

ASSESSMENT PRACTICES USED
BY MONTESSORI TEACHERS OF KINDERGARTEN
THROUGH SIXTH GRADE STUDENTS IN
THE UNITED STATES

A Dissertation
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Degree
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DEDICATION

This dissertation is dedicated with love to my parents
Mr. James Monroe Boyer
and
Mrs. Alma E. Strohecker Boyer
who have always believed that I could do anything.

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ABSTRACT

This research examines student evaluation practices used by Montessori elementary teachers. The Montessori teaching method emphasizes students learning at their own pace within a prepared environment where the teacher's role is somewhat different compared to traditional classroom settings. Both traditional and less common methods of student assessment are utilized by Montessorians (e.g. standardized achievement tests, student portfolios, audio/visual recordings of students' work, individual conferences, etc.). The methodology and reasoning behind student evaluation is not well understood for the educational community, and today's dynamic cultural environment demands better attention to this subject. Following a review of assessment practices, analysis consisted of sampling member schools of the American Montessori Society (AMS). A questionnaire was submitted to 731 AMS member schools across the United States, and 108 responses were collected, representing 30% of the possible AMS member schools with elementary programs. The questionnaire's items (27 total questions) were refined to 16 research questions which were analyzed using both quantitative and qualitative methods. A number of useful results were produced: the factors that influence the assessment practices used by Montessori teachers is the make up of students in the classroom and the Montessori method of education; Montessori elementary teachers use both alternative and traditional methods of assessment practices; Montessori schools use standardized achievement tests but are not convinced they fit the Montessori method of teaching; the combination of non-graded report cards, anecdotal records, and student portfolios are successful reporting practices for parent teacher conference; and, issues and concerns about assessment practices. The study concludes with identifying several areas of

assessment practice where future research and professional development may benefit Montessorians.

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CHAPTER 1

INTRODUCTION AND LITERATURE REVIEW

“We must constantly remind ourselves that the ultimate purpose of evaluation is to enable students to evaluate themselves”.

Arthur Costa, 1989

Rationale for the Study

Education in America is undergoing significant changes. The role of schools is being redefined from ranking students by levels of achievement to being accountable for student competence as viable members of our culture. Assessment practices are changing along with the roles of teachers, students and parents in the realm of education.

The Montessori method of education has evolved to become a model for educators who are defining developmentally appropriate classroom instruction and student outcomes (Roemer, 1998). The Montessori method offers an individualized approach that allows students to learn at their own pace with a prepared learning environment. However, guidelines for Montessori elementary teachers to assess students’ progress and achievement are not well defined. Some Montessori teachers use traditional measures of student assessment, for example, standardized achievement tests and tests of memory and recall (McKenzie, 1998). Other Montessori teachers use portfolios and individualized discussions and conferences for assessment. The purpose of this study was to

examine the assessment practices used by Montessori elementary teachers for student evaluation.

Conceptual Framework

Assessment practices have never been examined more closely than now. It is an exciting time for educators. There are three major factors contributing to the current reforms in assessment, including (1) the changing nature of educational goals to more outcome-based education, (2) the relationship among the processes of teaching, learning and assessment practices, and (3) the limitations of the present testing and recording of student achievement (Benson, 1995).

Outcome-Based Education

Many school programs today were originally designed for the 19th century, and it is recognized that they are incapable of teaching students how to solve many contemporary and future problems (Kearney, 1994). Educators have begun to look at Outcome-based Education (OBE) and student learner outcomes to determine the best possible educational program to prepare students for today's dynamic world. Educators need a list of goals for student outcomes to guide preparation for success in the modern world.

The shift from an agrarian based society to an information based society has left many Americans without the skills needed to succeed in life. School reformers are focusing on what students need to know to live and work in a highly complex, technological society and marketplace. Corporate America, federal government, and state governments are actively supporting efforts to redesign education. The 1983 report, A Nation at Risk, published by the National Commission on Excellence in Education is perhaps the key study that

led to the movements in educational reform (Marzano & Kendall, 1996).

Educators have begun to look not only at the process of education but also at the product of education which leads to OBE models.

Outcomes are the demonstration of what you have learned rather than reiterating facts and formulas learned from a textbook to earn a score or grade (Spady, 1994). Demonstration is the key word in OBE. Among the skills and characteristics frequently listed as outcomes of educational programs are:

- the ability to communicate orally, in writing and technologically;
- the ability to cooperate, collaborate and negotiate;
- the ability to think critically and solve complex problems effectively;
- the ability to view the human experience and our constantly changing world from a global perspective (Puckett & Black, 1993; Redding, 1992; Roemer, 1998; U.S. Dept. of Labor, 1992).

Outcome-based education requires a different approach, with the emphasis on active modeling from adults, higher expectations from educators and more intensive involvement with students. Teachers using OBE clearly convey expectations to students at the beginning of all courses, units and lessons (Spady, 1988). Feedback to students is also a large part of OBE. Outcome-based education requires a different model of assessment, rather than using scores from achievement tests and rote learning. Such assessment utilizes performance-based tools such as portfolios, projects and oral presentations.

Outcome-based Education and Montessori Schools

Montessori educators have long prepared students for their future in the “real world” (Seldin, 1996; Weaver, 1996). Montessori outcomes were identified by Nancy Rambusch, founder of the American Montessori Society (AMS), and are part of a document used by schools seeking accreditation with AMS

(Rambusch & Stoops, 1992). Since 1992, more than 35 American schools have been accredited using Rambusch's The Authentic American Montessori School. The learner outcomes are one of the components of Montessori schools that first attracted parents to this method of education. Montessori schools strive to produce students:

- who are moral beings; who are confident, competent learners;
- who are independent; who are autonomous;
- who are intrinsically motivated; who are academically prepared;
- who are socially responsible; who are free within limits;
- who are spiritually aware; who are able to handle external authority;
- who become citizens of the world; and, who become stewards of the planet. (Rambusch & Stoops, 1992, pp. 43-44)

Many of the learner outcomes of a Montessori program are not easily measured on a percentage scale or by testing lower order thinking skills. Many of the learner outcomes of a Montessori program require assessment of higher order thinking skills like the demonstration of problem solving, analysis, and implementation. Montessori teachers need to assess students using a variety of alternative assessment practices that involve student projects, student portfolios and verbal discussion skills. However, many Montessori schools do not have these alternative assessment practices in place.

Some guidelines and teacher preparation about student assessment practices are provided during Montessori teacher training programs. Most of the assessment practices learned during training involves the observation of students' during large blocks of work time, demonstration of student mastery of the concepts presented with the sequential, hands-on-material lessons, and individual discussions with students to determine if understanding exists for curriculum topics. Yet, consistent assessment practices do not exist across the

community of American Montessori schools. Montessori teachers need more information and guidelines about alternative assessment practices (P. A. Calvert, personal communication, October 23, 1998; J. Chattin-McNichols, personal communication, October 29, 1998; M. Eanes, personal communication, October 22, 1998; M. Loeffler, personal communication, October 12, 1998; Turner, 1991)

Changes in the Relationships Between Teaching, Learning and Assessment Practices

Objectives, or outcomes are the intended goals of education. They are the expectations that one hopes students will achieve through the educational program of teaching and learning (Eisner, 1994). The most important value teachers can offer to the success of an educational program is a very strong sense of caring about students' well being in school. Students are the heart of every program (Stiggins, 1994). Making sure they succeed should be the ultimate goal of teachers and administrators.

Classroom designs. Classroom environments are changing from the traditional model of the teacher at the front of the room directing learning to rows of students with textbooks and workbooks. More innovative classrooms of today can have many learning centers with self-directed activities or circular seating for Socratic discussion. Students in these new classroom designs are able to work in groups and share their own wealth of information with peers. Rather than being so competitive, students are cooperating more with each other and students might have the role of mentor, tutor, or discussion leader. There are many new school models for schools and districts to choose from. The Montessori method is also a model that can be adapted to a public as well as private school. Elementary Montessori programs were first implemented in the public sector in the late sixties. During the 1970s, new Montessori programs were started as magnet public schools. During the 1980s, there was a 500%

increase in the number of Montessori magnet schools and this growth continues today (Daoust, 1994).

Educators are realizing the value of collaborative classrooms in regards to independent learning for students and opportunities for observation by teachers (Eisner, 1994; Hart, 1994; Stiggins, 1994; Wiggins, 1992). Collaborative classrooms are thoughtfully prepared and are designed to help the process of assessment. Teachers and students work together to establish their instructional goals in each subject area (Hart, 1994). Collaborative classrooms free the teacher to be a perceptive observer of student performance, social interactions and achievement (Wiggins, 1992). One of the basic premises of the Montessori method is that teachers provide opportunities for students to work independently and in small groups without constant teacher direction.

Montessori Theory and Philosophy

The Montessori method of education has been successfully assisting in the development of children for more than a century. It is an internationally recognized method that translates into many different cultures. Montessori schools follow a model of education first developed by Maria Montessori in the mid 19th century in Italy. Dr. Montessori “had a clear theory of development, primarily a constructivist theory similar to Piaget’s” (Chattin-McNichols, 1992, p. 3). Montessori believed there were planes of development for children to learn and she called these planes “sensitive periods”. During these sensitive periods of a child’s development, manipulative materials are presented sequentially to introduce concepts concretely that would also lead to later abstraction. Four main aims of a Montessori lesson were to encourage control (of movement and self), concentration, independence and order (completing a cycle, replacing materials). Montessori philosophy sought to develop children who were

independent, confident (based on their competence), responsible and respectful of others.

Montessori classrooms. Montessori classrooms are composed of multi-aged students with an age span of three years. The three year span allows opportunities for children to learn from each other, to find appropriate peer groups that offer intellectual challenges and support (Loeffler, 1992). The student to teacher ratio can range from 10:1 to 15: 1 and depends on individual schools and state regulations. A Montessori classroom is designed for the students that spend most of their day there. All of the furnishings and materials are at the students' height for easy accessibility.

Much of the didactic materials students work with in Montessori classrooms are self correcting which provide students the opportunity for self-evaluation and discovery. The work choices are not static, nor are they identical from one culture to another.

By assisting children in solving problems and evaluating their own successes, Montessori's didactic apparatus provides a unique form of scaffolding and, especially in the mathematics and language materials for early elementary children, is designed to help children construct a higher level of abstraction while building on present understanding and skills. (Loeffler, 1992, p. 109)

Students have freedom of movement to move at their own pace through a prescribed, integrated curriculum, put work away when finished and then move on to the next task. Students are given individual, small group, and whole class lessons from teachers who are guides in the environment. Direct teacher instruction, for the whole class on curriculum topics is rare. Whole class group time is reserved for morning meetings with announcements, times for music experiences or reading aloud by the teacher. Individual learning styles are

respected and lessons are reformatted to meet individual needs. Projects, presentations, and current events are shared and discussed.

Montessori's prepared environment - with self-selection and free choice for the child as its major components, coupled with interesting manipulative objects as stimulation for activity, and a three-year age span for social and intellectual collaboration and challenges - provides an ideal setting for the child's self-construction process. (Loeffler, 1992, p.102)

In a Montessori classroom, observation is one of the primary roles of the teacher (Neubert, 1992). Observation is basic and significant to the Montessori method. Dr. Montessori referred to her approach as a "scientific pedagogy" (Montessori, 1962, p.21) with its foundation based on observation and experimentation. Teachers act more like facilitators and have the role of being an affirmer of each individual student in the classroom.

The teacher is the architect and the resource person in the Montessori classroom. Much of a Montessori teacher's time is spent assessing and preparing the classroom environment to ensure that the educational, developmental, and social needs of each student are met.

Assessment

Assessment is the process of gathering information about students - what they know and what they can do. There are alternative methods of gathering information, for example: by observing students and what they are learning; by examining their projects and products; by questioning students; by having a conversation with students; or, by testing their knowledge and skills. The key question about assessment is, "how can we find out what students are learning?"

As the American 2000 proposal and similar efforts are coming into their own, educators are examining programs that encourage lifelong learning (Benson, 1995). Outcome-based instruction is taught in classrooms where processes are just as important as products. Assessment of the processes can take many forms.

Without assessment, goals remain, it is claimed, empty aspirations. And once having an assessment system in place, there needs to be standards for each domain being assessed so that it is possible to determine if levels of student performance are adequate. (Eisner, 1994, p. 4)

The purposes for assessment are many. Assessment is used to:

- diagnose content knowledge and discrete process skills;
- diagnose application of skills;
- diagnose students strengths, needs and patterns of change;
- provide feedback on self-assessment;
- provide goal setting parameters;
- determine instructional placement and promotion;
- inform and guide instruction;
- provide practice in applying knowledge, skills and work habits;
- motivate students' attention and efforts;
- communicate learning expectations;
- provide a basis for student evaluation and grading;
- provide a basis for comparing students;
- obtain data for site-based management;
- obtain data for district-level or state-level decision making; and,
- gauge program effectiveness (Educators in Connecticut's Pomeraug Regional School District 15, 1996, pp. 192-93)

- anticipate educational needs; and,
- determine if the objectives have been achieved. (Eisner, 1994, p. 171)

Assessment practices in Montessori schools are varied. Generally, the progress of students is recorded on non-graded forms and teachers write anecdotal records. Some Montessori teachers assess students by observation and student performance of skills mastered. Portfolios, longitudinal samples of work, are compiled by some Montessori teachers to share at conferences with parents. Some Montessori schools administer standardized tests to compare students' achievement to a normed scale, or to be accountable for education in progress.

Teachers' Roles in Assessment

In the past, teachers were not thought of as knowing a great deal about assessment other than to assign letter or number grades for work completed. Now teachers are defining outcomes through their professional organizations and by working on different models of curriculum. Teachers today need to be clear about expectations of students work. Teachers can become masters of assessment and need to teach students to assess themselves (Stiggins, 1991). When students begin to assess themselves, they become intrinsically motivated to do the best they can. True assessment comes when students can examine their own work and determine the level of mastery and understanding for themselves.

Teachers must choose the assessment models that best fit the actual work done in their classrooms. Teachers also must consider the assessment models that enhance the teacher, student and parent involvement while making sure goals have been met. The value of assessment depends on the teachers' ability to plan complex and meaningful tasks that challenge students to use prior knowledge, recent learning and applicable skills. Students need to solve

relevant, meaningful and realistic problems that assess progress on learning outcomes (Fischer & King, 1995).

Assessment does not drive instruction, but follows naturally from particular arrangements of curriculum and teaching. Assessment is a process that must involve students and teachers from beginning to end (Graves & Sunstein, 1992; Stephen et. al, 1995). Assessment to enhance student learning must be integrated with, not separated from curriculum and instruction (Neill, 1997).

