkins, 1998).

Rationale for the Study

Wiggins and McTighe (1998) described their "backward" design as being the most effective of curricular design strategies. The researcher was intrigued

with the philosophical underpinnings of this approach and its possible value,

especially when utilized with preservice teachers; therefore, the researcher

wanted to compare lesson and unit plans designed using the backward design

model to those developed using the traditional curricular design process.

Investigating preservice teacher's (1) knowledge of content and pedagogy, (2)

knowledge of students, (3) selection of instructional goals, (4) knowledge of

resources, (5) design of coherent instruction, and (6) assessment of student

learning were components utilized for the comparison. These were six

components that Charlotte Danielson (1996) identified as being critical when

defining and describing excellence in teaching during the planning and

preparation process.

Research Questions

This study sought to answer the research question: Were the population

means for the scores from the planning and preparation framework the same or

different for the two groups; lesson and unit plans that were designed by

elementary preservice teachers having been taught a traditional method of

curriculum design and lesson and unit plans that were designed by elementary

preservice teachers having been taught the backward design method?

Relatively little empirical research has been completed that compares any types

of curriculum development processes. However, researchers focusing on

enhancing professional practice have identified 22 essential components of the

complex activity of teaching clustered into four domains of teaching responsibility: planning and preparation (Domain 1), classroom environment (Domain 2), instruction (Domain 3), and professional responsibilities (Domain 4). "These responsibilities seek to define what teachers should know and be able to do in the exercise of their profession" (Danielson, 1996, p. 1). For the purpose of this study, the researcher chose to examine only domain one, planning and preparation, in order to compare the backward design method and the traditional method when used in teacher preparation.

Danielson (1996) believed the skills listed in domain one, planning and preparation, "are demonstrated primarily through the plans that teachers prepare to guide their teaching and ultimately through the success of those plans as implemented in the classroom" (p. 30). Therefore, the six components of domain one were the focus of the six sub-research questions that also guided this study:

1. Were the population means for the scores from the demonstrating knowledge of content and pedagogy component of the planning and preparation framework the same or different for the two groups?

2. Were the population means for the scores from the demonstrating knowledge of students component of the planning and preparation framework the same or different for the two groups?

3. Were the population means for the scores from the selecting instructional goals component of the planning and preparation framework the same or different for the two groups?

4. Were the population means for the scores from the knowledge of resources component of the planning and preparation framework the same or different for the two groups?

5. Were the population means for the scores from the designing coherent instruction component of the planning and preparation framework the same or different for the two groups?

6. Were the population means for the scores from the assessing student learning component of the planning and preparation framework the same or different for the two groups?

Significance of the Study

On Saturday, March 2, 2002, President Bush pledged to work to enlist a new generation of well-trained teachers to help America's children succeed in school. Highlighting his educational agenda, Bush said in his weekly radio address: "The effectiveness of all education reform eventually comes down to a good teacher in a classroom. A good teacher can literally make a lifelong difference" (Bozeman Daily Chronicle, 2002. p. A3). In 2002 Bush approved nearly three billion dollars from the education budget to be used for teacher training, recruiting, and hiring. The president said earlier in the year, "We've spent billions of dollars with lousy results. Now it's time to spend billions of dollars and get good results" (Bozeman Daily Chronicle, 2002, p. 1). If money is

going to be spent on educational reform and teacher training, it would be imperative to know on which useful strategies money should be spent.

The improvement of our nation's educational system is under greater scrutiny than ever before because of Bush's educational agenda. When designing curriculum, a vital component of teacher training, it was important to determine which curricular design process allowed for the teacher to cultivate knowledge of content and pedagogy, demonstrate knowledge of students, select suitable instructional goals, demonstrate knowledge of resources, design coherent instruction, and assess student learning, components of planning and preparation tasks required of beginning teachers (Danielson, 1996). These six components include those aspects of teaching that are expected of experienced as well as beginning teachers. Therefore, it was imperative that when planning and preparing curriculum, future educators learned to employ the curriculum process that best incorporated these six components of effective teaching.

Definition of Terms

For the purposes of this study, the following operational definitions were used. Although some of these terms are widely accepted in education, the researcher chose to include them because they often have several meanings.

1. Acceptable evidence: The collected assessment evidence needed to document and validate that the goals, standards, or objectives were accomplished (Wiggins & McTighe, 1998).

2. Alignment: When the objectives, assessments, teaching and learning experiences, and the curriculum all support the standards or goals that were initially utilized.

3. Assessment: A broad and relatively nonrestrictive label for the kinds of measuring and testing teachers must do. It is a deliberate effort to determine a student's status regarding such variables as the student's knowledge, attitudes or skills (Popham, 1999).

4. Backward Design: "One starts with the end – the desired results (goals or standards) – and then derives the curriculum from the evidence of learning (performances) called for by the standard and the teaching needed to equip students to perform" (Wiggins and McTighe, 1998, p. 8).

5. Coherent Instruction: When the teacher translates instructional goals into learning experiences through the instructional design of the lesson or unit. Instructional goals, instruction, activities, assessments, resources, and research support each other and are a reflection of content standards (Danielson, 1996).

6. Curriculum: A plan for action, a course to be run, or a written document that includes strategies for achieving desired goals or standards (Tyler, 1949; Taba, 1962).

7. Curriculum Development: "The process of designing a curriculum or a component of the curriculum and analyzing the impact on student learning" (Danielson & McGreal, 2000, p. 109). This includes designing lesson plans, unit plans, or a particular course of study.

8. Elementary Preservice Teachers (K-8): "Teachers who are taking professional education courses and have been formally admitted to a teacher education program, but have not yet had sole responsibility for a classroom on a full-time, contractual basis" (Ehrig, 1992, p. 7).

9. Enduring Understanding: The big ideas, the important understandings that we want students to retain and get inside of after they have forgotten many other details (Wiggins & McTighe, 1998).

10. Framework for Professional Practice: Well-established definitions of expertise and procedures to certify novice teachers and strengthen practicing teachers. Such procedures are the public's guarantee that the members of the teaching profession hold their colleagues and themselves to the highest standards (Danielson, 1996).

11. Inservice Teachers: "Teachers who have completed a teacher education program, hold at least a bachelor's degree, and have sole responsibility for a classroom on a full-time, contractual basis" (Ehrig, 1992, p. 7).

12. Instructional Goals: Clear purposes stated in terms of student learning. They are "worthwhile and represent learning central to a discipline as well as high-level learning for the students" (Danielson, 1996, p. 68). They

must take into account state and local standards, a district's curriculum, and the requirements of external mandates.

13. Objectives: A description of a learning outcome, describes where we want students to go and they pinpoint the destination (Price & Nelson, 1999).

14. Progressivism: "A contemporary reform movement in educational, social, and political affairs" (Ornstein & Hunkins, 1998, p. 45).

15. Standards: What every student should know and be able to do in each content area. Standards can be national, state, or local. Standards should apply equally to students of all races and ethnicities, from all linguistic and cultural backgrounds, both with and without special needs.

16. Traditional Curriculum Design: Often includes the following steps when developing curriculum: (1) selecting objectives or purposes of the school, (2) selecting educational experiences related to the objectives and purposes, (3) organizing these experiences, and (4) evaluating the objectives or purposes (Ornstein & Hunkins, 1998).

Assumptions

Charlotte Danielson (1996) established several assumptions about the uses of frameworks for professional practice: (a) given the complexity of teaching, a professional framework is invaluable for novice teachers, (b) veteran teachers who rarely devote time to professional dialogue and sharing techniques will find using a framework for professional practice a means of providing the

opportunity for genuine professionalism, (3) with a framework of professional practice in hand, educators can conduct conversations about where to focus improvement efforts, and (4) through the use of a framework for professional practice, educators can "define clearly what constitutes excellence in teaching. . . to the general public" (Danielson, 1996, p. 7). Further, the framework for professional practice can be utilized in the evaluation of the planning and preparation process; therefore, for the purposes of this study it was assumed that the research conducted using the framework for professional practice transferred to effective evaluation practices when assessing unit and lesson plans from both the backward design and traditional approaches.

Students learn to plan lessons and units using a variety of formats and designs. The experimental group used the backward design format and the control group used the traditional format. Therefore, another assumption was the students in each section used the formats provided.

Limitations and Delimitations

Workshops and college courses throughout the country put emphasis on the use of backward design when discussing curriculum development. Dr. Judith Hilton, professor of secondary education at The Metropolitan State College of Denver used <u>Understanding by Design</u> in her college courses with notable results ("Using Understanding by Design," 2002). Workshops such as "Assessment, Evaluation, and Curriculum Redesign"(2002) and "Relearning by

Design" (2002) also emphasized the work of Wiggins and McTighe. Although state-by-state, as well as district-by-district efforts to find the most effective curriculum/lesson plan format has grown and will continue to grow as a direct result of the book Understanding by Design, selection of subjects for this study were limited to a population comprised of a convenience sample of Educational Planning and Management students (EDEL 401) from one four-year public, comprehensive, land-grant university. For this reason, findings were not broadly generalizable to findings in other districts, states, or regions of the country. However, Cronbach, et al. (1980) suggested that creating a research design that balances "depth and breadth, realism and control" permits "reasonable extrapolation" or "modest speculations on the likely applicability of findings to other situations under similar, but not identical conditions" (p. 231). The design of this study reflected Cronbach's criteria through a focus on quantitative methodology including an information-rich sample and careful attention to data collection and data analysis protocol (Betances, 1999). Consequently, in chapter five, extrapolations from this researcher's findings resulted in lessons learned and potential applications to future curriculum design efforts.

Summary

This study focused on the value of the backward design model as preservice teachers in the elementary education program at Montana State University developed lesson and unit plans utilizing this design. Charlotte

Danielson (1996) developed a six-component framework for determining the

effectiveness of preservice and inservice teachers' ability to design valuable

instruction and organize the content that the students are to learn. The

framework was the rubric used to compare lesson and unit plans from both the

experimental group and the control group.

CHAPTER 2

REVIEW OF THE LITERATURE

Introduction

This study was designed to examine the question underlying the backward design approach as presented in the text Understanding by Design (1998): Were the population means for the scores from the planning and preparation framework the same or different for the two groups; lesson and unit plans that were designed by elementary preservice teachers having been taught a traditional method of curriculum design and lesson and unit plans that were designed by elementary preservice teachers having been taught the backward design method? This design was supported by an empirical knowledge base of Grant Wiggins and Jay McTighe, who developed the backward design method.

The research for this literature review was divided into four sections. The first section traced the process of curricular design as it related to development and change from its inception in the 1850s. Changes in curriculum were presented as they lead up to the innovative backward design approach.

The second focused on the backward design approach, the research base for the design, and similar designs such as standards-based education. There have been a few other developments in curricular design that were similar and those were discussed in this section.

Section three discussed the framework that was used to compare the backward design approach to the traditional curriculum design process. The framework included six components that were essential when planning and preparing curriculum. The six components were demonstrating knowledge of content and pedagogy, demonstrating knowledge of students, selecting instructional goals, demonstrating knowledge of resources, designing coherent instruction, and assessing student learning. Each component was presented individually. The six components are what preservice teachers should know and be able to do when planning and preparing curriculum.

Section four considered preservice teacher preparation in the six different areas referred to in the evaluation framework. This final section revealed strengths and several weaknesses in preservice teacher education in the planning and preparation stage.

Historical Foundations of Curriculum

Section one of the literature review examined a century of changes in curriculum content and curriculum development. Most of the changes that took place were a direct result of past and current world events. The history started in the mid-1800s and ended during the 1980s. In this section there were two types of curriculum discussed. One was the content, or the topics and material, which were covered during a certain timeframe. The other type was development, or the process of creating a curriculum that meets the needs of the students.

Universal Education

During the mid-1800s schools in the United States began dividing

students into different classes according to their age. In urban communities with

more and more children attending school, this became an essential and practical

step in keeping class numbers down and student abilities somewhat similar. By

1860 most of the schools in cities and large towns were graded. The proper

classification of students was only the beginning for this new graded system.

The next step was to design a course of study and examinations for each grade

level.

From 1856 to 1864, William Harvey Wells was the superintendent of the

Chicago public schools. "Almost single-handedly, Wells divided over 14,000

children into ten grades and assigned 123 teachers to these primary and

grammar grades. Each teacher was expected to follow a uniform schedule for

teaching the subjects of spelling, arithmetic, and reading" (Tyack, 1974, p. 45).

In 1862, Wells published A Graded Course of Instruction with Instructions to

Teachers which outlined specific material to be covered in each subject at each

grade level and prescribed proper teaching methods. Wells' book was widely

adopted in many cities as an official curriculum (Tyack, 1979).

Transitional Period

In the 1890s the development of curricula began. The 1890s brought a

heightened public awareness of changes in American society. Growth in popular

journalism, rapid advancements in railroads as a means of transportation, growth

of cities, and the influx of students into secondary schools were significant factors

in the transformation of American society. America changed from relatively

isolated, self-contained communities into an urban, industrial nation (Kliebard,

1995). With the changes taking place, the National Education Association (NEA)

organized three committees between 1892 and 1895: the Committee of Ten on

Secondary School Studies, the Committee of Fifteen on Elementary Education,

and the Committee on College Entrance Requirements. The three committees

were charged with determining curricula for schools (Orstein & Hunkins, 1998).

The Committee of Ten, chaired by Charles W. Eliot, president of Harvard

University, identified in their report nine academic subjects as central to the high

school curriculum. The classes were (1) Latin; (2) Greek; (3) English; (4) other

modern languages; (5) mathematics (algebra, geometry, trigonometry, and

higher or advanced algebra); (6) physical sciences (history, civil government, and

political economy); and (9) geography, geology, and meteorology (National

Education Association, 1894). The committee also recommended four courses

of study or programs in the high school: (1) classical; (2) Latin scientific; (3)

modern languages; and (4) English. Each program included offerings of the nine

courses to varying degrees (Kliebard, 1995; Ornstein & Hunkins, 1998).

The Committee of Ten took a position that all students, regardless of their

course of study, were to be entitled to the best ways of teaching the various

subjects. Despite this position, the committee indirectly tracked college-bound

students into the first two superior programs, Classical and Latin Scientific,

calling Modern Languages and English "distinctly inferior to the other two" (Report of the Committee of Ten on Secondary Schools, 1894, p. 48). The first two programs were more likely to provide the requirements needed for college acceptance. The Committee ignored art, vocational education, physical education, and music, arguing that these courses contributed little to mental discipline (Kliebard, 1995; Ornstein & Hunkins, 1998). The Committee did agreed to allow local school authorities to determine how these extra subjects should be introduced into the programs if they chose to include them (Report by the Committee, 1894).

The second committee, The Committee of Fifteen on Elementary Education, lead by superintendent of schools William H. Maxwell of Brooklyn, New York, was heavily influenced by Charles Eliot and the Committee of Ten. The Committee reduced the number of elementary grades from ten to eight and stressed the three Rs, as well as history, geography, English grammar, and literature (Orstein & Hunkins, 1998). The idea of newer or interdisciplinary subjects was rejected because an elementary education was preparation for high school, and courses taught in the elementary grades should reflect the high school curriculum.

The third committee, established in 1895 by the National Education Association, was the Committee on College Entrance Requirements. Consisting mainly of university and college presidents, the Committee recommended strengthening the college preparatory elements of the high school curriculum.

They believed the admission requirements and classical subjects for mental training best served all students. "It also made recommendations regarding the number of credits required in different subjects for college admission . . . and served as a model for the Carnegie Unit, a means for evaluating credits for college admission" (Orstein & Hunkins, 1998, p. 80), which is still in existence today in most high schools.

These committees were instructed to bring consistency and order into rather diverse and somewhat muddled programs. Their responsibility was to make recommendations regarding content and organization of elementary and secondary school curricula. During this period committee leaders and members tended to be content specialists and university professors who often recommended college preparatory curriculum (Taba, 1962). Unfortunately local school systems adopted them without thinking about students who were not on the college track.

With more and more students attending elementary and secondary schools during the early 1900s, demands arose for changes in schools to meet the needs of a changing society. "The pace of industrial development and immigration led a growing number of educators to question the classical curriculum and the constant emphasis on mental discipline and incessant drill" (Orstein & Hunkins, 1998, p. 80). The scientific movement in education and psychology influenced this shift in curriculum in the late nineteenth and early twentieth centuries. Most notably the social theories of Darwin, Spencer, and

Herbart; the pragmatic theories of William James and Charles Peirce; and the pedagogical impact of Montessori, Froebel, Pestalozzi, helped shape school curriculum at this time. The scientific movement rejected the classical curriculum and instead, put emphasis on technical, vocational, and scientific subjects – fitting into the concurrent age of industrialism, materialism, and colonialism (Orstein & Hunkins, 1998).

Abraham Flexner, John Dewey, and Charles Judd also influenced the Commission on the Reorganization of Secondary Education. Flexner proposed a "modern" curriculum which consisted of four basic areas: (1) science (the major emphasis of the curriculum); (2) industry (occupations and trades of the industrial world); (3) civics (history, economics, and government); and, (4) aesthetics (literature, languages, art, and music) (Flexner, 1923).

Dewey argued that subjects could not be placed in an order of importance and that attempts to do so were erroneous. Any study or body of knowledge was capable of expanding the child's experience, and experiencing – that is, being stimulated to internalize and develop intellectual capabilities – was the process of educating the child (Dewey, 1916). Dewey did consider science, scientific inquiry, and the method of inquiry to be the best forms of knowledge for a society; thus he elevated the place of science in education (Orstein & Hunkins, 1998).

Charles Judd was a colleague of Dewey's who, like Dewey and others, "constructed a science of education based on the methods of finding facts and

then applying them as a basis for reasoning out solutions to problems and for making decisions" (Orstein & Hunkins, 1998, p. 83). By preparing students to make decisions and deal with problems, he believed students would be ready for the changing world and the problems they would encounter as adults. In his book The Scientific Study of Education, Judd was concerned with what he called "systematic studies . . . of the curriculum" (Judd, 1918, p. 197). To systematize curriculum would be to apply scientific strategies, and "the purpose of scientific studies here, as in every other sphere, is to facilitate natural evolution and to give it rational guidance" (Judd, 1918, p. 200).

Reorganization of Education

In 1918 the NEA Commission on the Reorganization of Secondary Education published the Cardinal Principles of Secondary Education, which, as previously noted, was influenced by Flexner and Dewey. The purpose of this commission was to establish a basis for designing a curriculum that would serve all youth, not just those entering college (Perkinson, 1965). The Commission emphasized the whole child (not just the cognitive area of study), education for all youth (not just college-bound students), diversified areas of study (not classical or traditional), common culture, ideas, and ideals for a democratic society (not religious, elitist, or mental, discipline learning) (Cardinal Principles, 1918). The Commission on the Reorganization of Secondary Education became an important component in progressive education.

