



Examining a Public Montessori School's Response to the Pressures of High-Stakes Accountability

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Abstract. A public Montessori school is expected to demonstrate high student scores on standardized assessments to succeed in the current school accountability era. A problem for a public Montessori elementary school is how to make sense of the school's high-stakes assessment scores in terms of Montessori's unique educational approach. This case study examined the ways one public Montessori elementary school responded to its high-stakes test scores in the areas of curriculum, instruction, and assessment. The research revealed the ways the principal, teachers, and parents on the school council modified Montessori practices, curriculum, and assessment procedures based on test scores. A quality Montessori education is designed to offer children opportunities to develop both cognitive skills and affective behaviors such as student motivation that will serve them beyond their public school experiences. However, fundamental Montessori practices were modified as a result of the pressure to raise test scores. The impact of the high-stakes assessment era on alternative types of schools must be considered because it is contradictory to support the availability of educational alternatives while at the same time pressuring these schools to conform to strict and narrow measures of success.

The curriculum in many states is driven by standardized testing (Berliner & Nichols, 2007; Kifer, 2001; Guskey, 2005; Madaus & Russell, 2010/2011; Miller, Linn & Gronlund, 2013; Nichols & Berliner, 2007; Waugh & Gronlund, 2013). In and of itself, standardized testing is not bad; however, the educational measurement community has called into question the unintended consequences that develop from the stakes associated with standardized test scores (Berliner & Nichols, 2007; Kifer, 2001; Madaus & Russell, 2010/2011; Nichols & Berliner, 2007; Waugh & Gronlund, 2013). Although the use of standardized testing as the primary determinant of school success can be problematic, policymakers implemented high-stakes testing with positive intentions (Hurley, 2004; Madaus & Russell, 2010/2011; Nichols & Berliner, 2007; Waugh & Gronlund, 2013). Equitable access to school curriculum was one of these positive intentions (Hurley, 2004; Madaus & Russell, 2010/2011). A quality Montessori education is designed to offer children opportunities to develop both cognitive skills and affective behaviors such as student motivation, which will serve them beyond their public school experiences. A public Montessori school is expected to produce high student scores on standardized assessments to succeed in the current accountability era. A problem for a public Montessori elementary school is how to make sense of the school's high-stakes assessment scores in terms of its unique educational approach (Madaus & Russell, 2010/2011; Murray & Peyton, 2008).

This case study examined the ways one public Montessori elementary school responded to its high-stakes test scores in the areas of curriculum, instruction, and assessment. The school operated on the margins of state-defined success and struggled to survive the assessment pressures. The question that guided this research was: How does a public Montessori school respond to testing pressures while implementing the Montessori Method?

Literature Review

The current national and state K–12 educational reform policy equates public school success to performance on standardized assessment scores (Gareis & Grant, 2015; Guskey, 2005; Kifer, 2001; Madaus & Russell, 2010/2011; Nichols & Berliner, 2007; Waugh & Gronlund, 2013). Test items on standardized assessments tend to be multiple choice, with some constructed-response items. Performance-type items have been used on standardized tests, but the number of multiple-choice items has been increasing (Kifer, 2001; Madaus & Russell, 2010/2011; Miller et al., 2013). The educational measurement community has expressed concerns that the prominence of multiple-choice items on standardized testing leads to a shortage of application, analysis, synthesis, and evaluation types of assessment items (Gareis & Grant, 2015; Kifer, 2001; Madaus & Russell, 2010/2011; Nichols & Berliner, 2007; Waugh & Gronlund, 2013). Waugh and Gronlund (2013) contended:

Many parents and teachers feel that there is too much emphasis on testing, and that teachers are being forced to spend instructional time on rote memorization of content and repetition to prepare students for the test. They argue that this time should be spent on teaching students how to think critically and solve problems.... While these concerns are prevalent, most will agree that assessment is necessary and accountability is needed (p. 12).

Richard A. Ungerer, executive director of the American Montessori Society (AMS) suggested that “Montessori educators need to speak out about what we see as the implications of high-stakes testing and what we envision as better forms of assessment” (2011, p. 3). Assessment of student learning in Montessori classrooms is interwoven within curriculum and instruction, so the review of literature begins by introducing Montessori practices and curriculum. Montessori assessment looks different from traditional types of assessment (Edwards, 2002) but does emulate educational measurement best practices, which are discussed later. Finally, the section on Montessori student achievement provides evidence of Montessori students’ academic success on traditional educational assessments, even though Montessori has a unique approach to assessment.