Authentic assessment

A “buzz word” in education is authentic assessment. Assessment is authentic when it involves students in tasks that are worthwhile, significant, and meaningful to them. Authentic assessment should be of student’s work and projects that are true to life and not arbitrary to give a grade or satisfy a school district’s reporting system. Authentic assessment requires student-centered classrooms (Hart, 1994), and Montessori classrooms are examples of student-centered classrooms or environments.

Authentic activities involve higher-order thinking skills and coordination of a broader range of knowledge. Students learn how to state, analyze, compare, summarize, define and evaluate when they are involved in authentic activities. Elliott Eisner (1994), describes eight features of this new assessment in education:

1. The tasks used to assess what students know and can do need to reflect the tasks they will encounter in the world outside of schools, not merely those limited to the schools themselves.
2. The tasks used to assess students should reveal the process of how students go about solving a problem - not only solutions formulated.
3. Assessment tasks should reflect the values of the intellectual community from which the tasks are derived.

4. Assessment tasks need not be limited to solo performance. Many of the most important tasks we undertake require group effort.
5. Assessment tasks should make possible more than one acceptable solution to a problem and more than one acceptable answer to a question.
6. Assessment tasks should have curricular relevance, but not be limited to the curriculum as taught.
7. Assessment tasks should require students to display a sensitivity to configurations or wholes, not simply to discrete elements.
8. Assessment tasks should permit the student to select a form of representation he or she chooses to use to display what has been learned. (Eisner, 1994, pp. 203-209)

Authentic assessment involves students and their learning and understanding of knowledge within the parameters of different learning styles. The context in which a task is performed makes it authentic. Authentic tasks that are interesting, worthwhile and relevant to their lives are the ones that will hold the most meaning and influence students' future successes.

Research has found that teacher's informal observations of students engaged in meaningful activities and intuitions about children's needs are far more useful than scores from formal tests for guiding instruction. (Fischer & King, 1995, p. 27)

Evaluation

Evaluation is the process of interpreting what is assessed and making judgments about the assessment information. Assessment data becomes meaningful when we decide that it reflects something that we value. Evaluation relates to the outcomes that are established by the school and the school community. Are the students learning what we want them to learn? Student evaluations should reflect a true picture of what a student has accomplished, and what they are still working on. Evaluation results are what teachers report to parents at parent teacher conferences.

Limitations of the Present Testing and Recording of Student Achievement

The use of standardized tests as a measure of student achievement took hold in the United States in the 1950's. Standardized assessment was designed to be used in many classrooms and schools. These tests are easy to administer, score and interpret. The purpose of standardized tests is to compare the performance of local pupils to that of similar pupils nationally. It was thought that these tests could provide developmental information about students' achievement over time and to identify areas of student strengths and weaknesses (Airasian, 1997).

Over time, these tests and the information they provide have been misused. These norm-referenced tests are mandated in some states and their results are often published. Parents and citizens who read these reports draw conclusions about the educational quality of the school or district (Airasian, 1997; Eisner, 1994; Fischer & King, 1995; Hart, 1994; Wolf, 1992). In some states, rewards are given to teachers and funding is given to school districts with high test scores. It is thought that a school that succeeds is one whose students receive high standardized test scores. The irony is that most educators would say that "neither letter grades or standardized test scores capture the richness of

educational experience or do they adequately disclose the quality of the education provided”(Eisner, 1994, p. 188).

Beginning in the 1980s standardized tests came under attack by educational reformers looking for alternative ways to assess student achievement. Standardized tests are a single measure of an individual’s performance and therefore misleading if they are used as the only basis for determining how a student will perform in the classroom or in their future workplace. These tests can be combined with other assessments to form a comprehensive picture of a student’s overall progress (Fischer & King, 1995).

The misuse of standardized tests has also lead to an erosion of the curriculum. Many educators under pressure from school districts, and community members have begun to “teach to the test”. Standardized tests are multiple choice in format. Some teachers have broken down the curriculum and concepts into bits of information similar to the items on test questions. Students were not required to process information for understanding, but regurgitate information through recall and rote memorization (Hart, 1994). Only part of any curriculum can be tested in a multiple choice format. The time that teachers focus on test content rather than on processes and problem solving of information has limited the curriculum by “over emphasizing basic skill subjects and neglecting higher-order thinking skills” (Herman, 1992, p. 74).

Montessori educators are now looking for alternative assessment practices that are built on current theories of learning and cognition and based on the outcomes and skills students will need for success in the future. The argument is not about which assessment practices is best, because that line of reasoning is counter productive. As Stiggins (1994) states, we have a wide range of complex achievement targets to assess. We need all of the tools available to do the job, we can’t afford to throw away standardized testing as one of many tools we use to

evaluate students. There are many different assessment practices and each have a value in the evaluation of a student (Birrell & Ross, 1996; Stiggins R.J., 1991). Educators need all of the assessment tools available to do the job effectively.

Significance of This Study

The majority of Montessori schools are private and are either proprietor owned and governed or are governed by a board of directors. Each school sets policy independently of each other until they choose to seek affiliation or accreditation from a Montessori Society. When a school becomes affiliated or accredited they are required to follow a set of guidelines that insure their quality education and management. Accreditation with the American Montessori Society is relatively new, beginning in 1992. Some areas of best practice are still under investigation and determination, for instance, assessment practices. Some states and local school districts have in place a wide variety of assessment tools, while others rely solely on professionally designed instruments that test recall of facts, but not higher level thinking skills. In some ways this diversity is so great, it may be concluded that there is not a clear national consensus about how to evaluate the job teachers are doing to educate students. The American Montessori Society believes that:

assessment procedures used in American's schools [should] move away from a reliance on written tests as the only format for indicating educational achievement, and toward formats (portfolios, presentations, and multi-media projects) that more authentically gauge the ability to interrelate ideas, think critically, and use information meaningfully (American Montessori Society, 1998 p. 16).

Because of the educational nature of Montessori schools, alternative assessment practices are needed to evaluate student achievement. Are Montessori schools following the guidelines established by the American Montessori Society and using less traditional assessment measures (texts and workbook tests, standardized achievement tests, written skills tests, and

checklists) and, are they using more alternative methods of assessment (portfolios, journals, individual conferences, teacher written anecdotal records and observations)?

Information about assessment practices used by Montessori elementary teachers was researched. A review of the literature revealed very little about assessment practices used in Montessori schools. Other than an article in the American Montessori Society Journal written by Joy Turner (1991) describing a record keeping/assessment system for early childhood classrooms, and an article by Dr. Ginger McKenzie (1998) integrating proficiency test topics into Montessori elementary curriculum, information about Montessori and assessment practices used by teachers is scarce.

Several Montessori researchers were contacted about the topic: Dr. John Chattin McNichols at the University of Washington State, Dr. Margaret Loeffler at Oklahoma University, and Michael Eanes, Executive Director of the American Montessori Society. Their opinions were unanimous - research about Montessori assessment practices is in dire need of attention. The American Montessori Society sponsored this study by mailing the questionnaire (see Appendix A) to the Heads of affiliated and accredited schools requesting that they distribute it to their elementary teachers.

A Review of Related Literature

A review of the literature examines three major areas: (1) historical perspectives of assessment; (2) the need for alternative assessment; and (3) types of alternative assessment practices.

Historical Perspectives of Testing and Assessment

The history of testing as an evaluation tool spans more than 5,000 years with the Chinese government administering tests to select and retain public office. The first records of examinations in education appeared in the Middle Ages in European Universities. In the 15th century, a master's salary for a teacher depended upon his student's performance (Madaus, 1985). Assessment changed to focus more on the student than on the teacher. During the 19th century, psychological and educational testing was developed using the "scientific method" on human beings.

Horace Mann, the father of public education in the United States, was an advocate of testing. In 1845, he promoted written tests with large numbers of questions and standardized answers to evaluate student performance (Hart, 1994). This was the beginning of standardized tests which took the form of mass produced multiple choice tests that could get consistent results from a large number of people. Pioneers in testing developed statistical concepts to ensure objectivity in scoring. The Child Study Movement, begun in the 1920's, started in university laboratory schools using rigorous experimentation and quantifiable aspects. The focus of this movement was on: characteristics of normal children; the relative influence of heredity and environment; and, improving assessment devices to use with young children. By the year 1930, over 4,000 psychological tests were in print (Puckett & Black, 1993). After World War I, commercial testing emerged within local districts to identify individual learning needs, to group students for learning groups, and to compare local test performance to national norms.

The American society evolved from an agrarian society to a more industrialized society and schools became more complex, comprehensive and bureaucratic. During the post WWII industrial surge, the idea that schools could

run like factories appealed to the American public of the 1950s. The key to making factory-like schools work was to break down learning into small bits of knowledge that could be taught and learned in sequential order (Puckett & Black, 1993; Stiggins, 1991). Hart (1994) refers to this as the "Education Assembly Line." Classrooms were broken down into one year per grade level and each grade had specific expectations for each. Even with knowledge of human growth and development expanding, testing changed very little. Standardized tests with multiple choice questions complemented this model of teaching and these tests became the preferred choice for monitoring quality control in the "factory" schools.

Through the 1950s, tests were a part of American culture. But in 1957, when the USSR launched the first artificial satellite called Sputnik, the American education system was launched into a period of self doubt, concern and competition between the two nations, especially in math and science. The question asked was, "Why didn't our educational system produce a satellite or why didn't it show us what was lacking?" As a solution to this dilemma, more testing was advocated.

There was more interest in cognitive development beginning in the 1950's. The work of Jean Piaget, a Swiss psychologist and contemporary of Maria Montessori's was influencing education. There was also a focus on the interaction of heredity and environment. The constructivist view of assessment determined that it is much more complex than a multiple choice test can measure. As perspectives on human growth and development changed in the 1960-70s, scholars began to look at different influences on learning. Factors such as: the early years as being critical to intelligence; the role of multiple intelligences in cognition; and the psychological, sociological, and ecological

influences on human functioning (Puckett & Black, 1993) were examined by various educators.

Test advocates still thought that segmented, sequenced skill learning was superior and that students would, by memorizing basic facts, be able to apply them to complex understandings. This notion was challenged by scholars in cognitive and educational psychology such as David Elkind, Constance Kamii, Lawrence Kohlberg and Jean Piaget (Puckett & Black, 1993, 8). Yet, during the 1970s-80s there was an increase in testing of younger children. Tests were given to gain entrance into private institutions. It became fashionable for parents to hold children back for a year to become ready for strenuous academic endeavors.

By 1960 funds from the National Defense Education Act were given to school districts that could boast of their standing with scores from their norm referenced tests. However, as the student population grew as a result of the baby boom years, and costs increased for education, student achievement could not keep up with the investment in education. During the 1960s and 1970s, commercial firms that provided school districts with instructional materials for reading were reimbursed, in part, by the improvement in student test scores (Madaus, 1985). Individual scores defined promotion, needs for remedial instruction, and graduation.

The Need for Alternative Assessment

In 1970 the Scholastic Aptitude Test (SAT) scores were falling. In addition, employers were complaining about high school students and army recruits who could not read (Eisner, 1994; Hart, 1994). What was the impact of testing on students and learning? There were many. Basically, the political powers sponsoring the increase in testing did not know about curriculum

assessment nor did they spend time in the classroom with students. The political powers made assumptions about improvement that were not based on best practice assessment. Traditionally, the United States has valued the products over the process of learning. The major stake holders involved in education, students, teachers and parents, were not involved in the assessment process at all. As Stiggins believes, "We are a nation of assessment illiterates. We are a society that has come to care very much about high standards of achievement but we are a society that is incapable of understanding whether those standards are being met" (Stiggins, 1991, p. 535).

Since 1980, educators have been more aware of the importance of educational outcomes and high achievement standards. A demand for accountability rose from educational reformers and parents. It was felt that schools must become performance driven and educators must be accountable for student attainment of specific academic outcomes. School districts were finding specific discrepancies between standardized test scores and students' actual progress. School districts also found that the content of the tests did not represent the district's program goals (Benson, 1995). Change in assessment practices was needed to compliment current cognitive and human growth and developmental theories.

Outcome-based education was found to be consistent with the voice of the current social and economic times. OBE got attention from schools and districts across the United States. Educators began to define mastery of knowledge and understanding of concepts as they relate to students' ability to problem solve. Assessment designs and curriculum designs began to match each other.

In addition teachers were empowered to make decisions about assessment as it related to their classroom and school. Good teaching is inseparable from good assessing (Wiggins & McTighe, 1998). Even though teachers were given

more authority on assessment, they were not given enough professional development time in preparation. In 1991, all fifty states had teacher training programs that did not require training in assessment as part of their certification program (Stiggins, R. J., 1991, 536).

Types of Alternative Assessment Practices

Observation

Montessori teacher preparation programs include many hours of instruction on observation of students. Montessori teachers are taught that observation is one of the most beneficial types of assessment practice. Observation includes the collection of information regarding different aspects of children's interactions within the total environment, the analysis of this data, and the utilization of this analysis for future planning (Charbonneau & Reider, 1995). Teachers need to be trained in human growth and development that goes beyond using a unilateral standardized method of teacher directed learning and testing. Observation includes student's inter-and intrapersonal intelligences. Integrated, collaborative classrooms give teachers time to develop their observation skills to have a different level of understanding of how students learn and process information. Observation takes into account students' cognitive and social development and the strengths and combinations of their various intelligences (Charbonneau & Reider, 1995; Drummond, 1994).

According to Airasian (1997), there are two types of observation: formal and informal. With the formal approach, teachers predetermine what they will observe students doing, so students will be able to demonstrate the desired behavior. Formal observations are generalizable and work well across many curriculum situations. Formal observations are objective and their

interpretations are based on external or empirical verification. A numerical rubric can be used with formal observation and this information can be recorded and reported.

Airasian describes informal observations as being more naturalistic, and unique to the student's perspective. Informal observations are subjective and they are interpreted from the individual's judgment. The recording of informal observation is more narrative. Anecdotal records of teachers are another component of assessment and are a result of informal and formal observations.

In addition to being direct observers of students, teachers have to be attentive listeners and capable questioners. There are many data collection tools teachers can use depending on the type of information they want to include in their assessment practices.

Anecdotal Records

Anecdotal records are an assessment practice used by teachers to record observations of students' development in terms of language, social, attitudes, strengths, weaknesses, needs, progress, learning styles, skills, strategies used and other significant bits of information (Routman, 1994). Recorded information can be used for conferences with parents and students. Anecdotal records can be the beginnings of setting instructional goals and promote reflections. Observations and anecdotal records are wonderful companions teachers may use to assess students.