The Cardinal Principles were a stepping-stone toward what society

needed and wanted at this time. Most importantly, there was acknowledgement

of the responsibility of schools to serve all children and youth, not just those who

were college-bound. The Commission on the Reorganization of Secondary

Education, Abraham Flexner, John Dewey, and Charles Judd were all a part of

the era of progressive education that was about to impact schools; the traditional

education, which had dominated American education for so long, was now

vanishing (Orstein & Hunkins, 1998).

Society was changing; because of industrialization, certain social

institutions such as family and church were believed to be in a state of decline.

Education was to be thoroughly restructured in order to take up the slack.

Kliebard (1995) believed

> The scope of the curriculum needed to be broadened beyond the
> development of intelligence to nothing less than the full scope of life
> activities, and the content of the curriculum had to be changed so that a
> taut connection could be maintained between what was taught in school
> and the adult activities that one would later be called to perform. (p. 77)

As a result of this state of decline, curriculum became more than just

subjects and the amount of time needed to study each subject; curriculum was

now viewed as a science. Curriculum-makers needed to devise programs of

study that prepared individuals specifically and directly for the role they would

play as adult members of a changing society. They would also examine the ideas

of planning and describing curriculum using principles and methodology – topics

of which were now being studied in the literature.

Curriculum as a Field

Several researchers, including Bobbit, Charters, Kilpatrick, Rugg, and Caswell, added literature to the new field of curriculum. Authors presented new information describing their view of curriculum and how it should be developed. Franklin Bobbit published a book called The Curriculum, which was considered by some to be the first book solely about curriculum as a science. Bobbit outlined the principles of curriculum planning focusing on an activities approach, which he defined as "a series of things which children and youth must do and experience by way of developing abilities to do things well and make up the affairs of adult life." The purpose of curriculum, Bobbit believed, was to outline the knowledge that would be important for each content area, and then to develop activities to train the learner and improve his or her performance (Bobbit, 1918, p. 42).

In his later book, How to Make Curriculum, Bobbit (1924) states "Curriculum-making must find guiding principles which will lead it with all the certainty that is possible in the right directions . . . that education is to prepare men and women for the activities of every kind which make up well-rounded adult life" (p. 7). Being prepared for the life of an adult was considered the main purpose of developing curriculum.

The first task of curriculum makers was to determine which activities ought to make up the lives of women and men. Along with these, the individual qualities and skills necessary for proper achievement – called educational

objectives – were included. Bobbit's method for choosing objectives was quite sophisticated for the period, and most guidelines can also be applied today: (1) choose objectives that are for all students, not just a few; (2) emphasize objectives that are important for adult living and success; (3) choose practical objectives; (4) avoid objectives that disagree with the community; (5) involve the community when choosing objectives; and (6) establish criteria for objectives.

The sixth guideline for choosing objectives directs curriculum developers into the next step of the curriculum development process: establishing specific activities and criteria related to the objectives. This final step in the development process allows educators to establish how far students will go each year in attaining the objectives. By establishing criteria, teachers can determine whether students have the abilities to perform activities properly (Bobbit, 1924).

Werrett Charters advocated a very similar approach to Bobbit's form of curriculum development. He viewed the curriculum as a series of objectives determined by variations of ideals that students must attain by way of variations of activities (Charters, 1923). In addition, though, he felt objectives were observable and measurable. Charters did not use the term assessment or evaluation, but instead started thinking about how the objectives could be verifiable. Charters also believed in evaluating the materials used to realize the objectives. He stated, "we are confronted by the task of evaluating the material so as to provide the learner with the best or with one or more alternatives of

equal value" (Charters, 1923, p. 78). It wasn't until years later that the term evaluation was actually used (Orstein & Hunkins, 1998).

Both Bobbit and Charters had a deep impact on curriculum development, as did several others. One of those activity-centered curricularists was William Kilpatrick. In 1918 Kilpatrick wrote an article called "The Project Method", where he stated, "We have a wholehearted purposeful act carried on amid social surroundings" (p. 321). Kilpatrick believed each person has a purposeful act, on which to follow through, in order to accomplish the objective or aim. Some advocates thought this idea of "purposeful act" was innovative and new, but most believed it was rooted in the curriculum ideas of Bobbit and Charters who stressed similar ideas using objectives and related activities. Kilpatrick argued that his ideas were different in that the child should plan curriculum. "We saw how far intent and attitude go in determining learning. These are at their best when pupils engage actively in enterprises they feel to be their own, for which they accept the responsibility" (Kilpatrick, 1932, p. 119).

Leaders of curriculum development such as Kilpatrick, Bobbit, Charters, Rugg, Whipple, and several others, formed a committee that developed two volumes of The Twenty-Sixth Yearbook of the National Society for the Study of Education (NSSE). Part I, Curriculum-Making: Past and Present (1926) and Part II, The Foundations of Curriculum Making (1930) were both landmark texts that criticized traditional curriculum, synthesized progressive practices, described the nature of curriculum making, and outlined characteristics of the ideal curriculum.

The committee recognized the need for curriculum reform and the need for "those who are constructing our school curriculum" to determine "an overview . . . and orientation . . . to curriculum making" (Rugg, 1926, p. 1).

Harold Rugg, the chairperson of the NSSE Yearbook, defined the role of the curriculum specialists. Their role was to plan curriculum in advance and to include four tasks: (1) "a statement of objectives, (2) a sequence of experiences to achieve the objectives, (3) subject matter found to be . . . the best means of engaging in the experiences, and (4) statements of immediate outcomes of achievements to be derived from the experiences" (Rugg, 1926, pp. 52-53). Rugg concluded that curriculum was adapting scientific methods and that there was a need for specialization and for professional training (Rugg, 1926).

In 1928, Harold Rugg coauthored The Child-Centered School with Ann Shumaker. In an era that stressed children becoming involved in the development of their own curriculum, the authors emphasized the need for curriculum specialists to preplan curriculum using their scientific and technical knowledge and for the teacher to implement the curriculum (Rugg & Shumaker, 1928). Rugg and Shumaker discussed the important role of the curriculum maker. The authors didn't agree with the idea of using student input, but instead, advocated cooperation among educational professionals from different areas, including classroom teachers, curriculum specialists, test experts, and administrators (Orstein & Hunkins, 1998).

Throughout the 1920s and 1930s, researchers claimed curriculum specialists, administrators, and classroom teachers, rather than students, developed curriculum. Most local and state districts were developing their own curriculum guides with the selection of methods and activities being left to the teachers. Caswell and Campbell (1935) were concerned that this practice of curriculum development was limited. Rather, they thought curriculum represented a method of incorporating the scientific process, organization, instruction, and evaluation. "An adequate curriculum can be developed only when all elements in the experience of the learner are considered, and when an orderly program is provided to assist the teacher in bringing these varied elements into suitable relationships" (p. 69). For the authors, curriculum represented a procedure or process, rather than a limited body of content.

The process that Caswell and Campbell used for curriculum development involved several ideas and are listed as follows: (1) state the principles presumed to guide the development of the curriculum; (2) determine the educational aims; (3) establish the scope of the curriculum; (4) determine the student purposes; (5) set up activities for realization of purposes; (6) select subject matter; (7) decide on the grade placement and time allotment of presenting materials; (8) choose teaching procedures; (9) evaluate the outcomes of instruction; and, (10) organize instruction (Caswell & Campbell, 1935).

These ideas grew from Hollis Caswell's position as the curriculum advisor for the state of Virginia from 1931-1932. It was Caswell who created a radically

new and different statewide course of study for elementary education. Kliebard

(1995) stated of Caswell

> A new curriculum device, the scope and sequence chart, was developed,
> a kind of deliberate cross-hatching of two approaches to organizing the
> curriculum: one, the major functions of social life's curriculum drawn from
> longstanding, social efficiency ideas, provided the scope, the actual
> subject matter of the study; the second, centers of interest, provided the
> sequence of these activities by attending to the interests that children
> presumably exhibited as they proceeded from early childhood to later
> maturity. (pp. 192-193)

Progressivism

Although the progressive movement in education was influential in some

areas of the country, traditional methods and subject matter still dominated the

school curriculum. Because of its college preparatory emphasis (i.e., being test

driven and dominated by college entrance admission requirements) traditional

curriculum was difficult to think about replacing. Nevertheless, many community

members, administrators, and educators supported efforts to stimulate curriculum

reform, partially abandoning the traditional approach.

One of those efforts was to embrace the progressivist philosophy.

"According to progressivist thought, the skills and tools of learning include

problem-solving methods and scientific inquiry. . . . heavy emphasis is placed on

how to think, not what to think. . . . the curriculum is interdisciplinary. . . . and, the

teacher helps students locate, analyze, interpret, and evaluate data" (Orstein &

Hunkins, 1998, p. 46). From 1932 to 1940, the Progressive Education

Association assumed one of the most ambitious efforts to determine which

curriculum was more effective in preparing students for their future, a progressive curriculum or a traditional curriculum. The research became known as the Eight-Year Study. In this study twenty-nine progressive or experimental high schools implemented their own curriculum to see whether the traditional curriculum was more effective than a progressive curriculum. The study found the experimental or progressive group did just as well or better for college preparation (Kliebard, 1995; Orstein & Hunkins, 1998).

In the Eight Year Study the authors declared, "it was assumed that education is a process which seeks to change the behavior patterns of human beings" (Smith & Tyler, 1942, p. 11). As a result of the study, members confirmed the need for comprehensive evaluation, as part of curriculum development. Members also advocated the infusion of behavioral objectives in curriculum thinking (Kliegard, 1995). Even though the members of the Eight Year Study reported plans to improve curriculum, ideas developed did not filter down to schools because teachers were not actively involved in the curriculum planning process. Curriculum making was frequently a top-down progression with curriculum guides being developed by central offices (Kennedy-Manzo, 1999; Kliegard, 1995; Taba, 1962).

Ralph Tyler played a key role in the evaluation of the Eight Year Study, and some of his ideas were the basis of the evaluation component of the Study (Orstein & Hunkins, 1998). Tyler went on to publish numerous articles and books related to evaluation, curriculum, and instruction. His most famous book, Basic

<u>Principles of Curriculum and Instruction</u>, became an important resource for curriculum makers in any subject or grade level. Tyler (1950) covers four basic questions curriculum developers need to answer when writing curriculum and planning instruction: "(1) What educational purposes should the school seek to attain? (2) What educational experiences can be provided that are likely to attain these purposes? (3) How can these educational experiences be effectively organized? and, (4) How can we determine whether these purposes are being attained?" (p. 1).

In a short, easy-to-understand way, Tyler gave many curriculum developers a simple model in which to prepare most school curricula. "The Tyler model summed up the best principles of curriculum making for the first half of the twentieth century. This model has been utilized and adapted by many curricularists. In fact, many practitioners in schools consider the Tyler model as a metanarrative of the way to create curricula" (Orstein & Hunkins, 1998, p. 93). Both Tyler and Caswell developed curriculum models that, in variations, are still widely used today to design curricula.

Curriculum for all Students

By 1940, foundations discontinued subsidizing research in the area of curriculum development. Instead, World War II was beginning to divert the country's attention to the more important issue of national defense; but, by the mid-'40s, American education was back in the spotlight.

Schools were failing to design programs that met the needs of all students, especially those who were not entering college-prep or vocational programs. Policymakers and researchers were determined to make education more functional by rewriting the high school curriculum. The newly developed curriculum was called life adjustment education, which "better equips all American youth to live democratically with satisfaction to themselves and profit to society as home members, workers, and citizens" (Ravitch, 1983, p. 66). The curriculum consisted of courses such as guidance and education in citizenship, home and family life, use of leisure, inter-group education, health and safety, tools of learning, human relationships, work experience, and occupational adjustment (Ravitch, 1983). The idea for "life-adjustment education" came from a study commissioned in 1945 by the U.S. Office of Education. This curriculum was utilized in the late 1940s and early 1950s until the United States fell behind in the space race with the Soviet Union's launch of Sputnik in 1957. At this time schools were again forced to re-evaluate the curriculum (Manzo, 1999). In response, the National Defense Act of 1958 called on the National Science Foundation to restructure curricula in science, math, and foreign languages. A few years later the law was expanded to include English and social studies (Manzo, 1999).

As the civil turmoil of the 1960s erupted, academic rigor took a back seat to educational unrest. Groups of minorities, women, and the handicapped demanded equality and pushed to get their viewpoints added to the curriculum.

They promoted a more "balanced curriculum that incorporated the contributions of all people" (Manzo, 1999, p. 16).

In the 1970s public concern erupted over poor performance on international mathematics and science assessments, declining student test scores, and challenges within the country to the nation's claims of equal educational opportunity for minority students (Education Commission of the States, 1996). Even though test scores and the overall performance of minority students had improved since the early 1980s, concern did not decrease (Berliner & Biddle, 1995; Education Commission of the States, 1996). Instead, it became increasingly evident that in the next century education would be the key – not only to individual quality of life, but also to the economic health of the nation (Betances, 1999; Marshall & Tucker, 1992; Reich, 1991).

Curriculum Models

Changes such as these, involving curriculum content, were often in direct response to world events. Content changed to meet the needs of society during different time periods. In the case of curriculum development methods, that wasn't always so; models of developing curriculum withstood the tests of time. The Tyler model of curriculum development was one of those models. Tyler used four simple questions that teachers would answer in order to plan curriculum. What educational purposes should the school seek to attain? What educational experiences can be provided that are likely to attain these purposes? How can these educational experiences be effectively organized? How can we

determine whether these purposes are being attained? These still had great appeal because the questions were so reasonable. In the 1960s, a colleague of Tyler's, Hilda Taba, also made her mark in the field of curriculum development by expanding on Tyler's model and developing her own.

Taba used many of Tyler's ideas except she developed an approach that included the teachers in the development process. Tyler designed his questions to be utilized by administrators, content specialists, and curriculum makers – more of a top-down approach. Taba's (1962) seven major steps to the model included (1) diagnosis of needs, (2) formulation of objectives, (3) selection of content, (4) organization of content, (5) selection of learning experiences, (6) organization of learning activities, and (7) evaluation and means of evaluation. Educators everywhere have used Taba's model. Many believed it had much merit, but others felt it puts too much emphasis on the teacher. Teachers may not have the expertise or the time needed to design effective curriculum. Nevertheless, Taba's model made it clear that there has been and will continue to be a broad base of involvement that is essential for curriculum decision-making.

In the late 1970s Francis Hunkins developed what he called a Decision-making Model. It is similar to other models with the exception of the first stage of curricular decision-making: curriculum conception and legitimization. The first stage requires curriculum developers to engage in a search for understanding, besides just creating an educational program. The other six stages include

diagnosis, content selection, experience selection, implementation, evaluation, and maintenance (1980).

The work of Madeline Hunter and her colleagues at UCLA began during this same time period. "They developed a set of prescriptive teaching practices designed to improve teacher decision making and thus enhance student learning" (Danielson & McGreal, 2000, p. 13). Hunter developed a lesson design that included seven steps: (1) anticipatory set, (2) statement of objective, (3) instructional input, (4) modeling, (5) checking for understanding, (6) guided practice, and (7) independent practice. The Hunter model guided views of teaching into the 1980s and started a trend toward instructionally focused staff development that continues to this day (Danielson & McGreal, 2000).

Today, researchers and content specialists continue the struggle to find the perfect model for curriculum development. Annually, they negotiate the changes in curriculum content in response to the needs of society. The information presented in this section offers a descriptive view of what has taken place in the area of curriculum and curriculum development over the past century. The material presented represents the key players who had a major influence in education.

The next section is a continuation of the history section, in that it is an overview of curriculum over the past two decades; but this section more thoroughly connected the relevance of researchers' writings with that of backward design. The 1980s and 1990s were two very important decades,

which influenced Grant Wiggins and Jay McTighe when they developed their method of curriculum design called backward design.

Backward Design

Backward design is a process of curriculum development that integrates the works of Jerome Bruner and his colleagues from the 1960s and 1970s, and later, the Teaching for Understanding project of Howard Gardner, David Perkins, and their Project Zero Colleagues in the 1980s. Even though Grant Wiggins' and Jay McTighe's book was published several years later, studies and research done in the 1980s and 1990s helped identify key components of their design. This section of the literature review presents the information that facilitated the development of the backward design process. What the literature review was unable to present was the comparison of the innovative backward design model with other models. Very little research, if any, has been conducted in this specific area.

Grant Wiggins is the President and Director of Programs for Relearning by Design. He is the author of several assessment books and has written many articles for a variety of journals. Jay McTighe is an independent consultant who has worked with more than a thousand educators over the past six years in a "work smarter" approach to designing, validating, reviewing, field-testing, and anchoring performance tasks. He has also published several articles and books related to educational development (Relearning by Design, 2002). The research

base for the theory was the outgrowth of 15 years of research by these two authors. Much of the conceptual structure came from Grant Wiggins and his colleagues at Relearning by Design, and his earlier work with the Coalition of Essential Schools. In addition, Relearning by Design sponsored a national curriculum design award process for several years. The entries and winners helped define many of the central ideas in Understanding by Design (Wiggins & McTighe, 2002).

Cognitive Learning

When Wiggins and McTighe first started work on their design, they wanted to make sure that their work was intellectually rigorous while focused on student inquiry. Jerome Bruner's and his colleagues' work on the cognitive learning model and constructivist theory played an important role in this component (Wiggins & McTighe, 2002). "Bruner's constructivist theory was a general framework for instruction based upon the study of cognition" (Kearsley, 2002, p. 1). A major premise in Bruner's framework was that learning was an active process in which learners constructed new ideas based upon their current or past knowledge while interacting with new information. "The learner selects and transforms information, constructs hypotheses, and makes decisions, relying on a cognitive structure (i.e., schema, mental models) to do so" (Kearsley, 2002, p. 1). The learner "focuses on the 'how' to learn, rather than 'what' to learn" (Craig & Reed, 2002, p. 1).

While developing their model of curriculum development, the authors kept Bruner's (1973) three basic principles in mind: "(1) Instruction must be concerned with the experiences and contexts that make the student willing and able to learn (readiness), (2) Instruction must be structured so that it can be easily grasped by the student (spiral organization), and (3) Instruction should be designed to facilitate extrapolation and or fill in the gaps (going beyond the information given)" (Kearsley, 1994, p. 2). Later, in this manuscript, when the backward design is explained in more detail, the constructivist theory will surface as an important element of the design.

