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The relationship among knowledge of, attitudes toward, and use of portfolios for assessment by teacher education professors

Naomi C. Coyle
Louisiana Tech University

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THE RELATIONSHIP AMONG KNOWLEDGE OF, ATTITUDES TOWARD, AND USE OF PORTFOLIOS FOR ASSESSMENT BY TEACHER EDUCATION PROFESSORS

by

Naomi C. Coyle, B.A., M.A., ED. S.

A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
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Supervisor of Dissertation Research

Head of Department
Curriculum, Instruction, & Leadership - Education
Department

Recommendation concurred in:

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Approved:
Director of Graduate Studies

Approved:
Director of the Graduate School

Dean of the College

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ABSTRACT

The major purpose of this study was to examine the evaluation of portfolios as an alternative assessment tool along with those factors which influence the implementation practices of portfolios by faculty in colleges of education. The specific goals of this study were to determine the relationship between college and university professors' knowledge of portfolio assessment and their attitudes toward using portfolios as an alternative to traditional assessment practices, as well as college and university professors' knowledge of portfolio assessment and use of portfolios in the courses that they teach, and professors' attitudes and use of portfolios. Other areas of investigation included professors' attitudes toward using portfolios and use of portfolios in their courses, gender and knowledge of portfolios, gender and attitude toward portfolio assessment, years of teaching experience and knowledge of portfolios, and years of experience and attitudes toward portfolio assessment. Data for this study were collected by e-mailing and mailing a questionnaire and demographic data form concerning portfolio assessment to all Louisiana professors involved in undergraduate teacher education courses in both public and private colleges and universities (N=342).

Analysis of the 98 responses utilizing Pearson Product-Moment correlation revealed a significant relationship between the professors' knowledge of portfolio assessment and their attitudes toward using portfolios as an alternative to

traditional assessment. In addition, a significant relationship was found using a Triserial correlation between professors' portfolio knowledge and the use of portfolios in the courses that they teach. A Triserial correlation also found that there was no significant relationship between professors' attitudes toward portfolio assessment and their use of portfolios in the courses that they teach. An analysis using t tests revealed that a significant difference between gender and portfolio knowledge and gender and attitudes toward portfolio assessment does exist. A significant difference between years of experience and portfolio knowledge and between years of experience and attitudes toward portfolio assessment was not revealed using t tests.

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CHAPTER 1

INTRODUCTION

The major purpose of this study was to examine the interpretations of portfolios as an alternative assessment tool along with those factors that influence the implementation practices of portfolios by faculty in colleges of education.

Statement of the Problem

Traditional assessment tends to use norm-referenced tests, which compare students and institutions to one another, and assume that all students can be assessed using the same instrument. According to Arter and Spandel (1992), a move away from traditional assessment and toward alternatives to traditional assessment, which are referred to as "authentic assessment" and include portfolio assessment, has occurred in recent years. Authentic assessment, nonetheless, has been criticized for its abundance of literature about theoretical bases, planning, organization, and use of portfolios in a variety of disciplines; while, very little research has been conducted about the knowledge and attitudes toward portfolio assessment among college education professors.

While there is a plethora of literature offering definitions of portfolios, advantages and disadvantages of portfolios, components for portfolio development, training for portfolio assessment, and use of portfolios in teacher education, there is a paucity of

factual research concerning the relationships and factors that define and support the use of portfolios.

The investigation of these potential relationships and factors has led to the following questions that guided this study.

1. What significant relationship exists between Louisiana public and private college and university education professors' knowledge of portfolio assessment and their attitudes toward the use of portfolio assessment?

2. What significant relationship exists between Louisiana public and private college and university education professors' knowledge and the actual use of portfolios in their classrooms?

3. What significant relationship exists between Louisiana public and private college and university education professors' attitudes toward and the actual use of portfolio assessment?

4. What significant difference exists in attitudes toward the use of portfolio assessment between male and female Louisiana public and private college and university professors?

5. What significant difference exists in knowledge of portfolio assessment between male and female Louisiana public and private college and university education professors?

6. What significant difference exists in knowledge of portfolio assessment between those Louisiana public and private college and university education professors having 11 plus years of teaching experience and those having less than 11 years of teaching experience?

7. What significant difference exists in attitudes toward the use of portfolio assessment between those Louisiana public and private college and university education professors having 11 plus years of teaching experience and those having less than 11 years of teaching experience?

The questions presented were answered by testing the following research hypotheses:

1. There is no significant relationship between Louisiana public and private college and university education professors' knowledge of portfolio assessment, which is the awareness of the nature and purposes of portfolios, and the attitudes of those professors toward the use of portfolios in the courses that they teach.

2. There is no significant relationship between Louisiana public and private college and university education professors' knowledge toward the use of portfolios in the courses that they teach and the actual use of portfolios as an assessment component.

3. There is no significant relationship between Louisiana public and private college and university education professors' attitudes and the actual use of portfolio assessment.

4. There is no significant difference in attitudes toward the use of portfolio assessment between male and female Louisiana public and private college and university professors.

5. There is no significant difference in knowledge of portfolio assessment between male and female Louisiana public and private college and university professors.

6. There is no significant difference in knowledge of portfolio assessment between those Louisiana public and private college and university professors having 11

plus years of teaching experience compared to those having less than 11 years teaching experience.

7. There is no significant difference in attitudes toward the use of portfolio assessment between those Louisiana public and private college and university professors having 11 plus years of teaching experience compared to those having less than 11 years teaching experience.

Table 1 provides a schematic of the potential relationships and causation factors that influence the use of portfolios as an instrument of authentic assessment.

Table1. The Relationships and Causation Factors Influencing Assessment

Hypothesis	Potential Relationships	Potential Causative Factors
1	Relationship between professor knowledge of and attitude toward portfolios	--
2	Relationship between professor knowledge of and actual use of portfolios	--
3	Relationship between attitude toward and actual use of portfolios	--
4	--	Gender differences in attitudes toward portfolios
5	--	Gender differences in knowledge toward portfolios
6	--	Difference in knowledge of portfolios comparing years of experience
7	--	Difference in attitude toward portfolios comparing years of experience

Limitations of Study

This hypotheses-testing study was limited to a 28% response rate from college and university educational professors who are employed in teacher preparation programs in public and private higher educational institutions in the state of Louisiana. The only criterion for being a part of the pool was to be teaching an undergraduate teacher training course. It is assumed that all the professors surveyed returned the feedback requested and that the information received from the college education professors was honest, competent, and complete.

Definitions of Terms

To enable the reader to understand the study, the following terms were identified and defined.

1. Assessment. The process of gathering data on educational outcomes and assembling evidence into an interpretable form for some intended use. The purposes of assessment can be to enhance teaching and learning and/or for external accountability. Assessment may take place at the individual student level, the program level, or the institutional level (Alexander & Stark, 1986).

2. Attitude. A score intended to identify both favorable and unfavorable feelings held by college and university professors toward portfolio assessment.

3. Authentic Assessment. A type of student evaluation that attempts to make the testing process more realistic and relevant (Schurr, 1998).

4. Knowledge. Familiarity with a particular subject.

5. College or University Education Professors. Those individuals who are employed by the public and private colleges and universities located in the state of Louisiana and who are involved in the teacher training programs.

6. Portfolio Assessment. Three primary purposes for implementing portfolios: student evaluation, program evaluation, and career/resume planning. This investigation focused on the type of portfolio that is used for student evaluation and is based on a meaningful collection of student work that exhibits the student's overall efforts, progress, and achievement in one or more subject areas. The student evaluation portfolio contents can range from paper-and-pencil tests or worksheets to creative writing pieces and drawings or graphs (Schurr, 1998).

7. Traditional Assessment. Norm-referenced measures, which compare students and institutions to one another, and assume that all students can be assessed using the same instrument (Wiggins,1989).

Importance of the Study

The trend today is to move away from traditional assessment and move toward assessment that indicates that students know something because they have not just received information, but have had to interpret it and relate it to other knowledge that they already have (Arter & Spandel, 1992). According to Herman (1992), good assessment is constructed on current theories of learning and cognition and is based upon the skills and capacities students will require for future success. It therefore follows that assessment also should include the role of the social context in shaping ability, because real-life problems often require that people work together as a group to find solutions. This recent awareness of the nature and context of assessment has bolstered the

movement toward alternative assessment, including national certification, in all educational institutions. Educators in all domains of the profession, university professors to classroom teachers, are searching for authentic assessment techniques. According to Hoag, Zalud, and Wood (1995), the evaluation technique used to augment traditional testing that is receiving the most attention in all spectrums of education is portfolio assessment.

The National Board for Professional Teaching Standards (NBPTS), a nonprofit, nonpartisan, and nongovernmental agency governed by a 63-member board of directors, (http://www.nbpts.org/) currently seeks to identify and recognize teachers who effectively enhance student learning and demonstrate a high level of knowledge, skills, abilities, and commitments by employing the use of alternative assessment. Such assessment includes portfolios, which are designed to reflect the standards and give a true picture of a teacher's level of accomplishment. During 1996-1997, the NBPTS awarded certification to 1,835 teachers in 45 states and the District of Columbia. According to Robert L. Wehling, NBPTS vice chair and senior vice president of Procter & Gamble Company, states and districts are supporting National Board Certification because they recognize how these standards help teachers become even more effective at helping students. Louisiana is one of the states that is supporting National Board Certification through the allocating of funds and encouraging teacher participation.

The Louisiana Department of Education is currently utilizing the NBPTS Candidate Subsidy funds to support 35 candidates at 50% of the certification fee, and will subsidize the remainder of the certification fee for the 35 candidates using funds allocated by the State Board of Elementary and Secondary Education. To provide additional fee support for National Board Certification, the State Board of Elementary and Secondary

Education has allocated a $300,000 supplement over a 3-year period (1997-2000). The New Orleans Parish School Board and the United Teachers of New Orleans have agreed that teachers who hold certification from the National Board will receive an annual 5 percent salary supplement (http:www.nbpts.org/). In Louisiana's 1999 Regular Legislative Session, House Bill 718, which provides for a salary adjustment of not less than $5,000 for public school teachers having been issued certificates by the National Board for Professional Teaching Standards was signed by Governor Mike Foster on July 9, 1999. A provision to House Bill 718, which became Legislative Act Number 975, is that the continued salary adjustment is contingent upon the teacher's evaluation indicating that the students have benefited academically from the teacher's national certification (http://www2.legis.state.la.us/script/avail-ocs.asp?insttype=HB7billid=718).

Teachers in K-12 schools in 45 states are being encouraged with a financial incentive to become nationally certified because of the prevalent belief that the national certification process causes teachers to become more effective in their instruction of students through intense self-reflection and analysis of their practice. It is the responsibility of colleges and universities to begin preparing preservice teachers in the rudiments of portfolio assessment. Teachers must not only be taught how to develop portfolios, but also be given the opportunity to have "hands-on" experience in their development. Education of K-12 students, therefore, begins with the teacher training programs in colleges and universities.

Based upon recent awareness of the nature and context of assessment, which has lead to the implementation of portfolio assessment as a portion of national certification, an investigation of the relationship of teacher education professors' portfolio knowledge, attitudes, and use is needed. It is the assertion of the researcher that portfolio assessment

must be an integral part of university preparation in order for teachers in K-12 settings to recognize the value of and practice the use of portfolio assessment.

CHAPTER 2

REVIEW OF LITERATURE

Traditional testing has been the status quo for assessment in colleges of education since their inception. In recent years, however, these methods of evaluation have begun to be questioned, not only by those in the field of education but also by those outside the profession. The question that is asked most often is whether or not the traditional types of assessments reflect the true range of abilities possessed by potential teachers. During the 1980s a form of authentic testing, portfolio assessment, surfaced as the possible solution for this perplexing question. The review of the literature was designed to determine whether this new type of testing is a "fading fancy" or a significant contribution to the assessment of preservice teachers. Following is a review of the various studies and articles that have emerged in response to the call from both educators and representatives from the public sector for compelling evidence of teaching competence. This chapter supports the major purpose of the study by examining the literature that focuses on the evolution of portfolio assessment, interpretations of portfolios as an alternative assessment tool, and on the factors related to the implementation practices of portfolios by individuals and organizations.

Evolution of Portfolio Assessment

When Ralph W. Tyler, a pioneer in the field of education and assessment, was interviewed by Rosalind Horowitz (1995, p. 74), he defined assessment as "the working out a problem, trying something, seeing what happens, modifying as a result, and learning what is valuable for the future." Horowitz summarized Tyler's comments by stating that multiple assessments and alternative assessments are not panaceas, and that evaluations must be guided by a purpose and sensitivity for the uniqueness of the individual or the student population being assessed. Tyler, consequently, argued for multiple assessments favoring the visible, practical uses of information by the individual student over the strict use of paper-and-pencil tests.

Cognitive theory purports that to know something is not just to have received information, but to have interpreted it and related it to other knowledge one already has. According to Herman (1992), good assessment, therefore, is constructed on current theories of learning and cognition and based upon the skills and capacities students will need for future success. Cognitive researchers define "meaning learning" as reflective, constructive, and self-regulated. It therefore follows that assessment also should include the role of the social context in shaping cognitive ability, because real-life problems often require that people work together as a group to find solutions. This recent awareness of the nature and context of learning has suppported the movement toward alternative assessment.

Linn, Baker, and Dunbar (1991) supported this movement, but also submitted a request for additional criteria for judging the quality of an assessment. The first criterion, according to the authors, is to plan from the onset to appraise the actual use and consequences of an assessment. In addition, all students should have the opportunity to

learn that which is being assessed. Third, the results of assessments should be reliable across raters and consistent in meaning across locales. Fourth, the evaluation instrument should assess higher-level thinking. Fifth, the content quality should be worthy of the time and effort of both the students and the teachers. The content assessed by the instrument should match the content taught by the teacher. There should be a relationship between student motivation to do well and the results of the assessment. Lastly, the assessment instrument's cost, design, and scoring procedures should be a consideration.

Ryan and Kuhs (1993) stated that four critical operational features for an assessment system should be considered when developing an assessment program. These components included: (a) flexibility, (b) the use of information from a variety of sources, (c) collection of assessment information longitudinally, and (d) processing or interpreting the information in an integrated, holistic fashion.

Unfortunately, some educators affirm the assumption that knowledge and skills are the only viable criteria for measuring student outcomes in education. What they may not realize is that two additional criteria have been proposed as necessary segments of assessment: attitudes and behavior. Behavior change in students is the ultimate criterion for measuring student learning (Travis, 1996). Although standardized tests are somewhat limited in gauging skill development, they may be almost futile in ascertaining student attitudes and behavior changes. Standardized tests tend to be norm-referenced, which means that students and institutions are compared with one another, and therefore they do little to enhance intended student outcomes. Students and educators have come to focus merely on test scores, rather than using testing as a learning tool.

Research indicates two basic flaws with standardized testing (Travis, 1996). Educators frequently teach students the test material. Another inadequacy in standardized

testing is the assumption that all students can be assessed using the same instrument. Presuming that each student has unique experiences, background, and learning styles, no single instrument realistically could be sufficient to measure individual development.

In order to insure that any assessment activity employed in schools is meaningful to the educational process, attention to the purpose for each test and to the criteria being measured is necessary. Assessment conducted merely for accountability reasons is not instructionally sound because the act of assessment must in some way enhance the learning process. Travis (1996) listed three basic considerations that should be made when developing meaningful assessment. Educators should establish the purpose or goals for assessment by determining who should be served by the tests and why the tests are being given. The "who" can be the schools, the public, politicians, or the students themselves. He points out that the true benefactors of any assessment, however, should always be the students. The "why" refers to the intended outcome such as, ranking of students, student placement, and improvement of learning. Another consideration is the determination of specific criteria to be measured that will assist the educator meeting the selected purpose. Travis suggested a paradigm of student assessment that incorporates the four criteria of knowledge, skills, behavior, and attitudes and emphasizes the multiple measurement approach. Lastly, a specific assessment technique should be selected. Travis recommended the following: (a) performance assessment, (b) authentic assessment, (c) portfolios, (d) journals, (e) interviews, and (f) attitude inventories. He believes that these techniques support meaningful assessment because they offer students the opportunity to recognize their progress and to discover what steps they can take to improve.