One-to-one Interviews

Teacher conducted interviews of students have many advantages for assessment. Teachers can build lesson plans on the basis of student's background knowledge as well as specific knowledge of the domain and individualize lessons as necessary. Interviews help promote the integration of curriculum areas according to the students intelligence strengths. Teachers can

assess motivation and initiative of students (Davidson & Scripp, 1989). One-to-one interactions between students and teachers allow a higher comfort level for students to take risks and stretch themselves cognitively and socially.

Portfolios

Powerful assessment tools should show more than what students know and understand. Assessment tools should show new understanding and the students' capacity to solve sophisticated problems, make sensitive judgments, and complete complex projects. One example of this type of assessment is "process-folios", or selected works showing the development of students' learning over time. The visual arts have long had a tradition of using student portfolios. Process-folios are similar, but they also include a range in variety and quality of works chosen to show the depth, breath, and growth of students' thinking (Zessoules & Gardner, 1991). Process-folios may contain students examples of: designing experiments, conducting interviews, oral history projects, testing theories from equations, writing and revising multiple drafts of a story. In each of these examples, students are constructing learning and demonstrating their understanding.

Student Journals

Student journal writing is an excellent assessment tool for language arts development. Journals provide a non-threatening place to explore learning, feelings, happenings, and language through writing. Emergent writers can be followed through their random string of letters to completed stories (Routman, 1994). Through the use of journals, student progress can be documented, strengths and weaknesses attended to by the teachers, and confidence built for the student. Authentic assessment isn't a single method. It includes performance tests, such as conversations

in a foreign language; observations, open-ended questions where students tackle a problem but there's no single right answer; exhibitions in which students choose their own ways to demonstrate what they have learned; interviews, giving students a chance to reflect on their achievement; and portfolios, collections of student work. The list is limited only by the criterion of authenticity, is this what we want students to know and be able to do? (Mitchell, 1989, p. 5)

Definition of Terms

The terms used in this study are defined as follows:

Anecdotal Records: Dated, informal observational teacher notations that describe an individual student's development in terms of social, attitudinal, learning style, or anything else that seems significant at the time of observation (Routman, 1994, p. 309).

Assessment: The process of data collection and the gathering of evidence about a student's achievement and progress (Routman, 1994, p. 302).

Audio/visual recording of student work: Audio or visual recordings of student's work made by teachers or peers to be viewed for assessment purposes.

Checklist of lessons/materials: Written list of performance criteria that is used to record students' performance or evaluate a project. The teacher determines whether it meets the criterion. Checklists are diagnostic, reusable and capable of charting student progress.

Evaluation: Bringing meaning to the assessment data that has been collected through interpretation, analysis, and reflection and includes the kinds

of instructional decisions made by careful examination of the evidence (Routman, 1994, p. 302).

Informal conferences: An informal meeting between student and teacher in which the teacher follows the student's lead and the teachers does not have a predetermined agenda (Routman, 1994, p. 321).

Observation of students: Teacher's concentrated attention on a student's work, behavior and activities for a period of time accompanied by note taking of what is observed (Drummond, 1994, p. 26).

One-to-one interview: Face to face conversations between teachers and students where teachers have a predetermined list of questions to assess a change in student attitude or what a student has learned about a subject.

Standardized achievement test: Either norm-referenced or criterion-referenced tests where performance of an individual or group is compared to the performance of other individuals or groups. These tests are usually in the form of multiple choice questions (Eisner, 1994, p. 178).

Student demonstration of skill mastery: Students are asked to perform specific behaviors for the teacher to assess (Meyer, 1992, p. 39).

Student journal writing: Students record their feelings, thoughts, happenings and language through writing in a non-threatening place (Routman, 1994, p. 197).

Student portfolios: Student selection of a representative, ongoing, and changing collection of work samples. Students examine their work and add reflective information about them (Routman, 1994, p. 331).

Teacher made tests: Open-ended questions determined by the teacher after a lesson has been completed to encourage a variety of thoughtful responses (Routman, 1994, p. 327).

Texts and workbooks: Published books with subjects, themes and follow up tests based on grade-level skills and achievement goals for student use as part of the classroom curriculum.

Written skills tests: Published diagnostic tests that students complete for teacher use in student assessment.

Problem Statement

Educators are changing their assessment practices for student evaluation. Many educators are transforming from test-oriented student evaluation to an evaluation system with multiple facets of assessment practices. While Montessori education is an alternative method of teaching compared to traditional methods, the question remains as to whether the assessment practices used by Montessori elementary teachers reflect alternative methods that match the method of teaching. Therefore, the main focus of this study was to explore and determine what assessment practices Montessori elementary teachers used to evaluate their students. More specifically, the following questions were examined:

1. Are Montessori elementary teachers using more alternative (anecdotal records, audio/visual records of student work, informal conferences with students, observation, one-to-one interviews, student journals, and student portfolios) or traditional, (checklists, skill mastery, standardized tests, teacher made tests, texts and workbooks, and written skills tests) assessment practices?
2. What is the relationship between the Montessori certification teachers have and the assessment practices they use?
3. What is the relationship between the number of years Montessori teachers have been teaching and the assessment practices they use?
4. What is the relationship between the number of students a teacher is responsible for and the assessment practices used?
5. What is the relationship between the type of school (charter, private, public, religious) and the assessment practices used?

6. What is the relationship between a school's accreditation status and the assessment practices used?
7. What is the percentage of schools that use a standardized achievement test and what tests are most commonly used?
8. How many scheduled conferences do teachers have with parents of students each year?
9. Are students included in these parent/ teacher conferences?
10. What are the teachers' perceptions of the parents satisfaction with the assessment practices used in the classroom?
11. What percentage of teachers participate in a yearly self-evaluation?
12. What specific aspects of student assessment do Montessori elementary teachers consider to be the most successful in their classrooms?
13. What specific aspects of student assessment do Montessori elementary teachers consider need improvement in their classrooms?
14. What factors influence the assessment practices used by Montessori elementary teachers i
15. What issues and concerns do Montessori elementary teachers have about assessment prac
16. What student assessment practices would teachers like to know _____ more

CHAPTER 2

RESEARCH METHODOLOGY

The focus of this study was to explore and describe the scope and nature of the assessment practices used by K - 6 Montessori teachers to evaluate their elementary students. A review of the related literature indicated a lack of published, professional guidance about assessment practices or current common practices used within the Montessori community for Montessori teachers to reference. A survey instrument, in the form of a questionnaire, was chosen to gather the information to be analyzed quantitatively and qualitatively.

Subject Participants

The American Montessori Society (AMS) was very interested in this study. According to Michael Eanes, executive director of AMS,

We [AMS] constantly get calls from school heads, parents and others asking for documentation of the effectiveness of Montessori education and pedagogy. Mostly these inquiries are looking for academic assessment. Some questions from Montessorians seek “proof” of the development of the whole child. M. Eanes (personal communication, January 13, 1999)

Montessorians did not have clear guidelines for teachers to follow regarding assessment. Two AMS guidelines made references to student assessment. They stated: “Does the school complete and communicate its assessment of the child’s development and progress to parents at regular intervals? [and] Does the school maintain the following records at the site of attendance? . . . (e.) developmental

progress assessment/transcript” (AMS, 1993, pp. 8 - 9). Both of these statements require that student assessment does exist in AMS schools, but neither gave clear guidelines or procedures pertaining to which assessment teachers should use.

During the October 1998 board meeting of the American Montessori Society, a committee made up of Montessori School Heads was appointed to study assessment. Following correspondence with Michael Eanes the Executive Director of AMS, and after executive board approval, AMS offered their support and mailed the questionnaire (see Appendix A) to 730 schools affiliated or accredited with them, of which 241 were eligible to participate in this study. Eligibility was based on one or more elementary classes operating at the school. This widespread mailing across the United States informed Montessori schools about the necessity for assessment research.

An AMS affiliated school is described as: a Montessori school that abides by the AMS code of ethics and has had an on-site consultation visit by an approved Montessori evaluator. An affiliate school is one that is staffed by teachers with AMS credentials in at least half of its early childhood (3 -6 year old) classes and by teachers with credentials recognized by the Montessori Accreditation Council for Teacher Education in the remaining classes. Guidelines for AMS school standards for affiliation and accreditation are outlined in an AMS publication titled Information on the School Consultation and Accreditation Process (AMS, 1993).

An AMS accredited school has gone through a two year self-study plan using The Authentic American Montessori School (Rambusch & Stoops, 1992) guide. Accredited schools have certified Montessori teachers in all classrooms. Accredited schools have had a consultation visit and an evaluation team visit after the self study process is completed. Accreditation is an ongoing process

with yearly reports and strategic planning updates. Accreditation with AMS lasts for seven years and then the self study process begins again.

Demographics of the Sample Population

Montessori teachers working at member schools of the American Montessori Society (AMS) were surveyed across the United States. Twenty-eight states or 55% were represented by the sample of respondents (results from question 2 on the questionnaire). Out of a total of 241 AMS schools with elementary programs 74 schools had teachers who responded to the survey. This represents 30% of the eligible schools responding. Twenty-two schools had more than one respondent. The total sample size of respondents was 108.

The respondents represented a variety of teachers enabling this sample's information to be generalized to the population of AMS Montessori elementary teachers. Questions 7 through 9 on the questionnaire focused on the demographic information about the respondents. The respondents' years of teaching experience ranged from 1 to 38 years (see Table 1).

Table 1
Respondents' Demographic Information

Description	Range	Mean	S.D.	Mode	Median
Years of experience	37	13.71	9.36	20	12
# of students in class	49	22.0	7.60	20	23
Student:Teacher ratio n = 108	26	11.79	4.48	10	11

The number of students in the respondents' classes ranged from 5 to 54. There were outliers on each end of this range, 5 is a very small class and 54 would be considered very large for Montessori schools. The mean for the

number of students in the respondents' classes was 22, the standard deviation 7.6, the mode 20 and the median is 23. Respondents were asked to give the student:teacher ratio of their classroom. There were outliers in this range from 4 to 30. The mean was 11.79, the standard deviation was 4.48, the mode was 10, and the median was 11. The data from the sample demonstrated close to a 12:1 student: teacher ratio that is typical for Montessori classrooms.

Montessori classrooms typically have students within a three year age range. In elementary classes, ages 6 - 9 or first through third grade students are in the same classroom and ages 9 - 12 or fourth through sixth grade students are in the same classroom. Question 6 on the questionnaire asked the respondents to give the age range of the students in their classrooms. The majority of the sample had these ranges of students in their classrooms (81.5% combined), however, some were ages 5 - 6, or kindergarten and first and others had ages 6 - 12, or first through sixth grade in one classroom. See Table 2 for the statistics related to the age range of students taught by the respondents.

Table 2
The Age Range of the Students in the Respondents' Classrooms

Age Range in Years	Frequency	Percent of Total
5 - 6	10	9.3%
6 - 9	50	46.3%
9 - 12	38	35.2%
6 - 12	7	6.5%
No Answer	3	2.8%
n = 108	Total 108	100%

The Survey Instrument and Data Collection

Survey research was chosen as the appropriate instrument of inquiry for making inferences about Montessori elementary teachers from data drawn from a sample of individuals from that larger group (Marshall & Rossman, 1995). A questionnaire was designed and developed by the researcher (see Appendix A). During the initial stages of development, information was formulated from the researcher's interest in alternative assessment, standardized tests, and general knowledge. As the questionnaire took form, and research was continued over the topic, additional questions were developed. The questionnaire consisted of 10 demographic questions, three questions about standardized tests, two scaled questions about assessment practices, one check list question about progress reports, three open-ended questions about assessment, one numerical question about parent conferences, one "yes or no" question about conferences with a "why or why not" attached and two "yes or no" questions about students and conferences and self-evaluation.

Review and Pilot of the Survey Instrument

The questionnaire was reviewed by Dr. Carole Bond, committee chair; before being piloted by teachers at Lamplighter School, Memphis, Tennessee (seven total) and Montessori Academy, Nashville, Tennessee (five total).

As a result of this pilot study, a list of definitions of terms was added. Also, the instrument was reformatted by adding charts for teachers to fill in with a check instead of writing in answers. Generally, the teachers involved in the pilot study filled out the questionnaire completely, using all of the lines for the open-ended questions.

Post Pilot Review of the Survey Instrument

The questionnaire was also reviewed by three other members of the researcher's graduate committee, Dr. Becky Anderson, Dr. Deborah Lowther, and Dr. Karen Weddle-West. In addition it was reviewed by representatives of the Montessori community of educators, Michael Eanes (AMS), Dr. John Chattin-McNichols (AMS), Dr. Patty Calvert (AMS), Dr. Margaret Loeffler (University of Oklahoma), Anna Perry (researcher), and Dr. Betsy Coe (Houston Montessori Teacher Training Center). All of the Montessori reviewers felt the study was important. Most of the reviewers offered helpful suggestions to improve the questionnaire. All suggestions were considered, almost all were implemented (see a copy of the final questionnaire in Appendix A).

Method of Data Collection

Data for this study was obtained through the use of a questionnaire (see Appendix A), research about assessment practices, and follow-up interviews. When the survey participants added additional comments, these comments were incorporated into the results.

Triangulation

This study included research and questionnaire results from participants teaching in Montessori schools across the United States. The participants represent a variety of perspectives from teachers: with training from different teacher preparatory programs; who teach at a variety of Montessori schools; and, with varying total years of teaching experience. Although the teachers who submitted questionnaires teach at member schools of the American Montessori Society, the author did not have any additional control over the participants in the sample. The questionnaire contained both fixed alternative and open-ended questions. The author used the services of another researcher to separately

analyze the open-ended questions for topics and categories to represent the data collected for a reliability check. Follow-up telephone interviews were conducted following the initial review of the data to collaborate questionnaire information and to get additional information about assessment practices used by participants.

Data Analysis

Both quantitative and qualitative statistical analysis were used to answer the questions relating to this study. Correlations were computed for Questions 2 through 6 to answer questions about the relationship between the assessment practices teachers used and: the teacher's Montessori certification; years of teaching experience; student teacher ratio; the type of school (charter, private, public or religious); and, the school's accreditation status. A frequency statistical analysis was conducted for Questions 1, 7, through 9 and 11 to determine: the percentage of schools that use standardized tests; the number of parent teacher conferences teachers conduct; the percentage of teachers who include students in their conferences; and, the percentages of teachers that participate in yearly self-evaluations. Questions 10 and 12 through 16 were analyzed qualitatively to find patterns and develop categories as outlined in the model described by Michael Patton (1990).