Teaching for Understanding

Another example of research that shaped the views of the authors and parallels their work is the Teaching for Understanding Project of Howard Gardner, David Perkins, and their colleagues at Harvard. Readers of Understanding by Design and articles from the Teaching for Understanding Project will notice many similarities between the pieces of work. Besides having worked with researchers from Harvard, the authors also integrated research done on authentic learning by Fred Newmann over the past decade (Wiggins & McTighe, 2002).

Project Zero. Both Perkins and Gardner were working at Project Zero at the time the authors worked with them. Project Zero, which was actually a research group from the Harvard Graduate School of Education, has been an

organization for over 34 years. "Project Zero's mission was to understand and enhance learning, thinking, and creativity in the arts, as well as humanistic and scientific disciplines, at the individual and institutional levels" (President and Fellows of Harvard College [PFHC], 2000, p. 1). Project Zero was founded by the philosopher Nelson Goodman, who believed that "arts learning should be studied as a serious cognitive activity, but that "zero" had been firmly established about the field; hence, the project was given its name" (PFHC, 2000, p. 1). " Project Zero researchers study human cognition in a range of domains and seek to apply their findings to the improvement of thinking, teaching, and learning in diverse educational settings" (Wiske, 1998, p. 5)

From 1972 to July 1, 2000, Howard Gardner and David Perkins served as co-directors of Project Zero. During that time the researchers involved in the project maintained a strong commitment in the arts and other disciplines. They studied individuals and groups of students mostly in American public schools, particularly those from disadvantaged areas. Project Zero's work was seen in numerous publications, and was written by the many researchers who worked in the program (PFHC, 2000). The information presented in this research was that of Howard Gardner, David Perkins, and their colleagues because of their impact on the authors of Understanding by Design.

The work of Grant Wiggins and Jay McTighe parallels the teaching for understanding work done by Perkins and Gardner. Each author conducted

research in specific areas of teaching for understanding and will be presented separately and together in the following paragraphs.

David Perkins. David Perkins conducted long-term programs of research and development in the areas of teaching and learning for understanding, problem solving, creativity, reasoning in the arts, sciences, and everyday life; more recently, he studied the role of educational technologies in learning and teaching, and strategies that enhance learning in organizations (PFHC, 2000). The information presented here covered developments in the areas of teaching and learning for understanding as they correlate to backward design.

David Perkins (1992, p. 2) stated, "We know a lot about how to educate well. The problem comes down to this: We are not putting to work what we know." In his book Smart Schools and in several other articles, Perkins addressed how students were learning but had a strikingly superficial understanding of what had been taught (Perkins, 1991; Perkins, 1992; Perkins, 1993; Perkins & Blythe, 1994). It is important for students to develop understanding, not just memorize facts and figures (Wiske, 1998). Perkins placed understanding at the forefront of his research.

In 1988-89, Project Zero directors Gardner, Perkins, and Perrone brought together university and public school colleagues to arrange research toward pedagogy of understanding. Teachers from numerous schools participated in a series of meetings where they were taught to use a framework for developing a curriculum unit. The teachers used the framework and made suggestions for

improvement. From this, the researchers developed the Teaching for Understanding Framework (Wiske, 1998). The framework provides teachers with a language for developing, discussing, and implementing a particular topic or an entire course.

The framework highlights four key areas. The first area is *generative topics.* These are topics, themes, concepts, or ideas that are central to the subject matter, interesting to students, accessible, interesting for teachers, and ". . . help people understand and deal with the world" (Perkins, 1992, p. 5). Generative topics lend themselves to teaching for understanding. The second concept is clarifying what students will understand by formulating *understanding goals* – specific objectives from the generative topics. To build focus, a teacher generates a few understanding goals for a lesson or unit of instruction.

Third, teachers foster student understanding by designing *performances of understanding* that support understanding goals. Students should be engaged in performances from the beginning to the end of a unit that utilize higher level thinking skills. The fourth concept of the framework is the need to measure students' understanding through *ongoing assessments.* Traditionally, teachers assess at the end of a lesson or even a unit. The researchers recommend that students need criteria, feedback, and reflection from the beginning to the end of instruction – a process called ongoing assessment (Perkins & Blythe, 1994; Wiske, 1998).

David Perkins suggested choosing generative topics as the first step in Teaching for Understanding. The generative topics are developed from the variety of disciplines in which teachers teach. Gardner and Boix-Mansilla (1994) encouraged the use of essential questions that promote understanding of generative topics. Essential questions are those which students arrive at independently and often have a deeply personal answer. Essential questioning is a key component of Wiggins and McTighe's backward design.

Perkins' research and other research by Project Zero were in response to the mediocre educational system in the United States. In the 1980s public concerns were fueled by the publication of what has since become perhaps the most well-known interpretation of the gap between the future requirements of American citizens and the schooling provided by the current system of education: A Nation at Risk: The Imperative for Educational Reform (National Commission on Excellence in Education, 1983). This report, which warned of the threatening results of an American education characterized by a "rising tide of mediocrity" (p.5), was viewed by many Americans as the single most important event launching the movement to develop high and clearly developed academic standards for all students (Marzano & Kendall, 1996).

Howard Gardner. Gardner (1991) also responded to the raft of books and reports about the "educational crisis". He felt the descriptions of failing schools were accurate, but didn't go far enough. Even when schools appeared to be successful, they fail to achieve their most important mission. ". . . even students

who have been well trained and who exhibit all the overt signs of success – faithful attendance at good schools, high grades and high test scores, accolades from their teachers – typically do not display an adequate understanding of the materials and concepts with which they have been working" (p. 3).

Howard Gardner is best known in the field of education for this theory of multiple intelligences, but he was also involved in Teaching for Understanding research. Gardner felt strongly that, "students do not understand, in the most basic sense of that term, that is, they lacked the capacity to take knowledge learned in one setting and apply it appropriately in a different setting. Study after study has found that, by and large, even the best students in the best schools can't do that" (Brandt, 1993, p. 1). This led Gardner to do more research in the area of authentic instruction or what is also called real-life instruction. Gardner believed that there were two ways to develop understanding that were more authentic: apprenticeships and children's museum-type programs. He felt these learning situations minimize mindless learning and maximize students' understanding of why they are doing things. Students in these settings were free to try things out in new ways (Brandt, 1993).

Of those students who were given the opportunity to try things out in new ways, many came to know the field of study in their own ways. Gardner "posited that all human beings are capable of at least seven different ways of knowing the world – labeled the *seven human intelligences*" (Gardner, 1991, p. 12). According to this analysis we are all able to know the world through language or

linguistic intelligence, logical-mathematical analysis, spatial representation,

musical thinking, the use of the body to solve problems or bodily kinesthetic

intelligence, an understanding of other individuals or interpersonal intelligence,

and an understanding of ourselves or intrapersonal intelligence (Gardner, 1991;

Gardner, 1983). Gardner (1991) acknowledged

> These differences challenge an educational system that assumes that
> everyone can learn the same materials in the same way and that a
> uniform, universal measure suffices to test student learning. . . . I argue
> that a contrasting set of assumptions is more likely to be educationally
> effective. Students learn in ways that are identifiably distinct. The broad
> spectrum of students. . . would be better served if disciplines could be
> presented in a number of ways and learning could be assessed through a
> variety of means. (p. 12)

Gardner suggested replacing rote or conventional performances that don't meet

the needs of all learners with performances of disciplinary understanding. "Such

performances occur when students are able to take information and skills they

have learned in school or other settings and apply them flexibly and appropriately

in a new and at least somewhat unanticipated situation" (Gardner, 1991, p. 8).

Fred Newmann. Making learning real or authentic is a challenge for

educators. Both Gardner and Perkins and their colleagues have emphasized the

importance of teaching for understanding by making learning real; using learning

experiences that relate to the real world. The authors of backward design have

also incorporated research done on authentic learning by Fred Newmann and his

colleagues at the University of Wisconsin.

Newmann and Wehlage (1993) chose to develop standards for authentic instruction because there are two common problems that make conventional schooling inauthentic: "(1) Often the work students does not allow them to use their minds well, and (2) The work has no intrinsic meaning or value to students beyond achieving success in school" (p. 2). Like Gardner, Perkins, and others, Newmann suspected that meaningful learning does not always take place in the classroom. "Unfortunately, even the most innovative activities – from school councils and shared decisions making to cooperative learning and assessment by portfolio – can be implemented in ways that undermine meaningful learning, unless they are guided by substantive, worthwhile educational ends" (Newmann & Wehlage, 1993, p. 1).

Newmann and Wehlage (1993) contended teaching efforts should be directed toward meaningful, authentic forms of student achievement. These authors encouraged educators to examine their teaching in the following five areas: (1) Higher-Order Thinking (requires students to use ideas and information in ways that transform their meaning); (2) Depth of Knowledge (the level of student knowledge as they consider lesson ideas); (3) Connectedness to the World (the extent to which the lesson has meaning beyond the instructional context); (4) Substantive conversation (the extent of talking to understand and learn the material of a lesson); and, (5) Social Support for Student Achievement (respect, inclusion, and high expectations of all students in the learning process)

(Newmann & Wehlage, 1993). The use of this five-part framework should help teachers reflect upon their teaching.

The research base for <u>Understanding by Design</u> was quite extensive. The constructivist work of Bruner, the Teaching for Understanding research done by Gardner and Perkins, and the authentic learning research completed by Newmann and his colleagues, have all provided justifications for the backward design approach.

Before the researcher discusses the backward design process, it is necessary to discuss the process of developing curriculum while utilizing standards, or what is presently called Standards-Based Education. Part of Wiggins' and McTighe's work was based on the implementation of standards.

Standards-Based Education

If the 1980s was a decade in which educational problems gained national attention, then the 1990s was the decade in which pressure from those outside the education realm changed educational practice. The 1990s was the decade of accountability because of the imposition of standards and assessments (Sewall, 1997). With myriad material available on standards and standards-based education, one might wonder where the discussion begins. The researcher felt it most appropriate to begin with a description of standards and standards-based education.

Every journal article and book written about standards gave similar definitions and most distinguished between standards, content standards, and

performance standards, even though these were sometimes jumbled together. Standards were defined as "both official requirements and numerically determined thresholds of acceptable performance" (Kordalewski, 2000, p. 2). Standards are also guidelines for what teacher should teach and what students should know (U.S. Department of Education, 1996). Academic content standards reflect the ideas, skills, and knowledge of what students should be able to do in the academic content areas (Kordalewski, 2000; The State Content, 1996; U.S. Department of Education, 1996). Performance standards define excellence and how students demonstrate their proficiency in the skills and knowledge framed by content standards. They answer the question, "How good is good enough?" (The State Content and Performance Standards Setting Process, 1996; U.S. Department of Education, 1996).

Standards-based education is primarily for the purpose of preparing students to meet the demands of life beyond public school. Anne Turnbaugh-Lockwood (1998) asserted

> The vision of reformers who believe in standards-based education is that the curriculum will be arranged around a consensually agreed-upon core body of knowledge that is determined by states and local communities. This body of knowledge will prepare students for the demands of a technologically sophisticated society and will address the needs of employers who complain of entry-level workers who are illiterate and who lack even the most basic skills. Simultaneously, this core body of knowledge will prepare students to go beyond rote memorization and drill to new skills that reformers agree are imperative in the next century's workforce: problem solving, analysis, and the ability to work cooperatively. (p. 4)

Standards and standards-based education are familiar to most educators across the country, but most don't know why the standards movement began. The initiating event of the modern standards movement can be traced to the 1983 report "A Nation at Risk" (Falk, 2000; Marzano & Kendall, 1996; Marzano & Kendall, 1998; Ravitch, 1995; Shepard, 1993). These are the alarming words quoted from the report, "The educational foundations of our society are presently being eroded by a rising tide of mediocrity that threatens our very future as a nation and as a people" (National Commission on Excellence in Education, 1983, p. 5), and "Without a doubt, engendered in American society is a deep concern for the quality and future of American education" (Marzano & Kendall, 1998, p. 1).

Rallied by this alert was then-President George H. Bush who convened a special summit with the nation's governors in 1991. This group drafted a document titled "The National Education Goals Report: Building a Nation of Learners," which presented six broad goals for education. Two of the six goals related specifically to academic standards (Falk, 2000; Marzano & Kendall, 1998; Marzano & Kendall, 2000).

As a follow-up to the governors' summit, national subject-matter organizations were inspired to establish standards and assessments that matched those standards in their respective content areas. The National Council of Teachers of Mathematics (NCTM) was at the forefront of the standards

movement, having already developed national standards by 1989 (Falk, 2000;

Marzano & Kendall, 1998; Marzano & Kendall, 2000).

The standards movement got another major boost when the "Goals 2000:

Educate America Act" passed in 1994 (Falk, 2000). The Act called for states to

develop standards and assessments that evaluated how students were

progressing toward them. Since that time, forty-nine states have developed

academic standards. "Much of the motivation for these initiatives stems from the

belief that standards and standards-based assessments, can be used to guide

practice, to create a more coherent curriculum, and ensure that all students are

educated equally" (Falk, 2000, p. 64).

Implementing Standards

How do school districts actually apply the state and district standards to

local classroom learning? Robert Marzano (2000) offered various options and

recommendations to help districts get started. One recommendation was to

choose subject area standards and general reasoning standards as the core of

the curriculum. This could be done by grade level or subject area. The district

would also choose benchmarks for gauging schools by describing, "desired

educational accomplishments in terms relevant to the hierarchical structure of

knowledge and skills at each level" (p. 31). Use of a variety of frequent

assessment techniques that are aligned with the standards was also essential for

evaluation of student learning. Marzano's final recommendation was to hold

students and teachers accountable for the standards. This step would lead to

student and teacher accountability for attainment of content knowledge and performance levels embedded in state and local standards.

Easton, Ryley, Teague, and Van Donselaar (2000) of the Association for Supervision and Curriculum Development (ASCD) presented material at a conference regarding "Administrative Leadership Development in a Standards-Based System". Their ideas and suggestions were quite specific and were presented in a way where they contrasted a standards-based classroom with a non-standards-based classroom.

In a standards-based classroom the curriculum is driven by standards, and in a non-standards-based classroom the curriculum has no clear achievement targets or standards; activities and assignments stand alone. In a standards-based classroom the assessments are up-front because the teacher wants to know whether students have met the standards. In a non-standards-based classroom assessments are usually designed at the end, if at all. Teachers use multiple ways to assess student understandings of the standards in standards-based classrooms, but in non-standards based classrooms, teachers usually use one assessment, and it is usually not related to standards.

To judge students' performances, teachers use criteria that is given to students in advance, and by having this criteria students can self-assess against performance criteria. Students in a non-standards-based classroom are usually unaware of criteria and wait for the teacher to tell them how they are doing. Lastly, in standards-based classroom the teacher gives specific feedback to

students concerning progress toward standards. In a non-standards-based classroom feedback is typically a score or a grade (Easton, Ryley, Teague, & Van Donselaar, 2000).

The standards-based component of the literature review leads directly into the backward design process of Grant Wiggins and Jay McTighe. Many curricular frameworks have similar components in which curriculum makers use to develop curriculum, but Wiggins and McTighe believed the most effective curricular designs were backward. Wiggins (1997) stated

> The implications of the standards movement require wholesale changes in our habits of instructional design and our curricular frameworks. This view requires that we design courses "backward" from complex tasks and their particular demands that meet high standards for work design, not "forward" from a logic based merely on the arrangement of a textbook or and analytical adult view of subject matter, as is now universally the case. (p. 56)

To conclude this second section, the researcher presents the backward design process and model of <u>Understanding by Design</u>. In this segment the reader is given more background knowledge in the area of curriculum and curriculum development. As in the case of Teaching for Understanding and Standards-Based Education, the reader will note many similarities exist when the information is presented. It was the researcher's intention for the reader to compare and contrast the many different models or designs presented previously in section one and subsequently in section two.

Understanding by Design

Wiggins and McTighe understood the importance of the imposition of standards and assessments and set out to design a procedure for curriculum development that would encourage educators to focus on enduring understanding when designing curriculum; this understanding led to the writing of the book Understanding by Design, a backward design approach to curricular design. The authors expected that by designing curriculum using their approach, educators would use more standard-based teaching as apposed to activity-based instruction where the work is mostly hands on without being "minds on" and coverage-oriented instruction where the teacher merely checks off topics that were covered and moves forward (Wiggins & McTighe, 1998).

"To ensure that learning is more successful and better focused, curricula must be built upon worthy and authentic tasks that provide a rationale for content, skills, and modes of instruction" (Wiggins, 1997, p. 56). The logic of backward design suggests a planning progression for curriculum that incorporates these three stages: (1) Identify desired results; (2) Determine acceptable evidence; and, (3) Plan learning experiences and instruction (Wiggins and McTighe, 1998). The researcher described the three stages in the following paragraphs.

Stage 1. The first stage of the design is called desired results. In this stage the curriculum designer considers four categories; content standards, enduring understandings, essential questions, and knowledge and skill. For the

first category, one or two standards (national, state, or local) that the curriculum is designed to address are identified. Goals of the curriculum must be considered, as well as curriculum expectations.

Typically, there is more content than can possibly be covered in one course. The authors (1998) believed it was important to identify the enduring understandings, the second category of the first stage. Clearly, curriculum developers cannot cover all content areas, so the authors identify three categories that will help establish curricular priorities. The first is to identify knowledge that is *worth being familiar with.* This will be content that students will read, hear, research, view, or encounter. The next category is to specify *important knowledge.* Students will learn facts, strategies, processes, concepts, principles, and methods. This knowledge is often the essentials that are needed for furthering knowledge of the next category, *enduring understandings.* Enduring understanding "refers to the big ideas, the important understandings, that we want students to 'get inside of' and retain after they've forgotten many of the details" (Wiggins and McTighe, 1998, p. 10). Enduring understandings immerse students through design work, extensive investigations, and critiques (Wiggins & McTighe, 1998).

The third category of identifying desired results is essential questioning. Essential questions are those that have no simple right answer; they are intended to lead to more questions which often cross subject boundaries. They "often address philosophical or conceptual foundations of a discipline. . . . They

can naturally and appropriately recur to highlight big ideas and issues, and can effectively provoke and sustain student inquiry" (Wiggins & McTighe, 2002, p. 82). Students often think of subjects as being straightforward. If a teacher provides students with essential questions, subject will not be straightforward at all; in fact, students will begin uncovering points of view, questions, debates, and problems. Essential questions will also guide students toward new understandings, knowledge, and skills (Wiggins & McTighe, 2002).

The last component of the first stage is to identify the key knowledge and skills you want students to know and be able to do. "It can refer to the knowledge and skill stated or implied in the content standards, the building blocks of the desired understandings, or the enabling knowledge and skill needed to perform the complex assessment performance tasks to be identified in Stage 2" (Wiggins & McTighe, 2002, p. 64).