Barrett (1994) stated that a good assessment system allows students and teachers to have a shared understanding of what constitutes good work. Assessment is a tool for school reform and is rooted in shared values. Assessment is a social process that is grounded in: (a) development of common language for discussing accomplishments, (b) conversations about student work as evidence of accomplishments, and (c) development of shared values and clear criteria for evaluating student work.

Ralph Tyler has stated that assessment should be a personal or individual question, and he used the metaphors of a physician and a factory (Horowitz, 1995). He defined successful assessment in terms of a physician because a human is not raw material; humans have already developed many habits and practices by the time they enter school. Therefore, just as the physician works with the individual to determine what disease he or she may have, successful assessment cannot be a "one size fits all."

Historically, assessment has focused on measuring how thoroughly students have mastered knowledge and skills. More recently, however, increasing attention has been placed on how effectively students can undertake unstructured problems and investigate novel, open-ended situations. Recent findings such as the 1990 report of the National Commission on Testing and Public Policy revealed that current testing was relied upon too much, lacked adequate public accountability, lead to unfairness in the allocation of opportunities, and too often undermined vital social policies (Miller, 1992). This focus of need for a change in the assessment process was not limited to the United States; it has also crossed the Atlantic Ocean to England. In England, according to Swan (1996), an assessment system that allows students adequate time to undertake extended tasks, collaborate with peers, reflect and redraft ideas, and polish products has been implemented. The system also attempted to be both manageable and rigorous, making the

assessments efficient and reliable. To insure validity, different assessors used common standards. Swan concluded by stating that educators everywhere are becoming more aware of the need to assess how well students perform, in addition to how well they have learned.

This assessment movement, according to Murphy (1995), was born out of a disenchantment with standardized achievement tests and fueled by factors such as current research on language, literacy, and cognitive development; a waning faith in behaviorism; and an explicit recognition of the politicization of educational assessment. In the late 1980s, states began to administer alternatives to standardized tests. Although early attempts retained multiple choice questions, they introduced new elements, concepts such as the inducement of schema in preparation for reading, the inclusion of some open-ended response questions, and an increase in the length of texts. Recent efforts have progressed toward making the text in reading assessments more like reading in the real world and less like school artifact.

Worthen (1993) also attempted to explain why there has been a recent upsurge in calls for alternative assessment. First, during the 1970s it became apparent that the public was unsure of the ability of American schools to deliver instruction that would generate desired student outcomes, so some state legislators responded by passing educational accountability laws. Most such statutes called for evidence in the form of test scores that would demonstrate that schools were performing adequately. Soon, schools in 37 states found themselves overwhelmed with new requirements for minimum competency tests. Second, both minimum competency tests and standardized achievement tests have been used to make high stakes decisions. Not only have student promotion and graduation decisions been based on such test scores, but also these scores have increasingly been

used in unanticipated ways that have far-reaching consequences. Individual schools and school districts, for example, have been affected when test scores have been published in ways that permitted the public to make direct comparisons among schools and districts. Third, negative consequences were the results of high-stakes testing because educators began to provide measurement-driven instruction for their students. Students in all 50 states scored above the national average in virtually every basic content area covered by school and district testing programs at the same time that national assessments were simultaneously discovering profound gaps in students' ability. In other words, teachers were teaching to their state's criterion referenced tests rather than instructing the students to think in all areas. Finally, there existed increased criticisms of standardized tests even by psychometricians, who pointed out that some of the tests used to make high-stake decisions were more travesties than models of measurement.

In contrast, Miller's 1992 findings indicated that even though recent economic and demographic factors required students to demonstrate improved skills in critical thinking and reasoning, there were new pressures and consequences attached to standardized test scores for both students and educators. The stakes for students have been raised as both graduation and promotion between grades are increasingly tied to test scores. The stakes and consequences for educators have also risen as test scores are used to hold professionals accountable. Horowitz (1995, p. 71) reported similar findings in that "the 1993 Educational Testing Service Report indicated that in the past, 80% of state tests have been achievement tests, only 3% were school readiness tests, and most testing being done was multiple-choice and group administered."

Some educators believe that alternative assessment is a relatively new procedure. In his 1995 interview with Horowitz, however, Ralph Tyler stated that alternative

assessment has been utilized for more than 60 years; in 1934, he had stressed that educators should not depend too much on one single assessment. Worthen (1993) pointed that oral examination, which is a type of alternative assessment, dates back to at least Socrates. Other examples of alternative assessment include judging performance in music, athletics, and business education; proficiency testing in both language conversation and translation; competency testing for pilots and dentists; hands-on assessment in such vocational programs as welding, auto mechanics, and carpentry; and the use of art portfolios. Bogus (1995) reported that there has existed in classrooms for years an assessment technique that is non-traditional and experiential. Intuitive assessment is based on the fact that it is empirically possible to quantify quality by using this innate ability, intuition, that has been overlooked in learning. Intuitive assessment occurs when teachers measure, compare, and analyze behavior and progress from day to day. This information is recorded by the teacher as mental notes and may not be written in a formal way.

Stiggins (1991) argued that the current assessment upheaval is not simply the latest fad to sweep the education scene, but a signal for the end of a 60-year period of educational assessment and the passage into a whole new era. This era addresses the questions concerning student characteristics that were assessed in the 1990s, the kinds of assessment alternatives used to reflect those traits and the very meaning of sound assessment. Stiggins described the previous assessment era as beginning in a time of history when the United States needed to educate its large and ethnically diverse population of students with maximum efficiency to meet the workforce requirements of the growing industrial complex. To accomplish this task, the assembly-line method of organizing schools that focused on the finished product evolved.

Stiggins (1991) cited three significant patterns of behavior concerning assessment. First, educators abdicated responsibility for testing to textbook publishers. Teachers taught and assessors assessed; assessment and instruction were separated from each other. Second, the assessment community's research became so technically intricate as to make it incomprehensible by teachers and administrators, thus placing even more distance between assessment and instruction. Third, there has been unparalleled progression toward more and more centralized testing programs. Stiggins also pointed out fundamental changes in educators' views of schools and assessment that contributed to the demise of the previous assessment era. The thought that schools might be held accountable for the attainment of educational results as evidenced by the mastery learning models, behavioral objectives, minimum competencies, and outcomes driven models, which became prevalent during the 1970s and 1980s, spawned an even greater reliance on standardized test scores. This reliance did not strengthen the popularity of standardized tests because it caused educators to begin to reflect in great depth upon their changing responsibilities. Disenchantment with standardized achievement tests, according to Murphy (1995), was a result of the inability to accomplish the objective of creating a controlled environment so that differences in performance could be attributed to differences in the behavior being tested. In standardized testing, the environment is presumed to be controlled by using exactly the same tasks administered and scored in exactly the same way. Research (Murphy, 1995) has demonstrated that this objective is naïve because factors such as test-taking knowledge, student attitude toward tests, gender, and race all appear to have an impact on standardized-test performance.

Another area of concern was culturally relevant assessment, which addresses the unique cultural aspects of class, school, and community among culturally diverse

populations. The need for culturally relevant assessment reflects the diversity of society, where students of color are expected to comprise 33% of public school enrollment by the year 2000. The Quality of Education for Minorities 1990 Report stated that test scores are poor measures of student potential because such measures fail to consider interpersonal skills, language abilities, and related talents that students will need in the real world (Tippins & Dana, 1992, p. 50).

National, state, and local agencies in the 1980s began to ask what citizens would need to know and be able to do to contribute economically and live comfortably in the twenty-first century. The need for information managers, not information memorizers, became apparent. Traditionally, the field of evaluation has relied heavily on standardized tests that recently have been criticized for a number of reasons. Some of those reasons are given by Rueda and Garcia (1997): (a) standardized tests tend to focus on a narrow range of content, (b) they include limited response formats, (c) they can be oversensitive to test-taking skills and mainstream background knowledge, (d) they provide scores that are not useful in designing specific instruction, and (e) they allow little adaptation to local classroom contexts.

In the 1980s, Stiggins stated that an alarm clock has sounded and assessment, the sleeping giant, has awakened. This "new" kind of assessment is really not new. The only thing new is that teachers are now teaching and assessing using alternative assessment. Wiggins (1992, p. 32) accurately sums it up in his statement "good teaching is inseparable from good assessing." An increase in the visibility and use of portfolios, a form of alternative assessment, was believed by Arter (1995), however, to be the result of the perceived promise that portfolios will improve assessment by motivating and involving students in their own learning.

Birrell and Ross (1996) added that just as teaching and assessing are not separable, standardized tests and portfolio assessment are also not oppositional methods for determining student growth and teacher effectiveness. They viewed these methods as different but complementary means of gathering and interpreting information that can lead to a more holistic evaluation of student achievement. They suggested that classroom teachers need not view instructional strategies within differing paradigms as necessarily oppositional, that pre-service teachers should not be encouraged to adopt an "either-or" perspective regarding the use of standardized tests or student portfolios, and that teachers must be given opportunities to explore ways to benefit from multiple assessment methodologies. They stressed that standardized tests are considered less subjective than teachers' intuition and that the value of portfolio assessment may greatly depend on teacher's qualitative research methodology skills because a portfolio is really a single case study assessing one child's performance in school. Keefe (1995) proposed that portfolio assessment can bind quantitative and qualitative data together to produce a broader reflection of learning. Consequently, she suggested that standardized test scores be included in the contents of the portfolio.

One of the latest education levels to implement portfolio assessment is the college level in teacher education programs. Barton and Collins (1993) reported that any new approach to evaluating graduates of a teacher education program should take into account the kinds of experiences the students will encounter and the professional duties that they will be required to perform in the schools where they will be employed. The authors believed that portfolios can be the answer to the evaluation dilemma based upon the following reasons: (a) Portfolios give both students and teachers the opportunity to reflect on student growth and change throughout a course—an opportunity that does not exist

with a comprehensive examination administered at the end of a program; (b) Portfolios allow faculty to observe student work in the context of teaching as a complex process with interrelated factors; (c) Portfolio development shifts the ownership of learning onto the student because it encourages students to use and mold knowledge as they determine the necessity; and, (d) Portfolios assist students in becoming more articulate because of the abundance of collegial sharing and collaboration built into portfolio development.

Portfolio assessment is being employed in both the graduate and undergraduate teacher education programs at various colleges and universities. According to Barton and Collins (1993), an example of portfolio use in teacher education is encountered at The University of Rhode Island, which utilizes portfolio assessment in their master's level program in literacy education. Approximately 40 part-time students are enrolled in the program and enter with a teaching credential and several years of experience. The students' portfolios are evaluated first on a course-by-course basis and later, as a cumulative file. Instead of sitting for a comprehensive exam, students present their portfolios to a core group of faculty as the culminating activity in their programs of study. An example of an undergraduate program using portfolio assessment is the science teacher education program at Florida State University (Barton & Collins, 1993). Each semester, there are peer portfolio review sessions, instructor conferences, and joint faculty discussions are conducted on each student's portfolio.

In 1990, the commissioner of the state of Vermont mandated a substantial reform in the accrediting of teachers in a manner requiring the improvement of the quality of teacher preparation programs. The result of this mandate was the evolution and implementation of Vermont's state-mandated system of evaluation by portfolios. The rationale for using portfolio assessment for the licensing of teachers, according to Dollase

(1996), was a natural extension of the state's use of portfolio assessment in several academic areas in the public schools of the state, as well as the national trend toward performance-based assessment. The state of Maine is following Vermont's lead in the evaluation of undergraduates by using portfolio assessment to determine if students have met all requirements for initial teacher certification process (Lyons, 1996).

The National Board for Professional Teaching Standards has as its mission the establishment of high and rigorous standards for what accomplished teachers should know and be able to do. The certification process is an extensive, yearlong series of performance-based assessments that includes two components: portfolios and written tasks, which include exercises focused on pedagogical content and knowledge. The board's position on portfolio assessment is that it will both reflect the standards and give a true picture of a teacher's level of accomplishment. States such as California, Missouri, and Maryland, along with some thirty-two others, are providing incentives such as paying 50% of the $2,000 certification fee for National Board Certification. Louisiana is currently providing funds to support candidates at 100% of the certification fee, with candidates selected on a first-come, first-serve basis. Twenty states have passed legislation allocating funds for those teachers who become nationally certified to receive a salary increase or bonus. Louisiana House Bill 718, which was passed in the 1999 Legislative Session, would provide a National Board Certified teacher with an annual $5,000 salary increase for the life of the certificate. Many local school districts throughout the United States have also passed laws allowing moneys to be given to teachers who complete the National Board Certification process. During the 1998-1999 school year, the New Orleans Parish School Board and the United Teachers of New Orleans funded an annual 5 percent salary increase for those teachers who hold

certification from the National Board and are teaching in the area for which the National Board Certification was granted (http://www.nbpts.org/).

Portfolio assessment has rapidly become an important educational issue among researchers and legislatures, which in turn causes it to become a significant issue for college and university professors who teach undergraduate and graduate teacher education courses. Teachers must be prepared during their teacher training programs in the dynamics of portfolio assessment. Teachers must not only be taught the portfolio jargon, but must also have the "hands-on" experience that involves the selection, collection, and reflection necessary for true portfolio assessment. The process causes teachers to become more effective at helping students because it requires intense self-reflection and analysis of their practice. Research concerning the actual use of portfolios at the college and university level, however, is very limited at this time.

Summary of Portfolio Evolution

The review of literature confirmed that portfolio assessment is not a recent fad; it is still, however, evolving. The evolution process began because educators and representatives from the public sector were disenchanted with traditional assessment and were searching for a form of assessment which would assess not only how much students learned but also how well they can perform related tasks in different situations. The educational community has now become an arena for the implementation of portfolio assessment.

Interpretations of Portfolio Assessment

This section describes two elements that must be addressed before one gains a true understanding of portfolio assessment—common definitions of portfolio assessment

and common components of effective assessment. Research reveals that there is no universally accepted definition for portfolio assessment; the purpose of the portfolio dictates the definition. A study of the components of effective assessment shows that the recent awareness of the nature and context of learning, which is the basic premise of cognitive learning theory, has aided in the advancement of the movement toward portfolio assessment. The following sections offer a detailed explanation of both definitions of portfolio assessment and the common components of effective assessment.

A portfolio was originally defined as a portable case for carrying loose papers with "port" denoting "to carry" and "folio" pertaining to "sheets of paper" (Olson, 1991). Portfolios are common components of job-search strategies in such fields as art, modeling, and finance, yet they are new to much of education. In discussing the educational applications of portfolios, Collins (1991) defined a portfolio as a collection of work that demonstrates evidence of knowledge, skill, and disposition. Barnett (1995) made a distinction between a folio and portfolio. A *portfolio* is the finished product, containing only those pieces of information that provide specific evidence documenting a person's knowledge. A *folio* is a non-discriminant accumulation of evidence collected by the learner. The portfolio is a selected sample taken from the accumulation of evidence in the folio. Wolf (1991) stated that a portfolio is more than a container for sorting and displaying evidence of a teacher's knowledge and skills. A portfolio embodies an attitude that assessment is dynamic and that the most vivid portrayals of student performance are based on multiple sources of evidence collected over time in authentic settings.

According to Paulson, Paulson, and Myer (1991), the Northwest Evaluation Association defined a portfolio as a purposeful collection of student work that displays the student's efforts, progress, and achievements in one or more areas. The collection

must include the student's selection of contents, the criteria for selection, the criteria for judging merit, and evidence of student reflection. Bonnstetter (1991) described a portfolio as a systematic, well-organized collection of a student's knowledge, process skill, and attitudes. Montgomery (1997) described the actual contents of a portfolio as those items that reflect what a person must know, care about, and be able to perform in order to teach well.