Procedure

The initial questionnaire was mailed out the week of November 9, 1998. In a cover letter (see Appendix A) accompanying the questionnaire, teachers were asked to return the questionnaire to the researcher in a pre-addressed envelope by November 23, 1998. Beginning November 30, 1998 the data from 56 participating schools was coded and entered into a data base.

On December 9th and 11th, in an attempt to increase the total number of school participation, the author sent follow-up faxes with the four pages of questionnaire information to AMS accredited schools and a sample of Montessori schools from each state. A total of 75 faxes were sent. In addition, an email notice about the assessment research was posted on a Montessori Listserv on the internet asking anyone who did not complete the questionnaire to email the author and have one forwarded. In addition, seven telephone calls were made to various teachers who expressed interest in the research, but who were not represented in the questionnaires received at that time.

CHAPTER 3

DATA PRESENTATION AND ANALYSIS

Results of the Analysis

Montessori elementary educators were surveyed to determine the assessment practices they used to evaluate students. Sections of this study were framed around the Research Questions found in Chapter 2, and the corresponding data from questions asked on the questionnaire (see Appendix A) followed by the results. The experience and behavior questions were recorded in tables using statistical analysis of frequency and percentages, primarily. The opinion and values questions were recorded in tables that indicated themes and categories of answers.

Montessori Teachers and Frequency of Assessment Practices Used

The first Research Question asked: are Montessori elementary teachers using more alternative (anecdotal records, audio/visual records of student work, informal conferences with students, observation, one-to-one interviews, student journals, and student portfolios) or traditional (checklists, skill mastery, standardized tests, teacher made tests, texts and workbooks, and written skills tests) assessment practices? The Montessori method of teaching is an alternative method of education compared to traditional methods. In order to find out if Montessori teachers used more alternative methods of assessment to evaluate students, respondents were asked two questions on the questionnaire.

First, Question 16 asked respondents to consider a list of assessment practices and indicate the amount of time they used them in their classrooms. Respondents reported how much they used different assessment practices. A Likert scale was used that had the choices: all of the time, a lot, some, a little and never. The data was scaled with 5 representing all of the time to 1 representing never. For this study, anecdotal records, audio/visual records of student work, informal conferences with students, observation, one-to-one interviews, student journals, and student portfolios were considered alternative methods of assessment. Checklists, skill mastery, standardized tests, teacher made tests, texts and workbooks, and written skills tests were considered traditional assessment practices. Tables 3 through 15 represent the data respondents reported for each assessment practice they used and how much they used them. Table 12 refers to the use of standardized achievement tests. Standardized tests were not included in the Likert scale question. Therefore, only frequency and percentages are reported in Table 12.

Tables related to respondents use of alternative assessment practices

Table 3
Respondents' Use of Anecdotal Records

Value Label	Value	Frequency	Percent	Median = 4
All of the time	5	29	26.8	
A lot	4	33	30.5	
Some	3	24	24.1	
A little	2	16	14.8	
Never	1	3	2.7	
No Answer		1	0.9	
n = 108	Total	108	100	

Table 4Respondents' Use of Audio/Visual Records of Students' Work

Value Label	Value	Frequency	Percent	Median = 2
All of the time	5	16	14.8	
A lot	4	10	9.3	
Some	3	16	14.8	
A little	2	12	11.0	
Never	1	49	45.4	
No Answer		5	4.6	
n = 108	Total	108	100	

Table 5Respondents' Use of Informal Conferences With Students

Value Label	Value	Frequency	Percent	Median = 4
All of the time	5	30	27.8	
A lot	4	43	39.8	
Some	3	27	25.0	
A little	2	6	5.55	
Never	1	0	0.00	
No Answer		2	1.85	
n = 108	Total	108	100	

Table 6Respondents' Use of Observation of Students

Value Label	Value	Frequency	Percent	Median = 5
All of the time	5	64	59.2	
A lot	4	27	25.0	
Some	3	16	14.8	
A little	2	1	00.9	
Never	1	0	00.0	
No Answer		0	00.0	
n = 108	Total	108	100	

Table 7Respondents' Use of One-to-One Interviews

Value Label	Value	Frequency	Percent	Median = 4
All of the time	5	17	15.7	
A lot	4	39	36.1	
Some	3	29	26.9	
A little	2	12	11.0	
Never	1	9	8.3	
No Answer		2	1.8	
n = 108	Total	108	100	

Table 8Respondents' Use of Student Journals

Value Label	Value	Frequency	Percent	Median = 3
All of the time	5	37	34.2	
A lot	4	15	14.0	
Some	3	26	24.0	
A little	2	14	12.9	
Never	1	15	13.9	
No Answer		1	00.9	
n = 108	Total	108	100	

Table 9Respondents' Use of Student Portfolios

Value Label	Value	Frequency	Percent	Median = 3
All of the time	5	30	27.8	
A lot	4	18	16.7	
Some	3	29	26.8	
A little	2	16	14.8	
Never	1	12	11.1	
No Answer		3	02.8	
n = 108	Total	108	100	

Tables related to respondents use of traditional assessment practices.

Table 10

Respondents' Use of Checklists

Value Label	Value	Frequency	Percent	Median = 4
All of the time	5	53	49.1	
A lot	4	27	25.0	
Some	3	16	14.8	
A little	2	4	03.7	
Never	1	5	4.63	
No Answer		3	02.7	
n = 108	Total	108	100	

Table 11

Respondents' Use of Skill Mastery

Value Label	Value	Frequency	Percent	Median = 4
All of the time	5	47	43.5	
A lot	4	43	39.8	
Some	3	16	14.8	
A little	2	1	00.9	
Never	1	0	00.0	
No Answer		1	00.9	
n = 108	Total	108	100	

Table 12

Respondents' Use of Standardized Achievement Tests

Value Label	Frequency	Percent
Used	100	93
Did not use	8	7
n = 108	Total 108	100

Table 13
Respondents' Use of Teacher Made Tests

Value Label	Value	Frequency	Percent	Median = 3
All of the time	5	11	10.2	
A lot	4	14	12.9	
Some	3	35	32.4	
A little	2	25	23.1	
Never	1	20	18.5	
No Answer		3	02.8	
n = 108	Total	108	100	

Table 14
Respondents' Use of Texts and Workbooks

Value Label	Value	Frequency	Percent	Median = 2
All of the time	5	6	5.55	
A lot	4	5	4.63	
Some	3	36	33.3	
A little	2	39	36.1	
Never	1	19	17.6	
No Answer		3	02.7	
n = 108	Total	108	100	

Table 15
Respondents' Use of Written Skills Tests

Value Label	Value	Frequency	Percent	Median = 2
All of the time	5	3	02.8	
A lot	4	9	08.3	
Some	3	32	29.6	
A little	2	28	25.9	
Never	1	28	25.9	
No Answer		8	07.4	
n = 108	Total	108	100	

The respondents indicated that they used a variety of assessment practices in their evaluations of students. All of the respondents indicated they used more than one method of assessment. To determine whether or not Montessori teachers in this sample used more alternative methods of assessment than traditional methods, two statistics were examined. The statistical analysis of

frequencies and percentages were calculated along with the median. The median was chosen because it is the statistic of choice for ordinal data. The Likert scale used by the respondents is ordinal. If more than 50% of the respondents indicated they used the assessment practice “all of the time” or “a lot” (5 or 4 respectively on the scale) and the median for the assessment practice was a 5 or a 4, then it was considered to be an assessment practice most of the Montessori teachers in the sample used. The assessment practices attaining those two criteria are as follows:

- Anecdotal records;
- Informal conferences with students;
- Observation of students;
- One-to-one interview with students;
- Checklists of lessons;
- Demonstration of skill mastery; and
- Standardized achievement tests.

The assessment practices used the most by the sample respondents indicate that Montessori teachers used both alternative and traditional methods of assessment. Ninety-three percent or 100 out of 108 respondents used some type of standardized achievement test. This information indicated that 93% (69 out of 74 total) of the schools represented in this study used standardized achievement tests. There is more information about standardized achievement tests later in this chapter.

The second indicator of use of assessment practices was indicated by the respondents' answers to Question 17 on the questionnaire. Respondents were asked to rank the same list of assessment practices in Question 16, indicating the practice they felt was most important with the number 1. If some were of equal importance, respondents gave them the same number in the ranking.

Tables 16 through Table 27 show the frequency and percentages respondents ranked each assessment practice. The alternative practices are on Tables 16 - 22, and the traditional assessment practices are on Tables 23 - 27.

Tables Related to Montessori Teachers Ranking of Importance of Alternative Assessment Practices

Table 16

Respondents' Ranking of the Importance of Anecdotal Records

Value Label	Value	Frequency	Percent
Most Important	1, 2, 3	61	56.5
Important	4, 5, 6	26	24.1
Least Important	7 and up	11	10.9
No Answer		<u>10</u>	<u>09.3</u>
n = 108	Total	108	100

Table 17

Respondents' Ranking of the Importance of Audio/ Visual Recordings of Student Work

Value Label	Value	Frequency	Percent
Most Important	1, 2, 3	27	25.0
Important	4, 5, 6	36	33.3
Least Important	7 and up	20	18.5
No Answer		<u>25</u>	<u>23.1</u>
n = 108	Total	108	100

Table 18

Respondents' Ranking of the Importance of Informal Conferences

Value Label	Value	Frequency	Percent
Most Important	1, 2, 3	70	64.8
Important	4, 5, 6	21	19.4
Least Important	7 and up	10	09.3
No Answer		<u>7</u>	<u>06.5</u>
n = 108	Total	108	100

Table 19Respondents' Ranking of the Importance of Observation

Value Label	Value	Frequency	Percent
Most Important	1, 2, 3	98	90.7
Important	4, 5, 6	6	5.5
Least Important	7 and up	1	0.9
No Answer		<u>3</u>	<u>2.8</u>
n = 108	Total	108	100

Table 20Respondents' Ranking of the Importance of One-to-One Interviews

Value Label	Value	Frequency	Percent
Most Important	1, 2, 3	55	50.9
Important	4, 5, 6	19	17.6
Least Important	7 and up	16	14.8
No Answer		<u>18</u>	<u>16.6</u>
n = 108	Total	108	100

Table 21Respondents' Ranking of the Importance of Student Journals

Value Label	Value	Frequency	Percent
Most Important	1, 2, 3	32	29.6
Important	4, 5, 6	35	32.4
Least Important	7 and up	26	24.1
No Answer		<u>15</u>	<u>13.9</u>
n = 108	Total	108	100

Table 22Respondents' Ranking of the Importance of Student Portfolios

Value Label	Value	Frequency	Percent
Most Important	1, 2, 3	43	39.8
Important	4, 5, 6	30	27.8
Least Important	7 and up	19	17.6
No Answer		<u>16</u>	<u>14.8</u>
n = 108	Total	108	100

When the respondents ranked an assessment practice with a 1, 2, or 3 it was considered very important for this study. Respondents' ranking of assessment practices from "most important" to "least important" was identical to the results of the indication of which assessment practices are used most. Standardized achievement tests were not included in the ranking question on the questionnaire. The following assessment practices were considered most important:

- Anecdotal records;
- Informal conferences with students;
- Observation of students;
- One-to-one interview with students;
- Checklists of lessons; and,
- Demonstration of skill mastery.

Tables Related to Montessori Teachers Ranking of Importance of Traditional Assessment Practices

Table 23

Respondents' Ranking of the Importance of Checklists

Value Label	Value	Frequency	Percent
Most Important	1, 2, 3	65	60.2
Important	4, 5, 6	23	21.3
Least Important	7 and up	14	13.0
No Answer		6	05.5
n = 108	Total	108	100

Table 24Respondents' Ranking of the Importance of Skill Mastery

Value Label	Value	Frequency		Percent
Most Important	1, 2, 3	83		76.9
Important	4, 5, 6	15		13.9
Least Important	7 and up	4	3.7	
No Answer		6		5.5
n = 108	Total	108		100

Table 25Respondents' Ranking of the Importance of Teacher Made Tests

Value Label	Value	Frequency		Percent
Most Important	1, 2, 3	27		25.0
Important	4, 5, 6	31		28.7
Least Important	7 and up	27	25.0	
No Answer		23		21.3
n = 108	Total	108		100

Table 26Respondents' Ranking of the Importance of Texts and Workbooks

Value Label	Value	Frequency		Percent
Most Important	1, 2, 3	18		16.7
Important	4, 5, 6	33		30.5
Least Important	7 and up	35	32.4	
No Answer		22		20.4
n = 108	Total	108		100

Table 27Respondent's Ranking of the Importance of Written Skills Tests

Value Label	Value	Frequency		Percent
Most Important	1, 2, 3	21		19.4
Important	4, 5, 6	28		25.9
Least Important	7 and up	38	35.2	
No Answer		21		19.4
n = 108	Total	108		100

Montessori teachers in this sample used more alternative assessment practices than traditional assessment practices. The assessment practices ranked most important (a 1, 2, or 3 on the questionnaire) by 50% or more of the respondents were: observation (90.7%); skill mastery (76.9%); informal conferences with students (64.8%); checklists (60.2%); anecdotal records (56.5%); and, one to one interviews (50.9%). Observation, informal conferences with students, anecdotal records and one to one interviews were alternative assessment practices and skill mastery and checklists were traditional assessment practices.

Student portfolios and student journals are considered to be an alternative assessment practice and were found to be used by the respondents 44.5% and 48.2%, respectively, “all of the time” or “a lot”. These two alternative practices are becoming more popular with Montessori teachers and one they indicated they would like to know more about (see Table 43).

The assessment practices used least by the respondents were:

- Teacher made tests, 41.6% used little or never;
- Texts and workbooks, 53.7% used little or never; and,
- Written skills tests, 51.8% used little or never.

In addition to the 12 assessment practices listed on questionnaire Question 16, respondents wrote in other practices they used that were successful. One written-in response was a “Student Self-Evaluation questionnaire”. A follow-up telephone call to the school which used these documents indicated that their contents and use will be published in a future edition of Montessori Life. Another respondent indicated that an assessment tool titled, “Goal Setting”, was used by students. A follow-up telephone call resulted in a copy of the document to the author for reference. Both of these documents, developed by

administrators and teachers in Montessori schools, contributed to the self-evaluation component important for student reflection and goal setting.