Stage 2. The backward design encourages curriculum developers to think about curricula in terms of the collected assessment evidence needed to document and authenticate that the desired learning in Stage 1 has been achieved (Wiggins & McTighe, 1998). The backward design approach encourages teachers to think like assessors, not activity designers. Stage 2 has three different components: performance tasks, other evidence, and self-assessment. All three are used throughout curriculum development. When planning to collect evidence of understanding, teachers must consider a range of assessment techniques. When the authors speak of evidence of understanding,

they are referring to evidence gathered through various informal and formal

assessments during a course or a unit of study. Wiggins & McTighe (1998)

maintained

> This continuum of assessment methods includes checks for
> understanding (such as oral questions, observations, and informal
> dialogues); traditional quizzes, tests, and open-ended prompts; and
> performance tasks and projects. They vary in scope (from simple to
> complex), time frame (from short-term to long-term), setting (from
> decontextualized to authentic contexts), and structure (from highly
> structured to nonstructured). (p. 12)

Given the focus on understanding, this design emphasizes the use of

performance tasks or projects. These provide students with a greater opportunity

to develop enduring understandings. More traditional assessments like tests and

quizzes help round out the picture by assessing essential knowledge and skills

that contribute to performances (Wiggins & McTighe, 1998).

Stage 3. With clearly identified desired results and assessment evidence

needed to determine the extent to which students have achieved desired results,

educators can now plan specific learning activities. Teachers will address the

specifics of instructional planning (teaching methods, materials, sequence of

lessons, and overall organization) after identifying the desired results and

assessments. The authors believe that having clear goals helps educators

"focus planning and guide purposeful action toward the intended results"

(Wiggins & McTighe, 1998, p. 13).

Several key questions must be considered at this stage of backward

design (Wiggins & McTighe, 1998):

- What enabling knowledge (facts, concepts, and principles) and skills (procedures) will students need to perform effectively and achieve desired results?
- What activities will equip students with the needed knowledge and skills?
- What will need to be taught and coached, and how should it best be taught, in light of performance goals?
- What materials and resources are best suited to accomplish these goals?
- Is the overall design coherent and effective? (p. 13)

Backward design is intended for those interested in improving student

understanding and in designing more effective assessments and curriculum to

promote understanding. The authors suggest using the framework for planning

all curricula: courses, units of study, or lessons. The audience includes teachers

at all levels, especially those who are just beginning their teaching careers.

In this section of the literature review the researcher explained the

background of the backward design framework and the process of developing

curriculum using the backward design. In the next section material is presented

explaining why the six components of domain one, planning and preparation, of

the framework of professional practice for teaching are of great importance for

novice and veteran teachers alike.

A Framework of Professional Practice for Teaching

The purpose of this experimental study was to determine if the backward

design process could be used during preservice teacher education to cultivate

knowledge of content and pedagogy, demonstrate knowledge of students, select

suitable instructional goals, demonstrate knowledge of resources, design coherent instruction, and assess student learning. These are the six components of the planning and preparation tasks of domain one of the framework of professional practice for teaching (Danielson, 1996). In this section of the literature review the researcher presented the importance of each component and why each was used for the framework for teaching, and in turn, why it was used to evaluate the lessons and units for this research study.

Hedges (1989) believed lesson planning was an important component in the teaching process for novice teachers. Lessons help the teacher and the students reach the objectives. Through the use of Danielson's framework, supervisors can evaluate beginning teachers' lesson plans. Incorporating ideas from the framework should be a part of any school district's strategic plan for assessing teacher performance (Wilcox, 1998).

The Center for Professional Teacher Education (CPTE) at the University of Texas at Arlington actually utilize Danielson's framework in their teacher education program. "The faculty recognize the framework as a very thorough collection of research-based information about the complex process of teaching" (Morgan, 1999, p. 3). Teachers in area schools are trained to score preservice teachers using the components of the framework. Feedback from teachers was very positive; they felt they could understand it and it was a great tool. The use of the tool benefited the preservice teachers and the supervising teachers. Preservice teachers learned in what areas they needed to improve and the

supervising teachers gained insight into the art and science of teaching (Morgan, 1999). Morgan (1999) states, "School districts recognize the difference in the preparation of our preservice teachers. The largest district in the area places our new graduates on the pay scale coming in at one year experience level" (p. 6).

The framework for professional practice was founded on the Praxis III: Classroom Performance Assessments criteria developed by the Educational Testing Service (ETS) after extensive surveys of the research literature, discussion with expert researchers and practitioners, wide-ranging job analyses, field work, and summaries of mandates of state licensing organizations. "The Praxis III is a nationally-validated system for licensing novice teachers" (Danielson & Dwyer, 1995, p. 66). It is a system of support, assessment, and feedback for beginning teachers that uses nineteen criteria in four domains to assess multifaceted performance factors. Taken as a whole, the criteria enables state assessors to determine which novice teachers with a provisional license deserve a continuing license (Danielson & Dwyer, 1995).

Danielson's framework for teaching, however, differs from the Praxis III in two important ways: it is intended to apply to the work of all teachers, novice and experienced; and it is designed to be used in professional conversations about self-assessments and peer coaching (Danielson, 1996). The framework divides the complicated act of teaching into four domains: Planning and Preparation, The Classroom Environment, Instruction, and Professional Responsibilities. Each domain consisted of five or six components that could be used for self-

evaluation, for peer coaching, supervision, or evaluation of teaching. For purposes of this study, though, the researcher used the framework to compare the curriculum planning process of the backward design model and a traditional model; therefore, only the planning and preparation domain was utilized. Even though little research has been conducted using the framework, the components have been the focus of many studies. The following research contains information pertaining to the importance of each component of domain one of the framework for professional practice.

Component I: Demonstrating Knowledge of Content and Pedagogy

"A person cannot teach what he or she does not know" captures the essence of why content knowledge is important in teaching (Danielson, 1996, p. 62). A teacher who knows his or her content is more aware of disciplinary connections, methods of inquiry, and outstanding issues. He/she is more likely to ask questions that are of interest to students and yields greater understandings from them. Shulman's work (1987) supports Component I: "We expect teachers to understand what they teach and, when possible, to understand it in several ways. They should understand how a given idea relates to other ideas within the same subject area and to ideas in other subjects as well" (p. 14). He also shed light on pedagogy

> The key to distinguishing the knowledge base of teaching lies at the intersection of content and pedagogy, in the capacity of a teacher to transform the content knowledge he or she possesses into forms that are pedagogically powerful and yet adaptive to the various actions in ability and background presented by the students. (p. 15)

The actions of both teachers and policymakers have been consistent with the conjecture that teaching requires skill, content knowledge, and general pedagogical skills. In 1987, the National Board for Professional Teaching Standards (NBPTS) developed five core principles for accomplished teaching. One of those principles stated, "Teachers know the subjects they teach and how to teach those subjects" (Serafini, 2002, p. 317). The Interstate New Teacher Assessment and Support Consortium developed standards for beginning teachers that were "based on the premise that an effective teacher must be able to integrate content knowledge with pedagogical understanding to assure that all students learn and perform at high levels" (Bidner, 2001, p. 3).

Researchers in specific disciplines were especially dedicated to emphasizing the importance of content and pedagogy. Quinn (1997) wrote, "A strong command of meaningful mathematical content and a positive attitude toward the subject are critical attributes for educators charged with teaching mathematics to children" (p. 1). Niess (2001) wrote of technology, "New, ambitious science and mathematics standards are directing a scientifically and mathematically rich curriculum, in which technology is an essential component of the learning environment, not only in what is taught (the curriculum) but also how it is taught (the pedagogy)" (p. 1). Niess also added, "Knowing the specific content and instructional approach of subsequent lessons has been shown to significantly enhance the quality of the current lesson" (p. 5). Hammadou-Sullivan

(2001) asserted, "Undoubtedly, knowledge of subject matter is a basic prerequisite for foreign language teaching" (p. 1).

In music education Bidner (2001) explained how important it was for music teacher educators to have knowledge of subject matter, but it was only one part of measuring successful teaching. In reading education Reinking, Mealey, and Ridgeway (1993) discussed the importance of teaching pedagogy. The authors believed that the central aim of teaching content area reading courses should be to help preservice teachers not only learn teaching strategies, but how to use those strategies to match specific teaching situations. When teaching science Anderson and Smith (1987) believed teachers should require a sound knowledge of the topic under study. "Teachers must be able to identify the most basic and important principles and organize their knowledge around those, seeing how those principles are related to other ways of understanding the world" (p. 101). Along with teacher's understanding of content to be taught, "The teacher must still make learning take place through the use of appropriate teaching strategies and classroom activities" (p. 101). Certainly, the knowledge of content and pedagogy are important when planning curriculum, as was shown in the literature. Next, the researcher presents the importance of the second component, demonstrating knowledge of students.

Component II: Demonstrating Knowledge of Students

To maximize learning, teachers must know not only content and its pedagogy; they must know their students as well. In this section the researcher

presented Charlotte Danielson's view of knowledge of students and the views of other researchers.

Danielson (1996) believed that teachers' knowledge of their students should include several areas. One of those areas is students' stages of developmental understanding. Each age group has certain developmental characteristics and teachers should understand where their students are emotionally, socially, and intellectually. Another area is understanding what students already know. Each child is actively constructing meaning based on her experiences in school. In order to find out what students already know and understand, the teacher must identify any understandings or misunderstandings that already exist.

Danielson also believed students vary a great deal in their talents, interests, and preferred approaches to learning. Some students are very artistic; others are great with numbers, while others are very talented musically. A skilled teacher builds on these strengths while developing competencies in all areas. Another area teachers need to be aware of is students' out-of-school knowledge of everyday events, activities, and interests. Students bring to school parents' opinions as well as misunderstandings. Such out-of-school experiences provide valuable material for teachers when they design learning experiences for their students. Lastly, Danielson believed that students come to the school environment with cultural characteristics that influence how they participate in classroom learning, see the world, and grasp new information. It is the

responsibility of teachers to demonstrate knowledge of their students and to use

that information when planning and preparing curriculum.

The importance of becoming familiar with students' knowledge is also the

focus of other research and writing. Sykes and Bird (1992) maintained

> There has been an explosion of research on students' prior knowledge
> around children's conceptions of mathematics or scientific concepts – of
> school knowledge and skills in general. This work strongly demonstrates
> that prior conceptions exert a powerful hold and are difficult to alter.
> Contemporary instructional aims include inducing conceptual change as a
> central preoccupation. (p. 28)

Floden, Buchmann, and Schwill (1987) had similar thoughts about "relationships

with prior knowledge" (p. 495). These authors felt teachers need to take into

account what students already know about subject matter as well as the

experiences and knowledge they bring with them. Golland (1998) emphasized

the importance of pre-assessment as being an explicit part of the planning

process when finding out what students already know in each curricular area.

Anderson and Smith (1987) affirmed, "teachers must combine knowledge of

content with knowledge of students' misconceptions to construct learning goals"

(p. 101).

The American Federation of Teachers (1990) claimed certain activities

should occur during the planning and preparation process. Teachers should,

"understand students' cultural backgrounds, interests, skills, and abilities as they

apply across a range of learning domains and/or subject areas; understand

students' motivations and their interests in specific class content" (p. 30). Patrick

and Reinhartz (1999) also believed teachers should understand students' distinct

backgrounds. They assert, "Educators in America will need to respond to the challenge of designing a learner-centered school curriculum which is relevant and meaningful to children from diverse backgrounds" (p. 2).

Previously, Danielson mentioned the importance of knowing students' preferred approaches to learning. Howard Gardner was the individual who initially developed the notion of different approaches to learning, or what he calls multiple intelligences. Gardner believed certain features characterize the learning of the vast majority of students. "Students possess different kinds of minds and therefore learn, remember, perform, and understand in different ways" (Gardner, 1991, p. 11). It is vital for teachers to understand in which of the seven intelligences students learn best: linguistically, musically, logically, spatially, kinesthetically, interpersonally, or intrapersonally (Gardner, 1983; Gardner, 1991).

Research showed the importance of teachers being able to demonstrate knowledge of their students. It is also essential for teachers to make sure teaching is a purposeful activity. The next section of the planning and preparation domain discusses the teacher's need to design well-defined purposes or goals.

Component III: Selecting Instructional Goals

In general, it is a teacher's responsibility to establish instructional goals. When teachers institute instructional goals, they must take into account a number of factors: a district's curriculum; national, state, and local standards; external

mandates; and community expectations (Danielson, 1996). In selecting goals, teachers ought to consider the value of what they introduce to students. Not all material in a discipline is worth learning. Goals must be worthwhile and represent learning vital to a discipline.

Danielson (1996) believed "goals are clear and stated in terms of student learning rather than student activity" (p. 68). They should be capable of assessment and must be appropriate for the diverse needs of the students. Danielson (1996) also believed that goals should reflect a balance among different types of learning and understanding. Some represent social skills, reasoning skills, and problem solving skills. Others may represent factual knowledge or conceptual understanding. A variety of goals should be in place throughout a unit to reflect a balance.

The importance of clear learning goals was well documented in other research literature. Studies by Brophy and Good (1986) and Walker (1985) emphasized the important link between effective teaching and learning and the teacher's development of learning goals that are appropriate for a diverse group of learners. Golland (1998) stated, "All lessons must have an aim, purpose, or objective" (p. 1). He and others (Berliner & Rosenshine, 1987; Druian & Butler 1987; Panasuk & Sullivan, 1998) stressed the importance of writing clear objectives in order to get successful learning outcomes. Specific goals and objectives are what drive the lesson, its activities, and its evaluation process (Natriello, 1987).

The U.S. Department of Education (1987) developed a set of recommendations regarding effective teaching. One such recommendation addressed the importance of goal setting: "Teachers who set and communicate high expectations to all their students obtain greater academic performance from those students than teachers who set low expectations" (p. 35).

All the research conducted on teaching for understanding emphasized the importance of formulating specific or overarching goals that are focused on fundamental questions and ideas in the curriculum (Perkins, 1992; Perkins & Blythe, 1994; Perrone, 1994; Simmons, 1994; Wiske, 1993). Earlier, in the research pertaining to standards, every piece of research cited, planning and preparation should begin with standards, which are the goals of what children should know and be able to do (Falk, 2000; Goals 2000, 1998; Marzano, 2000; Marzano & Kendall, 1996; Turnbaugh-Lockwood, 1998; Wiggins, 1997).

Teaching is a purposeful activity – it is goal directed. The successful outcome of a unit or lesson is dependent upon the teacher's ability to establish instructional goals. The researcher has shown the importance of beginning any curriculum planning process with a standard, goal, purpose, or an objective. In the next section the researcher presents information related to the importance of demonstrating knowledge of resources.

Component IV: Demonstrating Knowledge of Resources

Danielson (1996) considered knowledge of resources an important component in the planning and preparation process. Resources are anything a

teacher utilizes in her classroom that assist in teaching and help students. Some examples are textbooks, materials from local businesses, museums, concert performances, internet materials, purchased or homemade items, guest speakers, or other human resources. When teachers are knowledgeable of a wide range of resources, they can expand their instructional goals, learning activities, and performance assessments (Danielson, 1996). When using a variety of resources, teachers can help students realize their full potential.

Peterson, Marx, and Clark (1978) and Evertson and Brophy (1980) discussed the importance of using a variety of materials and resources to improve student achievement. O'Shea (2002) agreed with the authors. He stated

> Student performances that meet standards will not come from continued reliance on worksheets, word searches, matching exercises, and puzzle activities. It is up to teachers, working collaboratively, to supplement or enhance publishers' materials in order that students will be able to provide the performances and products that meet standards. (p. 3)

These are a few authors who argue for the link between effective instruction, learning activities, and selection of appropriate teaching materials. The next section presents material related to component five of the planning and preparation domain, designing coherent instruction.

Component V: Designing Coherent Instruction

A teacher converts instructional goals into experiences of understanding for students through the design of instruction and learning experiences. A significant element in instructional design is the creation of a series of learning activities and experiences. This arrangement should be logical and the activities

should be suitable for students in terms of their prior knowledge, age, interests, and approaches to learning (Danielson, 1996). The materials and resources chosen for the activities should visibly support instructional goals. Current research as reported in professional journals should guide teachers in areas of new methodologies and teaching strategies. This allows for greater coherency in planning and instruction.

Danielson (1996) also considered coherent instruction to be a well-defined structure. "Individual activities support the whole. . . . Topics from one part of the unit are connected with others" (p. 73). Planning for coherent instruction involves connection between clearly defined goals, instructional activities, and assessment. When students perform poorly on post-instruction assessments it generally suggests inadequacies in the instructional sequence. "In such instances, instructional plans should be modified so that in subsequent attempts to accomplish those objectives, better progress can be made" (Popham & Baker, 1970, p. 17).

Smith (1985) discovered that students rate teachers higher and learn more when they understand how all the components of a lesson are interrelated. Armento (1977) showed that students learn better when instruction is logically sequenced. The Presidential Task Force on Psychology in Education and the American Psychological Association (1993) developed twelve psychological principles that pertain to the learner and the learning process. The second principle stated, "The learner seeks to create meaningful, coherent

representations of knowledge regardless of the quantity and quality of data available" (p. 6).

Mabry (1993) also stressed the importance of coherent instruction. She asserted, "Simply allowing assessment to happen without attention to purpose, without sensitive matching of assessment strategy to information needs and contexts, can result in frustration, time-consuming effort without the desired recompense" (p. 41). Lezotte (1997) agreed with Mabry, "The alignment of the intended and assessed curriculum set the brackets, and the instruction delivery system must fit inside those brackets" (p. 25).

The evidence is clear; designing coherent instruction is of great importance when planning and preparing curriculum. Lezotte (1997) summarized instructional coherence succinctly: "The issue of instructional alignment rests on one of the best-kept secrets in American public education: Students do tend to learn those things they are taught" (p. 25).

The final component of the planning and preparation domain is assessing student learning. In this section the researcher presents the importance of using a variety of assessments when planning curriculum.