Reckase (1996) proposed the following definition for portfolio assessment: a purposeful collection of student work that tells the story of the student's efforts, progress, or achievement in given areas. He stated that the teachers involved in his study particularly liked that the definition called for a purposeful collection and the story of progress. In an earlier definition, Reckase (1995) stated that portfolios must include the following: (a) student participation in selection of portfolio content, (b) the criteria for selection, (c) the criteria for judging merit, and (d) evidence of student self-reflection. Reflective practice has its origin in the learning theories of Dewey and Piaget, which maintain that learning is dependent upon the integration of experience with reflection, and of theory with practice. It functions as a dialectic process in which thought is integrally tied with action (Geltner, 1993). To help ensure that the documents and materials in the portfolio would be meaningful to those who review them, brief, written captions identifying and explaining the purpose of each piece of evidence should be attached (Wolf, 1991).

Ryan and Kuhs (1993) defined portfolio assessment as a comprehensive, multi-dimensional but integrated system that is sensitive to the multiple attributes of an educational program. Portfolio assessment, therefore, encompasses both the process and product. Both the process of developing the portfolio and the product, the final

submission, are utilized for assessment purposes. The process dimension supports formative assessment, and the product, summative. Portfolio assessment refers to the compilation of data documenting a person's knowledge and understanding over a substantial period of time (Barnett, 1995). Fahey and Fingon (1997) defined portfolios as a dynamic and systematic process that documents student progress over time in real-life settings.

Arter (1995) stated that portfolios are not folders of all the work a student does; rather, a portfolio has two basic purposes: assessment and instruction. Arter cites three common assessment uses of portfolios which include certification of competence (passportfolio), tracking over time, and accountability and gives examples for each use. An example of the certificate of competence was the state of Oregon's plans that call for portfolios to illustrate student progress toward or mastery of the state's eleven major goals for students. The Integrated Language Arts Portfolio used in Juneau, Alaska was designed to replace report cards and standardized tests as ways to demonstrate growth and achievement. A large-scale example of portfolio accountability was Vermont's grade 4 and 8 math portfolios. A classic example of an instructional portfolio was the Arts PROPEL secondary creative writing, visual arts and music portfolios in Pittsburgh Public Schools because they help develop student self-reflection, critical thinking, responsibility for learning, and content area skills and knowledge.

Katz and Johnson-Kuby's (1996) magic three rules for portfolio assessment mandated that each portfolio should include selection, reflection, and sharing. The sharing of portfolios with others was one aspect that few authors discussed. Katz and Johnson-Kuby stated the importance of all three components of portfolio assessment. They described the process of portfolio assessment as (a) selection of items by the

student, or the student and the teacher, or the student, the teacher, and the parent; (b) reflections by the student, or possibly by the teacher and parents, on the entire portfolio; and (c) sharing which allows all the students to observe diverse learning when they gather together to communicate their learning discoveries.

Collins (1992) defined a portfolio as anything that teachers and students want—as long as they are thoughtful about what they want the portfolio to be for them. Collins' major focus was on the aspect of portfolio production which included three roles: (a) the portfolio designer, (b) the portfolio developer, and (c) the portfolio assessor. The portfolio designer in the traditional classroom is the teacher, who states what should be included in the portfolio. The portfolio developer is the student, who completes and collects all assignments and places them in the portfolio. The third role of portfolio assessor is one who reviews the portfolio and assigns value to the work. The person who fills the role of portfolio assessor can be a student, teacher, parent, or administrator.

Most articles offer a definition for portfolio assessment. Rueda and Garcia (1997) offered the following concise definition for portfolios: portfolio assessment usually refers to systematic collections of actual work samples, artifacts, and products that are prepared for a variety of purposes and audiences. Lengeling (1996) dealt with teacher evaluation using portfolios, so she proposed that the definition of portfolio is an accumulation of documents that best describe a teacher's strengths and philosophies. Lamme and Hysmith's (1991) definition is rather lengthy, but gives the reader a satisfactory understanding of what portfolio assessment entails. They stated that portfolio assessment included: (a) more informal observation that is used to gather data in open and unobtrusive methods during instruction; (b) artifacts selected by students and teachers for a particular purpose; and (c) records kept by students of work they have accomplished.

The authors further stated that these records could be analyzed to determine the student's progress. Cramer (1993) added a new twist to the definition of portfolio when she proposed that the portfolio itself is not a type of assessment, but an assessment tool which provides a collection of student work that documents the process of learning and individual growth. Glazer (1995) stressed the importance of the assessment tool being an honest alternative and not merely camouflaged labels for traditional letter grades. Koskinen (1994) suggested that the definitions and structures of portfolios vary, but in general, all encompass three major concepts: (a) the relationship of curriculum, instruction, and assessment; (b) student involvement in their learning and evaluation; and (c) student growth over time. Sunstein (1992) concluded that she was not sure what portfolios are and that one should resist suggesting a rigid definition.

In conclusion, while there is no universally accepted definition for portfolio, the purpose of a portfolio dictates present-day definitions (Wenzall & Cummings, 1996). Dutt, Tallerico, and Kayler (1997) stated that, despite the diversity in definitions, it is generally agreed upon that the portfolio's form, presentation, and content should vary, depending upon its purpose. The term portfolio has evolved from meaning "a portable case for holding papers" to "a display for selected contents" to "a case for competence" (Biddle, 1992).

Just as there is no universal definition for portfolio assessment, there is also no consensus on which specific portfolio components yield an effective assessment. The following is a summary of literature that describes what the authors believe to be the components of meaningful portfolio assessment.

Joyce and Weil (1986) noted that four elements were required to effect successful transfer of knowledge to practice: (a) the study of the theoretical basis or the rationale of

the teaching method, (b) the observation of demonstrations by persons who are relatively expert in the model, (c) practice and feedback in relatively protected conditions, and (d) coaching one another as the new model becomes part of the teaching repertoire. Stahle and Mitchell (1993) stated that the institution of portfolio assessment involves all four components.

Ryan and Kuhs (1993) suggested that the following categories be incorporated in a balanced assessment system: (a) knowledge of subject matter; (b) intellectual abilities and problem solving skills; (c) pedagogical skills; (d) curriculum knowledge, insight, and skill; (e) knowledge about learners and learning; and (f) attitudes and dispositions. Similarly, Winsor and Ellefson (1995) recommended that professional portfolios show evidence of the following types of information: (a) professional development, (b) teaching competencies, (c) knowledge of child development and learning processes, (d) content knowledge, (e) personal and professional attributes and experiences that contribute to teaching. Winsor and Ellefson also purported that portfolio conferences should be a part of the portfolio process. The authors suggested three guidelines for the conferences. Responses should (a) offer praise in respect to progress and achievement, (b) submit expertise concerning any issues or questions raised by students' self-evaluation, and (c) guide teachers in setting goals for further development as professional educators. According to Stone (1995), teachers should hold frequent, brief portfolio conferences that allow the teacher to identify opportunities to adapt instruction according to students' needs.

Collins (1990) classified four types of portfolio evidence: (a) artifacts, (b) attestations, (c) productions, and (d) reproductions. An artifact is an article produced by the student. An attestation is a document about the student, prepared by someone else.

Productions are documents prepared especially for the portfolio. Reflections on documented accomplishments and caption statements about the learning experiences are examples of productions. A reproduction is a representation or an example of a typical event in the student's work. Examples may include photographs of bulletin boards or videotapes. According to Hannam (1995), caption statements are the most important part of the portfolio documents because they convert the document into evidence. Caption statements distinguish a portfolio from a mere collection of a student's work.

Cramer (1993) discussed rubrics and their importance. Murphy (1995) defined a rubric as a written description of performance accompanied by a value on a scale indicating the quality of the performance. Usually there are five or six points on the scale, with 5 or 6 being the highest score and 0 or 1 being the lowest score. Cramer (1993) stated that not only does a prior specification of evaluation criteria allow students to recognize, strive for, and select work that is considered high quality, but it also helps teachers and others make decisions about what to emphasize during instruction and when assessing the portfolio. Moreover, it simplifies the evaluation phase as judges know the standards that they are to use. Finally, criteria specification allows and encourages debate and discussion among teachers, students, and others concerning the outcomes and quality of outcomes that are desired for the instructional situation for which the portfolio is being developed.

Ross, Bondy, Hartle, Lame, and Webb (1995), after analyzing 73 portfolios prepared by faculty from various colleges, developed seven common guidelines for portfolio construction:

1. Specify a criteria for contents.
2. Include quantitative student evaluation information.

3. Include a teaching statement.
4. Present evidence of recent attempts to improve instruction.
5. Submit evidence from multiple sources to support claims of teaching excellence.
6. Define all evidence presented in the portfolio.
7. Limit the quantity of evidence presented (p.51).

Simmons (1996), however, stated that it is a mistake to try and control the contents of portfolios. Only the purpose of the portfolio should be controlled, according to Simmons, because student control of the content provides evidence of the student's ability to solve problems, to reflect, and to analyze their work. He stated that there are three important processes in portfolio construction: collection, selection, and reflection.

In contrast, Montgomery (1997) stated that students should be given explicit directions about the form and procedure of portfolio documentation and that students should be given guidelines about the types and amount of evidence to include. The students should, however, be given control over selecting the particular evidence for the portfolio. Lengeling (1996) suggested that guidelines concerning portfolio formation and evaluation need to be clearly defined in order for them to be useful. She also stated that portfolios should be implemented only after there is a clear understanding of the goals of the institution, department, community, and teachers.

According to Potthoff (1996), the specific selection guidelines that are provided to portfolio users help determine portfolio contents. Potthoff reported, however, that even though there is a general agreement on the key purposes for using portfolios in teacher preparation programs, there appears to be an amazing variety in the selection guidelines being used at different institutions. Mathies and Uphoff (1992) reported that in order to

assist the student in gaining a better understanding of the rubrics that the college had established, the students attended a two-credit hour seminar during their first quarter of coursework. The purpose of the seminar was to introduce students to the structure of the portfolio. Another suggestion by Mathies and Uphoff was that the student at the successful conclusion of the coursework make an oral presentation for the faculty.

Murphy (1995) did not believe that the use of rubrics would increase the accuracy of assessment because the numeric scale encourages comparison of students and student groups. The problem with this type of assessment is the assumption that all students and schools are alike and that the assessment task is neutral toward people of varying economic and cultural backgrounds. Unless the tasks account for this difference, then the results of using rubrics will not be contrary to the results of using standardized tests.

Summary of Portfolio Interpretations

An understanding of two elements—common definitions of portfolio assessment and the common components of effective assessment—is essential before one gains a true understanding of portfolio assessment. There is no universally accepted definition for portfolio assessment; the purpose of the portfolio dictates the definition. The recent awareness of the nature and context of learning, which is the basic premise of cognitive learning theory, has aided in the advancement of the movement toward portfolio assessment which is believed by many to be more effective than traditional assessment.

Evaluation of Portfolio Assessment

This section gives a detailed report on the literature that reviews the advantages of portfolio assessment, the disadvantages of portfolio assessment, and the reliability and validity of portfolio assessment.

The advantages of portfolio assessment, according to Dutt, Tallerica, and Kayler (1997), are that portfolio development leads to (a) student self-reflection, (b) the opportunity to engage in professional dialogue about portfolio entries, and (c) student teachers' developmental perspectives on self-assessment. Ohlhansen and Ford (1991) listed the following concerning the advantages of portfolio assessment in their graduate literacy learning class: (a) helped personalize assessment; (b) encouraged reflective thinking and self-discovery; (c) provided greater authenticity, accuracy, and long-term perspective; and (d) enhanced student organization and accountability. Wolf (1991) reported that portfolios provide a connection to the contexts and personal histories of real teaching and make it conceivable to document the unfolding of both teaching and learning over time. He further stated that no one method of assessment could equal portfolios in providing a connection to the contexts and personal histories of real teaching. He concluded that the advantages for utilizing portfolio assessment are that portfolios can (a) give teachers a purpose and framework for preserving and sharing their work, (b) provide occasions for mentoring and collegial interactions, and (c) stimulate teachers to reflect on their own work and the act of teaching itself.

Geltner (1993) stated that portfolio assessment is a formative process because it compiles multi-faceted evidence of performance and growth. She determined that a portfolio could be a limitless opportunity for students to display, in one collection, evidence of what they know, think, and are able to do. A portfolio further provides a complex and comprehensive view of student performance that encourages one to look at learning as a multidimensional process. Portfolios, Geltner stated, more accurately measure leadership behaviors and activities that take place in actual school settings, and

encourage students to view learning as an incrementally-staged process, with concrete benchmarks for their own progress.

Stone (1995) reported that there are three strategies that teachers can implement to use portfolios most effectively as a dynamic tool. First, they can integrate portfolio assessment into their instructional day. A portfolio must be a part of the instructional day so that the teacher can combine assessment with instruction. Second, teachers must make portfolio decisions as they work with each student. Keeping the portfolio interactive means that decisions about its content must be made during the day when the student is available to reflect on his or her own work or choose items for his or her portfolio. Finally, teachers should build on their own knowledge of how students learn. Salinger and Chittendon (1994) interviewed elementary teachers who were using portfolios and found that portfolios both directly and indirectly contributed to instructional decisions. Data from portfolios were used to support specific instructional decisions; however, indirectly, portfolios contributed to teachers' general knowledge of learning and child development. Not only do portfolios affect daily instructional goals, but they also affect the larger issues of curriculum, classroom management, and classroom environment.

Barnett (1995) asserted that the portfolio could be used as a self-assessment tool, a program assessment, or an external assessment. Because the recommended structure of portfolios allows for personal insights to be obtained in the reflective entries, learners have the opportunity to personally assess their strengths and weaknesses. During the program, portfolio entries aid as a formative assessment device, indicating present progress and likely areas for continued growth and development. At the conclusion of the program, the portfolio emphasizes the degree to which the learner has accomplished the aspired outcomes. External assessment is achieved when the completed portfolio can be

shared with other people to assist them in better understanding the learner's skills and abilities. LeMahieu, Gitomer, and Eresh (1995) stated that portfolios are thought to engage students in tasks that are comprehensive and consistent with the goals of a discipline or harmonious with the desired outcomes of the educational process. LeMahieu et al. furnished detailed evidence about student thinking that enables more specific instructional decision making, and they encouraged students to take an active role in their own assessment, making possible a sharing of the responsibility for learning.

In a study examining how portfolio data compared to traditional standardized assessment data, Rueda and Garcia (1997) indicated that educators found portfolio data more useful and informative than traditional data, and that portfolio assessment broadened the range of stakeholders in the assessment process. Precisely, the information given to parents was more specific for portfolio data than for traditional data. Tippins and Dana (1992) reported that the use of portfolios in assessment reflects a fundamental change from traditional assessment practices in that the development of portfolios (a) encourages teachers and students to work and learn together, (b) provides opportunities for reflection and self-assessment, (c) helps redefine traditional student and teacher roles in relation to the curriculum, (d) empowers both students and teachers with regard to learning, and (e) emphasizes the culture in which teaching and learning occurs.

Potthoff, Carroll, Anderson, Attivo, and Kear (1996) asserted that portfolios are an assessment tool for all ages and should be used in teacher education programs. Research supports Potthoff et al. with the following reasons for employing portfolios. Portfolios promote self-analysis and critical reflection in way that help to unlock the complexities of teaching (Wolf, 1992). The portfolio process allows both preservice teachers and faculty to observe the preservice teacher's performance in courses and field

experiences as a complex set of activities that contain many interrelated components. Portfolios help document learning, growth, and development over time (Barton & Collins, 1993; Stowell, Rios, McDaniel, & Kelly, 1993). Preservice teachers can prepare the story of the process that they have encountered in becoming a teacher. Portfolio use in teacher education is consistent with the move to use portfolios in state and national certification. Finally, experience with portfolios facilitates preparation for working in reformed and restructured schools where strategies such as integration, interdisciplinary instruction and alternative assessments are especially valued (Stahle & Mitchell, 1993; Stowell et al. 1993).