Montessori Teacher Certification and Assessment Practices

Research Question 2 asks what is the relationship between the Montessori certification teachers have and the assessment practices they use? Montessori is an international method of teaching. It had its roots in Europe, but Maria Montessori carried the method to other parts of the globe including the United States and India. Because the Montessori method is so global and widespread, there are many centers of Montessori teacher training. The two predominate Montessori training programs are offered by the Association Montessori Internationale (AMI), based in Italy and the American Montessori Society (AMS), with a national headquarters in New York City. Other teacher training programs include: St. Nicholas, a correspondence course offered from a London, England base; and, the National Center for Montessori Education (NCME) based in Georgia, USA.

To find out if there is a relationship between the Montessori certification teachers have and the assessment practices they used, respondents were asked to indicate their certification on Question 10 on the questionnaire. Statistical analysis of frequency and percentages of the respondents' certification was calculated (Table 28). A total of 84 out of 108, or 78% of the respondents were AMS certified. Nine or 8.3% of the respondents were AMI certified, 2 or 1.8% were St. Nicholas and 1 or 0.9% was NCME certified.

Table 28
Respondents' Montessori Teacher Certification

Certification	Frequency	Percent
AMS	84	78.0%
AMI	9	8.3%
Other	5	4.6%
St. Nicholas	2	1.8%
AMI/ AMS	2	1.8%
AMI/St. Nicholas	1	0.9%
AMS/St. Nicholas	1	0.9%
NCME	1	0.9%
No Answer	3	2.8%
n = 108	Total	108
		100%

A statistical analysis test for correlation between teacher certification and assessment practices was not conducted considering the small sample size of all other Montessori teacher certifications represented other than those of AMS. The respondents in this study were teaching in a member school of AMS. This study did not survey all possible Montessori teachers in the United States, therefore a larger sample of other certified teachers was not represented. The question still remains as to whether the type of Montessori certification a teacher holds has an effect on the assessment practices teachers use. It was interesting to note that four of the respondents had more than one Montessori certification. Each level of certification corresponds to the three levels in each of the multi-aged teaching groups. Some teachers apparently chose to do their level training under different training methods.

The Relationship Between Respondents' Demographics and Assessment Practices

Several of the questionnaire Questions asked general information about the Montessori elementary teachers responding to the study. The data from respondents' demographics was compared to the assessment practices the respondents used for student evaluation.

Years of Teaching Experience and Assessment Practices

Research Question 3 asks: what is the relationship between the number of years Montessori teachers have been teaching and the assessment practices they use? Information was obtained through the answers respondents gave on questionnaire Question 9, pertaining to the number of years respondents have been teaching and Question 16 where respondents indicated the amount they used each of the assessment practices listed in the question.

In Table 1, years of teaching experience was reported for the respondents. The range in the years of experience for the respondents was 37 with the minimum of 1 year and the maximum years of 38. Statistical analysis of correlation coefficients were calculated between the years of experience, student:teacher ratio, and the values respondents gave to assessment practices they used in the classroom (see Table 29).

Table 29**The Correlation Coefficients Among Variables in Assessment Study**

Assessment Practices	Years of Experience	Student:Teacher Ratio
Anecdotal Records	+.09	+.19
Audio Visual Recordings	+.03	+.16
Checklists of Lessons	+.08	+.04
Informal Conferences	+.09	+.10
Observations of Students	+.06	+.06
One-to-one Interviews	+.29	+.13
Demonstration Skill Mastery	+.07	-.03
Student Journal Writing	+ .01	+.01
Student Portfolios	-.03	+.13
Teacher Made Tests	+.12	+.07
Texts and Workbooks	+.16	+.03
Written Skills Tests	+.18	+.10
n = 105		

Note: there were 105 respondents in this calculation because three respondents did not give the years of experience or the student: teacher ratio.

There were low correlations between the assessment practices and the years of experience. The years of experience and one-to-one interviews were slightly related ($r = +.29$, $p = .002$).

Student:Teacher Ratio and Assessment Practices

Research Question 4 asks: what is the relationship between the number of students a teacher is responsible for and the assessment practices used?

Information from questionnaire Question 8 (which asked for the student:teacher ratio in the respondents' classrooms) and Question 16 (on which teachers record

how much they used assessment practices in a list) were used to obtain data to answer this question.

Student:teacher ratio refers to the number of students each teacher in the classroom was responsible for. The data that was recorded was the student number of the ratio, only. In Table 1, the student:teacher ratio was reported for the respondents. The range of students was 26 with a low of 4 and a high of 30. Both the high and low values of this range are outliers. The mode and the median are good statistics to view for the central tendency of this value.

Correlation coefficients were calculated between the number of students a teacher is responsible for and the values respondents gave to assessment practices they used in the classroom, see Table 29 for the results. There were low correlations between the students per teacher and the assessment practices. The student:teacher ratio had no significant relationship to any of the assessment practices respondents used.

Age Range of Students and Assessment Practices Used

The age range of students in the respondents' classrooms was indicated on Table 2 in Chapter 2 (page 33). The age ranges were 5 - 6, 6 - 9, 9 -12 and 6 - 12 years. The information reported by respondents on question 16 on the questionnaire was analyzed statistically in reference to the age range groups. The median was chosen as the statistic to examine the relationship between age range and assessment practices used by the respondents.

Five assessment practices were used consistently with all four age range groups all of the time or most of the time:

- Anecdotal Records;
- Checklists;
- Informal Conferences;
- Observations; and,

- Skill Mastery.

Audio and visual recordings of students' work was consistently used a little or none of the time across all of the age range groups. One to one interviews were used less with the 5 - 6 age range group and more with the other age range groups. An interesting result was that student journals and student portfolios were used little and never (respectively) with the 6 - 12 age range group, and used some to most of the time with the other three age range groups. Teacher made tests, and texts and workbooks were used some and a little by respondents. Written skills tests were used some and a little by respondents except the 6 - 12 age range group that indicated they never used this assessment practice. The overall consistency of the assessment practices used indicate that the age range of the classroom did not have a relationship to the assessment practices used. The only exception is the group of four respondents who taught an age range of 6 - 12 year old students in the same classroom. This group used student journals, student portfolios and written skills tests less than the other respondents with other age ranges in their classrooms.

The Type of School and Assessment Practices

Research Question 5 asks: what is the relationship between the type of school (charter, private, public, religious) and the assessment practices used? Data from questionnaire Question 3 on which respondents recorded the type of school they are teaching in, and Question 16 where respondents recorded the types and amount of assessment practices they used, was examined to answer this question.

The Montessori method in the United States began in private schools in the 1960s. Beginning in the 1980s the Montessori method was considered a good alternative for public optional or magnet schools to use. The 1990s saw an

increase in the number of charter schools in the United States as a public school alternative. Many charter schools based their educational philosophy on Montessori. There were other types of schools, including religious, that incorporate the Montessori method in their curriculums. A statistical analysis of the frequency and percentages of the types of Montessori schools represented in this sample were recorded in Table 30.

Table 30

Types of Schools Represented in the Sample

Types of Schools		Frequency	Percent
Private		98	91.0%
Public		5	4.6%
Charter		3	2.8%
Religious		2	1.8%
n = 108	Total	108	100

The majority of the schools where the respondents were teaching were private. The total of private schools in the sample was 98 or 91% of the total. Five public schools were represented in the sample, or 4.63% of the total. Three charter schools, or 2.8% and two religious or 1.85% of the total were in the sample. A correlation was not calculated between the type of school and the assessment practices respondents used considering the small sample size of types of Montessori schools, other than private.

Schools' Accreditation and Assessment Practices

Research Question 6 asks: what is the relationship between a school's accreditation status and the assessment practices used? Data for this correlation was obtained from the responses on questionnaire Question 4 where respondents indicated their school's accreditation, and Question 16 which gave the respondents use of assessment practices and frequency of each.

Accreditation of schools usually require a written self-study, strategic planning, and peer review. This stage in the life of any school is dynamic and indicates a level of financial and developmental maturity on behalf of the school. The American Montessori Society, independent school associations and regional accrediting agencies accredit Montessori schools. In addition, the Independent Schools of the Central States (ISACS) and the Pennsylvania Association of Independent Schools (PAIS) were listed by two respondents. One respondent reported having been accredited with the North Central Association of Colleges and Schools (NCACS).

Respondents were not always clear about their school's accreditation status. When the author cross referenced some respondents' responses as being AMS accredited to the published list of schools accredited with AMS (Bobb-Semple, 1998), for example, the answers were not consistent. To date, AMS lists 37 schools accredited with AMS. Some of the sample schools maybe affiliated with or auxiliary schools of AMS, but have not yet completed the accreditation process. This may be one area of the school's environmental press that teachers were not clear about. Table 31 gives the frequency and percentages of reported accreditation status of respondents' schools.

Table 31
Respondents' School Accreditation

Accrediting Agency		Frequency	Percent
AMS		84	78.0%
AMS/other		12	11.0%
ISACS		2	1.8%
AMS/AMI		1	0.9%
PAIS		1	0.9%
NCACS		1	0.9%
No Answer		7	6.5%
n = 108	Total	108	100

A correlation was not done to find the relationship between the accreditation of schools and the assessment practices used. More than 97 or 89.8% of the respondents reported that their schools were accredited by AMS or AMS and another accrediting agency. The sample size of the other accreditation agencies was not large enough to make a correlation.

Respondent's Use of Standardized Achievement Tests

Research Question 7 asks, what is the percentage of schools that use a standardized achievement test and what tests are most commonly used? Data from questionnaire Questions 13 through 15 asked: if the school administered a standardized achievement test; the name of the test; and, the grade levels of students that were tested.

Types of Standardized Achievement Tests Used

A statistical analysis of frequency distribution was used to determine the types and numbers of achievements tests used by Montessori teachers. The frequency of achievement tests used by schools can be found on Table 12. There was a total of 74 schools represented in this study. Sixty-nine or 93% of the schools' administered standardized achievement tests. Out of a sample size of 108 respondents, 100 or 93% used achievement tests at their schools. Eight or 7% of the respondents did not use achievement tests for student evaluation.

Table 32**Standardized Achievement Tests Used by Respondents**

Name of Test	Frequency	%
Iowa Test of Basic Skills	23	21.2
California Achievement Test	23	21.2
Stanford Achievement Test	22	20.4
Metropolitan Achievement Test	15	13.9
Educational Records Bureau	11	10.2
Comprehensive Test of Basic Skills	4	3.7
Terra Nova	3	2.8
McGraw-Hill	1	0.9
Other, state tests	2	1.8
Did not give the test's name	5	4.6
None	8	7.4
n = 117	Total	117
		100

The most frequently administered achievement tests were: the Iowa Test of Basic Skills (ITBS), 21.2%; the California Achievement Test (CAT), 21.2%; the Stanford Achievement Test (SAT), 20.4%; and, the Metropolitan Achievement Test (MAT), 13.9%. The sample size for this frequency study was larger because some respondents' administer more than one test. Each test is listed followed by the number of respondents using the test: CAT and the Educational Records Bureau (ERB) (2); ITBS and SAT (2); SAT and MAT (2); CAT and MAT (1); ERB and SAT (1); and, CAT and the local state test (1).

Standardized Achievement Tests Used by Regions in the United States

In addition to determining the achievement tests used by respondents and the name of the test, the author was interested in any patterns of test used by educational regions of the United States. In order to determine if respondents in the same region administered the same achievement tests, percentages were calculated for each accreditation region of the United States (Table 33).

The most frequently used tests by the Middle States Association of Schools and Colleges (M) region which includes: Maryland, New Jersey, New York and

Pennsylvania were SAT (33%) and MAT (33%). The most frequently used tests by the New England Association of Schools and Colleges (NE) region which includes: Connecticut, Massachusetts, were ERB (60%) and CAT (40%). The most frequently used tests by the North Central Association (NC) which includes: Arkansas, Arizona, Colorado, Illinois, Indiana, Michigan, Missouri, Nebraska, New Mexico, and Ohio were MAT (29.4%) and CAT (23.5%). The most frequently used tests by the Southern Association of Colleges and Schools (S) region includes: Alabama, Florida, Georgia, Louisiana, North Carolina, South Carolina, Tennessee, Texas, and Virginia, were ITBS (39%) and SAT (33%). The most frequently used tests by the Northwest Association of Schools and Colleges (NW) region includes: Montana, and Washington were CAT (66%) and CTBS (33%). The most frequently used tests by the Western Association of Schools and Colleges (W) region includes: California were CAT (37%) and ITBS (25%).

Table 33

Standardized Achievement Test Used by Accreditation Regions

Test Name	M	NC	NE	NW	S	W
	%	%	%	%	%	%
ITBS	13.0	14.7	0	0	39	25
CAT	6.6	23.5	40	66	18	37
SAT	33.0	11.7	0	0	33	12
MAT	33.0	29.4	0	0	0	0
ERB	0.0	11.7	60	0	0	12
CTBS	13.0	0.0	0	33	0	12
TN	0.0	0.0	0	0	9	0
MG-H	0.0	2.9	0	0	0	0
Other	0.0	5.8	0	0	0	0
n = 103	15	34	10	3	33	8

Standardized Achievement Tests and the Age They are First Given

Question 15 on the questionnaire asked respondents to record the years the achievement tests were given at their schools. For the purposes of this study, it was noted at which grade the achievement testing began at the respondents' schools (Table 34).

Table 34
Respondents Began Giving Achievement Tests by Grade

Grade	Frequency	Percent
K	13	14
1	33	36
2	16	17
3	19	21
4	11	12
n = 98	Total 98	100

Respondents began administering achievement tests as early as Kindergarten (14%) and in first grade (36%). Administration of achievement tests in third grade was common as well with 21% of the respondents reporting this situation.

Respondents' Progress Reporting to Parents

Research Question 8 asks how many scheduled conferences teachers have with parents of students each year. Research Question 9 asked whether or not students were included in these parent/teacher conferences. These research questions corresponded to questionnaire Questions 23 and 24.

Respondents' Parent and Teacher Conferences

Respondents indicated the number of parent/teacher conferences they held last year regarding normal students' progress reporting and if students are included in the conferences (Table 35).

Table 35
Respondents' Conferencing Information

Number of Conferences	Frequency	Percentage
1	13	12
2	66	61
3	23	21
4	4	4
No Answer	2	2
n = 108	Total	108
		100

Addition of Students with Parents During Conference

Value	Frequency	Percentage
Yes	31	29
No	60	56
Some	14	13
No Answer	3	3
n = 108	Total	108
		100

The majority, 66 (61%), respondents participated in two conferences last year with parents to discuss student progress. A greater number of respondents reported having had more than 2 conferences per year, 25% combined, rather than only one conference per year, 12%. Sixty of the respondents (56% of the total) did not include students in their conferences. Although the respondents reporting yes or some total 45% of the sample, the trend was not to include students in parent and teacher conferences.