Component VI: Assessing Student Learning

In 1987, the American Federation of Teachers, the National Council on Measurement in Education, and the National Education Association (1990) began working on the development of standards for teacher competence in student assessment. By establishing standards, "the associations subscribe to

the view that student assessment is an essential part of teaching and that good teaching cannot exist without good student assessment" (p. 30). Each standard that follows is an expectation for assessment knowledge that teachers should possess. The seven standards that the associations developed follow:

> (1) Teachers should be skilled in choosing assessment methods appropriate for instructional decisions; (2) Teachers should be skilled in developing assessment methods appropriate for instructional decisions; (3) Teachers should be skilled in administering, scoring, and interpreting the results of both externally-produced and teacher-produced assessment methods; (4) Teachers should be skilled in using assessment results when making decisions about individual students, planning teaching, developing curriculum, and school improvement; (5) Teachers should be skilled in developing valid pupil grading procedures which use pupil assessments; (6) Teachers should be skilled in communicating assessment results to students, parents, other lay audiences, and other educators; and, (7) Teachers should be skilled in recognizing unethical, illegal, and otherwise inappropriate assessment methods and uses of assessment information. (pp. 31,32)

Only through the assessment of student learning will teachers know when and if students have met the goals of a lesson or unit (Danielson, 1996).

Danielson (1996) believed there are several requirements of a design for assessing student learning. One is that each goal can be assessed in some way. Another is that a well-designed assessment is clear about how work will be evaluated. The students should know on what criteria they would be evaluated; there should be no surprises. Ideally, assessments should reflect authentic, real-world applications of knowledge and understanding. Last of all, assessments can be used to provide feedback to students, allow teachers to reflect on teaching, and help them plan for future lessons.

Other researchers have had similar ideas regarding assessment. Porter and Brophy (1987), Reynolds (1992), Walker (1999), and Zigmond, Sansone, Miller, Donahoe, and Kohnke (1986) all believed that effective teachers plan goals and assessments simultaneously. Student assessments tell whether the instructional goals are being met.

A theme in the latest calls for school reform is the need to integrate alternative types of assessment. Proponents of authentic assessment contend that it is a more valid way to measure student performance (Darling-Hammond, 1994). Authentic assessments are assessments where more valid inferences can be made about a student (e.g., students actually write for and publish a school newspaper as opposed to taking a test about the procedures of publishing a newspaper). When well designed, properly implemented, and aligned with curriculum, alternative assessments are alleged to be an authentic indicator of student performance because they closely resemble real-life (Bol, Stephenson, & O'Connell, 1998). McConney and Ayers (1998) emphasized how student teachers assess students will make a difference in their performance, "Only assessment aligned with instruction and responsive to students' individual needs and learning styles will provide the formative information necessary for the teacher to adjust instruction effectively and the summative information to determine if all students attain the learning standards set" (p. 2).

Planning for a variety of assessments to use during lessons and units is an essential component of effective teaching. During the planning and

preparation stage of curriculum development is when assessments should be designed, not as an afterthought or filler at the end of a lesson. Terence Crooks (1988) stated, "The primary conclusion is that classroom evaluation has powerful direct and indirect impacts, which may be positive or negative, and thus deserves very thoughtful planning and implementation" (p. 438).

The researcher has presented information that reflects the views of many researchers in the field of effective teaching in the planning and preparation domain. In the next section, the researcher presents information related to how well preservice teachers are prepared to handle the six components of domain one. This, in turn, will help the researcher discover whether her findings are similar to those of the research.

Current Preservice Teacher Preparation Practices

As mentioned earlier, the researcher intended to discover how the use of the backward design model compared to the traditional models when preservice teachers plan curriculum. Danielson (1998) listed six key components that effective preservice and inservice teachers use when planning and preparing to teach. It is important to determine if research shows that preservice teachers are prepared to cultivate knowledge of content and pedagogy; demonstrate knowledge of students; select suitable instructional goals; demonstrate knowledge of resources; design coherent instruction; and assess student learning in unit and lesson planning. The research literature on preservice

teacher planning and preparation is not sufficiently mature; however, the

researcher will present material available related specifically to the planning and

preparation domain.

Clark and Yinger (1979) published their research concerning teacher

planning. They revealed several results:

- o Learning objectives are seldom the starting point for planning. Instead, teachers plan around their students and around activities.
- o Teachers tend to limit their search for ideas to resources that are immediately available, such as teacher additions of textbooks, magazine articles, films, and suggestions from other teachers.
- o The most common form of written plans was an outline or list of topics to be covered, although many teachers reported that the majority of planning was done mentally and never committed to paper.
- o Planning seems to operate not only as a means of organizing instruction, but also as a source of psychological benefits for the teacher. Teachers reported that plans gave them direction, security, and confidence. (p. 15)

Wiggins and McTighe (1998) and Black (2001) report similar findings about

activities. Many teachers begin planning lessons and units by using activities.

The student's role is to merely participate in fun activities without having to

demonstrate what they understand. Taylor (1970) established that inservice

teachers most often began planning with the context of teaching, next considered

learning situations likely to motivate students, and then considered the purposes

of their teaching. Zahorik (1975) found that the kind of decision made most often

by teachers in the planning process concerned student activities. The decision

made first was the content, followed by learning objectives. Goodlad, Klein, and

Associates (1974) found some teachers were primarily concerned with "coverage of certain material" (p. 78).

Popham and Baker (1970) generated a self-instruction program that provided a set of competencies that can be employed by teachers when making instructional decisions. They found in their research that teachers who have little or no training in developing objectives, established objectives which were not tied closely to either assessments or learning experiences. Bol and Strage (1996) also found, in a study of biology teachers, that assessment practices did not support goals of the class.

About one-third of classroom teachers' time is spent assessing and evaluating students. It is unfortunate that an estimated one-half of currently practicing teachers have had inadequate training in assessment and measurement (Gullickson & Hopkins, 1987; Marzano & Kendall, 1998; Stiggins, 1991; Wise, Lukin & Roos, 1991). Farr and Griffin (1973) found teachers are not being taught what they need to know about assessment in order to be effective teachers. Even those teachers who did receive adequate training often rely on workshops, graduate courses, or trial and error to become better informed in the area of assessment and measurement (Wise, Lukin & Roos, 1991). This data is somewhat troubling because of our growing emphasis on outcomes and meeting state and local standards. In a study of preservice teachers' assessment knowledge, Campbell and Evans (2000) found that when planning lessons, preservice teachers "were unable to explicitly document the association between

curriculum goals, instruction, and student achievement" (p. 6). Also, the preservice teachers were unable to write observable instructional goals, preventing a link between assessment and instruction.

Richardson-Koehler (1987) presented her research related to the improvement of science teaching. She felt improvement of science teaching should start with teacher educators. "They can help students to understand the relationships among content knowledge, the processes of student learning, and pedagogical techniques" (p. 107). She also believed that there has been a great deal of research done of how students understand science, but this information is locked away in professional journals that teachers seldom read. Lastly, Patrick and Reinhartz (1999) maintained that the largely monocultural preservice teacher population is not prepared to address the diversity issues because of the curricular demands of preservice teacher preparation, but this issue could be diminished through field-based experiences.

There are several areas of preservice teacher education in which preservice teachers could be more skilled. Students are lacking in their ability to develop observable instructional goals and objectives. When goals and objectives were developed, they were not always aligned with instruction and assessment. Assessment knowledge is another area where preservice teachers are inexperienced. Teachers don't feel they were prepared for the demands of the variety of assessments with which they are faced. Preservice teachers are not prepared to teach in multicultural environments or to meet the needs of all

students. In conclusion, there are gaps in the planning and preparation domain of teacher education programs. The researcher wants to discover whether the backward design, when taught in teacher preparation programs, is able to fill some of the gaps mentioned. Does the design teach preservice teachers in the area of planning and preparation as suggested by Danielson (1996)?

Summary

Research on curriculum design models has failed to compare curricular design processes. Researchers have presented new curricular ideas and models repeatedly throughout this past century. They regularly offer reasons a particular model is better than others, or why they have changed an existing model to make it more effective. What they have not done is provided data that tells the reader or user, in which areas of curriculum development their design is of most value, especially those areas presented by Danielson (1996) in the planning and preparation domain. Without comparing curriculum models in the planning and preparation stage of teacher preparation, it will be difficult to adequately prepare preservice teachers for the task of curriculum development.

Based on preliminary work, there is a need to compare different curriculum design models: the traditional approach, which is the process of designing curriculum using models similar to the Taba or Tyler models, and the backward design model which was presented previously in the chapter. By comparing the two designs in the six areas of planning and preparation, teacher

educators will be able to identify which model would best fit their teacher education program. This research attempted to fill this gap by identifying preservice teacher training needs previously overlooked.

CHAPTER 3

RESEARCH METHODOLOGY

Introduction

This chapter describes the research methodology used to determine if lesson and unit plans developed by elementary preservice teachers using the backward design process differed from lesson and unit plans developed by elementary preservice teachers using a traditional model. The chapter begins by describing the elementary education program from which the sample was taken. Next, the sample of the study will be described in greater detail. Following this, the researcher presents the instrument, research design, and the analysis strategy. The chapter concludes with the researcher's time frame for the study.

Population

The population for this study included all elementary education majors enrolled at Montana State University (approximately 400). The Teacher Education Program at Montana State University (MSU), Bozeman offers National Council for Accreditation of Teacher Education (NCATE) accredited Bachelor of Science degrees leading to Montana Teacher Certification for both secondary and elementary education majors (Thomas, 2000). The elementary education program enrolls over 550 students at any given time and graduates approximately 100 students per year (Office of the Registrar, 2001). Admission

to the Teacher Education Program occurs as students finish specified university core classes and their file review. File review includes completing an application, a written document pertaining to experiences with children, an earlier sample of written work, a minimum GPA of 2.5, a 20-minute spontaneous written response to a prompt, and scores from the Pre-Professional Skills Test (PPST). The PPST is a standardized achievement test required for students at Montana State University who want to become licensed teachers. For most candidates, official admission occurs in their fifth or sixth semester at MSU.

The majority of students in the elementary education program are Montana residents (82%), who entered the university the fall semester immediately following their high school graduation. A minority (18%), however, are over the traditional age of 25, 98% are Caucasian, and a small minority (2%) are American Indian (Thomas, 2000).

Beginning the spring term 2002, the researcher sought to determine whether students in EDEL 401, Educational Planning and Management, were planning units and lessons effectively. At that time, the researcher was using a combination of the Taba and Tyler models to educate students about lesson and unit planning. She then read of a model called "backward design" that emphasized the need to align standards, assessments, and learning instruction. In April of the same semester, the researcher attended a workshop that trained participants in the process of developing curriculum using backward design. At that point, the researcher wanted to compare the traditional method she had

been using and the backward design model to determine which was better suited for the teacher education program at Montana State University.

Each semester, the Department of Education offers two sections of EDEL 401, Educational Planning and Management, for elementary education majors. "Educational Planning and Management is an introduction to instructional planning (lesson and unit planning,) classroom management and organization, and working with parents" (Montana State University Bulletin, 2000-2003, p. 239). The class enrollment for each section of EDEL 401 is approximately 30 students who are in their senior year of the elementary education program. The researcher collected lesson plans and unit plans from students who attended two different sections of EDEL 401. One section was the experimental group, which was taught using the backward design method in the fall semester of 2002. The other section was the control group. The lesson and unit plans taken from this section were developed using a traditional model, before the researcher was educated in the backward design process, spring semester 2002.

Each semester the students in EDEL 401 take this course in conjunction with methods courses and their paraprofessional experiences. A paraprofessional is a preservice teacher who is taking courses for half of the day and learning and teaching in the local school district the other half of the day. Each student in EDEL 401 submitted two lesson plans they taught while they were in their classroom assignment. Students in both the control and the experimental groups were taught how to prepare and present each component of

a lesson during the first four weeks of class. Most of the EDEL 401 students learned how to develop an entire lesson plan before they had to develop and teach a lesson. In a few situations, students did not receive the final instruction on lesson planning (how to conclude a lesson and determine extension activities) because they were required to teach before that instruction took place. Students in this situation who wanted to make changes to lesson plans after they were taught, were encouraged to do so. Lesson plans were not collected until everyone had been instructed in lesson planning and one lesson had been taught. In all instances lesson plans were designed in conjunction with lessons that were actually taught during the paraprofessional experiences. Therefore, most students received input from their cooperating teacher as to what topic would be taught for the lesson. In most instances, the preservice teachers (EDEL 401 students) developed the lessons on their own. Many students were able to find useful materials in their classrooms and on the internet.

Sample

Ideally, the sample the researcher would have liked to use for this study would have been all preservice teachers. Of course, this was not practical or feasible, so the researcher chose a more accessible population. The subjects of the study were students who took one of two sections of EDEL 401, Educational Planning and Management. These students were of all ages and were listed as juniors or seniors on the course registration list. In the control group, 94% of the

students were female and 6% were male. In the experimental group, 72% were female and 18 % were male. Montana State University often gets students who are older, coming back for a second degree or just completing their first degree. These students are considered nontraditional students. In the control group, 13% of the students were nontraditional students, 25 years of age or older, and 87% were traditional students, 24 years of age and younger. In the experimental group, 28% were nontraditional students and 72% were traditional students. In the experimental group, 2% of the students had another degree. There were no students in the control group with another degree. Prior to taking EDEL 401, students in both groups mentioned having to prepare lesson plans in several classes; therefore, both groups had some lesson and unit planning background knowledge. They were also taking methods courses that required them to develop lesson and unit plans.

Because of time constraints, the researcher used a nonrandom-convenience sample. Having one class as a control group and the other as the experimental group lessened sampling bias. Students were assigned to be in either section one or section two; they did not self-select. For this research, there were 59 preservice teachers participating with 31 students in the control group and 28 students in the experimental group. These participants were asked to develop two lesson plans and one unit plan for this course. One group was taught lesson and unit planning using a traditional model that was in the education department for several years (control group), and the other group

learned how to develop lessons and units using the backward design method (experimental group).

Independent Variable

For the purpose of this study the independent variable was curriculum design, which was divided into two groups. The first group, called traditional, included all lesson and unit plans designed by preservice teacher who were taught in a traditional manner. The second group, backward design, included all lesson and unit plans designed by preservice teachers using the backward design model. Thirty-one elementary education students were taught by a traditional approach and 28 were taught curriculum development using the backward design model.

Dependent Variables

The dependent variables in this study were the components of the Planning and Preparation Domain as described by Danielson (1996). There were six dependent variables associated with the performance aspects of lesson and unit planning: demonstrating knowledge of content and pedagogy, demonstrating knowledge of students, selecting instructional goals, demonstrating knowledge of resources, designing coherent instruction, and assessing student learning.

Instrument

The instrument used for this study came from the book Enhancing
Professional Practice: A Framework for Teaching by Charlotte Danielson. It is
considered a professional practice framework that contains four domains. For
the purpose of this study, domain one, planning and preparation, was utilized.
Domain one contains six components, and each component was scored using
levels of performance or a rating scale (see appendix A). This form of rating
scale provided descriptions of performance and asked the reviewer to check the
most appropriate description. The researcher chose two experts in the field of
lesson planning and curriculum development and had them appraise each lesson
(114) and unit plan (39) using the framework of the planning and preparation
domain.

The framework used measured the six components with a rating scale for
each criteria of each individual component. For example, the first component,
demonstrating knowledge of content and pedagogy, was based on three criteria:
knowledge of content, knowledge of prerequisite relationships, and knowledge of
content-related pedagogy. Each criterion was measured using a rating scale:
one (1) signified an "unsatisfactory" rating; two (2) represented "basic"
knowledge; three (3) denoted a "proficient" level of understanding in the specific
criteria; and, four (4) represented a "distinguished" rating on the rating scale (see

appendix A). Danielson (1996) distinguishes between the four levels of performance:

- o Unsatisfactory: The teacher does not yet appear to understand the concepts underlying the component
- o Basic: The teacher appears to understand the concepts underlying the component and attempts to implement its elements. But implementation is sporadic, intermittent, or otherwise not entirely successful.
- o Proficient: The teacher clearly understands the concepts underlying the component and implements it well.
- o Distinguished: Teachers at this level are master teachers and make a contribution to the field, both in and outside their school. (pp. 36-37)

The next component, demonstrating knowledge of students, was divided into four elements or criteria: knowledge of characteristics (social, intellectual, and emotional) of age group; knowledge of students' varied approaches to learning; knowledge of students' skills and knowledge; and, knowledge of students' interests and cultural heritage. Selecting instructional goals was the third component. This component was also divided into four elements. The first was value, which meant goals represented high expectations for students and clearly reflected important learning and conceptual understandings, curriculum standards, and framework. Clarity was the next element. For clarity, goals were clearly stated as student learning and permitted sound assessment. Suitability for diverse student recommended that goals reflected the needs of all students in class. Lastly, balance indicated goals represented opportunities for different types of learning – for example, thinking as well as knowledge – and coordination or integration within or across disciplines.

For the fourth component, demonstrating knowledge of resources, there were two criteria: resources for teaching and resources for students. The researcher and the evaluators chose to combine the two because preservice teachers are encouraged to list all materials and resources together. Designing coherent instruction, the fifth component, included four criteria: learning activities, instructional materials and resources, lesson and unit structure, and instructional groups. For the final component, assessing student learning, Danielson listed three elements: congruence with instructional goals, criteria and standards, and use for planning. Again, each element was rated on a level of performance from one to four.

Validation

The instrument used in this study was taken from a book, Enhancing Professional Practice: A Framework for Teaching by Charlotte Danielson. "The framework for professional practice is based on the PRAXIS III criteria developed by Educational Testing Service (ETS) after extensive surveys of the research literature, consultation with expert practitioners and researchers, wide-ranging job analyses, summaries of the demands of state licensing programs, and field work" (Danielson, 1996, p. 120). Danielson (1996) acknowledged the other

research that influenced the development of the framework

> . . . documents from the standards committees of the National Board for Professional Teaching Standards (NBPTS); work at the University of Wisconsin (Newmann, Secada, and Wehlage, 1995); Michael Scriven's (1994) conceptions of teacher duties; and recent research on the pedagogical implications of constructivist learning. ETS colleagues have subjected the framework to a further intensive review as well. (p. 7)

Other extensive content validity research was also presented in section three of the literature review.

To verify if this framework provided a useful instrument for this study, the researcher chose experts in the field of curriculum development and backward design to examine the instrument for content and construct validity. The experts, professors at Montana State University and a presenter at the Understanding by Design workshop, stated it would be a suitable instrument for the study.

The researcher was concerned about threats to internal validity because the two courses were not taught during the same semester. The possible threat, history effects, refers to events that occur during the course of the program. However, the researcher felt the control group would be taught differently, not solely in a traditional manner, by teaching both courses at the same time, after having attended the workshop. By teaching the control group before the researcher had any training in the backward design process, and by teaching the experimental group after the training occurred, the researcher attempted to eliminate any invalidity.