Cramer (1993) summarized the benefits of portfolio assessment as being able to document learning in the cognitive, affective, and psychomotor domains and provide information about the student as both a learner and individual. Administrators, according to Rothman (1995), believe that portfolio assessment methods not only provide better information about student abilities, but also help teachers improve their practice and enables students to reach high levels of performance. Koskinen (1994) concurred with Rothman and added that by engaging in self-reflection and self-evaluation, teachers are encouraged to evaluate their instruction critically and to use portfolio information to make instructional decisions. In addition, students become more interested in and responsible for their own learning.

Schurr (1998) provided another array of advantages for using portfolio assessment which included that portfolios (a) provide tools for discussion, (b) provide opportunities to demonstrate what students know and what they can do, (c) provide a vehicle for students to reflect on their work, (d) document the growth of a student's learning over time, (e) furnish avenues for expression of alternative student learning styles and multiple

intelligences, (f) allow students to make decisions about what to include or exclude, and (g) make it easier for students to make connections and transfers between prior knowledge and new learning. Portfolios provide for students the opportunity to express themselves in formats that are within their learning styles and intelligences through varied types of work samples that can be included in the portfolio. Those samples could include essays, reports, letters, creative writing, problem statements and solutions, journal entries, interviews, artistic media, collaborative works, paper and pencil tests, surveys or questionnaires, reading reviews, self-assessments, peer reviews, videos, pictures, or parental observations. Because the student is empowered to decide what will be included in the portfolio, the list is limitless.

Even though Black (1993) predominately focused on the problems of portfolio assessment, she did provide a different perspective on the advantages of using portfolios. She went beyond the typically stated advantage of assessment and offered four additional reasons for using portfolios. They can be used (a) as a teaching tool, (b) as professional development of teachers, (c) in assessment, and (d) in research. Portfolios are used as a teaching tool because they provide student ownership, motivation, a sense of accomplishment, and participation; involve students in the process of self-reflection; and aid in parent conferences. They can be used in professional development because they support the study of curriculum and effective teaching practices and identify school strengths and needs for improvement. Using portfolio assessment is an advantage because it can serve as an alternative to standardized testing, replace competency exams, and serve as a grade or end-of-the-year culminating activity. Research for the purpose of examining growth over time and progress in students' work is a final reason for using portfolio assessment.

Dutt, Tallerica, and Kayler (1997) stated that the major concern in using portfolio assessment for the 26 student participants in their study was the amount of time required developing the portfolio. The portfolio was not understood as a complement to the pre-service teacher training education, but rather, as an "add-on" to course requirements. Wolf (1991) reported that portfolios are messy to construct, cumbersome to store, difficult to score, and vulnerable to misrepresentation. Paris (1991) also noted that teachers are often enthusiastic, but bewildered, by the challenge of creating their own portfolio assessments. Providing hands-on portfolio assessment experience may be the best preparation to improve instructional efforts. The following were reported by Ford and Ohlhausen (1991) as some of the reasons cited by 230 teachers in graduate level courses for not using portfolio assessment: (a) too time consuming, (b) not enough knowledge, (c) storage problems, (d) do not provide grades, and (e) uncertainty of what should go into the portfolio. LeMahieu, Gitomer, and Eresh (1995) also stated that the amount of time needed to develop a portfolio was perceived by participants in their study to be a major disadvantage for portfolio assessment.

Black (1993) dealt with the problems associated with portfolio assessment, citing the report of the RAND Corporation, an independent evaluator that evaluated Vermont's portfolio assessment program. The major problem, according to Black, lies with the inability to accurately record and measure student performance. The RAND Corporation found that scores on portfolios are not statistically reliable and, therefore, made recommendations that improved training be afforded to teachers in how to score portfolios accurately and that the complex scoring system be changed. Black also cautioned that using portfolios without a clear plan could lead to misunderstandings with parents, administrators, and students. Further problems can also occur as the teacher tries

to determine acceptable standards for student work, coordinating assessments with grading requirements, and storing the portfolios.

"If alternative assessment is to survive, its proponents must clarify its concepts and terminology" (Worthen, 1993, p. 447). Worthen has identified 12 issues that he believes must be addressed if alternative assessment is to reach its full potential. First, advocates must spend time clarifying the concepts and terminology of alternative assessment. Second, a mechanism or forum for internal self-criticism that would prohibit the one-sided nature of the current discourse on the topic of alternative assessment must be established. Third, if the alternative assessment movement is to succeed, it must have the support and involvement of a large and well-informed cadre of professional educators. Stiggins (1991), however, reported that teachers and other educational practitioners are lacking in assessment literacy and that teacher training programs are not preparing a well-informed group of educators. Fourth, there must be some evidence that the technical quality of the assessment is good enough to yield a truthful picture of student abilities. Fifth, alternative assessment must provide standardization of assessment judgment so that teachers, parents, and even students know what progress is developmentally appropriate. Sixth, if alternative assessment is to measure higher-order thinking skills, great care must be taken to select and present assessment tasks in ways that require students to use and to demonstrate complex thinking in their responses and not just a display of a memorized sequence or responses. Seventh, in attempting to persuade stakeholders of the importance and usefulness of alternative assessment, educators must not overpromise or undersell the results of alternative assessment. Eighth, the unknowns about alternative assessments that raise questions about their usefulness in high-stakes settings must be resolved. One such unknown is the ability or inability of

alternative assessment to provide sufficient standardization to defend high-stakes decisions based on such measures. Another unknown is the uncertainty of how ethnic minorities will score on alternative assessments versus traditional assessment. The last unknown is one that addresses the inevitable legal challenges aimed at high-stakes decisions based on alternative assessment because the results may be more difficult to defend, since the validity of such measures may be less apparent to psychometricians and thus, less convincing to the courts. Ninth, the issue of whether alternative assessment is feasible for large-scale efforts to assess student performance is one of the most frequently debated topics. Everyone, whether a proponent or opponent of traditional assessment, will admit that alternative assessments are more costly and take more time to score. Tenth, there must be continuity and integration across educational systems which could be resolved if the alternative assessment movement developed or refined strategies that link the assessment for accountability more effectively to assessment for individual student diagnosis and prescription. Eleventh, if alternative assessment is to survive, technology must be harnessed to make alternative assessment less labor intensive. Twelfth, there must be an avoidance of monopolies and "reinventing of the wheel." School districts must rely on the wisdom of existing expertise to develop high-quality performance assessments.

Arter (1995) pointed out that because there is no single correct way to "do" portfolios and that portfolios can be used for so many purposes, developing a portfolio system can be confusing and stressful. She stressed that portfolios are a means to an end and not an end in themselves; therefore, there must be a clear vision of what the "end" is.

How to store and manage portfolio materials is a concern shared by many educators considering implementing portfolio programs. Many educators have been

reluctant to implement portfolio assessment programs because of storage concerns; however, a possible solution to this problem is the creation and storage of portfolios using computer technology. According to Lankes (1995), the terms "computer-based portfolio" and "electronic portfolio" are used to describe portfolios saved in an electronic format. Tuttle (1997) defined an electronic portfolio as a concise, annotated collection of student work that reflects educational standards.

Barrett (1994) cited in her article that technology support in assessment allows students and teachers to have a shared understanding of what constitutes good work by (a) making work in many media accessible, portable, examinable, and widely distributable, (b) making performance replayable and reviewable, and (c) addressing ownership issues. Current technology thus allows for the creation and storage of information in the form of text, graphics, sound and video on a hard disk or a CD-ROM. Lankes (1995) stated that a CD-ROM might be the better of the two because the amount of information that can be stored on a CD-ROM.

Other than just saving space, electronic portfolios have other advantages. For example, within an electronic portfolio a student can play a digitized tape of the most important part of his or her presentation or show a movie of how he or she used math and science to solve an environmental problem. Various parts of the electronic portfolio can be interconnected through hyperlinks. In summary, the electronic portfolio assists the student with organization skills because it stores copies of work samples so that they do not get lost or misplace and allows older student work samples to be replaced by new student work with minimal effort.

Tuttle (1997) also reviewed the process of how his school district selected an electronic portfolio program. The district evaluated the following approaches to

electronic portfolios: (a) simple word processing portfolios, (b) videotapes, (c) Web pages, and (d) multimedia software applications. Each was determined by the district to have advantages and disadvantages, which were discussed in the article. Word processing portfolios were found to be limited in functionality. Videotapes required too much space for storage. Most student webfolios did not relate to the district goals nor did they include student/teacher reflections. The focus on portfolio software is software that is specifically designed for electronic portfolios and general purpose multimedia programs that can be used for electronic portfolios.

Good portfolio software should include or facilitate (a) an introduction to the portfolio, (b) an introduction of the student, (c) district goals and competencies, (d) various ways to show student work, (e) evaluation of student work (a rubric), (f) student reflection, (g) teacher feedback, and (h) a summary of the student's achievement (Tuttle, 1997). Based upon these components and the fact that Tuttle's school district wanted flexibility in rearranging the screens, the district opted for the HyperStudio software because it could be customized.

The hardware requirements for portfolio assessment are a financial investment. Because school districts are receiving very large amounts of money for technology, this should not be a major hindrance to the implementation of electronic portfolio assessment. Tuttle (1997) and Barrett (1994) proposed the following for the necessary hardware requirements for an electronic portfolio assessment program. Electronic portfolios require a multimedia computer with a microphone because a multimedia computer can accept sound and images from external sources and can digitize sound and images as well. A portable storage device such as a zip drive is necessary if the school does not have a network. A color hand-held scanner or flat-bed scanner, color digital camera, and a

general purpose multimedia software program or an electronic software portfolio program are also required.

Moersch and Fisher (1995) reported on the progress that has been made with the electronic portfolio assessment that has been implemented in Oregon. Learning Quest's Electronic Portfolio is the software that Oregon is using as the tool to appraise classroom teachers in assessing, managing, storing, and accessing student portfolios electronically. In Learning Quest's Electronic Portfolio, the student's performance can be scored using a redefined scoring rubric, which ensures a more efficient portfolio. The authors concluded that from a technological perspective, the future of electronic portfolios appeared to be encouraging. Improvements in mass storage devices, processing speed, and compatibility among different formats of technology have signaled a new generation of electronic portfolios capable of fulfilling their promise of providing successful authentic assessment.

LeMahieu, Gitmoer, and Eresh (1995) reported that even though the arguments for using portfolio assessment are persuasive, there is relatively more skepticism in the literature concerning their utility and practicality for institutional accountability, where needs traditionally have been satisfied by standardized tests. A literature review was conducted to determine if portfolio assessment was both reliable and valid.

In a 1997 study, Naizer evaluated the validity and reliability of performance portfolios in a preservice elementary methods class. Validity was determined by the assessment of the students' domain-strategic and general-learning strategic knowledge about mathematics and science into the learning environment of an elementary school classroom. These measures, employing The Test of Logical Thinking and Motivated Strategies for Learning Questionnaire, were used in combination with the number of

education courses and the total hours of prior teaching experience to predict group membership of students as determined by performance-portfolio scores. Reliability was examined by comparing the two course instructors' scoring to each other and to student peer-raters. Results from this study indicated that performance portfolios can be reliably and consistently graded. Results from each predictor variable, the percent of correct predictions, and the canonical discriminant functions supported performance portfolios as a valid method of assessing desired abilities of preservice teachers.

Reckase (1995) reported that Nystrand's 1993 study found internal consistency reliabilities of portfolio scores in the mid-.50s for total scores based on three papers and two readers. A similar study by Koretz, McCaffrey, Klein, Bell, and Stecher (1992) reported average reliabilities of .43 on the scores on five areas of an eighth grade writing portfolio from Vermont. Results of both of these studies proposed that scores on individual entries in the portfolio probably would not be sufficiently reliable for supporting use with individual students; however, Reckase (1995) suggested that if each portion in the portfolio is scored and the scores are summed to form a composite score, it might be possible to achieve levels of reliability that would support the use of the scores to inform decisions at the student level.

LeMahieu, Gitomer, and Eriesh (1995) reported that instability might be introduced through the judgments of raters or through variability in the collection of student work. The authors stated, however, that portfolio assessment could have sufficient psychometric integrity to support the purpose of accountability. To achieve this standard, four primary components must be in place. First, the purposes of the assessment must be clear, and the practices must be consistent with the purposes. Second, there must be a shared interpretive framework within the population that conducts and uses the

assessment. Third, there must be continuity in the system, so that accountability goals are consistent with classroom goals. Fourth, the development of this portfolio-based instructional and assessment system must be dominated by discussions designed to address issues of quality in both instructional and psychometric terms.

Summary of Portfolio Evaluation

The review of literature supported the many advantages of portfolio assessment—such as self-reflection, multi-faceted evidence of performance and growth in both program and external assessment. Some of the disadvantages of portfolio assessment that were discussed included development of portfolios may be confusing and stressful, too much time spent developing portfolios, and portfolio storage problems. Studies on using electronic portfolios purported a reduction in the problems related to the amount of time and to storage. In the literature concerning the reliability and validity of portfolio assessment, it was determined that four components must be in place: (1) the purpose of the assessment must be clear, (2) the population must share the same framework for interpretation of the portfolio, (3) portfolio goals must be consistent with classroom instruction, and (4) discussions must address the issues of quality of both instructional and psychometric terms.

Factors Related to the Implementation of Portfolio Assessment

There is a dearth of literature that deals with factors—knowledge, attitude, years or teaching experience in teacher training programs, and gender—related to portfolio assessment. The review of literature, however, did disclose information on two factors: knowledge in the form of training and attitudes toward portfolio assessment. No

information was located on the factors concerning the years of teaching experience in a teacher training program and knowledge of portfolio assessment, the years of teaching experience in a teacher training program and attitude toward portfolio assessment, gender and knowledge of portfolio assessment, and gender and attitude toward portfolio assessment.

The articles reviewed represented two areas of cognitive training: one for assessors and one for the developers of portfolios. Dutt, Tallerico, and Kayler (1997) reported in their qualitative study of the use of portfolios in a preservice teacher education program that their observations emphasize the importance of training and communication to ensure cognition of the potential benefits of using portfolios as the means for assessment and professional growth. Student teachers, cooperating teachers, and university supervisors require a common understanding of proposed implementation processes and purposes of the developmental portfolio. The authors stressed the significance of such shared knowledge because of the broader concepts within which portfolio assessment is conducted.

Geltner (1993) described an innovative approach that is used to prepare school administrators in which instructors and students, who are school administrators, come together in a learning situation which integrates three core components: formative portfolio assessment, reflective practice, and cognitive apprenticeship. The component of formative portfolio assessment can be accomplished by review sessions that are scheduled between the student and the instructor at periodic intervals. During these sessions, both individuals can come together for the purpose of reviewing the portfolio contents, paying attention to their quality and quantity, and the desirability of adding other materials that would prove useful as evidence of explicit learning and

understanding. Reflective practice, a dialectic process of transferring from theory to practice and back again to theory, occurs during the formative assessment and causes the student to take an active role. This active role is not merely developing new ideas of theories of action, but eliminating or modifying those old ideas that have been shaping behavior. Consequently, through the integration of knowledge and action via thought, reflective practice can alter understanding and behavior, and help students improve their teaching ability. The cognitive apprenticeship approach builds on the traditional apprenticeship archetype, by which an individual who desired to become professional worked as a subordinate to a qualified practitioner or master and learned essentially by observation, discussion, and imitation. "Unlike the technical-rational approach which operated didactically in the lecture hall, the cognitive learning approach is active (as opposed to passive), social (collaborative, cooperative) and authentic (enculturated)" (Geltner, 1993, p. 7).