Respondents' Reporting of Students' Progress to Parents

On questionnaire Question 25, respondents were asked to indicate how they reported student progress to parents. Some reporting instruments were listed on the questionnaire: anecdotal written report, audio/visual recordings of student presentations, graded report cards, non-graded report card, student portfolio, and spaces for respondents to write in other instruments or practices (Table 36). Table 37 indicated the combinations and singular use of reporting practices respondents used and the frequency and percentages of these.

Table 36**Respondents' Reporting of Students' Progress by Type**

Use of Reporting Practices	Frequency	Percentage
Non-Graded Report Cards	91	84.3
Anecdotal Written Reports by Teachers	71	65.7
Portfolios	67	62.0
Audio Visual Recordings of Student Presentations	16	14.8
Graded Report Cards	6	5.5
n = 251	Total	251
		100

Non-graded report cards (91%) and anecdotal written reports by teachers (71%) were used by most respondents to report student progress to parents. Most of the respondents indicated they use more than one practice for reporting student progress (various combinations total 84.3%). The combination of reporting practices used most frequently was anecdotal written reports by teachers, together with non-graded report cards and portfolios (29.6%).

Table 37**Respondents' Reporting of Students' Progress by Combinations**

Reporting Practice Combinations	Frequency	Percentage
Anecdotal / Non-graded reports / Portfolios	32	29.6
Non-graded reports / Portfolios	19	17.6
Anecdotal / Non-graded reports	15	13.9
Non-graded only	11	10.2
Anecdotal / Audio-visual / Non-graded / Portfolios	7	6.5
Anecdotal / Portfolios	5	4.6
Anecdotal / Non-graded / Audio-visual	4	3.7
Anecdotal only	3	2.8
Anecdotal / Graded Reports	2	1.9
Audio-visual / Non-graded / Portfolio	2	1.9
Anecdotal / Audio-visual	1	0.9
Graded Reports / Portfolio	1	0.9
Student Questionnaires only	1	0.9
Anecdotal / Graded Reports / Portfolios	1	0.9
Anecdotal / Audio-visual / Graded / Non-Graded / Portfolios	1	0.9
Graded Reports / Non-Graded Reports	1	0.9
Conferences only	1	0.9
Portfolio only	1	0.9
n = 108	Total	108
		100

Parents' Satisfaction with Assessment Practices

Research Question 10 asks, what is the teachers' perceptions of the parents' satisfaction with the assessment practices used in the classroom? This corresponds to the questionnaire Question 26, that asks respondents if they feel their student's parents are satisfied with the assessment practices used in their classroom, and why or why not. Responses were calculated for frequency and percentage (Table 38).

Table 38
Respondents' Perception of Parent Satisfaction with Conferences

Value	Frequency	Percentage
Yes	93	86.0
No	6	5.6
Some	5	4.6
No Answer	4	3.7
n = 108	Total 108	100

Eighty-six percent of the respondents answered yes, and 5% reported no and 5% reported some. Most of the comments about parents who were satisfied listed reasons as: well informed; good communications; and thorough evaluations by teachers. Some reasons respondents felt their parents were not satisfied are listed below:

- . . . uneasy about the completeness and objectivity of our recorded assessments. This is critical in our Montessori education because we need credibility and validation in some objective manner.
- . . . our parents seem to question whether our tests cover Montessori curriculum.
- Our checklist is not self-explanatory.

- Many [parents] are from traditional school settings. . . they want to be assured that their child is getting everything he/she needs. Also, there is a trust factor among other professionals in the community;
- As with the children the parents interests and needs will vary so to meet the needs many different forms will have to be used. This has to have some guidelines so the workload doesn't become overwhelming;
- [Parents] want to know where their child stands in comparison to other children. They often expect grades/rankings which are not consistent with Montessori.

Teacher Self-Evaluations

Research Question 11 asks, what percentage of teachers participate in a yearly self-evaluation? Questionnaire Question 27 asked respondents to indicate their response. The American Montessori Society and other accrediting agencies require teachers to participate in a yearly self-evaluation. Respondents were asked to indicate whether or not they participated in yearly self evaluation. A total of 82, or 76% of respondents did participate in a yearly self-evaluation. Twenty-one or 19% indicated they did not participate in a yearly self-evaluation. One respondent (0.9%) indicated participation some years and 4 respondents, or (3.7%) did not give an answer to this question on the questionnaire.

Respondents' Most Successful Assessment Practices

Research Question 12 asks, what specific aspects of student assessment did Montessori elementary teachers consider to be the most successful in their

classrooms? This open-ended question was asked on Question 18 of the questionnaire. Responses were recorded and themes and categories were developed from them (Table 39).

Table 39

Aspects of Assessment Respondents Consider to be Most Successful

Item/Category	Frequency	Percentage
Teacher Directed	142	46.9
Observation	45	21.1
One-to-one interviews and conferences	41	19.2
Checklists of students' work	19	8.9
Anecdotal records	14	6.5
Record keeping	12	5.6
Teacher made tests and review sheets	8	3.7
Daily and weekly meetings with co-teachers	3	1.4
Student Directed	56	26.3
Portfolios and review of work samples	18	8.4
Demonstration of skill mastery	15	7.0
Journal writing	7	3.3
Self-evaluation, goal setting, and questionnaires	7	3.3
Daily interaction with teachers	4	1.9
Student folders in curriculum areas	2	0.9
Student presentations	2	0.9
Homework	1	0.4
Parent Involvement	7	3.9
Conferences with teachers	4	1.9
Including students in conferences	3	1.4
Miscellaneous	8	3.7
Testing and grades	7	3.3
Student:teacher ratio	1	0.4
n = 213		

Most of the responses had themes or activities that related to the constituents most involved in the educational process, teachers, students and parents. The three dominant categories were: successful assessment practices

that were teacher directed (66.7% of responses); successful assessment practices that were student directed (26.3% of responses); and, successful assessment practices that involved parents (3.3% of responses).

Respondents considered observation of students (21.1% of responses), one-to-one interviews and conferences with students, and checklists of students' work (8.9% of responses) to be the most successful assessment practices directed by teachers. Some respondents indicated they included mini-lessons, review of work plans and weekly meetings with one-to-one interviews and informal conferences with students. A few respondents' comments about these assessment practices are as follows:

- Observation and interacting with students using materials and creating portfolios. I can see and hear the student's reasoning. From this I can assess the level of understanding and determine whether the child needs to continue practice, more teaching and new lessons;
- Observing the student in action with a work, you can see the comfort and success;
- Observation of student work, student attitudes, student understanding and student abilities to express learning.

In the student directed category, portfolios (8.4%), demonstration of skill mastery (7.0%), student journals (3.3%), and student goal setting with self-reflection (3.3%) were considered to be most successful by the respondents.

Some specific responses were:

- The students' portfolios because it is an illustration of the work and the child's loves to add to it and compose;
- I am also pleased with student demonstration of skills mastery especially when it also involves some independent thinking;

- I have found daily journal writing to be very successful, a very visual tool [that gives] the ability to see progress and application of language art skills.
- Being able to teach peers and having the peers understand is another key to the students' mastery;
- The most successful aspect of my student assessment is the children's self-evaluation. They perform/interact during conferences. It enables the children to be more "in control" and aware of both their strengths and weaknesses.

In the parent involvement category, parent teacher conferences with and without students were considered the most successful. The miscellaneous category contained two themes, tests and grades and student:teacher ratio.

Assessment Practice Areas Respondents Feel Could be Improved

Research Question 13 asks, what specific aspects of student assessment do Montessori elementary teachers consider need improvement in their classrooms? Responses from open-ended Question 20 on the questionnaire correlated to this topic directly. Responses were examined for recurring regularities. These regularities represented patterns of themes and categories (Table 40).

Table 40Respondents' Suggestions or Improvements of Assessment Practices

Item/Category	Frequency	Percentage
Improvements Related to Specific Assessment Practices	53	38.0
Record keeping and progress reports	16	11.5
Anecdotal records	11	7.9
Tests	8	5.7
Student portfolios	6	4.3
Audio/visual recordings of students' projects	6	4.3
Increased opportunities for students' reflection	5	3.6
Development of a standardized Montessori assessment tool	1	0.7
Improvements Related to Time	41	29.4
Time for observation	21	15.1
Time for more one-to-one with students	13	9.3
Time to assess without interruptions	5	3.6
Time to meet with team teachers	2	1.4
Improvements in General	17	12.2
Standardize objectives	6	4.3
Improve consistency	5	3.6
Increase the number of teachers and professional development opportunities	3	2.2
More objective administration	1	0.7
Increase assessment practices	1	0.7
Use only one assessment practice	1	0.7
Improvements Related to Conferences	10	7.2
Improve parent/teacher conferences	7	5.0
Add students to conferences	3	2.2
No Improvements Needed	5	3.6
No Answer	12	8.6
Not Sure	1	0.7
n = 139		

The response themes were divided into four categories: improvements related to specific assessment practices (38%); improvements related to time (29.5%);

improvements in general (12.2%); and, improvements related to conferences (7.2%).

In the category related to specific assessment practices, the three most common responses were: record keeping and progress reports (11.5%); anecdotal records (7.9%); and tests (5.7%). Respondents mentioned specific improvements pertaining to record keeping:

- forms that require less time for record keeping;
- tracking via the computer;
- streamline assessment records, ie. entering data into database and later adding to progress reports;
- more organization to my written records;
- anecdotal records more complete and kept more up-to-date.

One respondent wrote about her need for improvement regarding tests, “need some actual tests, especially for 3rd graders . . . building test taking skills”.

Improvements in assessment practices related to the category of time were common.

Forty-one responses out of 139 total or 29.4%, were related to time. Respondents felt their assessment practices could be improved if they had more time: to observe students; to meet more one on one with students; to assess without interruptions; and more opportunities to meet with team teachers.

The category of general improvements included standardizing objectives. Some of the comments respondents made were:

- we need a much more comprehensive approach that gives reliable tests but I feel that we do not have really solid alternative[s] that effectively assesses the children in the ways we try to teacher, ie: whole child whole assessment;
- more specific set of criterion may also make it more “standardized” and interchangeable between teachers;

- I would like to align our Montessori curriculum with out of state objectives so that I'm sure I'm covering the necessary materials.

The themes in this general area have consistency, frequency and organization mentioned in them as areas that need improvement. Respondents also felt there was a need for more professional development for assessment practices.

The next category was improvements related to the conferences with parents.

There were ten responses in this category, or 7.2% of the total. Responses in the improvements related to conferences category included:

- increase parent observations and participation;
- would be interesting to see what a parent survey indicated they want;
- if all students attend parent conferences the parents could listen to my feedback given directly to their sons and daughters;
- If parents understood better how we tracked and evaluated students, their [students'] weekly work would improve.

Five of the respondents did not feel their assessment program needed improvements.

Twelve respondents did not answer the question.

Factors That Influence the Assessment Practices Respondents Use

Research Question 14 asks, what factors influence the assessment practices used by Montessori elementary teachers in their classrooms? This corresponds directly to Question 19 on the questionnaire (Appendix A). Respondents were asked to write in factors that influenced the assessment practices they used.

There were a total of 183 responses to the question from the 108 respondents.

The themes presented in the responses translated into six categories: factors related to students; to teachers; to accountability; to time; to specific assessment practices; and, to curriculum. The response categories can be examined in Table 41.

Table 41
Factors that Influence the Assessment Practices Respondents Used

Item/Category	Frequency	Percentage
Factors Related to Students	50	27.3
Self-paced, individualized program	15	8.2
Large student:teacher ratio	14	7.6
Multi-age range of students	8	4.4
Students' ability to demonstrate mastery	6	3.3
Students who have learning differences	4	2.2
Student-centered assessment	2	1.1
"Normalization" of the class	1	0.5
Factors Related to Teachers	32	17.5
Past experience and personal choice	8	4.4
Availability and scheduling	6	3.3
Teacher training and peer tutoring	5	2.7
Strength of other adults in the classroom	4	2.2
Comfort level with assessment tool	3	1.6
Teacher's observations and planning	2	1.1
Teacher responsibility and effort	2	1.1
Effective communication	1	0.5
"Follow the child" method	1	0.5
Factors Related to Accountability	32	17.5
To administration and school	12	6.6
To parents	10	5.5
To the state	5	2.7
To the school district	3	1.6
To AMI or AMS standards	1	0.5
To what other schools in the area are doing	1	0.5
Factors Related to Time	27	14.7
Factors Related to Specific Assessment Practices	24	13.1
Observation	9	4.9
Anecdotal records	4	2.2
Student self-evaluation and record keeping	2	1.1
Testing: recall and memorization	2	1.1
One-to-one interviews with students	2	1.1
Item/Category	Frequency	Percentage
Portfolio	1	0.5
Teacher checklist	1	0.5
Factors Related to Curriculum	9	4.9
Curriculum development	3	1.6
Sequencing	2	1.1
Integrated curriculum	1	0.5
Technology	1	0.5
Others	2	1.1
No Response	9	4.9
n = 183		

_ The factors relating to students were the most common, 50 total or 27.3% of all responses. Some of the responses relate directly to characteristics of the Montessori method and classroom, characteristics that make the Montessori method and classroom unique. For instance, respondents wrote:

- each child working at their own level;
- the student's learning style may also play a role as to whether I "test", allow peer teaching , or simply talk with them over a work.
- small number of students with a wide range of ability;
- the 6 - 9 program is open-ended and many children are on different levels;
- striving to make a match with the students' needs and materials while observing the emotional development of the child;
- student-centered assessment;
- normalization of the class and mobility of the students.

The second category or the factors related to teachers had 32 responses or 17.5% of the total. Many of the responses in this category were related to teachers' scheduling time for assessment and working well as a team with other adults in the environment. Respondents wrote about the daily dilemmas of the responsibility of planning time for assessment and the effort involved:

- The strength and support of the assistant in the room determines how much one-on-one time and uninterrupted observation time I'm able to take;
- having a consistent time each day for observation;
- I assess the way I learned many years ago and add new practices as I see them performed by other Montessori teachers;
- The purpose of assessment is to determine the effectiveness of my teaching and to determine what to teach next and to determine how best to assist students in their learning process;
- assessing the information to be obtained. . . is it Montessori?

Respondents indicated factors of accountability influenced the assessment practices they used to what other schools in the area are doing. As we have observed in this study many of the responses to the questions about assessment practices have time as a factor. The respondents listed time as a factor 27 times or 14.7 % of the total responses to the questionnaire Question 19.