To control for selection effects, effects of differences in composition of control and treatment groups, the researcher assumed students in both sections

of EDEL 401 had learned very similar content and had the same prerequisite courses. The National Council for Accreditation of Teacher Education (NCATE) accredits the Teacher Education Program at Montana State University. "NCATE provides assurance to the public that the graduates of accredited institutions have acquired the knowledge, skill, and dispositions necessary to help all students learn" (NCATE, 2002, p. 1). As defined by accreditation procedures and documents, the Teacher Education Program at Montana State University is stable in content and format; and teacher preparation and development is seen as a continuum and a diverse, well planned, and sequenced experience (NCATE, 2002). Therefore, composition of both the control group and the experimental group should have been similar.

During the summer session of 2002, a pilot study was conducted. The enrollment of the summer session EDEL 401 class was nine students. The researcher, after having attended an Understanding by Design workshop, taught lesson and unit planning using the backward design knowledge gained and information provided at the workshop. The researcher used the pilot study to help determine the best possible method of presenting the material to students for the backward design process. In the pilot study, the researcher found some of the materials redundant; therefore, some handouts were not used. The researcher also found she was not teaching the stages as in-depth. Because of this, the researcher modeled more effectively and included more detailed

examples of each stage of the backward design process when she taught the experimental group.

The researcher also controlled for possible biases. "Active experimenter bias effects occur when the researcher's expectations of the study results affect her behavior and the research outcomes. Knowing which students are in the control and experimental groups may cause the researcher to unintentionally evaluate their performances differently" (Gay & Airasian, 2000, p. 381). To control for this type of bias, the researcher had two outside people score lessons and units using the framework. One person chosen to evaluate the lesson and unit plans had a doctorate in Curriculum and Instruction and had previously taught EDCI 401. She had extensive background in lesson and unit planning evaluation and knowledge of standards and curriculum development. The second rater was a former teacher and content specialist. This rater had extensive background in all areas of the elementary school curriculum. The two reviewers conducted blind evaluations on every lesson and unit plan. The lessons and units were coded in a fashion known only to the researcher.

Reliability

Danielson (1996) based her framework on the work she did with ETS and the development of a training program for the assessors of PRAXIS III. Throughout the pilot and field-testing of the instrument and training program, the rates of interrater agreement were high. In other words, when two or more

independent scorers rated the preservice teachers' skills and performances, the scores were very similar. During the pilot of this study, the researcher also conducted similar tests. Two experts in the area of lesson and unit development both rated four lesson plans using the planning and preparation framework.

Item analyses assessing multiple constructs were used to determine the reliability coefficients of the instrument. The purpose of this test was to determine internal consistency, the extent to which the items in a test are similar to one another in content, of an instrument that uses rating scales. Internal consistency is a commonly used form of reliability among the items in a single test. "Because internal consistency approaches require only one test administration, sources of measurement errors, such as differences in testing conditions, are eliminated" (Gay & Airasian, 2000, p. 173).

Item analyses were conducted on the six components hypothesized to assess domain one, the planning and preparation practices of teachers. Each component was correlated with its own scale. Coefficient alphas for five of the six components of domain one follow: demonstrating knowledge of content and pedagogy was .83; demonstrating knowledge of students was .78; selecting instructional goals was .93; designing coherent instruction was .91; and, assessing student learning was .81. Demonstrating knowledge of resources was not correlated individually because there was only one question. The researcher expected high reliability for the instrument used in this study.

To test for interrater reliability, the researcher used the Pearson product-moment correlation coefficient (r). The data file for this analysis included scores from both raters. Each of the six components of the rating framework was correlated separately. The correlation between the two raters for the component demonstrating knowledge of content and pedagogy was significant, $r(150) = .89$, $p < .001$. The correlation between the two raters for the component demonstrating knowledge of students was significant, $r(150) = .87$, $p < .001$. The correlation between the two raters for the component selecting instructional goals was significant, $r(150) = .90$, $p < .001$. The correlation between the two raters for the component demonstrating knowledge of resources was significant, $r(150) = .84$, $p < .001$. The correlation between the two raters for the component designing coherent instruction was significant, $r(150) = .87$, $p < .001$. Lastly, the correlation between the two raters for the component assessing student learning was significant, $r(150) = .94$, $p < .001$.

Research Design

This study employed a quasi-experimental posttest-only control group design to compare two methods of curriculum development, the traditional model and the backward design model, when used with preservice teachers in the Montana State University Elementary Teacher Education Program. Sometimes it is not possible to randomly assign individual participants to groups. Thus, in this research study, entire classrooms, not individuals were assigned to treatments.

These designs are referred to as quasi-experimental designs. For the posttest-only design, classes are chosen and exposed to different treatments, and then posttested (Gay & Airasian, 2000). In this study, the researcher taught curriculum development using two different designs. The experimental group received instruction taken from Wiggins' and McTighe's book and workshop Understanding by Design, and the control group received instruction that was more traditional, prior to the researcher attending the Understanding by Design workshop. The posttest was a framework designed to analyze the lesson and unit plans developed in the two treatment groups; it included six components of the planning and preparation domain of Danielson's (1996) framework for teaching.

Analysis Strategy

To compare the backward design curriculum development process to the traditional design, the researcher compared mean scores of lesson and unit plans developed by elementary preservice teachers in the experimental group and the mean scores of lesson and unit plans developed by elementary preservice teachers in the control group. The researcher chose the one-way MANOVA because it evaluates whether the population means on a set of dependent variables vary across levels of a factor or factors (Green, Salkind, & Akey, 2000). MANOVA is a multivariate extension of analysis of variance (ANOVA). "As with ANOVA, the independent variables for a MANOVA are

factors, and each factor has two or more levels. Unlike ANOVA, MANOVA includes multiple dependent variables rather than a single dependent variable" (Green, Salkind, & Akey, 2000, p. 198).

A one-way MANOVA measures a single factor that distinguishes participants into groups and two or more quantitative dependent variables. In this research the single factor was curriculum design. The groups included lesson and unit plans developed by elementary preservice teachers who were taught curriculum design using a traditional model and lesson and unit plans developed by elementary preservice teachers who were taught using the backward design model. The dependent variables were demonstrating knowledge of content and pedagogy, demonstrating knowledge of students, selecting instructional goals, demonstrating knowledge of resources, designing coherent instruction, and assessing student learning. Multiple ANOVAs were conducted to assess whether there were differences among groups on the population means for the six dependent variables. The ANOVA evaluated whether the group means on the dependent variable differed significantly from each other.

Some researchers argue that rating scales are nominal, not interval data, and should be analyzed using only non-parametric statistics. Others argue that many parametric tests for scaled data are sufficiently "robust" to be used with rating scales. Suskie (1996) asserted

> Robust means that, while these statistical analyses assume that the data
> are scaled, using interval data will not change the results significantly. . . .

If you expect someone to challenge you on your analysis choice, do both analyses, parametric and non-parametric. If you get the same results, report the parametric results with a clear conscience. (p. 35)

The researcher conducted both the MANOVA (parametric test) and a two-way contingency table using crosstabs (non-parametric test). A contingency table analysis evaluated whether the proportions of individuals in the dependent variables were the same for all populations (i.e., for all levels of the independent variable). A one-way MANOVA measured a single factor that distinguished participants into groups and two or more quantitative dependent variables and the six quantitative dependent variables. Results were the same.

The researcher also conducted one-way ANOVAs (parametric tests) and one-sample chi-squared tests (non-parametric tests) on each of the dependent variables and found the same results. The ANOVA tests evaluated whether the group means on the dependent variable differed significantly and the chi-squared tests evaluated whether the proportions of the individual dependent variables associated with the populations of the independent variable were significantly different. The researcher chose the MANOVA and ANOVAs as the analyses utilized in this study.

The alpha level of .05 was set before collection of data took place. This level was adopted instead of a more conservative 0.01 because it is hard to imagine any harm that could be done to preservice teachers by advocating one area of curriculum instruction over the other even if no measurable advantages existed. That is to say, a Type I error (rejecting the null even though it is true)

could not possibly have serious negative effects. The researcher was more concerned about the possibility of making a Type II error (failing to reject the null even though it is false). Doing so would mean that teacher educators missed the opportunity to develop instruction that helped students be better prepared in the area of planning a lesson. To control for Type I errors across the multiple ANOVAs, the researcher chose the traditional Bonferroni procedure and tested each ANOVA at the 0.0083 level (0.05 divided by the number of ANOVAs conducted).

Limitations

1. One limitation of the study was that selection of the subjects was limited to the population of all elementary education students at Montana State University.

2. Another limitation of the study was that students were not randomly assigned to the two treatment groups by the researcher. The office of the registrar determined which students attended which EDEL 401 section.

3. The third limitation of this study was that not all students took their preservice education courses at Montana State University. The students who have taken all of their courses at Montana State University took them during different semesters with different instructors; therefore, the background and experiences of instructors were not exactly the same.

4. Another limitation of this study was that when comparing the two curriculum designs the comparison was limited to the six components of

Danielson's framework. Other components might have been just as important, but were not utilized.

Delimitations

1. The independent variable of the study (the control group and the experimental group) would not be the only one that affected statistical data analysis knowledge, nor would it be the most significant variable.

2. The study was conducted spring and fall semesters of 2002 at Montana State University – Bozeman.

3. The study was limited to the unit and lesson plans developed by EDEL 401 students enrolled in the spring and fall semesters of 2002 at Montana State University - Bozeman.

Timeframe

October	Send proposal into Human Subjects Committee
December	Proposal meeting
December	Collection of data
December	Data analysis using Danielson's Framework
January	On-going data analysis
February	Chapter IV to committee to make revisions
March	Full dissertation to committee for final revisions
April	Dissertation Defense
May	Graduation

Summary

When preservice teachers develop lesson and unit plans using the backward design model, how do those compare with lessons and units developed using traditional models? The purpose of this experimental study was to compare the backward design process of developing curriculum with the traditional process in six areas: cultivating knowledge of content and pedagogy, demonstrating knowledge of students, selecting suitable instructional goals, demonstrating knowledge of resources, designing coherent instruction, and assessing student learning, components of planning and preparation tasks required of beginning teachers (Danielson, 1996). The researcher desires that information obtained in this study can be used to guide teacher educators in their manner of teaching preservice teachers.

Chapter three has detailed the methodology to be used in this study, including the population and sample, instrumentation, validity and reliability, the research design, and data analysis procedures. The analysis of data is presented in chapter four.

CHAPTER 4

DATA ANALYSES AND FINDINGS

Introduction

Results from this study comparing traditionally taught preservice
elementary teachers and backward design taught preservice elementary
teachers came via analyses of lesson and unit plans designed during each
group's Educational Planning and Management (EDEL 401) course. This
chapter was arranged to show data gathered and to summarize statistical results
related to the specific questions stated in this study. The overarching question
was analyzed using a one-way multivariate analysis of variance and sub-
questions one through six were analyzed using a one-way analysis of variance.

One-Way MANOVA Analysis

Introduction

Two independent raters read through and scored 153 lesson and units
plans developed by preservice teachers in two different sections of EDEL 401,
Educational Planning and Management. Of all the plans developed, 74 were
from students in the control group and 79 were from students in the experimental
group. Data was evaluated using a rating scale from one to four with one
indicating an unsatisfactory level of performance, two indicating a basic level of

performance, three indicating a proficient level of performance, and four

indicating a distinguished level of performance.

Each rater went through a two-hour training session with the researcher

before evaluating any plans. The instrument used by the raters consisted of six

different components that were divided into 19 different elements; component

one was divided into three elements, components two and three were both

divided into four elements, component four had one element, component five had

four, and component six had three. The researcher combined the means of the

different elements of each component in order to interpret the data for each

component individually.

Research Question

For the overall research question of this study, the researcher employed a

one-way MANOVA. The question was this: Were the population means for the

scores from the planning and preparation framework the same or different for the

two groups: lesson and unit plans that were designed by elementary preservice

teachers having been taught a traditional method of curriculum design and

lesson and unit plans that were designed by elementary preservice teachers

having been taught the backward design method?

A one-way multivariate analysis of variance (MANOVA) was conducted to

determine the effect of the two types of curriculum designs (the traditional design

and the backward design) on the dependent variables demonstrating knowledge

of content and pedagogy, demonstrating knowledge of students, selecting

suitable instructional goals, demonstrating knowledge of resources, designing

coherent instruction, and assessing student learning. In this research, the test

for homogeneity of dispersion matrices (Box's Test) was significant, F (21,

83,100) = 1.99, $\underline{p}$ = .004. Significant differences were found among the two

curriculum designs on the dependent measures, Wilks' Lambda (Λ) = .82, $\underline{F}$ (6,

146) = 5.53, $\underline{p}$ < .001. The multivariate η^2 of .19, based on Wilks' Λ, indicates a

strong relationship between the curriculum design factor and the dependent

variables. "In general, η^2 is interpreted as the proportion of variance of the

dependent variable that is related to the factor. Traditionally, η^2 values of .01,

.06, and .14 represent small, medium, and large effect sizes, respectively"

(Green, Salkind, & Akey, 2000, p. 159). The results from Box's test of equality of

covariance matrices and multivariate tests can be found below in Tables 1 and 2.

Table 3 contains the means and the standard deviations on the dependent

variables for the two groups.

Table 1. Box's Test of Equality of Covariance Matrices

Box's M	43.786
F	1.997
df1	21
df2	83100
Sig.	.004

Tests the null hypothesis that the observed covariance matrices of the dependent
variables are equal across groups.
a Design: Intercept+CURRDESI

Table 2. Multivariate Tests

Effect		Value	F	Hypothesis df	Error df	Sig.	Eta Squared
Intercept	Pillai's Trace	.964	653.981	6.000	146.000	.000	.964
	Wilks' Lambda	.036	653.981	6.000	146.000	.000	.964
	Hotelling's Trace	26.876	653.981	6.000	146.000	.000	.964
	Roy's Largest Root	26.876	653.981	6.000	146.000	.000	.964
CURRDESIGN	Pillai's Trace	.185	5.533	6.000	146.000	.000	.185
	Wilks' Lambda	.815	5.533	6.000	146.000	.000	.185
	Hotelling's Trace	.227	5.533	6.000	146.000	.000	.185
	Roy's Largest Root	.227	5.533	6.000	146.000	.000	.185

a Exact statistic
b Design: Intercept+CURRDESI

One-Way ANOVA Analyses

Research Sub-Questions

For the research sub-questions, the researcher employed the one-way ANOVA for each. The six sub-questions are as follows:

1. Were the population means for the scores from the demonstrating knowledge of content and pedagogy component of the planning and preparation framework the same or different for the two groups?

2. Were the population means for the scores from the demonstrating knowledge of students component of the planning and preparation framework the same or different for the two groups?

Table 3. Means and Standard Deviations on the Dependent Variables for the Two Groups

COMPONENTS OF RATING SCALE	CURRDESIGN .00 = TRADITIONAL 1.00 = BACKWARD DESIGN	Mean	Std. Deviation	N
AVCONTENT	.00	2.1171	.6117	74
	1.00	2.5928	.7332	79
	Total	2.3627	.7159	153
AVSTUDENT	.00	2.0304	.4658	74
	1.00	2.4003	.4949	79
	Total	2.2214	.5141	153
AVGOALS	.00	2.0777	.6319	74
	1.00	2.6535	.8344	79
	Total	2.3750	.7952	153
AVRESOURCE	.00	2.4932	.6330	74
	1.00	2.8418	.7005	79
	Total	2.6732	.6890	153
AVCOHERENT	.00	2.3226	.6799	74
	1.00	2.7199	.6276	79
	Total	2.5278	.6811	153
AVASSESSMENT	.00	1.5631	.6191	74
	1.00	2.1540	.7529	79
	Total	1.8682	.7502	153

3. Were the population means for the scores from the selecting instructional goals component of the planning and preparation framework the same or different for the two groups?

4. Were the population means for the scores from the demonstrating knowledge of resources component of the planning and preparation framework the same or different for the two groups?

5. Were the population means for the scores from the designing coherent instruction component of the planning and preparation framework the same or different for the two groups?

6. Were the population means for the scores from the assessing student learning component of the planning and preparation framework the same or different for the two groups?

Because the MANOVA was significant, individual ANOVAs were conducted on each of the six components or dependent variables. To control for a Type I error across the multiple ANOVAs, the traditional Bonferroni procedure was utilized. Each ANOVA was tested at the .0083 level (.05 divided by the number of ANOVAs conducted, which was six).

A one-way analysis of variance (ANOVA) was conducted to evaluate sub-question one: Were the population means for the scores from the demonstrating knowledge of content and pedagogy component of the planning and preparation framework the same or different for the two groups? The independent variable, curriculum design, included two groups, the traditional approach and the backward design approach. The dependent variable was demonstrating knowledge of content and pedagogy. The ANOVA indicated a significant difference between knowledge of content and pedagogy and the curriculum design with F (1, 151) = 18.86, p < .001. The strength of the relationship between the curriculum design and demonstration of knowledge of content and pedagogy, as assessed by η^2, was strong, with the curriculum design factor accounting for 11% of the variance of the dependent variable. Means and standard deviations for knowledge of content and pedagogy (four-point scale) as

a function of curriculum design can be found below in Table 4, and the ANOVA

statistics, in Table 5.

Table 4. Descriptive Statistics for Knowledge of Content and Pedagogy

Dependent Variable: Knowledge of Content and Pedagogy

CURRDESIGN	Mean	Std. Deviation	N
TRADITIONAL .00	2.1171	.6117	74
BACKWARD 1.00	2.5928	.7332	79
Total	2.3627	.7159	153

Table 5. ANOVA Table for Demonstrating Knowledge of Content and Pedagogy

Dependent Variable: Demonstrating Knowledge of Content and Pedagogy

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	8.647	1	8.647	18.855	.000	.111
Intercept	847.615	1	847.615	1848.265	.000	.924
CURRDESIGN	8.647	1	8.647	18.855	.000	.111
Error	69.249	151	.459			
Total	932.028	153				
Corrected Total	77.895	152				

a R Squared = .111 (Adjusted R Squared = .105)

A one-way analysis of variance (ANOVA) was conducted to evaluate sub-

question two: Were the population means for the scores from the demonstrating

knowledge of students component of the planning and preparation framework the

same or different for the two groups? The independent variable, curriculum

design, included two groups, the traditional approach and the backward design

approach. The dependent variable was demonstrating knowledge of students.

The ANOVA indicated a significant difference between knowledge of students

and the curriculum design with F (1, 151) = 22.59, p < .001. The strength of the

relationship between the curriculum design and demonstrating of knowledge of students, as assessed by η^2, was strong, with the curriculum design factor accounting for 13% of the variance of the dependent variable. Means and standard deviations for demonstrating knowledge of students (four-point scale) as a function of curriculum design can be found below in Table 6, and the ANOVA statistics, in Table 7.