The Bellevue Portfolio Project was initiated in Bellevue, Washington schools to improve instruction, improve student learning and ownership for learning, and report to others. Koskinen (1994) reported that one of the project's outstanding features was the teachers' monthly group meetings, which were held either during or after school. The agenda of these meetings was to begin with an open time for teachers to raise concerns, tell stories, and share new ideas. Initial meetings focused on logistics, such as constructing portfolios that were durable, helping students choose the portfolio contents, designing entry slips for students at various grades, and managing portfolio components. Koskined reported that as the year progressed the open part of the meetings began to shift to issues of instruction and student performance, which were the initial goals of the project.

Graduate students in the Educational Technology programs at Wright State University received a two-step training process in the development of a portfolio (Mathies & Uphoff, 1992). First, the students were introduced to the portfolio process in a mandatory two-credit seminar during their first quarter of coursework. The seminar was intended to furnish a common beginning point to introduce students to the structure of the portfolio. Reflection was also emphasized and students were encouraged to build their portfolios as they progressed through their programs of study. During their last quarter of study, students took another two-credit seminar. The purpose of this seminar was to provide a climactic experience where issues, trends, research, and problems were investigated. During this time, portfolios were completed and an oral, videotaped presentation was made to the faculty. The portfolio and its oral presentation were regarded as the comprehensive examination for the educational technology program.

After serving as the former research assistant with the Teacher Assessment Project (TAP) at Stanford University, Kenneth Wolf (1991) reported that one of the areas of concern that teachers who participated in the project had was that teachers wanted more direction about the form and procedure of documentation concerning the contents of the portfolio. The research also indicated that prior attempts at employing portfolios to assess teachers in licensure and career ladder programs in Tennessee and Florida revealed that, "if the portfolio process is too open-ended or ill-defined, it can turn into a paper chase" (Wolf, 1991, p. 133). One of the recommendations from the research, therefore, was that a portfolio construction kit, which gave the specifics of portfolio contents and also examples of portfolios, be made available for the teachers. These recommendations have been implemented by the National Board for Professional Teaching Standards

(NBPTS) because TAP was intended to assist the NBPTS in its creation of a voluntary program for the national certification of teachers for elementary and secondary schools.

Barnett (1995) also suggested recommendations on how to alleviate the ambiguities and uncertainties faculty and students experience when portfolio assessment is utilized. Those suggestions included having the faculty become more familiar with the various aspects of portfolios, specifically the types of evidence to include in portfolios, the structural features of portfolios, and the intended uses for portfolios. To achieve this, he stated that the faculty needed to read the emerging literature in the field of authentic assessment, particularly portfolio assessment, and to tap the experience of those educators who are familiar with this type of assessment. The final suggestion that he gave was that the faculty should construct their own portfolios and present them to one another so that they could learn firsthand about the complexities of portfolio assessment.

Abruscato (1993) stressed the importance of training by comparing it to the glue that causes wallpaper to stick to the wall. He uses this analogy by asking the reader to think of the recent failed educational innovations attempted in their school districts. Just as new wallpaper will not last without glue, so will the new innovative assessment ideas fade away without proper training. Abruscato advocated training for the new assessment programs that is intensive and is provided by three different groups—the state department of education, individual districts, and institutions of higher education.

Barton and Collins (1993) stated that their review of relevant literature indicated that there is no definitive approach for evaluating portfolio materials. Evaluating portfolios is very subjective, and according to Barrow (1993), a scoring form helps preservice teachers to focus on the content rather than the display. Barrow also suggested that the criteria for the scores on the form (that entailed two basic areas of evaluation:

competence in subject matter and instruction) may be based on an average of all the graded work. After the evaluation, the form and comments should be returned to the student. These comments not only give valuable feedback but can also be used in future teaching.

After Geltner (1993) conducted qualitative ethnographic research concerning a graduate administrator preparation program at a major university, she offered an approach to the evaluation process of portfolio assessment, which did not employ a scoring rubric. As the graduate students developed their portfolio, they prepared for a meeting with the program coordinator/instructor to present and discuss their portfolio. These meetings were scheduled at semester intervals throughout the program and were held a total of five times in individual sessions with each student who was enrolled in the program. In order to prepare for the meetings, the instructor reviewed the portfolio and carefully examined the documentation of each activity or experience and the accompanying reflective statement. Meetings with the student lasted for one hour with the student initiating the discussion, describing an entry, and commenting on the experience. The instructor's role was to question, redefine, and reframe. Alternative possibilities were explored and linkages were made with theories discussed in class. Geltner stated that this served as the basis for a shared process of critical reflection as the dialogue flowed back and forth; no scoring rubric was used in this approach.

The Teacher Assessment Project (TAP) which was associated with the National Board for Professional Teaching Standards (NBPTS) proposed that rather than take a teacher's portfolio apart for a point-by-point analysis, that a portfolio is more coherent and informative when evaluated holistically. The results from the project, however, recommended that some kind of structure or guidelines were needed to make a

professional judgment. The goal of the professional judgment is to make only supported judgments about specific aspects of the problem being evaluated without reducing the judgment task to a formula. The project administrators felt that they accomplished this task by having trained examiners, experienced and knowledgeable in the content area and grade level, rate each portfolio according to a few broad but specific criteria. In scoring the portfolios, each item, as well as the teacher's overall performance, was rated for each appropriate standard on a five-point scale: unacceptable, weak, adequate, proficient, and superb. Each scale point was accompanied by criteria describing the main characteristics of a performance at that level. A two-stage procedure in the scoring of the portfolios was developed. First, small groups of examiners were trained to rate specific portfolio entries. Second, caucus groups with each group composed of members from the different examining teams were formed. The caucus groups were assigned the responsibility of examining all of the performances of several teachers and making final recommendations for board certification. In this way, the scoring represented a combination of judgments from different raters and different vantagepoints. Wolf (1991) stated that the examiners were allowed to apply their professional judgment, but their subjectivity was offset through training and multiple independent ratings.

The recommendation concerning evaluation of portfolios that was reported by Reckase (1996) and resulted from the field testing for the American College Testing Program (ACT) was that scoring of the portfolios must be conducted through a rigorous process using highly trained individuals with expertise in the appropriate content area. At the end of the academic year, students submit five entries and a self-reflective letter explaining why each entry was selected and what it tells about their abilities. These entries and letter are sent to ACT to be scored using a six-point scoring rubric designed to

match the requirements of that work sample. In the scoring process, each work sample is scored, and the portfolio is given an additional holistic portfolio score using a four-point rubric. All of the entries for a particular work sample are scored before the next sample is scored. All the readers are appropriately trained and scoring accuracy is carefully monitored.

In 1992, the Pittsburgh Public School District began the process of authentic assessment of writing using portfolios (LeMahiu, Gitomer, & Eresh 1995). The scoring process consisted of a six-point scale with the end points anchored as "Inadequate Performance" and "Outstanding Performance," respectively. A "No Evidence" rating was also included that signified that the rater did not believe there was sufficient evidence in the portfolio to make an inference about the quality of the student's work. All the raters underwent training and calibration using benchmark samples of student portfolios. If the two raters who initially scored the portfolio differed by one point or less, their ratings were summed to arrive at the operational score. If both raters assigned a "No Evidence" rating, then the overall score was accepted an "No Evidence." When the two raters' scorings differed by more than one point, or, if one rater had a "No Evidence" rating and one did not, an arbitration process was imposed in which a chief arbiter independently scored the portfolio. The sum of the ratings of the arbiter and the rating that was within one point of the arbiter's score became the operational score. The authors stressed that a key feature in the success of portfolio assessment is a shared understanding of the rubric by the raters.

Previous research in the area of attitudes toward portfolio assessment is tenuous. A study by Johns and Van Leirsburh (1992) revealed that those teachers who had gone through portfolio training and also had implemented portfolios in their classroom tended

to be more favorable toward portfolios as an assessment tool in comparison to the group that had not received training. Bushman and Schitker (1994) reported that teachers are generally positive toward the outcomes derived from portfolios even though major concerns were expressed that dealt with inadequate teacher training and difficulties in content and time management. This finding was supported by previous research by Salinger and Chittenden (1994) who found that training was viewed by teachers as a crucial element in effective implementation of portfolios. There is a paucity of current research that categorizes those who are favorable or unfavorable regarding portfolios.

Summary of Factors Related to Portfolio Assessment

The use of portfolio assessment training is of major importance both for the assessor and for the one completing the portfolio. Both must have a clear understanding of the purpose of the portfolio and of the criteria for the selection of the portfolio components. Without training, the process of portfolio assessment will not be successful. Research also shows that if these individuals receive adequate training then they will have positive attitudes toward portfolio assessment. No current research is available concerning years of teaching experience and gender as related to portfolio assessment.

Summary of Related Literature

This review of the literature confirmed that portfolio assessment is not a recent fad; it is still however, evolving. The evolution process was initiated because educators and noneducators became disillusioned with traditional assessment and were searching for a form of assessment which would assess not only how much students learned but also how well they could perform related tasks in different situations. Teacher education

programs are the latest educational area for portfolio implementation. The review of literature lends support to state governments and teacher education professionals advocating greater use of portfolios as alternatives to traditional assessment.

The review not only reported the diversity in definitions for portfolios but also the general agreement that portfolio form, presentation, and content should vary depending upon the portfolio's purpose. An understanding of the common definitions of portfolio assessment and the common components of effective assessment are essential in the discernment of portfolio assessment.

Pedagogical journal articles examined revealed both the advantages and disadvantages of portfolio assessment. The major disadvantage that was cited within the research was the amount of time required to prepare a portfolio; the advantages included self-reflection, multi-faceted evidence of performance and growth, and both program and external assessment. Rubrics for portfolio development and the evaluation of portfolios with emphasis on electronic portfolios were both adequately reported by the literature.

An area of concern for the researcher is the lack of data concerning portfolio reliability and validity. The researcher has determined, however, that the literature does support the hypothesis that portfolio assessment is a viable tool for educational assessment because portfolio assessment renders evidence that a person has not only received information, but has also interpreted and related it to other knowledge.

There is a paucity of literature that deals with the factors related to the implementation of portfolio assessment. The two factors that the limited review of literature did address were knowledge of portfolio assessment and attitude toward portfolio assessment. There is no current research available to the researcher that deals with the factors of teaching experience in teacher training programs and of gender.

CHAPTER 3

METHODOLOGY

The research procedures employed in this investigation of the use of portfolio assessment by college faculty are described in this chapter. In order to provide a complete description, the following are explained in detail: selection of subjects, selection of dependent variable, administration of questionnaire, tester competency, statistical procedures, statistical tools used in the investigation, and procedures for data analysis.

Selection of Subjects

The researcher collected data from public and private college and university education professors in the state of Louisiana during the spring and summer sessions of 1999. Based upon lists of faculty provided by the deans of colleges of education and from colleges' and universities' web pages, 302 participants for the study were determined. The researcher also sent to deans at those colleges and universities who did not respond to the request for a list of faculty members or did not have a web page a packet of questionnaires and demographic data forms. Since the researcher had no data base as to the number of professors involved in teacher training programs at these colleges and universities, 10 questionnaires were sent to both Tulane University and Xavier University and 20 questionnaires were sent to Southern University at Baton Rouge.

A total of 342 questionnaires were mailed. The researcher included the professors who were involved in undergraduate teacher training from each of the following 20 colleges and universities: (a) Centenary College, (b) Dillard College, (c) Grambling State University, (d) Louisiana College, (e) Louisiana Tech University, (f) LSU-Baton Rouge, (g) LSU-Shreveport, (h) Loyola University of New Orleans, (i) McNeese State University, (j) Nicholls State University, (k) Northeast Louisiana University, (l) Northwestern State University, (m) Our Lady of Holy Cross, (n) Southeastern Louisiana University, (o) Southern University-Baton Rouge, (p) Southern University-New Orleans, (q) Tulane University, (r) University of New Orleans, (s) University of Southwestern Louisiana, and (t) Xavier University. The number of faculty who received questionnaires and demographic data forms at each college and university is shown in Table 2.

Selection of Dependent Variable

One purpose of this study was to ascertain whether any significant relationship existed between knowledge of portfolio assessment and attitudes toward portfolio assessment among college and university professors, and if there existed any significant relationship between college and university professors' knowledge toward portfolio assessment and actual use of portfolios in their classrooms. A third area of investigation was the relationship between attitudes toward use of portfolio assessment and actual use of portfolios. Because the researcher was unable to locate a standardized instrument to measure the knowledge, attitude, and actual use of portfolio assessment, an instrument was designed which utilized the four guiding principles (systematic, representative, objective, and quantifiable) that Isaac and Michael (1987) stated are

Table 2. College/ University, Number of Questionnaires E-Mailed, and Number of Questionnaires Sent via U. S. Mail

College/University	Questionnaires E-Mailed	Questionnaires Mailed
Centenary College*	0	0
Dillard University	0	14
Grambling State University**	0	12
Louisiana College	3	0
Louisiana State University-Shreveport**	7	0
Louisiana State-Baton Rouge	21	10
Louisiana Tech University**	19	3
Loyola University of New Orleans	8	0
McNeese State University	9	4
Nicholls State University	17	3
Northeast Louisiana University**	23	1
Northwestern State University	21	3
Our Lady of Holy Cross College	3	0
Southeastern Louisiana University	32	2
Southern Baton Rouge	0	20
Southern New Orleans	0	19
Tulane University	0	10
University of New Orleans	37	3
University of Southwestern Louisiana	27	1
Xavier University	0	10
Totals	227	115

* All Centenary professors were involved in the pilot test of the questionnaire and were therefore not included in the final study.
** Some professors at these colleges and universities were not included in the final study because of participation in the pilot testing.

essential when developing questionnaires. In order to insure systematic coverage of appropriate content and sound, efficient data collection, the researcher reviewed the questionnaires developed by Mokhtari, Yellin, Bull, and Montgomery (1996). Mokhtari et al. conducted a similar study of the impact of preservice teachers' knowledge and attitudes on portfolio assessment, in which they developed questionnaires which drew upon the research of Barton and Collins (1993). According to Mokharti et al., their questionnaires had an internal consistency reliability of .91 for attitudinal items and .82 for cognitive items. Content validity was also insured as the researchers had a group of

experts review the questionnaires, and indicated revisions were made. A copy of Mokhtari et al.'s questionnaire concerning knowledge is found in Appendix A, and a copy of their attitudinal questionnaire is provided in Appendix B.

After reviewing the questionnaires, the researcher contacted Dr. Kouider Mokhtari and received permission to use sample items from the questionnaires that were used in his study. Both the principles that a questionnaire should be systematic and objective and the concept of validity for those items were established through the researcher's review of the literature as well as a review of the redefined questionnaire by a panel of experts. A comprehensive review of literature was conducted and yielded a synthesis of research concerning portfolio assessment. This synthesis provided the foundation for the refinement of the questionnaire. Three Vermont college professors with special expertise in portfolio assessment and who also serve on the state licensure board which has portfolio assessment as a component for licensure of teachers, reviewed the questionnaire and categorized the questionnaire's statements into either knowledge or attitudinal statements.

The reliability for the adapted questionnaire was established through a pilot test conducted with a representative sample of Louisiana college and university professors. The investigator mailed pilot questionnaires and the demographic data form found in Appendixes C, D, and E to professors of the sampled Louisiana colleges and universities requesting their comments. After the researcher revised the original pilot questionnaire and demographic data form, the amended questionnaire was sent to the pilot sample of Louisiana college and university professors for their comments on the structure and content of the questionnaire. A content analysis of the comments indicated that the revised questionnaire was much improved as it was well structured and concise. Not only

was the reliability established during the pilot testing of the questionnaire, but also the determination of ambiguous or redundant items. A format that would ease data tabulation and analysis was also determined. The researcher chose to employ dichotomous responses as opposed to unstructured and open-ended items for uniformity of results and ease of analysis. The final questionnaire, was developed based upon all data collected from the literature review, from the panel of experts, and from the pilot study. The four principles that were determined by Isaac and Michael (1987) are incorporated into the instrument. The final questionnaire and demographic data form are found in Appendixes F and G.