Less important factors mentioned specific assessment practices such as observation, anecdotal records, student self-evaluation, testing and one-to-one interviews as having an influence over the assessment practices used.

Respondents' Issues and Concerns About Assessment Practices

Research Question 15 addressed what issues and concerns Montessori elementary teachers had about assessment practices. This information directly relates to Question 21 on the questionnaire (Appendix A). Respondents wrote responses to this open-ended question about issues and concerns regarding assessment practices they used.

There were a total of 153 responses from the 108 questionnaires. Themes were examined and categories developed. There were six categories for this topic: concerns related to standardized achievement tests; to teachers and guidelines; to students; to parents; to time; and, no concerns. Table 42 indicates the categories and themes.

Standardized achievement tests, as we have learned, were administered in 93% of the respondent's schools (see Table 12). The majority of the responses to questionnaire Question 21, (55 or 36% of the total) were related to standardized achievement tests. Respondents expressed concerns about: the accuracy of reporting assessment of the whole child; the logistics of test taking; the need for a Montessori standardized test; and, negative test taking experiences. More specifically, respondents wrote:

- Even the term smacks of forgetting the individual child, it is

scary on a locked in, inflexible, prepared form or process of testing;

- I do not particularly like standardized achievement tests but feel that we do not have a really solid alternative that effectively assesses the children in the ways we try to teach, ie: whole child, whole assessment.

I do not have time to create a really good system and no one else is able to do it either;

- I have great concern about the standardized tests, in that I feel they give a somewhat skewed idea of where a student truly is academically such factors as “test anxiety”, misunderstanding a question, or even worse, the instructions, and boredom can give a false impression of a student’s mastery of a subject (and our students seem to do well on these tests!);

- I have concerns regarding validity of standardized testing assessment within the Montessori environment. I also wonder how to maintain the integrity of the Montessori philosophy yet meet standards.

- students who do not do well may not be able to demonstrate what they really know;

- We have to do so many district assessments and unfortunately, more are coming, that we tend to focus on preparing for upcoming assessments rather than looking at the needs of the child and where he is developmentally;

- I’d like to see national academic standards, and a national, objective academic assessment.

The second category was related to teachers and guidelines. It had 33 responses (21.6%). Respondents expressed concerns about record keeping, testing and practices, keeping up with assessment and the need for professional development and training. More specific responses were as follows:

- not everyone keeps up with their notes and observations;
- sometimes filling out scores for motivation, neatness and order seems so arbitrary. There is no criterion or list of guidelines - it can just depend on the mood you are in;
- so much assessment in Montessori is subjective and indicative of that day and circumstances;
- I feel that I rely on instinct and student personality maybe a bit too much yet I don't want to get into the traditional school practice of just getting something correct or done for the test;
- Authentic assessment through the use of rubrics. . . must be recreated each year as a student's abilities will vary and cultural themes rotate.

Table 42Issues and Concerns Respondents Have About Assessment Practices

Item/Category	Frequency	Percentage
Concerns Related to Standardized Achievement Tests	55	36.0
Accuracy in assessment of the whole child	22	14.4
Logistics of test taking: when? how? which one?	12	7.8
Montessori test needed: valid, relevant, integrative	14	9.2
Negative test experiences	7	4.6
Concerns Related to Teachers and Guidelines	33	21.6
Record keeping, testing, and practices	17	11.1
Keeping up with assessment	14	9.2
Professional development and training	2	1.3
Concerns Related to Students	17	11.1
Follow the child rather than assessment dictates	5	3.3
Student accountability and completion of work	7	4.6
Pushing students before they are prepared	3	2.0
Other	2	1.3
Concerns Related to Parents	14	9.2
Parents' anxiety and attitude about assessment	7	4.6
Accountability	5	3.3
Communications: honest, not misleading	2	1.3
Concerns Related to Time	14	9.2
No Concerns	10	6.5
No Answer	10	6.5
n = 153		

The third category of issues related to students had 17 responses or 11.1% of the total. Respondents expressed concerns for: students rather than what assessment dictates; students' accountability and completion of work; and, pushing students before they are prepared. More specifically, respondents wrote:

- I am very concerned about accountability . . . I think students need due dates for closure while being able to go back to a work for free choice after some sort of follow-up activity has been performed;

- I am afraid that many directresses [teachers] become hung up on assessment practices and trying to pigeon hole students onto graphs and charts - and end up leading instead of following the child;
- Assessment itself. It can be dangerous - it may lead to over-emphasis on making the grade rather than allowing the child to lead. It can lead to distrusting the inner work of the child;
- Children should thoroughly master a concept before moving on. I worry that many are too rushed with mere “check offs” that the quality and beauty of work can easily be lost in the race to finish first;
- Montessori students often complete work without retention of information. The ideal of self-motivation to achieve mastery needs constant bolstering by adults.

Respondents indicated concerns they had relating to parents of students (14 responses, 9.2%). More specifically, respondents wrote:

- My concern is parents’ overly confident attitude, or too much anxiety to others that influences our students’ attitudes also;
- How do we interpret standardized tests results to parents of Montessori children?;
- The biggest one is accountability to parents -- I think that assessment is becoming way too politicized at present and Montessori parents are beginning to feel as though they can demand accountability in the same way as public school parents do. But this is against the spirit and purpose of Montessori education.

Again, time was a concern for respondents (14 responses, 9.2% of total).

Basic concerns were: to have more time to assess students; assessment is time

consuming; and assessment takes time away from curriculum lessons. One respondent wrote:

- Effective assessment and constructive feedback and follow-up are so time consuming that I never feel like I have enough time to give to other important priorities like consistent curriculum presentation schedules.

Ten respondents did not have any concerns about their assessment practices (6.5%) and ten respondents did not give an answer to the question on the questionnaire (6.5%).

Professional Development Related to Assessment Practices

Montessori teachers gain knowledge and experience through training related to certification and by participation in professional development opportunities. Professional development hours are required by some schools and states for teachers to continue teaching. If respondents spent a lot of time in professional development related to assessment practices, it could have influenced what practices they used in their classrooms. Question 12, on the questionnaire, asked how many hours respondents spent during the 1997-98 school year in professional development related to assessment practices. The range in hours was 0 to 400. The mean was 16.79, the standard deviation was 48.18, the mode was 0 and the median was 3.5. Professional development had an outlier of 400 hours. It may be that the respondent misunderstood the question and reported more hours than was spent actually related to assessment practices. Therefore, the mode (0) or median (3.5) would be a more appropriate item to examine for the central tendency rather than the mean for hours respondents spent in professional development related to assessment practices.

Professional Development Respondents are Interested In

Research Question 16 asks what assessment practices teachers would like to know more about and to indicate which ones they would like to attend professional development training, inservice, conferences or workshop about. The data for this question was obtained from the responses o questionnaire Question 22.

There were a total of 139 responses as indicated on Table 43. The responses were related to three categories: specific assessment practices; assessment practices in general; and, reporting of student assessment.

In the specific assessment practices, there were a total of 67 responses, 16 (11.5%) of which pertain to testing, standards, a Montessori test, or, the value of testing. Sixteen (11.5%) of the responses were related to wanting to learn more about student portfolios. Student self-assessment and audio visual recordings of students' work each had 6 responses (4.3%). Student journals and assessment of students with special needs each had 4 responses (2.9%). Some specific responses were:

- I would like more information on how other teachers really do observation
- Meeting special needs and assessing progress of special needs children;
- Reading assessment is the big one - how to diagnose reading disorders. . . I find the whole area of reading/learning disabilities very confusing;
- I would like to see a standardized test akin to the Iowa test (ITBS) developed that specifically relates to the cultural lessons given in most Montessori elementary classrooms;
- I would like to attend inservice or workshops to learn more

how to use student journaling and portfolios for student assessment

My students are reluctant to write about their own learning;

- Involving students in their own assessment;
- Would like to know about or see technology used to benefit assessment practices.

Table 43

Professional Development Workshops Respondents are Interested In

Item/Category	Frequency	Percentage
Specific Assessment Practices	67	48.2
Tests: standardized, Montessori, value of	16	11.5
Student portfolios	16	11.5
Student self-assessment	6	4.3
Audio/visual recordings of students' work	6	4.3
Student journals	4	2.9
Assessment of special needs students	4	2.9
Observation of students and other teachers	3	2.2
Reading and writing assessment	3	2.2
Conferences with students	3	2.2
Anecdotal record keeping	2	1.4
Technology and assessment	2	1.4
Item/Category	Frequency	Percentage
Other	2	1.4
Assessment Practices in General	27	19.4
Reporting of Teachers' Assessment of Students	13	9.4
Progress reports	6	4.3
Parent/teacher conference techniques	4	2.9
Transitions from Montessori to traditional	2	1.4
Montessori newsletter on current issues	1	0.7
None	7	5.0
No Answer	25	18.0
n = 139		

Twenty-seven of the responses (19.4%) were in the category for respondents who wanted to know more about assessment practices in general.

More specifically, respondents wrote:

- I would love to have a sharing session about this;
- ways other people assess students;
- I am interested in becoming better in this area. It has always been an area of constant change and concern over the years;
- Rubrics. Yes if it has a lot of meat to the workshop - and assessment that has had success, not a get together to share new ideas;
- I never had a good overview of what the possibilities are. I was taught the system that my school uses, and we've made some changes, but I don't really know what else is out there.

The third category related to reporting of student assessment.

Respondents wanted to know more about: progress reports; parent/teacher conference techniques; transitions from Montessori to traditional schools; and some would like to receive a newsletter pertaining to Montessori and current assessment issues. Specific responses were:

- I would love to have a sharing session about . . .the transition of our methods into other school settings, ie. public schools.

Seven respondents did not have a topic on assessment that they would like to learn more about. Twenty-five or 18% of the respondents did not answer this question on the questionnaire.

Summary of the Analysis

In summary, among the 16 Research Question topics addressed by the present study, the following questions were important for new interpretation and further study. These questions will be addressed in the next chapter and will guide the framework.

1. Are Montessori elementary teachers using more alternative (anecdotal records, audio/visual records of student work, informal conferences with students, observation, one-to-one interviews, student journals, and student portfolios) or traditional (checklists, skill mastery, standardized tests, teacher made tests, texts and workbooks, and written skills tests) assessment practices?
7. What is the percentage of schools that use a standardized achievement test and what tests are most commonly used?
8. How many scheduled conferences do teachers have with parents of students each year?
9. Are students included in these parent/teacher conferences?
11. What percentage of teachers participate in a yearly self-evaluation?
12. What specific aspects of student assessment do Montessori elementary teachers consider to be the most successful in their classrooms?
13. What specific aspects of student assessment do Montessori elementary teachers consider need improvement in their classrooms?
- _____ 14. What factors influence the assessment practices used by Montessori elementary teachers in their classrooms?
- ___15. What issues and concerns do Montessori elementary teachers have about assessment practices?

16. What student assessment practices would teachers like to know more about and would they be interested in attending a professional _ development training, inservice, conference, or workshop?

CHAPTER 4

DISCUSSION, IMPLICATIONS AND RECOMMENDATIONS

Discussion

Assessment is a topic of interest and significance to the American Montessori Society and teachers in Montessori schools. This study examined the assessment practices used by Montessori elementary teachers. Sixteen Research Questions about assessment practices were addressed in the analysis section of the study which resulted in topics from the perspective of the teachers. Input came from the comments teachers wrote on a questionnaire and from follow-up telephone calls.

For purposes of this summary, patterns from the results of the 16 Research Questions were sorted into 6 categories that defined trends found throughout the responses to the questionnaire questions. In addition, these categories provided a beginning for additional research topics regarding assessment practices. The 6 categories are as follows:

1. Factors that influence the assessment practices used by Montessori teachers;
2. Montessori teachers and assessment practices used;
3. Montessori teachers' use of standardized achievement tests;
4. Respondents' reporting of assessment practices to parents;
5. Respondents' issues and concerns about assessment practices; and,
6. Professional development related to assessment practices.

Factors That Influence the Assessment Practices Used by Montessori Teachers

One main focus of this study was to determine what factors influence the assessment practices used by Montessori teachers of elementary students.

Respondents' demographic statistics including years of teaching experience and the student:teachers ratios in the classrooms did not have a relationship to the assessment practices used. This study was not able to determine a relationship between the variables of the respondents' certification, school accreditation and the type of school and the assessment practices used.

Respondents indicated that the students in the classroom were the largest contributors to the types of assessment practices used. More importantly, the assessment practices were determined in a large part by the Montessori method of teaching the students in the classroom. Most of the themes relating to students were a direct result of the unique components of the Montessori method of teaching.

The Montessori method utilizes a self-paced, individualized program with multi-aged students in one classroom. The make up of the class, various levels of student ability, and strengths and weaknesses of the students influenced the amount of time spent on each assessment practice the teacher chose to use. The availability of enough qualified, Montessori-experienced teachers in the classroom influenced the assessment practices used. The third major influence on the assessment practices used was related to respondents' accountability to the administration, school and parents.

The dictates of the Montessori method were the key to what choices Montessori teachers made regarding assessment practices. The logistics of the Montessori classroom determined the students' needs, teachers' availability, time to initiate and complete assessment practices and the accountability to the school

and parents. The factors contributing most to what assessment practices respondents made were related to those which matched the Montessori method.

Montessori Teachers and Assessment Practices Used

The Montessori teachers represented in this study used a combination of alternative and traditional assessment practices, although more alternative practices were used. As previously reported, most of the practices used required a lot of time and input on the teachers' part. Teachers spent most of their assessment time involved with observation of students' work. Teachers wrote anecdotal notes about each student to record daily or weekly progress. Teachers spent a lot of time meeting and talking with students individually during informal conferences and one-to-one interviews. These assessment practices seemed to work well within the Montessori method and philosophy of teaching.

Montessori teachers used checklists to record lessons that had been given to students including lessons (with or without the use of materials). This record keeping system appeared to be a successful use of a traditional practice, and one that would be difficult to do without. Because students worked on an individualized educational plan, teachers needed a system to keep up with all of the lessons given and those yet to be presented to students.

The majority of Montessori teachers represented in this study also administered standardized achievement tests as part of their student assessment practices. Ninety-three percent of the teachers used these tests that are considered an extremely traditional measure of student achievement and progress.

Respondents' Most Successful Assessment Practices

Observation was by far the assessment practice Montessori teachers commented about most frequently. Certified Montessori teachers spend many hours during the required classroom management portion of their training on learning how to observe students and record their observations. Montessori teachers not only observe students working to determine mastery levels before giving new lessons, but they observe students' reasoning abilities, time management skills, and attitudes.