Table 6. Descriptive Statistics for Demonstrating Knowledge of Students

Dependent Variable: Demonstrating Knowledge of Students

CURRDESIGN	Mean	Std. Deviation	N
TRADITIONAL .00	2.0304	.4658	74
BACKWARD 1.00	2.4003	.4949	79
Total	2.2214	.5141	153

Table 7. ANOVA Table for Knowledge of Students

Dependent Variable: Knowledge of Students

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	5.228	1	5.228	22.593	.000	.130
Intercept	750.095	1	750.095	3241.361	.000	.955
CURRDESIGN	5.228	1	5.228	22.593	.000	.130
Error	34.943	151	.231			
Total	795.172	153				
Corrected Total	40.172	152				

a R Squared = .130 (Adjusted R Squared = .124)

A one-way analysis of variance (ANOVA) was conducted to evaluate sub-question three: Were the population means for the scores from the selecting instructional goals component of the planning and preparation framework the same or different for the two groups? The independent variable, curriculum

design, included two groups, the traditional approach and the backward design

approach. The dependent variable was selecting instructional goals. The

ANOVA indicated a significant difference between selecting instructional goals

and the curriculum design with F (1, 151) = 22.92, p < .001. The strength of the

relationship between the curriculum design and selecting instructional goals, as

assessed by η^2, was strong, with the curriculum design factor accounting for 13%

of the variance of the dependent variable. Means and standard deviations for

selecting instructional goals (four-point scale) as a function of curriculum design

can be found below in Table 8, and the ANOVA statistics, in Table 9.

Table 8. Descriptive Statistics for Selecting Instructional Goals

Dependent Variable: Selecting Instructional Goals

CURRDESIGN	Mean	Std. Deviation	N
TRADITIONAL .00	2.0777	.6319	74
BACKWARD 1.00	2.6535	.8344	79
Total	2.3750	.7952	153

Table 9. ANOVA Table for Selecting Instructional Goals

Dependent Variable: Selecting Instructional Goals

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	12.667	1	12.667	22.919	.000	.132
Intercept	855.277	1	855.277	1547.450	.000	.911
CURRDESIGN	12.667	1	12.667	22.919	.000	.132
Error	83.458	151	.553			
Total	959.141	153				
Corrected Total	96.125	152				

a R Squared = .132 (Adjusted R Squared = .126)

A one-way analysis of variance (ANOVA) was conducted to evaluate sub-question four: Were the population means for the scores from the knowledge of resources component of the planning and preparation framework the same or different for the two groups? The independent variable, curriculum design, included two groups, the traditional approach and the backward design approach. The dependent variable was demonstrating knowledge of resources. The ANOVA indicated a significant difference between knowledge of resources and the curriculum design with $\underline{F}$ (1, 151) = 10.38, $\underline{p}$ = .002. The strength of the relationship between the curriculum design and demonstrating knowledge of resources, as assessed by η^2, was moderate, with the curriculum design factor accounting for 6% of the variance of the dependent variable. Means and standard deviations for demonstrating knowledge of resources (four-point scale) as a function of curriculum design can be found below in Table 10, and the ANOVA statistics, in Table 11.

Table 10. Descriptive Statistics for Demonstrating Knowledge of Resources

Dependent Variable: Demonstrating Knowledge of Resources

CURRDESIGN	Mean	Std. Deviation	N
TRADITIONAL .00	2.4932	.6330	74
BACKWARD 1.00	2.8418	.7005	79
Total	2.6732	.6890	153

Table 11. ANOVA Table for Demonstrating Knowledge of Resources

Dependent Variable: Demonstrating Knowledge of Resources

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	4.641	1	4.641	10.380	.002	.064
Intercept	1087.524	1	1087.524	2432.154	.000	.942
CURRDESIGN	4.641	1	4.641	10.380	.002	.064
Error	67.519	151	.447			
Total	1165.500	153				
Corrected Total	72.160	152				

a R Squared = .064 (Adjusted R Squared = .058)

A one-way analysis of variance (ANOVA) was conducted to evaluate sub-question five: Were the population means for the scores from the designing coherent instruction component of the planning and preparation framework the same or different for the two groups? The independent variable, curriculum design, included two groups, the traditional approach and the backward design approach. The dependent variable was designing coherent instruction. The ANOVA indicated a significant difference between designing coherent instruction and the curriculum design with F (1, 151) = 14.13, p < .001. The strength of the relationship between the curriculum design and designing coherent instruction, as assessed by η^2, was moderate, with the curriculum design factor accounting for 8% of the variance of the dependent variable.   Means and standard deviations for designing coherent instruction (four-point scale) as a function of curriculum design can be found below in Table 12, and the ANOVA statistics, in Table 13.

Table 12. Descriptive Statistics for Designing Coherent Instruction

Dependent Variable: Designing Coherent Instruction

CURRDESIGN	Mean	Std. Deviation	N
TRADITIONAL .00	2.3226	.6799	74
BACKWARD 1.00	2.7199	.6276	79
Total	2.5278	.6811	153

Table 13. ANOVA Table for Designing Coherent Instruction

Dependent Variable: Designing Coherent Instruction

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	6.031	1	6.031	14.125	.000	.086
Intercept	971.564	1	971.564	2275.373	.000	.938
CURRDESIGN	6.031	1	6.031	14.125	.000	.086
Error	64.476	151	.427			
Total	1048.125	153				
Corrected Total	70.507	152				

a R Squared = .086 (Adjusted R Squared = .079)

A one-way analysis of variance (ANOVA) was conducted to evaluate sub-question six: Were the population means for the scores from the assessing student learning component of the planning and preparation framework the same or different for the two groups? The independent variable, curriculum design, included two groups, the traditional approach and the backward design approach. The dependent variable was assessing student learning. The ANOVA indicated a significant difference between assessing student learning and the curriculum design with F (1, 151) = 27.91, p < .001. The strength of the relationship between the curriculum design and assessing student learning, as assessed by η^2, was strong, with the curriculum design factor accounting for 16% of the variance of the dependent variable. Means and standard deviations for

assessing student learning (four-point scale) as a function of curriculum design

can be found below in Table 14, and the ANOVA statistics, in Table 15.

Table 14. Descriptive Statistics for Assessing Student Learning

Dependent Variable: Assessing Student Learning

CURRDESIGN	Mean	Std. Deviation	N
TRADITIONAL .00	1.5631	.6191	74
BACKWARD 1.00	2.1540	.7529	79
Total	1.8682	.7502	153

Table 15. ANOVA Table for Assessing Student Learning

Dependent Variable: Assessing Student Learning

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	13.343	1	13.343	27.909	.000	.156
Intercept	527.921	1	527.921	1104.208	.000	.880
CURRDESIGN	13.343	1	13.343	27.909	.000	.156
Error	72.193	151	.478			
Total	619.528	153				
Corrected Total	85.536	152				

a R Squared = .156 (Adjusted R Squared = .150)

Meaning and Discussion of the Analyses of Data

Significance of the Results

Overall, plans designed using the traditional model had lower means than

did their backward design counterparts on all of the six components of the

planning and preparation framework. These findings suggest instructors of

preservice teachers explore the possibility of using the backward design model

when teaching lesson and unit planning design.

Relationship of Data to Prior Research

Relatively little empirical research has been completed that compares types of curriculum development processes. However, researchers focusing on enhancing professional practice have identified 22 essential components of the complex activity of teaching clustered into four domains of teaching responsibility. Danielson (1996) believed the skills listed in domain one, planning and preparation, "are demonstrated primarily through the plans that teachers prepare to guide their teaching and ultimately through the success of those plans as implemented in the classroom" (p. 30). Therefore, the six components of domain one were the focus of this study: knowledge of content and pedagogy, knowledge of students, selection of instructional goals, knowledge of resources, design of coherent instruction, and assessment of student learning. These are six components that Charlotte Danielson (1996) has identified as being critical when defining and describing excellence in teaching during the planning and preparation process. The current study showed higher mean scores for the backward design model in all six components.

Wiggins and McTighe (1998) described their "backward" design as being the most effective of curricular design strategies. Data from the MANOVA and the ANOVAs found differences between the curriculum design (traditional and backward) and the six dependent variables to be significant.

Weaknesses, Uncontrolled Factors, and Incongruities in the Study

A few factors potentially weakened this study. First, the interrater reliability was high, but the two raters did not have the same background in the area of curriculum development. As stated previously, one rater actually teaches lesson and unit planning to preservice teachers. She also evaluates those plans using her own scoring system. Unfortunately, another rater with that background could not be found. The other rater had extensive background in developing and utilizing lesson and unit plans but had never taught anyone how to develop them. She tended to score more quickly and more to the middle of the rating scale. The other evaluator spent more time, really evaluating the plans.

Eta squares (η^2) for two dependent variables were moderate, .08 and .06 respectively. This would indicate that the proportion of variance of the dependent variables, demonstrating knowledge of resources and designing coherent instruction, have a moderate relationship to the independent variable.

A third potential weakness was the use of a rating scale. The rating scale itself was complete, but to determine what scores meant when they were averaged was difficult. For example, when a score for assessing student learning was 2.37, what did this mean on a four-point scale? The researcher will address this matter in chapter five.

Summary

Results from this study comparing planning and preparation measures of lesson and unit plans designed using a traditional approach and the backward design method came from the analyses of one data set from two EDEL 401 Educational Management courses taught Spring and Fall semesters of 2002. This data set was analyzed by two different methods. From the first analysis, MANOVA, the researcher determined that lesson and unit plans designed using the backward design model had significant differences in means compared to lesson and unit plans designed using a traditional model. From the second analysis, ANOVAs, the researcher uncovered similar results when the backward design method was used during planning and preparation; more significant differences were found in the areas of knowledge of content and pedagogy, knowledge of students, selecting instructional goals, knowledge of resources, designing coherent instruction, and assessing student learning.

CHAPTER 5

CONCLUSION TO THE STUDY

Introduction

This study was designed to investigate whether lesson and unit plans designed using the backward design approach, developed by Grant Wiggins and Jay McTighe, differed from lesson and unit plans designed using a traditional model. In particular, this study focused on whether elementary preservice teachers developed plans that integrated key ideas of planning and preparation: demonstrating knowledge of content and pedagogy, demonstrating knowledge of students, selecting instructional goals, demonstrating knowledge of resources, designing coherent instruction, and assessing student learning.

The traditional model of curriculum design had four basic steps: (1) define the goals, purposes, or objectives, (2) define experiences or activities related to the goals, (3) organize the experiences and activities, and (4) evaluate the goals (see appendix B). Wiggins and McTighe included these steps for their backward design: (1) identify the desired results (standards, goals, and objectives), (2) determine the acceptable evidence (designing assessments), and (3) plan learning experiences and instruction (see appendix C). These authors expected that by designing curriculum using their approach, educators would use more standard and assessment based teaching as opposed to activity-based instruction.

In order to sample elementary preservice teacher knowledge relative to the planning and preparation of lesson and unit plans, a framework for teaching was utilized reflecting what teachers should know and be able to do in the exercise of their profession. In the framework for professional practice, the complex activity of teaching is divided into four domains of teaching responsibility: planning and preparation, classroom environment, instruction, and professional responsibilities (Danielson, 1996). Experts in curriculum design and the backward design reviewed the framework to determine its validity. Subsequently, the planning and preparation domain of the framework was used to evaluate the lesson and unit plans designed by preservice teachers.

During the summer semester of 2002, a pilot study was conducted in order to determine reliability of the instrument and to make improvements on the teaching methods that would be used for teaching the backward design model of curriculum development to the experimental group. Data collection took place during spring and fall semesters of 2002. The courses from which data were aggregated were two different sections of Educational Planning and Management (EDEL 401). The researcher taught the traditional model of developing curriculum to EDEL 401 students spring semester and the backward design model to EDEL 401 students fall semester, after taking a workshop on backward design.

Two raters were chosen to evaluate the 153 lesson and unit plans developed by preservice teachers in both sections of EDEL 401. Each plan was

scored on a rating scale from one through four on the 19 elements of the six

different components, using domain one of the framework for professional

practice (see appendix A). The average score of the two raters was obtained

and used for data analyses. The data obtained were then analyzed using the

SPSS statistical program at Montana State University, and the findings were

used to answer the study's research questions.

Conclusions

This study sought to answer the question: Were the population means for

the scores from the planning and preparation framework the same or different for

the two groups: lesson and unit plans that were designed by elementary

preservice teachers having been taught a traditional method of curriculum design

and lesson and unit plans that were designed by elementary preservice teachers

having been taught the backward design method? To find out if plans designed

by the two groups differed, two raters scored 153 lesson and unit plans using the

framework for professional practice. The scores of the two raters were averaged

for each plan.

The framework used in this study was developed from a solid research

base that reflects what preservice teachers should know and be able to do in the

area of planning and preparation (Danielson, 1996). Data obtained from the

framework were used to differentiate the lesson and unit plans designed by the

two groups. While the following analyses and conclusions discuss the answers

to this question and the sub-questions in detail, the overall conclusion was clear: the results showed that lesson and unit plans designed by preservice teachers who were taught the backward design approach to curriculum development scored higher than those plans designed by preservice teachers who used the traditional approach.

Elementary preservice teachers who learned curriculum design using the backward design method outperformed elementary preservice teachers who learned curriculum design using a traditional method when developing lesson and unit plans. Similarly, preservice teachers who were taught curriculum design using the backward design method outperformed preservice teachers who were taught curriculum design using a traditional method on all six components of the framework for professional practice of domain one: demonstrating knowledge of content and pedagogy, demonstrating knowledge of students, selecting instructional goals, demonstrating knowledge of resources, designing coherent instruction, and assessing student learning.

In the area of demonstrating knowledge of content and pedagogy, preservice teachers who developed lessons and units using the backward design model outperformed traditionally taught students. Bidner (2001) alluded to this component when he stated instruction is "based on the premise that an effective teacher must be able to integrate content knowledge with pedagogical understanding to assure that all students learn and perform at high levels" (p. 3). Backward design students were able to display content knowledge and make

connections between the content and other disciplines, and develop plans that reflected current research on best pedagogical practices, better than traditionally taught students.

The American Federation of Teachers (1990) claimed teachers should, "understand students' cultural backgrounds, interests, skills, and abilities as they apply across a range of learning domains and/or subject areas" (p. 30). In the area of demonstrating knowledge of students, backward design students were better able to display accurate knowledge of developmental characteristics of different age groups and different approaches to learning that students exhibit. They were also better able to recognize the knowledge of skills of students, students' interests, and their cultural backgrounds.

When selecting instructional goals, backward design students were better able to set more valuable goals that were clear and suitable for students in the class. Studies by Brophy and Good (1986) and Walker (1985) emphasized the important link between effective teaching and learning and the teacher's development of learning goals that are appropriate for a diverse group of learners. Backward design students' goals also reflected several different types of learning and opportunities for integration better than traditional students. Peterson, Marx, and Clark (1978) and Evertson and Brophy (1980) discussed the importance of using a variety of materials and resources to improve student achievement. When demonstrating knowledge of resources, backward design

students were more aware of resources available through the school district and outside the district.

For the component designing coherent instruction, backward design elementary preservice teachers were better able to develop plans that linked learning activities, teaching materials and resources, and instructional groupings to the instructional goals. Armento (1977) agreed that coherence is important when he stated that students learn better when instruction is logically sequenced. When assessing student learning, Porter and Brophy (1987), Reynolds (1992), Walker (1999), and Zigmond, Sansone, Miller, Donahoe, and Kohnke (1986) all believed that effective teachers plan goals and assessments simultaneously. Backward design students were better at assessing instructional goals and communicating the criteria for those assessments to their students than were traditionally taught students.

These six areas of planning and preparation are essential for teachers; therefore it is important for teacher educators to teach their students a curriculum design that has strengths in the six areas. Lesson and unit plans developed using the backward design model had higher rating scores than those developed using a traditional model in all six areas of the framework. This finding answered the research question: Were the population means for the scores from the planning and preparation framework the same or different for the two groups? Lessons and units designed by the two groups (backward design and traditional design) were significantly different; elementary preservice teachers who were

taught the backward design model had better scores on their plans than did elementary preservice teachers who were taught in a traditional manner.

Implications of the Findings

Two broader implications, stemming from results of this study and its review of literature, point to a need for changes in the way preservice teachers are taught curriculum design and the need for clarifying how those plans should be evaluated. First, the results from this study found better rating scores for lesson and unit plans designed using the backward design model than for those designed using a traditional model. Even though there were differences, and the significance favored backward design, this finding does not mean that backward design is necessarily the best model to use with preservice teachers in all areas of planning and preparation.

The rating scale for this research used the numbers one through four: one designated an unsatisfactory score, two designated a basic level of performance, three designated a proficient level of performance, and four designated a distinguished level of performance. As shown in Chapter 4, on Table 3, the mean scores for the two groups of students who designed the lesson and unit plans were mostly between the basic (2) and proficient (3) levels. When scores were observed, some showed little differences in levels of performance between the backward design and traditional groups. For example, for the components, demonstrating knowledge of students and assessing student learning, the

backward design students scored mostly 2s, as did the traditional students. For the component, demonstrating knowledge of resources, backward design students and traditional students scored mostly 3s. For the other three components, demonstrating knowledge of content, selecting instructional goals and designing coherent instruction, the backward design group scored mostly 3s, the proficient level of performance, while plans developed by preservice teachers using a traditional model scored mostly 2s, the basic level of performance.

Even though elementary preservice teachers, who have not had much experience in the classroom, developed the plans that were analyzed for this study, a basic level of performance should not be the level of performance expected of them; the level should be higher. Therefore, there is still work to be done in the areas of demonstrating knowledge of students and assessing student learning – two components where both groups scored at a basic level.

The second implication is related to the evaluation tool administered in this study. The researcher believed the best instrument to evaluate lesson and unit plans was Danielson's framework for professional practice. When utilizing an evaluation tool with preservice teachers, it is important for them to know the criteria on which they will be evaluated for their lesson and unit plans (Popham, 2002). Students perform better knowing the criteria on which they will be evaluated therefore, it is important for teacher educators to inform their students of specific criteria. To see where strengths and weaknesses occurred in lesson

plan design and instruction, the researcher chose not to present the criteria from the framework to the 401 students. Results could have been different if she had.

Limitations of the Study

Chapter 3 listed a number of limitations related to the study. After concluding the study, the researcher discovered others. The first limitation concerned the use of a rating scale as discussed in the preceding paragraphs. When a mean score of a number besides one, two, three, or four is found, 2.45 for example, how is that number interpreted according to a rating scale?

Another limitation to this study was that there might be more components to the planning and preparation domain than were included in this framework. Therefore, an important component for which preservice teachers need to help them plan and prepare lessons may not be included in this research.