Other purposes for this study were to determine if a significant difference existed in attitudes toward portfolio assessment and knowledge of portfolio assessment between male and female professors; in knowledge of portfolio assessment, and in attitudes toward the use of portfolio assessment between those professors having 11 or more years of teaching experience and those having less than 11 years of teaching experience. The rationale for dividing the sample into one group which had less than 11 years experience and another group which had 11 years plus experience is that in the state of Louisiana teachers may retire at 20 years. The instrument that the researcher developed and a demographic information form also designed by the researcher were used to collect these data.

Administration of Questionnaires

The investigator contacted the deans of colleges of education for each of the public and private colleges and universities in Louisiana and requested a list of e-mail addresses of those professors who were involved in teacher training courses. Because

some professors did not have e-mail addresses, regular addresses were requested and received. Through the use of the Internet, the researcher acquired either e-mail or regular addresses for professors at the colleges and universities whose deans did not respond. To obtain responses from those colleges and universities who did not respond, nor had web pages, the researcher mailed to the deans of the colleges of education copies of the questionnaire and asked that they disseminate them. Professors at the various colleges and universities who did not have e-mail addresses were mailed the finalized questionnaire and the demographic data form. The questionnaires were distributed to approximately 342 professors who were identified in the three phases. The professors at each college and university were asked to complete the questionnaire anonymously and return it in an enclosed stamped, self-addressed envelope within 30 days. Professors who had e-mail addresses received an e-mail requesting that they complete a questionnaire located at the web site, http://personal.centenary.edu/~ncoyle.index.html. The questionnaire, which is found in Appendixes F and G, was developed by the researcher based upon the literature review, piloted in a state-wide study in print form, revised to meet the needs of the study, and then converted to hypertext markup language. The hypertext markup language format allowed the participants to access the questionnaire and then to submit their responses via the Internet. Two days after the e-mail message was sent, a reminder was sent to all the participating professors encouraging those who had not yet responded to do so within the next three days. The schedule for administration of the questionnaires is found in Appendix H. The procedure for scoring and coding the final instrument is described in Appendix I.

Statistical Procedures

A review of the literature verified that the following statistical tests can be used as the best techniques for determining either the significant relationship or difference for the proposed hypotheses.

Hypothesis 1

A Pearson Product-Moment correlation was calculated on the data collected concerning hypothesis one to determine if the attitudinal scores concerning the portfolio assessment of professors were significantly related to the knowledge scores. According to Crowl (1996), correlational methods are used to determine the extent to which two or more variables are related for a single group of people. The most frequently used measure of correlation is the Pearson Product-Moment correlation coefficient, which is symbolized by r. The value of r may range from +1.00 (perfect positive correlation) to –1.00 (perfect negative correlation). An r value of zero indicates the lack of a relationship between variables. The Pearson Product-Moment correlation was computed between the attitudes of the college and university professors toward portfolio assessment and their knowledge of portfolios.

Hypotheses 2 and 3

A Triserial correlation was used to determine if a significant relationship existed between the knowledge and the actual use of portfolio assessment and if a significant relationship existed in professors' attitudes toward portfolio assessment and the actual use of portfolio assessment. The Triserial correlation provides procedures for determining correlation coefficients when the variable is segmented into three categories. The

formula for this procedure was developed by Nathan Jaspen (1946) and was based upon the procedures outlined by Peters and Van Voorhis (1940) and encompassed Pearson's correction for broad categories (1913). Wert, Neidt, and Ahman (1954) further developed Jaspen's formula.

Hypotheses 4 , 5, 6 and 7

The t tests for independent means on data were employed to determine if a significant difference existed in the attitudes toward the use of portfolio assessment and if a significant difference existed in the knowledge of portfolio assessment between male and female professors. The t test for independent means was utilized as it is a statistical test used to determine if the means of two groups are significantly different and is particularly appropriate for small samples (Isaac & Michael, 1981).

The t tests for independent means were also used to determine if a significant difference existed in the knowledge of portfolio assessment and if a significant difference existed in the attitudes toward the use of portfolio assessment between those professors having 11 plus years of teaching experience compared to those having less that 11 years teaching experience.

CHAPTER 4

RESULTS OF THE STUDY

The purpose of this study was to address the issues and concerns surrounding portfolio assessment as it pertains to preservice teachers by investigating professors' portfolio knowledge, attitudes toward portfolio assessment, influence of gender and teaching experience on portfolio knowledge and attitudes, and actual use of portfolios in higher education in the state of Louisiana. A review of literature showed that portfolio assessment is not only being utilized at all levels of education as a form of assessment for student evaluation, but it is also being used to help determine national certification for K-12 teachers. An attempt was made to collect and assess information concerning professors' portfolio knowledge, attitudes toward portfolio assessment, the influence of gender and teaching experience on portfolio knowledge and attitude, and actual use of portfolios. The analyses used were the Pearson Product-Moment correlation, Triserial correlations, and t tests based upon data collected from questionnaires and demographic data forms completed by professors involved in teacher training programs in the state of Louisiana.

This chapter presents an analysis of the data which were used in answering the questions set forth in Chapter 1 and collected by the procedures described in Chapter 3. In addition to statistical analyses used to test the hypotheses, the

respondents were given an opportunity to make comments concerning portfolio assessment. This chapter is divided into two sections. The first section presents the frequencies and means of descriptive data concerned with the demographic variables of the responding professors' gender and years of teaching experience. The survey data were collected through information the professors supplied by completing demographic data forms.

The second section presents data collected from a questionnaire used by the researcher based upon the previous research of Mokhtari, Yell, Bull, and Montgomery (1996). Professors were asked to respond to items that reflected their knowledge concerning portfolio assessment and their attitudes toward the actual use of portfolios. A Pearson correlation was utilized to determine if significant relationships existed between professors' knowledge of portfolio assessment and their attitudes toward portfolio assessment. Triserial correlations were utilized to determine if a significant relationship existed between knowledge and actual use of portfolios and to determine if a significant relationship existed between professors' attitudes towards portfolio assessment and portfolio use. The t-tests were employed to examine group differences using the demographic independent variables of gender and years of experience.

Analysis of Survey Data

This section reviews data collected from the demographic data form. Participants in the study were asked to respond to two questions: gender and years of teaching experience. Years of teaching experience was divided into two categories: 0-10 years of experience and 11-20 plus years of teaching experience.

Twenty (20) public and private universities in the state of Louisiana which are representative of the public and private colleges and universities in the state of Louisiana were involved in the study. The total population consisted of 342 professors identified as those who are involved in undergraduate teacher training programs in the state. Questionnaires and data forms were sent to all 342 professors at all Louisiana colleges and universities. Ninety-eight (98) questionnaires and demographic data forms were returned during the period of data collection from May 1999 through September 1999. The data from the 98 responses, which represented 28% of the total number of questionnaires and forms sent, were examined and analyzed in this study. Because the study was conducted anonymously, the researcher was unable to identify who responded.

The number of valid responses on the demographic data form was 95 with three missing responses for gender and 96, with two missing responses, for years of experience. The valid percent for the gender category is 97%, and the valid percent for years of experience is 98%.

Table 3 presents data concerned with the demographic variable of gender. Nominal data for gender was coded as follows: Male = 1 and Female = 2. Years of experience was coded as follows: 0 – 10 years = 1 and 11- 20 plus years = 2. Frequencies and percentages of the professors in the study are listed according to gender. A total of 95 of 98 participants responded to the gender item of the demographic form.

Table 3. Frequency Distribution by Gender

	Frequency	Percent	Valid Percent
Male	27	27.6	28.4
Female	68	69.4	71.6
Missing	3	3.0	
Total	98	100.0	

As shown in Table 3, 69.4% of the professors who participated in the study were female (n = 68); while 27.6% were male (n = 27). Three percent of the participants did not complete the gender item on the demographic form

In Table 4 demographic data concerned with years of teaching experience are reported. Frequencies and years of teaching experience of professors participating in the study are listed.

Table 4. Frequency of Response by Years of Experience

	Frequency	Percent	Valid Percent
0 – 10 Years	59	60.2	61.5
11 – 20+ Years	37	37.8	38.5
Missing	2	2.0	
Total	98	100.0	

As reported in Table 4, of the 98 respondents, two did not complete the years of experience item of the survey. Of those completing this item, 60.2% have zero to ten years of teaching experience, and 37.8% have 11 to 20 plus years teaching experience.

Tables 3 and 4 provide a synopsis of the frequencies of responses given. Females who have less than 11 years experience in teacher training programs were the typical respondents to the questionnaire.

Analysis of Data

This section presents the results of the data collected from the questionnaire. From the total population of 342 Louisiana college and university professors involved in teacher training programs, 98 questionnaires and demographic data forms were returned during the data collection period. All the responses from the 98 questionnaires and demographic data forms were analyzed in this study. The questionnaire assessed both knowledge and attitudes toward portfolio assessment. The information from the

demographic data forms was used to determine professors' actual use of portfolio assessment, gender, and years of experience in teacher education.

In an effort to answer the problem statement set forth in Chapter 1, seven hypotheses were formulated. The following three hypotheses were established to test for significant relationships:

1. There is no significant relationship between Louisiana public and private college and university education professors' knowledge of portfolio assessment, which is the awareness of the nature and purposes of portfolios, and the attitudes of those professors toward the use of portfolios in the courses that they teach.
2. There is no significant relationship between Louisiana public and private college and university education professors' knowledge toward the use of portfolios in the courses that they teach and the actual use of portfolios as an assessment component.
3. There is no significant relationship between Louisiana public and private college and university education professors' attitudes and the actual use of portfolio assessment.

The following four hypotheses were formulated to test for significant differences:

4. There is no significant difference in attitudes toward the use of portfolio assessment between male and female Louisiana public and private college and university professors.
5. There is no significant difference in knowledge of portfolio assessment between male and female Louisiana public and private college and university professors.

6. There is no significant difference in knowledge of portfolio assessment between those Louisiana public and private college and university professors having 11 plus years of teaching experience compared to those having less than 11 years teaching experience.
7. There is no significant difference in attitudes toward the use of portfolio assessment between those Louisiana public and private college and university professors having 11 plus years of teaching experience compared to those having less than 11 years teaching experience.

Hypothesis 1

In an effort to determine the strength of the relationship as described in Hypothesis 1, data were analyzed using the Pearson Product-Moment correlation. The correlation coefficient for the professors' knowledge and their attitudes toward portfolio assessment was $r = 0.28$, which is significant at the .05 level for 98 participants. The first hypothesis was, therefore, rejected because there was a significant positive correlation between the professors' knowledge and their attitudes toward portfolio assessment. The results of the correlational analyses are presented in Table 5.

Table 5. Correlation between Portfolio Knowledge and Attitude toward Portfolio Assessment

	Knowledge	Attitude
Knowledge	1.00	.28
Attitude	.28	1.00
N	98	98

As shown in Table 5, the Pearson correlation coefficient of 0.28 indicates a moderate relationship between professors' knowledge and attitudes toward portfolio assessment;

however, according to Hinkle, Wiersma, and Jurs (1998), an $\underline{r} > .205$ for 90 participants is significant at the .05 level of significance. The hypothesis was, therefore, rejected.

Hypothesis 2

Data were analyzed using the Triserial correlation to determine the strength of the relationships between professors' portfolio knowledge and actual use of portfolios. The correlation coefficient for professors' knowledge and their actual use of portfolios in their courses was $\underline{r} = 0.299$. According to Hinkle, Wiersman, and Jurs (1998), a correlation coefficient greater than .205 at the .05 level of significance is significant. Therefore, the value of the first Triserial correlation Coefficient, 0.299, indicated that a significant relationship between professors' portfolio knowledge and actual use of portfolios existed. This hypothesis was, therefore, rejected, because there was a significant positive correlation between the professors' knowledge and actual use of portfolios. The data utilized in calculating the correlational analysis are presented in Table 6.

The information in Table 6 indicates that eight respondents used traditional assessment only, three used portfolio assessment exclusively, and 83 used both types of

Table 6. Data Concerning Portfolio Knowledge and Actual Use of Portfolios

Type of Assessment Used	Number Using Assessment	Mean Score on Cognitive Items
Traditional	8	13.13
Portfolio	3	14.00
Both Types	83	14.81
Missing	4	

assessment in their courses. The mean score on the knowledge questionnaire items was highest for those using both types of assessment. The score was lowest for those who use only traditional assessment

Hypothesis 3

Data were analyzed using a second Triserial correlation to determine the strength of the relationships between attitudes toward portfolio assessment and actual use of portfolios. The correlation coefficient for professors' attitudes and their actual use of portfolios in their courses was $r = -0.08$. The near zero value of the second Triserial correlation Coefficient indicated a very weak relationship between professors' attitude toward portfolio assessment and actual use of portfolios. The hypothesis was, therefore, accepted, because there was a non-significant correlation between the professors' knowledge and their attitudes toward portfolio assessment. The data utilized in calculating the correlational analysis are presented in Table 7.

The information in Table 7 indicates that eight respondents use traditional assessment only, three use portfolio assessment exclusively, and 83 use both types of

Table 7. Data Concerning Professors' Attitudes toward Portfolios and Actual Use of Portfolios

Type of Assessment Used	Number Using Assessment	Mean Score on Attitudinal Items
Traditional	8	5.88
Portfolio	3	3.00
Both Types	83	5.83
Missing	4	

assessment in their courses. The mean score on the attitudinal questionnaire items concerning portfolio assessment was highest for those professors who used only traditional assessment in the courses that they teach; the mean score was lowest for those professors who use only portfolio assessment in the courses that they teach.

Hypothesis 4

A t test for independent groups was performed to determine if a significant difference existed in attitudes toward the use of portfolio assessment between male and female professors. As reported in Table 8, the results of the t test was t (93) =-2.00 at the p. < .05 level of significance; therefore, the hypothesis was rejected. The mean of the attitudinal score was higher for the females than the males. Table 8 provides an analysis of the data.

The calculated t was significant, t (93) = -2.00, p. < .05. This significant difference between male attitudes toward portfolio assessment and female attitudes toward portfolio assessment caused hypothesis 4 to be rejected.

Table 8. Data Concerning Professors' Attitudes toward Use of Portfolios and Gender

Gender	N	Mean	Standard Deviation	Standard Error of Mean	t	df
Males	27	5.19	2.06	.40	-2.00	93
Females	68	5.96	1.53	.19		

(p.> 0.5)

Hypothesis 5

A t test for independent groups was performed to determine if a significant difference existed in professors' portfolio knowledge between genders of the professors. As reported in Table 9, results of the t test was t (93) = -2.09, p. < .05; therefore, the hypothesis was rejected. The mean score of professors' portfolio knowledge was significantly higher for females than males. Analysis of the data is provided in Table 9.

Results indicated that a significant difference in portfolio assessment knowledge existed between male and female professors. The calculated t test was significant, t (93)= -2.09, p. < .05; therefore, hypothesis 5 was rejected.

Table 9. Data Concerning Professors' Portfolio Knowledge and Gender

Gender	N	Mean	Standard Deviation	Standard Error of Mean	t	df
Males	27	13.89	2.67	.51	-2.09	93
Females	68	14.97	2.11	.26		

(p.> 0.5)

Hypothesis 6

A t test for independent groups was used to determine if a significant difference existed in knowledge of portfolio assessment between those professors having 11 plus years of teaching experience compared to those having less than 11 years teaching experience. The results indicated that t (93) = 0.252, p. > .05; therefore, this hypothesis was accepted. Table 10 provides an analysis of the data.

Table 10. Data Concerning Professors' Portfolio Knowledge and Teaching Experience

Teaching Experience	N	Mean	Standard Deviation	Standard Error of Mean	t	df
0-10 Years	22	14.77	2.39	.51	0.252	93
11-20+ Years	73	14.63	2.31	.27		

Hypothesis 7

A t test for independent groups was performed to determine if a significant difference existed in the attitudes toward the use of portfolio assessment between those professors having 11 plus years of teaching experience compared to those having less than 11 years teaching experience. The results indicated that t (93) = -1.60 p. > .05 level of significance; therefore, this hypothesis was accepted. Those professors who had more experience had a higher mean score on attitude than those who had less experience indicating a more favorable attitude. However, the difference was not statistically significant. Table 11 furnishes an analysis of the data.