Individual discussions between teachers and students were also listed as a very successful assessment practice by the respondents in this study. Typically, Montessori collaborative classrooms offer more opportunities for one-to-one lessons for students. There are very few times during the day that Montessori students are all engaged in the same activity which would require the teachers to be totally involved in directed teaching to the whole class. Most lessons are given in small groups and/or individually so teachers have opportunities to delve into a student's level of understanding about a curriculum unit and to advance students' higher level thinking skills.

Checklists, anecdotal records, and teacher's record keeping systems were reported to be very successful assessment practices by the respondents in this study. One respondent indicated using a successful classroom record keeping system that is made commercially by a company called, Montessori Made Manageable (1997).

Student portfolios were also reported as having been successful. Respondents reported that the use of portfolios gave students opportunities to be creative, while getting a first hand view of their own progress over time. Typically, Montessori teachers give students instruction on how to evaluate their own work, and teachers allow students to have time to self-reflect on the work in

their portfolios. Self-evaluation is an important component to increase student understanding and motivation. These student characteristics are considered important learner outcomes of a Montessori program (Rambusch & Stoops, 1992).

Assessment Practices Respondents' Consider Needing Improvement

While record keeping, both checklist and anecdotal, were listed as being very successful for some Montessori teachers in this study, they were also among the top assessment practices that teachers considered as needing improvements. Respondents felt some record keeping systems were cumbersome and difficult to manage for a full classroom. Some respondents expressed that they would like to see a clear, concise, abbreviated form developed for teachers to use. Some respondents mentioned their desire for a computer system to record student progress and keep track of daily comments and plans.

Throughout the entire study, respondents mentioned time as being a principal factor that contributed to every aspect of assessment. Teachers indicated that they did not have enough time: to do observations; to work individually with students; to assess without interruptions; and, to meet with team teachers.

Time related issues are an administrative concern as well. Scheduling breaks for faculty and observation time is very difficult in a Montessori environment because of the nature of the various activities students are involved in at any one time during the day. Even the most organized Montessori teachers have difficulty finding the time to fit in all that they plan to accomplish during the day. "Following the child" is a Montessori phrase used to describe the flow of teacher and student interactions directed by the student's needs and interests during the course of learning. When teachers follow the child, the best intended plans may be postponed as teachers accommodate the needs, abilities, and

interests of individual children. Time to observe the results and assess understanding does not always exist in the course of each day.

Montessori teachers in this study also indicated the need for improvements to the standardization of objectives and expectations within the Montessori community. Respondents mentioned consistency as being an issue between classrooms in the same school, between Montessori schools, and at the national level. Montessori schools may be accredited under the umbrella of a national organization such as the American Montessori Society, but, at the same time, Montessori standards and policy pertaining to specific assessment practices do not exist. As the constituents in this study exhibited, assessment is certainly an area of interest and potential development for the American Montessori Society and other Montessori accrediting agencies.

Montessori Teachers' Use of Standardized Achievement Tests

The extent of the use of standardized achievement tests by Montessori teachers was an interesting revelation. Most standardized achievement tests relied on students' lower order thinking skills like memorization and recall, to answer multiple choice questions. The Montessori teachers in this study did not use numerous texts and workbooks which have a similar format to that of achievement tests. Most Montessori lessons and materials required higher level thinking skills like exploration, evaluation, and analysis. Standardized achievement tests served some purpose for the respondents, but this study did not ascertain what that purpose was.

Respondents' Reporting of Assessment Practices to Parents

Student assessment and progress are universally reported in schools by teachers in written or verbal form to parents. As indicated in this study, Montessori schools and teachers followed this widespread practice. Most of the respondents indicated that they held two or more parent teacher conferences per year. Many Montessori teachers have included students in these conferences. A major difference between traditional schools and Montessori schools was the written report cards. This study indicated Montessori teachers used non-graded report cards as opposed to graded report cards to illustrate student assessment and progress for all grade levels, K - 6.

Anecdotal records written by teachers was another major instrument of assessment that Montessori teachers shared with parents during conferences. These individualized reports gave parents confirmation of teachers' personal knowledge and concern for their child.

Student portfolios were also used by a large number of respondents to report student assessment and progress. The combination of these three tools: non-graded report cards, anecdotal records, and portfolios was reported as being the most beneficial methods of reporting to parents.

Respondents indicated that parents were generally pleased with the assessment practices used. However, to get objective input on this important component of successful assessment practices, a future study of parents and assessment practices should be done.

Respondents' Issues and Concerns About Assessment Practices

Standardized achievement tests was one assessment practice used by an overwhelming majority (93%) of the respondents' schools. It also had the most issues and concerns related to it. As previously mentioned, this study asked limited questions about standardized achievement tests and this topic requires further research.

The respondents indicated uncertainty about standardized achievement tests' accuracy in assessing the "whole child" that the Montessori method teaches to. Logistics surrounding standardized achievement tests were a concern to Montessori teachers in this study. Respondents indicated that making a choice about which standardized achievement test they administered was met with skepticism. Not one of the different standardized achievement tests was used by a majority of Montessori teachers. Some respondents indicated the need for a Montessori-based standardized achievement test, another excellent avenue for future study.

Another frequent area of concern for respondents was the logistics of record keeping and keeping up with assessment in general. Finding time to fit in all of the components of a successful assessment system was a recurring theme throughout this study. Typically, record keeping and assessment take tremendous amounts of time to accomplish and need to be considered as part of a teacher's day. This topic may be of interest to administrators of Montessori schools as they plan schedules and delineate expectations to teachers.

Professional Development Related to Assessment Practices

The results of this study indicated that most Montessori teachers spent less than 5 hours of professional development time in an inservice, workshop, or training related to the use of assessment practices during the last year. To the author's knowledge, there have not been any regional or national Montessori conferences related specifically to assessment practices. Over the past two years, Montessori conferences have had short workshops about components of assessment but not the thorough coverage that is needed according to the respondents of this study.

Respondents indicated that most of the assessment practices they used were related to their Montessori training program, what was shared with them by another teacher, or what was used at the school where they teach. An increase in professional development training related to assessment practices was a desire mentioned in this study by respondents.

Respondents indicated within the majority of themes they would attend professional development related to particular assessment practices. Respondents were clear about wanting information about successful practices that Montessori teachers were actually involved in to demonstrate effectiveness for assessment. The professional development choices made by respondents ranged from useful observation techniques to more contemporary audio visual recordings of students work. One respondent wrote:

Some of the listed items on page one [of the survey] were great.
There were some of which I hadn't thought of yet. Sometimes
a spark in another direction can get you thinking in that mode.

Only 7 of the 108 respondents did not have an assessment practice they wanted to learn more about. Professional development concerning assessment practices is certainly another area for future planning and study at the both individual schools and at the national level within the American Montessori Society.

Implications

This study provided implications related to the various groups of constituents associated with Montessori education: administrators, teachers, students, parents, and non-Montessori educators. Therefore, the implications are presented by group.

Implications for Administrators

Standardized achievement tests, the most widely used assessment tool in this study, requires further analysis. Possibly the use of standardized achievement tests began as an administrative tool that measured a students' yearly growth, or as an initiative to determine how Montessori students ranked nationally, and continued to be used as an accountability measure for schools that pursued accreditation. It was not clear from this study how standardized achievement tests were used. Montessori teachers are definitely concerned about the use of these tests within a Montessori school. Several questions remain unanswered concerning standardized achievement tests. What dictated the standardized achievement test used by the schools? What was standardized achievement tests' data used for, or reported to? Why are they used so

extensively in Montessori schools when teachers reported that they did not test the actual learning taking place?

There was a general lack of knowledge by individual teachers about the accreditation status of the school where they were teaching. More information about accreditation, the process, and what it means for the school and teachers could be shared by administrators and all faculty of a school.

The variety of assessment practices used by Montessori elementary teachers as evidenced by this study is important for AMS to know. The results of this study could help AMS answer questions about accountability, support documentation of the effectiveness of Montessori education, and give proof that Montessori programs develop and assess the whole child. As a result of this study, more consistent practices may be encouraged by AMS and individual schools. This could be the beginning of AMS standardized objectives and guidelines for assessment practices.

Implications for Montessori Teachers

An analysis of the results of this study indicated that many Montessori teachers use the combination of ungraded report cards, anecdotal reports, and student portfolios successfully for reporting student progress to parents. Montessori teachers presently not using these tools may want to learn more about them. This combination of reporting tools may become a focus of AMS in its efforts to offer more guidance to administrators, teachers, and parents.

Professional development about assessment practices would be extremely helpful for Montessori teachers who have found their previous training inadequate. Accountability to both school and parents is a critical factor to the longevity of a student's continuance in a Montessori program. Parents want to

be assured that their child is accomplishing or exceeding educational expectations in a Montessori school. Montessori teachers need more practical training in this crucial area of continuing education.

Accreditation information is essential for teachers to obtain from their schools. To become more aware of the accreditation status of their school and what it means for them would strengthen their continued commitment to their workplace. Teachers would benefit from being more aware of what other Montessori teachers are doing in their classrooms. Montessori conferences and networking are excellent avenues for this type of sharing and feedback.

Implications for Students

The use of student portfolios, student journals and audio/visual presentations of students' work, all relatively new practices of student assessment, have been reported as being useful for Montessori teachers. However, more professional development is needed to continue this growth and increase the use of student self-evaluation which is a major component of all three practices.

As improvements are made in assessment practices it is apparent that students' contributions are getting more focus. Students now more than ever before have opportunities to voice their reflections and concerns over the education they are getting. As Arthur Costa (1989) wrote, "We must constantly remind ourselves that the ultimate purpose of evaluation is to enable students to evaluate themselves".

Implications for Parents

Accountability to parents was an influential factor in the assessment practices used by Montessori teachers. The demonstration of accurate evaluations of students' progress to parents was important to teachers. Parents are the clients in the business world of education. Feedback from parents was a contributing factor for Montessori teachers success with assessment practices. Informed parents were essential to the success of a Montessori program. Parents must know what works well and what practices assess well.

Implications for Non-Montessori Educators

As more schools and educational reformers examine alternative educational models, especially those that resemble Montessori methods, a closer look at successful assessment practices used by Montessori teachers could be helpful. Educators can learn from the successes of each other. For example, as more alternative assessment practices like student portfolios are used by educators, techniques that help students evaluate their work through self-reflection could benefit all teachers.

Recommendations

The large scale use of achievement tests by Montessori teachers unearthed more questions than were asked on the questionnaire. For instance: what was the goal of using standardized achievement tests in Montessori schools; how was the particular test chosen; what were the results used for; and, to what other groups of students were Montessori students compared? Montessori teacher and school use of standardized achievement tests is clearly a topic that requires further research.

All of the respondents reported holding parent teacher conferences to provide information about student achievement and progress. More information could have been obtained if respondents had been asked how they present their assessment materials to parents. And certainly, the question about parents' satisfaction with parent teacher conferences must be addressed to parents in a future study.

More information could have been asked about professional development training. Information about the professional development focus, whether it was personally chosen or school required, would have been interesting to know. A future study about professional development in the area of assessment would be helpful.

This study represented a sample of teachers from member schools of the American Montessori Society. Not all Montessori teachers in the United States were included. A future study which included Montessori teachers other than those affiliated with AMS would give a broader perspective.

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APPENDIX

Heads of Schools

Please copy these two double sided pages and distribute them to your elementary teachers. They can mail their returns to Kathy Roemer, directly. Your help with this research is greatly appreciated.

Michael N. Eanes, American Montessori Society

November 9, 1998

Dear Elementary Montessori Teacher,

You have been selected to be a part of a very important study on assessment practices. As part of a research project, Montessori teachers are being asked to fill out a survey about assessment practices they use to evaluate students in their classrooms. It is hoped the results of this study will reveal areas of common practice and areas where teachers would like more information.

Please complete the survey and mail it back in the enclosed envelope to Kathy Roemer by November 23, 1998

Thank you for your consideration and time.

Some information about the project researcher, Kathy Roemer:

- Doctoral student at the University of Memphis in Tennessee;
- Head of Lamplighter School, a thirty-one year old, accredited Montessori school with students three through twelve years of age, in Cordova, Tennessee;
- Member of the American Montessori Society's School Accreditation Commission;
- Author of the article, Outcome Based Education and Montessori Schools in Montessori Life, Fall, 1998;
- A Montessori educator who would like to help improve assessment practices at Lamplighter School and other Montessori schools.

If you have any questions, please do not hesitate to call, xxxxxxxxxx during the day and xxxxxxxxxx in the evenings.

Sincerely,

Kathy Roemer, MEd.

Definition of Terms

The terms used for this questionnaire are defined as follows:

Anecdotal Records: Dated, informal observational teacher notations that describe an individual student's development in terms of social, attitudinal, learning style, or anything else that seems significant at the time of observation.

Assessment: The process of data collection and the gathering of evidence about a student's achievement and progress.

Audio/visual recording of student work: Audio or visual recordings of student's work made by teachers or peers to be viewed for assessment purposes.

Checklist of lessons/materials: Written list of performance criteria that is used to record students' performance or evaluate a project. The teacher determines whether it meets the criterion. Checklists are diagnostic, reusable and capable of charting student progress.

Evaluation: Bringing meaning to the assessment data that has been collected through interpretation, analysis, and reflection and includes the kinds of instructional decisions made by careful examination of the evidence.

Informal conferences: An informal meeting between student and teacher in which the teacher follows the student's lead and the teachers does not have a predetermined agenda.

Observation of students: Teacher's concentrated attention on a student's work, behavior and activities for a period of time accompanied by note taking of what is observed.

One to one interview: Face to face conversations between teachers and students where teachers have a predetermined list of questions to assess a change in student attitude or what a student has learned about a subject.

Standardized achievement test: Either norm-referenced or criterion-referenced tests where performance of an individual or group is compared to the performance of other individuals or groups. These tests are usually in the form of multiple choice questions.

Student demonstration of skill mastery: Students are asked to perform specific behaviors for the teacher to assess.

Student journal writing: Students record their feelings, thoughts, happenings and language through writing in a non-threatening place.

Student portfolios: Student selection of a representative, ongoing, and changing collection of work samples. Students examine their work and add reflective information about them.

Teacher made tests: Open-ended questions determined by the teacher after a lesson has been completed to encourage a variety of thoughtful responses.

Texts and workbooks: Published books with subjects, themes and follow up tests based on grade-level skills and achievement goals for student use as part of the classroom curriculum.

Written skills tests: Published diagnostic tests that students complete for teacher use in student assessment.