A third limitation to this study was the researcher only required two lesson plans and one unit plan from each student. Judgment was based on a small sample of student's work rather than multiple samples.

Recommendations for Teacher Education Program

An essential component of teacher preparation is the planning and preparation of curriculum: yearly plans, unit plans, or daily lesson plans. To meet the needs of preservice teachers, courses devoted to this area must include best practices in the field of curriculum development. The researcher discovered that

when elementary preservice teachers developed lesson and unit plans using the backward design model of curriculum development, they outperformed elementary preservice teachers who developed plans using a traditional model. In light of the findings presented in this study, a number of recommendations are offered regarding the preparation of preservice teachers at Montana State University.

1. One such recommendation is that preservice teacher educators incorporate the backward design model when teaching curriculum design, which should include an emphasis on the two components demonstrating knowledge of students and assessing student learning, which both scored at the basic level on the rating scale.

One teacher educator, Dr. Judith Hilton, professor of secondary education, has been using Understanding by Design (UbD) in her classes with noteworthy results. She feels it "provides students with the tools necessary to successfully complete student teaching; interviews and being selected for employment; and is a useful template to guide all their planning as first year teachers" (Relearning by Design, 2002, p. 1). Her students agreed, here was what they said about UbD (Relearning by Design, 2002):

> If I hadn't had the templates to follow and help guide me through the stages, I would have had no clue as where to start; but the format showed me how to develop units of study and appropriate assessments. Understanding by Design allowed me to investigate the validity of what it is that I want to teach my students, and to investigate on a deeper level of what is important for students to learn.
> Understanding by Design is a wonderful way to see where you are going before you begin. (p. 1)

2. Another recommendation that corresponds with the previous one is to provide inservice for all preservice teacher educators who teach or require any type of lesson or unit planning in their courses. Reading the book Understanding by Design is a good introduction to the backward design model but does not require a hands-on approach to its developmental process. Wiggins and McTighe (2002) suggest three possible options for learning the backward design method in greater detail. One option is to attend a workshop, presented by the authors, as did the researcher. This two-day workshop is an intense, hands-on approach to learning the design. Another possible option is to have a member of the national training staff for Understanding by Design present an inservice training session at the university. This is similar to the workshop that is offered by the authors. These two options are the most valuable if one is really interested in understanding the backward design process. Unfortunately, these options are very expensive.

A third possibility is to follow the workbook called The Understanding by Design Handbook. The book discusses the logic of a backward design approach to planning curriculum, assessment, and instruction; criteria for selecting matters of understanding; design standards for quality control; and misconceptions and misunderstandings. The handbook offers the practical side – a unit planning template, exercises, worksheets, design standards and test, and a peer review process (McTighe & Wiggins, 1999). This is a good option if funds are limited;

otherwise, attending a workshop conducted by someone who is an expert on backward design is the recommended next step.

3. A third recommendation, in light of the research, is to not only utilize the backward design approach to curriculum development, but also utilize Danielson's framework of professional practice in courses for preservice teachers. The framework is a tool designed for all teachers who want to improve instruction in some way: for novice teachers, it is a checklist or a reminder of day-to-day needs or goals; for experienced teachers it is a technique to improve their effectiveness and help their colleagues do so as well; and, for preservice teachers it is a complete inventory of those aspects of a teacher's responsibilities that promote student learning (Danielson, 1996). Preservice teachers could utilize the framework as a self-assessment or peer assessment tool after they have developed plans for their courses or paraprofessional teaching experiences. It is the means for which preservice teachers have an opportunity to discuss the strengths and weaknesses of their own plans and the plans of others related to the six components of the planning and preparation domain.

As cited in the literature review, the six components of the planning and preparation domain are important to know and put into practice in order to promote student learning. Incorporating the framework into a preservice course on curriculum development could be an integral component for teacher educators.

4. As a final recommendation, the researcher is encouraging the use of both the backward design model and the framework for professional practice to help teacher educators improve upon the areas in which research has shown weaknesses in preservice teacher preparation practices. There were several areas mentioned in the literature review, in which preservice teachers could be more skilled; areas such as developing observable goals and objectives, developing a variety of assessments, meeting the needs of the students, and aligning goals with instruction and assessments. Utilizing both the backward design and the framework for professional practice simultaneously is an opportunity for college instructors to help fill those gaps in teacher education programs.

Recommendations for Future Research

Questions arise as to the extent that the backward design model is different from other models of curriculum design. A recommendation for further research is to replicate this study to determine if there are any differences between the plans designed by the backward design method and other methods. There may be other designs that are even stronger in the six areas of planning and preparation. Another possibility is to replicate the study using another instrument, one utilized in a teacher education program. Some teacher education programs have a rubric that is utilized in the student teaching program.

This could be a good evaluation tool to replace the framework designed by Danielson.

Another suggestion for further research is to go beyond domain one and compare students in the other domains: classroom environment, instruction, and professional responsibilities. In this way, preservice teacher instructors and supervisors could tell if there is a connection between planning and preparation and student's actual teaching experiences.

A final recommendation is to replicate and extend the study to include practicing teachers. Do those who have had experience with the backward design process use more standard-based teaching as opposed to activity-based instruction?

Summary

This chapter began with a summary of how the backward design model of curriculum design differed from a traditional model. The instrument utilized in this study was also explained briefly. The research questions were revisited and answered. Major findings showed that lesson and unit plans designed using the backward design model scored higher than those plans designed using a traditional model in all areas of the framework for professional practice. It also showed that the backward design and traditional groups' average ratings were somewhat similar when compared on the four point rating scale. Two components in particular were at a basic level (2) for both curriculum designs.

Two important broader implications of the results led to several recommendations for the teacher education program at Montana State University and for future research. Research pointed to a need for changes in the way preservice teachers are taught curriculum design and the need for clarifying how those designs should be evaluated. The recommendation was made to utilize the backward design model, emphasizing knowledge of students and assessing student learning, and the framework for professional practice in the teacher education program at Montana State University.

A recommendation for further research was to replicate the study evaluating practicing teachers. Changing the instrument or utilizing another curriculum design model, instead of the traditional model, was also recommended. Lastly, in light of the findings, there are gaps in the planning and preparation domain of teacher education programs. It will be important to discover which other methods best fill those gaps.

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APPENDICES

APPENDIX A: FRAMEWORK FOR PLANNING AND PREPARATION

Framework for Planning and Preparation

Figure 6.1

DOMAIN I: PLANNING AND PREPARATION
Component 1a: Demonstrating Knowledge of Content and Pedagogy
Elements:
Knowledge of content • Knowledge of prerequisite relationships • Knowledge of content-related pedagogy

ELEMENT	UNSATISFACTORY	BASIC	PROFICIENT	DISTINGUISHED
		LEVEL OF PERFORMANCE		
Knowledge of Content	Teacher makes content errors or does not correct content errors students make.	Teacher displays basic content knowledge but cannot articulate connections with other parts of the discipline or with other disciplines.	Teacher displays solid content knowledge and makes connections between the content and other parts of the discipline and other disciplines.	Teacher displays extensive content knowledge, with evidence of continuing pursuit of such knowledge.
Knowledge of Prerequisite Relationships	Teacher displays little understanding of prerequisite knowledge important for student learning of the content.	Teacher indicates some awareness of prerequisite learning, although such knowledge may be incomplete or inaccurate.	Teacher's plans and practices reflect understanding of prerequisite relationships among topics and concepts.	Teacher actively builds on knowledge of prerequisite relationships when describing instruction or seeking causes for student misunderstanding.
Knowledge of Content-Related Pedagogy	Teacher displays little understanding of pedagogical issues involved in student learning of the content.	Teacher displays basic pedagogical knowledge but does not anticipate student misconceptions.	Pedagogical practices reflect current research on best pedagogical practice within the discipline but without anticipating student misconceptions.	Teacher displays continuing search for best practice and anticipates student misconceptions.

Figure 6.2

DOMAIN I: PLANNING AND PREPARATION
Component 1b: Demonstrating Knowledge of Students
Elements:
Knowledge of characteristics (intellectual, social, and emotional) of age group • Knowledge of students' varied approaches to learning • Knowledge of students' skills and knowledge • Knowledge of students' interests and cultural heritage

ELEMENT	UNSATISFACTORY	BASIC	PROFICIENT	DISTINGUISHED
		LEVEL OF PERFORMANCE		
Knowledge of Characteristics of Age Group	Teacher displays minimal knowledge of developmental characteristics of age group.	Teacher displays generally accurate knowledge of developmental characteristics of age group.	Teacher displays thorough understanding of typical developmental characteristics of age group as well as exceptions to general patterns.	Teacher displays knowledge of typical developmental characteristics of age group, exceptions to the patterns, and the extent to which each student follows patterns.
Knowledge of Students' Varied Approaches to Learning	Teacher is unfamiliar with the different approaches to learning that students exhibit, such as learning styles, modalities, and different "intelligences."	Teacher displays general understanding of the different approaches to learning that students exhibit.	Teacher displays solid understanding of the different approaches to learning that different students exhibit.	Teacher uses, where appropriate, knowledge of students' varied approaches to learning in instructional planning.
Knowledge of Students' Skills and Knowledge	Teacher displays little knowledge of students' skills and knowledge and does not indicate that such knowledge is valuable.	Teacher recognizes the value of understanding students' skills and knowledge but displays this knowledge for the class only as a whole.	Teacher displays knowledge of students' skills and knowledge for groups of students and recognizes the value of this knowledge.	Teacher displays knowledge of students' skills and knowledge for each student, including those with special needs.
Knowledge of Students' Interests and Cultural Heritage	Teacher displays little knowledge of students' interests or cultural heritage and does not indicate that such knowledge is valuable.	Teacher recognizes the value of understanding students' interests or cultural heritage but displays this knowledge for the class only as a whole.	Teacher displays knowledge of the interests or cultural heritage of groups of students and recognizes the value of this knowledge.	Teacher displays knowledge of the interests or cultural heritage of each student.

DOMAIN I: PLANNING AND PREPARATION
Component 1c: Selecting Instructional Goals

Figure 6.3

Elements:

VALUE: Goals represent high expectations for students; and reflect important learning and conceptual understanding, curriculum standards, and frameworks. • CLARITY: Goals are clearly stated as student learning and permit sound assessment. • SUITABILITY FOR DIVERSE STUDENTS: Goals reflect needs of all students in a class. • BALANCE: Goals represent opportunities for different types of learning—for example, thinking as well as knowledge—and coordination or integration within or across disciplines.

	LEVEL OF PERFORMANCE			
ELEMENT	UNSATISFACTORY	BASIC	PROFICIENT	DISTINGUISHED
Value	Goals are not valuable and represent low expectations or no conceptual understanding for students. Goals do not reflect important learning.	Goals are moderately valuable in either their expectations or conceptual understanding for students and in importance of learning.	Goals are valuable in their level of expectations, conceptual understanding, and importance of learning.	Not only are the goals valuable, but teacher can also clearly articulate how goals establish high expectations and relate to curriculum frameworks and standards.
Clarity	Goals are either not clear or are stated as student activities. Goals do not permit viable methods of assessment.	Goals are only moderately clear or include a combination of goals and activities. Some goals do not permit viable methods of assessment.	Most of the goals are clear but may include a few activities. Most permit viable methods of assessment.	All the goals are clear, written in the form of student learning, and permit viable methods of assessment.
Suitability for Diverse Students	Goals are not suitable for the class.	Most of the goals are suitable for most students in the class.	All the goals are suitable for most students in the class.	Goals take into account the varying learning needs of individual students or groups.
Balance	Goals reflect only one type of learning and one discipline or strand.	Goals reflect several types of learning but no effort at coordination or integration.	Goals reflect several different types of learning and opportunities for integration.	Goals reflect student initiative in establishing important learning.

DOMAIN I: PLANNING AND PREPARATION
Component 1d: Demonstrating Knowledge of Resources

Figure 6.4

Elements:

Resources for teaching • Resources for students

	LEVEL OF PERFORMANCE			
ELEMENT	UNSATISFACTORY	BASIC	PROFICIENT	DISTINGUISHED
Resources for Teaching	Teacher is unaware of resources available through the school or district.	Teacher displays limited awareness of resources available through the school or district.	Teacher is fully aware of all resources available through the school or district.	In addition to being aware of school and district resources, teacher actively seeks other materials to enhance instruction, for example, from professional organizations or through the community.
Resources for Students	Teacher is unaware of resources available to assist students who need them.	Teacher displays limited awareness of resources available through the school or district.	Teacher is fully aware of all resources available through the school or district and knows how to gain access for students.	In addition to being aware of school and district resources, teacher is aware of additional resources available through the community.

DOMAIN I: PLANNING AND PREPARATION
Component 1e: Designing Coherent Instruction
Elements:
Learning activities • Instructional materials and resources • Instructional groups • Lesson and unit structure

Figure 6.5

ELEMENT	LEVEL OF PERFORMANCE			
	UNSATISFACTORY	BASIC	PROFICIENT	DISTINGUISHED
Learning Activities	Learning activities are not suitable to students or instructional goals. They do not follow an organized progression and do not reflect recent professional research.	Only some of the learning activities are suitable to students or instructional goals. Progression of activities in the unit is uneven, and only some activities reflect recent professional research.	Most of the learning activities are suitable to students and instructional goals. Progression of activities in the unit is fairly even, and most activities reflect recent professional research.	Learning activities are highly relevant to students and instructional goals. They progress coherently, producing a unified whole and reflecting recent professional research.
Instructional Materials and Resources	Materials and resources do not support the instructional goals or engage students in meaningful learning.	Some of the materials and resources support the instructional goals, and some engage students in meaningful learning.	All materials and resources support the instructional goals, and most engage students in meaningful learning.	All materials and resources support the instructional goals, and most engage students in meaningful learning. There is evidence of student participation in selecting or adapting materials.
Instructional Groups	Instructional groups do not support the instructional goals and offer no variety.	Instructional groups are inconsistent in suitability to the instructional goals and offer minimal variety.	Instructional groups are varied, as appropriate to the different instructional goals.	Instructional groups are varied, as appropriate to the different instructional goals. There is evidence of student choice in selecting different patterns of instructional groups.
Lesson and Unit Structure	The lesson or unit has no clearly defined structure, or the structure is chaotic. Time allocations are unrealistic.	The lesson or unit has a recognizable structure, although the structure is not uniformly maintained throughout. Most time allocations are reasonable.	The lesson or unit has a clearly defined structure that activities are organized around. Time allocations are reasonable.	The lesson's or unit's structure is clear and allows for different pathways according to student needs.

DOMAIN I: PLANNING AND PREPARATION
Component 1f: Assessing Student Learning
Elements:
Congruence with instructional goals • Criteria and standards • Use for planning

Figure 6.6

ELEMENT	LEVEL OF PERFORMANCE			
	UNSATISFACTORY	BASIC	PROFICIENT	DISTINGUISHED
Congruence with Instructional Goals	Content and methods of assessment lack congruence with instructional goals.	Some of the instructional goals are assessed through the proposed approach, but many are not.	All the instructional goals are nominally assessed through the proposed plan, but the approach is more suitable to some goals than to others.	The proposed approach to assessment is completely congruent with the instructional goals, both in content and process.
Criteria and Standards	The proposed approach contains no clear criteria or standards.	Assessment criteria and standards have been developed, but they are either not clear or have not been clearly communicated to students.	Assessment criteria and standards are clear and have been clearly communicated to students.	Assessment criteria and standards are clear and have been clearly communicated to students. There is evidence that students contributed to the development of the criteria and standards.
Use for Planning	The assessment results affect planning for these students only minimally.	Teacher uses assessment results to plan for the class as a whole.	Teacher uses assessment results to plan for individuals and groups of students.	Students are aware of how they are meeting the established standards and participate in planning the next steps.

APPENDIX B: TRADITIONAL PLAN FORMS

Traditional Lesson Plan Form

Teacher_____Date_____

Course/Class_____ Unit_____

General Objective:

Learning Outcomes:

Rationale for the Lesson:

Instructional Procedures:
[Focusing event] [Teaching methods] [Student Activities] [Formative checks]
[Closure]

Evaluation Procedures:

Materials Needed:

Traditional Unit Plan Form

Planning an Integrated Unit

1. What is the purpose of this particular unit? Why are we doing it?

2. How does the purpose fit in with the curriculum standards for this school?

3. Who is the target population?

4. How much time will be allotted to this unit?

5. Which disciplines will make a contribution to this unit?

6. What will be included in the unit? What will be left out?

7. What resources are available to implement this unit?

8. How are students going to be involved in the planning of the curriculum?

9. How will the unit be assessed?

Developing an Integrated Unit

Thematic Unit _____

How will you incorporate the following disciplines?

Mathematics?

Music?

Art?

Social Studies/History?

Geography?

Health/Physical Education?

Science?

Language Arts?

(

APPENDIX C: BACKWARD DESIGN PLAN FORMS

Backward Design Lesson Plan Form

I.   **General Information**
     A. Name
     B. Grade
     C. Class size
     D. Approximate length of lesson

II.   **Identify Desired Results** (What should students know, understand, and be able to do? What is worthy of understanding? What enduring understandings are desired? p. 10)
     A. Identify standard(s) (local, state, or national)
     B. Identify instructional objective(s)

III.   **Determine Acceptable Evidence (**How will we know if students have achieved the desired results and met the standards? What will we accept as evidence of student understanding and proficiency?)
     A. Identify the assessment strategy(ies), (e.g., informal checks for understanding, observation/dialogue, test/quiz, academic prompts, performance task/project)
     B. Identify the assessment procedures, both formative and summative

IV.   **Plan Learning Experiences and Instruction** [What enabling knowledge (facts, concepts, and principles) and skills (procedures) will students need to perform effectively and achieve desired results? What activities will equip students with the needed knowledge and skills? What will need to be taught and coached, and how should it best be taught, in light of objectives? What materials and resources are best suited to accomplish these goals? Is the overall design coherent and effective?]
     A. Introduction, anticipatory set, the "hook"
     B. Lesson Body, (list steps and procedures)
     C. Lesson Closure
     D. If students finish early

V.   **Housekeeping**
     A. Materials (I highlight these so I don't forget them)
     B. Reference (Give credit where credit is due)

Backward Design Unit Plan Form

Stage 1 – Desired Results
Content Standard(s)/Overarching Performance Goals
Understanding(s) *Students will understand that…*
Essential Question(s)
Students will know…   *Students will be able to…*
Stage 2 – Assessment Evidence
Performance Task(s) & Product(s)
Key Criteria for use in evaluating work:
Other Evidence

Stage 3 – Learning Plan

Learning Activities