Table 11. Data Concerning Professors' Attitudes toward Use of Portfolios and Teaching Experience

Teaching Experience	N	Mean	Standard Deviation	Standard Error of Mean	t	df
0-10 Years	22	5.23	2.31	.49	-1.60	93
11-20+ Years	73	5.89	1.49	.17		

(p.> 0.5)

When comparing two groups of faculty with different years of teaching experience, results indicated that there is a non-significant difference in professors' attitudes toward the use of portfolio assessment.

CHAPTER 5

SUMMARY, FINDINGS AND CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Chapter 5 contains a summary of the study, findings, and conclusions. Recommendations are presented to aid in further research in the area of portfolio assessment, and implications for educators involved in portfolio assessment are also precluded.

The purpose of this study was to examine the evaluation of portfolios as an alternative assessment tool along with those factors which influence the implementation practices of portfolios by faculty in colleges of education. A state-wide online survey and mailed survey were conducted to collect data for the study. The questionnaire and demographic data form were developed by the researcher based upon the literature review, piloted in a state-wide study in print form, revised to meet the needs of the study, and then converted to hypertext markup language for placement on the Internet for those professors who had e-mail addresses. The hypertext markup language format allowed the participants to access the questionnaire and then to submit their responses via the Internet. Professors without e-mail addresses received the questionnaire and demographic data form via U. S. mail. Data from the on-line survey and the mailed survey were examined within the context of the purpose of the study and the hypotheses proposed to guide the process. An attempt was made to assess the current status of professors' portfolio knowledge, attitudes toward portfolio assessment, the influence of

proposed to guide the process. An attempt was made to assess the current status of professors' portfolio knowledge, attitudes toward attitude assessment, the influence of gender and teaching experience on portfolio knowledge and attitude, and actual use of portfolio assessment by using a sample of professors from Louisiana colleges and universities who are involved in undergraduate teacher training programs. This assessment, which was based upon the synthesis of findings concerning portfolio assessment revealed from the literature, was made by analyzing the quantitative data gathered in this study.

Prior to data collection, current literature was reviewed to determine the issues and concerns that surround portfolio assessment. The topics and problems discussed were the evolution of portfolios, portfolio interpretations, portfolio evaluation, and factors related to portfolio assessment.

The literature review revealed that educators' and the public's awareness of the cognitive theory, which purports that to know something is not just to have received information, but to have interpreted it and related it to other knowledge one already has, initiated the evolutionary process of portfolio assessment. Educators and representatives from the public sector who have become disillusioned with traditional assessment, are advocating greater use of portfolios as alternatives to traditional assessment. The literature revealed that portfolio assessment is being employed at all educational levels including teacher certification (Barton & Collins, 1993; Lyons, 1996; http://www.nbpts.org).

Interpretations concerning portfolio assessment are based upon not only the definitions of a portfolio but also on the uses of the portfolio. While most articles offered a definition for portfolio assessment, the authors' definitions were dictated by the purpose

of the portfolio (Biddle, 1992; Dutt, Tallerico & Kayla, 1997; Wenzaff & Cummings, 1996). For the purpose of this study, portfolio assessment was defined as a meaningful collection of student work that exhibits the student's overall efforts, progress, and achievement in one or more subject areas. This collection of student work would be used for student evaluation.

The evaluation of portfolio assessment, which was included in the literature review, focused on the disadvantages and advantages of portfolio assessment, rubrics, and their role included guidelines for portfolio construction and evaluation, and the reliability and validity of portfolio assessment. Evaluation of portfolio assessment included examining the disadvantages of portfolio assessment which ranged from the amount of time required in developing the portfolio (Dutt, Tallerica, & Kayla, 1997; Ford & Ohlansen, 1991; LeMahieu, Gitomer, & Eresh, 1995) to a lack of assessment literacy and failure of teacher-training programs to prepare a well-informed group of educators (Black, 1993; Stiggins, 1991; Worthen, 1993). The evaluation also included investigating the advantages of utilizing portfolio assessment, and the investigation revealed that the major advantage for utilizing portfolio assessment was its providing a connection to the contexts and personal histories of real teaching (Geltner, 1993; Ohlansen & Ford, 1991; Tipping & Dana, 1992; Wolf, 1991).

The discussion of rubrics and their role included guidelines for portfolio construction (Cramer, 1993; Hannam, 1995; Montgomery, 1997; Ross, Bandy, Hartle, Lame, & Webb, 1995) and portfolio evaluation (Barrow, 1993; Geltner, 1993; Reckase, 1996). Many educators shared concerns regarding the storage and management of portfolio assessment. A possible solution to this problem discussed in the literature was

the creation and storage of portfolios using computer software technology (Barrett, 1994; Lankes, 1995; Tuttle, 1997).

The literature review to determine if portfolio assessment was both reliable and valid revealed little information. Results from the limited number of relevant studies, however, indicated that portfolio assessment is both reliable and valid (LeMahiei, Gitomer, & Eresh, 1995; Naizer, 1997; Reckase, 1995).

There is a paucity of literature that deals with factors – knowledge, attitude, years of teaching experience in teacher training programs, and gender related to portfolio assessment. The review of literature did reveal information on two factors: knowledge in the form of training (Abruscato, 1993; Dutt, Tallerico, & Kayler ,1997; Geltner, 1993; Koskinen, 1994; Wolf, 1991) and attitudes toward portfolio assessment (Bushman, & Schitker, 1994; Johns, & Van Leirsburh, 1992; Salinger, & Chitternden, 1994). No information was located on the factors concerning the years of teaching experience in a teacher training program and knowledge of portfolio assessment, the years of teaching experience in a teacher training program and attitude toward portfolio assessment, gender and knowledge of portfolio assessment, and gender and attitude toward portfolio assessment.

The results of the data analysis in this study were used to determine professors' portfolio knowledge, attitudes toward portfolio assessment, the influence of gender and teaching experience on portfolio knowledge and attitude, and actual use of portfolios. The total population of professors involved in Louisiana undergraduate teacher-training programs was 342. All 342 professors from each of Louisiana's public and private colleges and universities were sent questionnaires and data forms. Ninety-eight (98) professors responded via either e-mail or U.S. mail. The analyses used were the Pearson

Product-Moment correlation, Triserial correlation, and four t tests based upon the data collected from questionnaires and demographic data forms completed by professors involved in the undergraduate teacher training programs in the state of Louisiana.

Findings and Conclusions

Given the nature of the knowledge and attitude variables, one would expect professors who have a wealth of portfolio knowledge also to have favorable attitudes concerning portfolios and those who have a limited knowledge of portfolios have less favorable attitudes toward portfolio assessment. To determine if a significant relationship existed between professors' knowledge and their attitudes toward portfolio assessment, a Pearson Product-Moment correlation was used. Analysis of the data revealed a significant relationship for Hypothesis 1. The finding of the Pearson Product-Moment correlation was that if there is a high mean score in professors' knowledge of portfolio assessment, there is also a high mean attitudinal score. Based upon this finding, null Hypothesis 1 was rejected.

This study indicated that a significant relationship existed between professors' portfolio knowledge and their attitudes toward portfolio assessment. In other words, higher index of knowledge was associated with higher mean scores and more favorable attitudes toward portfolio assessment. Data about the first variable provided information about the second variable, as there was a predictable pattern for the hypothesis. One can say based upon the findings of this study and those by Johns and Van Leirsburh (1992) that there is a significant relationship between portfolio knowledge and attitudes toward portfolios.

Using a Triserial correlation, a significant relationship was also found for Hypothesis 2. Hypothesis 2 stated that there is no significant relationship between professors' knowledge and actual use of portfolios. The findings of the Triserial correlation were that the mean score on the knowledge questionnaire items was highest for those professors using both portfolio and traditional assessments and that the score was lowest for those professors who use only traditional assessment.

The study also revealed a relationship existed between professors' portfolio knowledge and their actual use of portfolios in the courses that they teach. The results indicated that a positive correlation existed between the two variables; a higher mean score on portfolio knowledge was related with higher use of portfolios. Data about the first variable provided information about the second variable, as there was a predictable pattern for the hypothesis. This finding was supported by Salinger's and Chittenden's (1994) study that there is a relationship between portfolio knowledge and use of portfolios.

Using a Triserial correlation, a non-significant relationship was found for Hypothesis 3. Hypothesis 3, which stated that there is no significant relationship between professors' attitudes toward portfolio assessment and their actual use of portfolios, was, therefore, accepted. The findings of the Triserial correlation are as follows:

1. The mean attitudinal score was highest for those professors who use traditional assessment.
2. The mean attitudinal score was lowest for those who use only portfolio assessment.

The results indicated that neither a positive nor negative correlation existed between the two variables. Data about the first variable did not provide information about

the second variable, as there was not a predictable pattern for the hypothesis. The study indicated that a non-significant relationship existed between professors' attitudes toward portfolio assessment and their actual use of portfolios in the courses that they teach; therefore, the hypothesis was accepted.

To examine the influence of gender and years of teaching experience, t tests were conducted to test four hypotheses. Two of the t tests indicated that there were significant differences at the $p. < 0.05$ level in attitudes toward the use of portfolio assessment between male and female professors and in professors' portfolio knowledge and the gender of the professors. Findings for Hypotheses 4 and 5 were as follows:

1. The mean portfolio knowledge score was higher for females than males.
2. The mean portfolio attitude score was higher for females than males.

Females are more knowledgeable concerning portfolio assessment and had a more favorable attitude toward portfolio assessment than males. Hypotheses 4 and 5 were rejected.

Hypotheses 6 which stated that no significant difference existed between knowledge of portfolio assessment and professors' years of teaching experience was tested using a t test. A t test was also utilized to determine that a non-significant difference existed between professors' attitudes toward portfolio assessment and their years of teaching experience. The findings of these t tests found in Tables 10 and 11 are as follows:

1. Those professors who had more experience had a lower mean score on knowledge than those who had less experience.
2. Those professors who had more experience had a higher mean score on attitude than those who had less experience.

Based upon the results of the t tests, the null hypotheses were accepted as the difference between groups was not significant.

Discussion

Because very little research has been conducted concerning the knowledge and attitudes toward portfolio assessment among college education professors, the researcher proposed seven hypotheses for the investigation of these potential relationships and factors that define and support the use of portfolios.

The researcher was interested in determining how professors' portfolio knowledge was related to their attitudes toward portfolio assessment, how professors knowledge was correlated with their actual use of portfolios, and how their attitudes were correlated with their actual use of portfolios. A questionnaire used by the researcher determined the level of portfolio knowledge and the attitude toward portfolio assessment. The most frequently missed items on the questionnaire were statements 2, 6, 15, 19, and 25. All of these statements are a part of the subsection of the questionnaire dealing with portfolio knowledge. The items most frequently answered correctly are statements 11, 12, 18, and 20. All of these statements are a part of the subsection of the questionnaire dealing with portfolio knowledge.

Implications

Both Vockell (1983) and Crowl (1996) have suggested that before conducting an experimental study one should determine that a relationship between variables actually exists. Following this advice, the researcher undertook the correlational component of this study to determine if a relationship existed between professors' portfolio knowledge and their attitudes toward portfolio assessment, between professors' portfolio knowledge

and the actual use of portfolios in the courses they teach, and between professors' attitudes toward portfolio assessment.

By determining the stronger correlation of the relationships, the researcher also intended to establish which variable (attitude toward portfolio use or portfolio knowledge) would be the better indicator of actual use of portfolio assessment. This information would be very helpful in determining the variables of an experimental study. The results of this study indicated that significant relationships existed both between knowledge and attitude and between knowledge and actual use. A significant relationship was not found to exist between attitude and actual use. Of the two variables, knowledge and attitude, knowledge of portfolios has the stronger correlation to use of portfolio assessment.

Based upon these results, future studies are called for to determine the causal relationship in portfolio assessment. Professors could receive portfolio inservice training dealing with the knowledge aspects of portfolio assessment, rather than focusing training on attitude toward the use of portfolio assessment. According to the results of the t tests, such portfolio inservice training would not need to differ for those professors who had less than 11 years of teaching experience and for those who have 11 plus years of teaching experience. The researcher would need to be cognizant, however, that according to the results of this study, females had a higher portfolio knowledge mean score and more favorable attitudes toward portfolio assessment than males.

Recommendations

Portfolio assessment is present at all levels of the educational process. Because states are funding and rewarding teachers who become nationally certified by successful

completion of the portfolio assessment process, K-12 teachers are involved in the process. Education of K-12 students, therefore, begins with the teacher-training programs in colleges and universities. Professors in teacher-training programs should consider instructing pre-service teachers not only in how to develop portfolios that can be used for evaluation, but should also utilize portfolio assessment in the courses that they teach.

Based upon the results of this study, the following recommendations are made for future research:

1. Conduct interviews with professors who are involved in teacher training programs for the purpose of providing a means of checking and assuring the clarity and effectiveness of each item on the questionnaire. Based upon the information collected from these interviews and the comments made by the professors in this study, appropriate additions, deletions, and modifications could be made to the questionnaire used in the current study.
2. Revise the questionnaire to allow the respondents to choose a response as a position along a scale rather than a forced-choice format as several of the respondents expressed irritation that a Likert scale was not employed.
3. Increase response rate by sending the questionnaire out at the beginning of a session, rather than at the end of one.
4. Code surveys to allow a follow-up of those respondents who make suggestions relative to personal experiences with portfolio assessment.

According to this study, a favorable relationship was found to exist between knowledge of and attitude toward portfolio assessment. A significant relationship was also found to exist between knowledge of and actual use of portfolios. Knowledge seems

to be the key factor; therefore, prior to the implementation of portfolio assessment as an alternative to traditional assessment, adequate training should be provided.

APPENDIX A

PORTFOLIO ASSESSMENT QUESTIONNAIRE

KNOWLEDGE

PORTFOLIO ASSESSMENT QUESTIONNAIRE

COGNITIVE KNOWLEDGE

This questionnaire was developed by Mokhtari, Yellin, Bull, and Montgomery.

1. Each portfolio must have a goal statement and a reflection (an analysis of whether or not the student believes that the goal has been met).
2. Each piece of evidence in a portfolio should have a caption that describes it and why it is included in the portfolio.
3. If the beginning of a portfolio is too brief or incomplete, it is impossible to show growth or change over time.
4. True self-reflection as evaluation of a portfolio cannot be taught; it must be discovered.
5. Portfolios are designed to help students become more articulate.
6. Teaching, based upon portfolios, becomes a collaborative effort.
7. Each portfolio is a unique creation because the student determines what evidence to include and completes a self-evaluation as part of the developmental process.
8. There are four classes of evidence that can be included in portfolios: artifacts, reproductions, attestations, and productions.
9. Students should not be able to self-evaluate their own progress using their portfolios.
10. Portfolios cannot be used to determine the efficiency of a teacher's teaching in a given area (as shown by students' products).
11. Students should not develop their own objectives for their own portfolios.
12. One of the primary benefits of portfolio assessment is building student reflection.
13. The portfolio-centered classroom should not always be student centered.

14. A portfolio-centered classroom may not provide a psychologically secure environment.
15. Portfolio conferences should never address a student's weaknesses or failures.
16. One of the major purposes of portfolio assessment is to document the students' success.
17. Collection of work samples for portfolio inclusion should be made selectively and reflectively.
18. Portfolio items should be dated to allow tracking across time.
19. A portfolio is seldom a systematic compilation of a student's work.
20. Students should not set the criteria for placing things in their portfolios.
21. Portfolios should not reflect the day-to-day learning activities of the students.
22. Portfolios should include material that shows how a student teacher deals with ethnic, cultural, gender, linguistic, and socioeconomic differences.
23. A portfolio should show how a student teacher deals with academic advantaged, average, and academically challenged students.
24. Portfolios should not contain multiple examples of similar activities to provide repeated observation.
25. Each individual's portfolio should be compared to his/her work over time rather than to the work of others.
26. A major purpose of portfolio is to empower students by letting them choose what will represent them in their portfolio.
27. Portfolio assessment is free of gender and culture bias.
28. The major components of a good portfolio should not be work samples.

APPENDIX B

PORTFOLIO ASSESSMENT QUESTIONNAIRE

ATTITUDINAL

PORTFOLIO ASSESSMENT QUESTIONNAIRE

ATTITUDINAL

This questionnaire was developed by Mokhtari, Yellin, Bull, and Montogomery.

1. I like the idea of doing portfolio assessment rather than conventional evaluation.
2. I believe that having a teacher select components for students' portfolios is risky for students.
3. I think it is very beneficial for me to compare various components of my portfolio to see if I have grown and developed.
4. Portfolio assessment is worthwhile.
5. Portfolio assessment is appropriate for this course.
6. Portfolio assessment should be done in many of the teacher education courses.
7. I can justify why different components were placed in my portfolio.
8. I appreciate the opportunity to reflect on my work and select portions of it to go into my portfolio.
9. I am uncertain about the value of being evaluated using a portfolio approach.
10. I do not trust my teacher/supervisors to evaluate my portfolio fairly.
11. I feel that I have the opportunity to choose my best work for portfolio inclusion.
12. Portfolio assessment in class helps me establish an appropriate career path.
13. I work harder to do portfolio assessment than I would it I were taking conventional exams.
14. Portfolio assessment helps instructors more than students.
15. The assessment process allows more student choice than the traditional forms of evaluation.
16. I do not feel that I have had significant input into the evaluation of this course.
17. I feel that I have had a lot of ways of demonstrating my competence in this course.
18. I believe that traditional assessment is a fairer form of evaluation of all students.

19. I have a greater opportunity to express what I have learned in portfolio assessment.

20. I do not believe that I understand the components of a portfolio.

21. I do not believe that I understand the selection process for components of a portfolio.

22. I do not believe that developing a portfolio will make me more articulate.

23. I believe that developing a portfolio will make me more reflective.

24. I think that I will be able to use my portfolio to evaluate my own progress.

25. I feel that the rise of portfolio assessment makes a classroom a more psychologically secure environment.

26. I believe that I do not control the criteria for putting things in my portfolio.

27. I believe that I am empowered by the use of portfolio assessment.

APPENDIX C

PORTFOLIO ASSESSMENT PILOT

QUESTIONNAIRE KNOWLEDGE

PORTFOLIO ASSESSMENT PILOT

QUESTIONNAIRE KNOWLEDGE

Directions: Please answer the following statements by circling yes, if you agree, or no, if you disagree.

1. Each portfolio must have a goal statement and a reflection (an analysis of whether or not the student believes that the goal has been met).

   Yes No

Comments:_____
_____

2. Each piece of evidence in a portfolio should have a caption that describes it and why it is included in the portfolio.

   Yes No

Comments:
_____
_____

3. If the beginning of a portfolio is too brief or incomplete, it is impossible to show growth or change over time.

   Yes No

Comments:
_____
_____

4. True self-reflection as evaluation of a portfolio cannot be taught; it must be discovered.

   Yes No

Comments:
_____
_____

5. Portfolios are designed to help students become more articulate.

Yes No

Comments:

_____

_____

6. Teaching, based upon portfolios, becomes a collaborative effort.

Yes No

Comments:

_____

_____

7. Each portfolio is a unique creation because the student determines what evidence to include and completes a self-evaluation as part of the developmental process.

Yes No

Comments:

_____

_____

8. There are four classes of evidence that can be included in portfolios: artifacts, reproductions, attestations, and productions.

Yes No

Comments:

_____

_____

9. Students should not be able to self-evaluate their own progress using their portfolios.

Yes No

Comments:

_____

_____

10. Portfolios cannot be used to determine the efficiency of a teacher's teaching in a given area (as shown by students' products).

Yes No

Comments:

---

11. Students should not develop their own objectives for their own portfolios.

Yes No

Comments:

---

12. One of the primary benefits of portfolio assessment is building student reflection.

Yes No

Comments:

---

13. The portfolio-centered classroom should not always be student centered.

Yes No

Comments:

---

14. A portfolio-centered classroom may not provide a psychologically secure environment.

Yes No

Comments:

---

15. Portfolio conferences should never address a student's weaknesses or failures.

Yes No

Comments:

_____

_____

16. One of the major purposes of portfolio assessment is to document the students' success.

Yes No

Comments:

_____

_____

17. Collection of work samples for portfolio inclusion should be made selectively and reflectively.

Yes No

Comments:

_____

_____

18. Portfolio items should be dated to allow tracking across time.

Yes No

Comments:

_____

_____

19. A portfolio is seldom a systematic compilation of a student's work.

Yes No

Comments:

_____

_____

20. Students should not set the criteria for placing things in their portfolios.

Yes No

Comments:

_____

_____

21. Portfolios should not reflect the day-to-day learning activities of the students.

Yes No

Comments:

_____

_____

22. Portfolios should include material that shows how a student teacher deals with ethnic, cultural, gender, linguistic, and socioeconomic differences.

Yes No

Comments:

_____

_____

23. A portfolio should show how a student teacher deals with academically advantaged, average, and academically challenged students.

Yes No

Comments:

_____

_____

24. Portfolios should not contain multiple examples of similar activities to provide repeated observation.

Yes No

Comments:

_____

_____

25. Each individual's portfolio should be compared to his/her work over time rather than to the work of others.

Yes No

Comments:

_____

_____

26. A major purpose of portfolio is to empower students by letting them choose what will represent them in their portfolio.

Yes No

Comments:

_____

_____

27. Portfolio assessment is free of gender and culture bias.

Yes No

Comments:

_____

_____

28. The major components of a good portfolio should not be work samples.

Yes No

Comments:

_____

_____

APPENDIX D

PORTFOLIO ASSESSMENT PILOT QUESTIONNAIRE

ATTITUDINAL

PORTFOLIO ASSESSMENT PILOT QUESTIONNAIRE

ATTITUDINAL

Directions: Please answer the following statements by circling yes, if you agree, or no, if you disagree.

1. I like the idea of utilizing portfolio assessment rather than conventional evaluation.

   Yes No

Comments:_____
_____

2. I believe that having a teacher select components for students' portfolio is risky for students.

   Yes No

Comments:
_____
_____

3. I think it is very beneficial for me to compare various components of a student's portfolio to see if he or she has grown and developed.

   Yes No

Comments:
_____
_____

4. Portfolio assessment is worthwhile.

   Yes No

Comments:
_____
_____

5. Portfolio assessment is appropriate for the course(s) that I teach.
   Yes No

Comments:

_____

_____

6. Portfolio assessment should be the type of assessment utilized in many of the teacher education courses.
   Yes No

Comments:

_____

_____

7. I believe that students can successfully justify why different components are placed in their portfolios.

   Yes No

Comments:

_____

_____

8. I support the opportunity for students to reflect on their work and select portions of it to go into their portfolios.

   Yes No

Comments:

_____

_____

9. I support the opportunity for students to select portions of their work to go into their portfolios.

   Yes No

Comments:

_____

_____

10. I am uncertain about the value of being evaluated using a portfolio approach.

Yes No

Comments:

_____

_____

11. I do not believe a student's portfolio can be evaluated fairly.

Yes No

Comments:

_____

_____

12. I feel that students should have the opportunity to choose their best work for portfolio inclusion.

Yes No

Comments:

_____

_____

13. Portfolio assessment in class helps students establish an appropriate career path.

Yes No

Comments:

_____

_____

14. Students work harder preparing for portfolio assessment than they would if they were taking conventional exams.

Yes No

Comments:

_____

_____

15. Portfolio assessment helps instructors more than students.

Yes No

Comments:

---

15. The portfolio assessment process allows more student choice than the traditional forms of evaluation.

Yes No

Comments:

---

16. I believe that traditional assessment is a fairer form of evaluation of all students.

Yes No

Comments:

---

17. Students have a greater opportunity to express what they have learned in portfolio assessment.

Yes No

Comments:

---

18. I do not believe that I understand the components of a portfolio.

Yes No

Comments:

---

19. I do not believe that I understand the selection process for components of a portfolio.

Yes No

Comments:

_____

_____

20. I do not believe that developing a portfolio will make students more articulate.

Yes No

Comments:

_____

_____

21. I believe that developing a portfolio will make students more reflective.

Yes No

Comments:

_____

_____

22. I think that students will be able to use their portfolios to evaluate their own progress.

Yes No

Comments:

_____

_____

23. I feel that the rise of portfolio assessment makes a classroom a more psychologically secure environment.

Yes No

Comments:

_____

_____

24. I believe that I should control the criteria for determining what goes into a student's portfolio.

Yes No

Comments:

_____

_____

25. I believe that students are empowered by the use of portfolio assessment.

Yes No

Comments:

_____

_____

26. I believe that I will lose my influence in the assessment of students if I use portfolio assessment rather that conventional assessment.

Yes No

Comments:

_____

_____

APPENDIX E

DEMOGRAPHICS OF PILOT STUDY

DEMOGRAPHICS OF PILOT STUDY

Please respond to the following statements.

1. Gender Male Female

2. Type of Institution Private Public

3. Is the institution where you teach NCATE approved? Yes No

4. Years of experience in teacher preparation program _____

5. Type of preparation for teaching the topic "portfolio assessment"

   College courses Workshops Independent Reading

6. Your academic field of expertise (i.e. math) _____

7. I use portfolio assessment rather than conventional assessment in the courses that I teach.

   Yes No

8. I use portfolio assessment and conventional assessment in the courses that I teach.

   Yes No

9. I use conventional assessment only in the courses that I teach.

   Yes No

10. What do you perceive as the barriers to using portfolio assessment in the classroom?

11. What is your interpretation/understanding of portfolio assessment?

APPENDIX F

FINAL QUESTIONNAIRE

FINAL QUESTIONNAIRE

Directions: Please answer each of the following statements by checking agree or disagree.

1. Each portfolio must have a goal statement.
   Agree _____ Disagree _____
2. True self-reflection, in terms of evaluation of a portfolio, cannot be taught; it must be discovered.
   Agree _____ Disagree _____
3. Portfolios are designed to help students become more articulate.
   Agree _____ Disagree _____
4. Teaching that is based upon portfolios becomes a collaborative effort.
   Agree _____ Disagree _____
5. Four classes of evidence can be included in portfolios: artifacts, reproductions, attestations, and productions.
   Agree _____ Disagree _____
6. I believe that to have a teacher select components for students' portfolios is risky for students.
   Agree _____ Disagree _____
7. Portfolio assessment should be the type of evaluation utilized in many of the teacher education courses.
   Agree _____ Disagree _____
8. A portfolio-centered classroom may not provide a psychologically secure environment.
   Agree _____ Disagree _____
9. I support the opportunity for students to reflect on their work for their portfolios.
   Agree _____ Disagree _____
10. One of the major purposes of portfolio assessment is to document the students' success.
    Agree _____ Disagree _____
11. Collection of work samples for portfolio inclusion should be made selectively and reflectively.
    Agree _____ Disagree _____
12. I support the opportunity for students to select portions of their work to go into their portfolios.
    Agree _____ Disagree _____
13. I am uncertain about the value of students being evaluated using a portfolio approach.
    Agree _____ Disagree _____
14. A portfolio is seldom a systematic compilation of a student's work.
    Agree _____ Disagree _____
15. Students should not set the criteria for placing things in their portfolios.
    Agree _____ Disagree _____
16. I do not believe a student's portfolio can be evaluated fairly.
    Agree _____ Disagree _____

17. I feel that students should have the opportunity to choose their best work for portfolio inclusion.
    Agree _____ Disagree _____
18. Portfolios should include material that shows how a preservice teacher deals with ethnic, cultural, gender, linguistic, and socioeconomic differences.
    Agree _____ Disagree _____
19. Portfolios should not contain multiple examples of similar activities.
    Agree _____ Disagree _____
20. The portfolio assessment process allows more student choice than the traditional forms of evaluation.
    Agree _____ Disagree _____
21. A major purpose of a portfolio is to empower students by letting them choose work that is representative of their ability.
    Agree _____ Disagree _____
22. I believe that traditional assessment is a more fair form of evaluation for all students.
    Agree _____ Disagree _____
23. I believe that I will lose my influence in the assessment of students if I use portfolio assessment rather than traditional assessment.
    Agree _____ Disagree _____
24. Work samples should not be the major component of a good portfolio.
    Agree _____ Disagree _____
25. If the beginning of a portfolio it too brief or incomplete, growth or change over time cannot be shown.
    Agree _____ Disagree _____
26. Portfolio conferences should not address a student's weaknesses or failures.
    Agree _____ Disagree _____

APPENDIX G

FINAL DEMOGRAPHICS FORM

FINAL DEMOGRAPHICS FORM

Please respond to the following questions/statements:

1. Gender: Male _____ Female _____
2. Type of Institution: Public _____ Private _____
3. Institution NCATE approved? Yes _____ No _____
4. Institution SACS approved? Yes _____ No _____

5. Years of experience in education?

   0-5 6-10 11-15 16-20 20+

6. Years of experience in teacher education?

   0-5 6-10 11-15 16-20 20+

7. Type of preparation for using and/or teaching about portfolio assessment?

   College Courses Workshops Independent Reading Other None

8. Your field of academic expertise (i.e. math, reading) _____

9. I use the following types of assessment in the courses that I teach:

   Portfolio only _____
   Traditional only (i.e., tests letter grades assigned by instructor) _____
   Both portfolio and traditional _____

10. Comments:

APPENDIX H

SCORING AND CODING OF INSTRUMENT

SCORING AND CODING OF INSTRUMENT

The final instrument consisted on a total of 26 items, eight of which were concerning attitudes toward portfolio assessment and 18 reflected a knowledge of portfolio assessment. The categorizing of knowledge or attitude items for the questionnaire was determined by the review of literature, responses from the participants in the pilot study, and the panel of experts. The knowledge and attitudinal items were dispersed throughout the questionnaire. The knowledge section of the final questionnaire consisted of items 1, 2, 3, 4, 5, 6, 10, 11, 12, 14, 15, 18, 19, 20, 21, 24, 25, and 26. The items in the attitudinal section were 7, 8 , 9, 13, 16, 17, 22, and 23. The response format for each item was "agree" or "disagree." Based upon the participant's responses, a raw score for each section was determined. A mean score based upon the raw scores was derived for both the knowledge and attitudinal sections. While a knowledge mean score of greater than ten would represent a higher knowledge of portfolio assessment, a mean score of less than ten would indicated a lower knowledge of portfolio assessment. A mean score of less than four on the attitudinal section points to an unfavorable attitude toward portfolio assessment. A mean score of more than four demonstrates a favorable attitude portfolio assessment.

APPENDIX I

ACTIVITY SCHEDULE

ACTIVITY SCHEDULE

January 27, 1999	Contacted Deans of Colleges of Education
March 6, 1999	Mailed Pilot Questionnaire to Professors
March 15, 1999	Second Mailing of Pilot Questionnaire Sent
March 30, 1999	Third Mailing of Pilot Questionnaire Sent
April 1, 1999	Began Pilot Study Data Analysis
April 1, 1999	Sent Mailing to Panel of Experts
April 5, 1999	E-mail Reminder Sent to Panel of Experts
April 15, 1999	Received Data from Panel
April 30, 1999	Refined Questionnaire and Designed Web Page
May 6-9, 1999	E-mailed and Mailed Professors Actual Questionnaire and Demographic Data
May 7, 1999	Began Receiving Data
May 8, 1999	E-mail Reminder Sent
May 24, 1999	Second Mailing
June 20, 1999	Third Mailing
August 30, 1999	Fourth Mailing
September 5, 1999	Began Compiling Data

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