Montessori Practices

Lillard’s concept of “high fidelity Montessori implementation” provides a foundation to describe the traditional approach to Montessori education (2012, p. 379). Multiple age groups are combined in each classroom, with a typical configuration that includes students across three-year age spans such as three-to-six-, six-to-nine-, or nine-to-twelve-year-olds (Lillard, 2012). Students remain with a teacher for three years, providing an opportunity for in-depth and long-term learning. Teachers are not the center of a Montessori classroom because they tend to interact one-on-one or with small groups of students in numerous places in the classroom. Students choose work from shelves or cabinets based on their work plans. Students return the work exactly as they found it before working (Montessori, 1964; Montessori, 1966). Montessori classrooms place importance on affective behaviors such as respect for self, respect for others, self-care, community, socio-emotional skills, and task completion, as well as cognitive skills such as deep content knowledge in each subject area, which engages students beyond the academic content covered in standardized assessments (Lillard, 1996; Lillard & Else-Quest, 2006; Montessori, 1964; Montessori, 1966; Rathunde & Csikszentmihalyi, 2005; Torrence & Chattin-McNichols, 2012).

Montessori Curriculum

Shelves and cabinets in Montessori classrooms hold engaging instructional materials that are concrete representations of concepts (Lillard, 1996; Montessori, 1964; Torrence & Chattin-McNichols, 2012). Relatedly, Montessori curriculum builds from year to year; “for example, students studying the binomial theorem in algebra will recall experiences with a three dimensional puzzle in pre-school called the binomial cube” (Montessori World School, n.d., p. 2). Whole-child development is paramount in the Montessori classroom (Montessori, 1964). Three-year age groupings allow older students to mentor younger students, with lessons often delivered by older children themselves (Montessori, 1964). Montessori curriculum outlines what students learn and do; however, students of the same age may be working on different content at different times because of individualized pacing. Individualized pacing positively engages students in learning because each student’s rate of learning varies (Guskey, 1997; Montessori, 1964). The Montessori curriculum is interconnected, cross disciplinary, hands-on, and experiential (Lillard, 2013; Lillard, 1996; Torrence & Chattin-McNichols, 2012). Variable pacing and unique learning materials create challenges for aligning Montessori curriculum with the content mandated by state assessments.

Types of Assessment

Systematic observations have been shown to be effective in assessing performance tasks (Gareis & Grant, 2015; Kifer, 2001; Miller et al., 2013; Popham, 2014; Waugh & Gronlund, 2013). Students engage in an activity such as a science laboratory experiment or construction of a graph for social studies during a performance assessment (Waugh & Gronlund, 2013). There are three components to performance tasks: knowledge, skills, and affect (Miller et al., 2013; Waugh & Gronlund, 2013). Knowledge components are content specific, such as historic dates, application of mathematics concepts, grammar, and vocabulary. The skills component “involves doing rather than just knowing about” (Miller et al., 2013). Miller et al. (2013) highlighted a difference between assessing knowledge components and skills components using the analogy of a computer programmer who knows the function of commands but cannot create a working program. The affect components are the ways in which students approach learning and their attitudes toward learning (Guskey, 1997; Kifer, 2001; Popham, 2014; Waugh & Gronlund, 2013). Observational assessments evaluate multifaceted learning tasks that cannot be assessed with other tools (Miller et al., 2013; Popham, 2014; Waugh & Gronlund, 2013).

Performance assessments once were used on state tests but have been replaced with multiple-choice items (Kifer, 2001; Madaus & Russell, 2010/2011; Miller et al., 2013). According to Miller et al. (2013), a performance task was used in the 1996 fourth-grade NAEP science assessment. Written instructions and a bag of supplies such as a pencil, beakers of fresh water, salt water, and “mystery water” were provided to the students. Students were to put the pencil in the different types of water to make conclusions as well as predictions about the “mystery water.” These are fairly “simple” tasks to assess “manipulations, observations, and measurements,” which are skills “not well assessed in a purely paper-and-pencil assessment” (Miller et al., 2013, pp. 259–260).

Instruction and assessment are inseparable in a Montessori classroom (Montessori, 1964). Observations that assess student learning are conducted while students perform learning tasks and without teacher interruption (Montessori, 1964; Torrence & Chattin-McNichols, 2012). Montessori teachers systematically take comprehensive notes about what students have learned and what they have yet to learn (Montessori, 1964; Montessori, 1966). Systematic observations, a key component of the Montessori Method, assess whether students have mastered content objectives (Edwards, 2002; Montessori, 1964; Montessori, 1966; Murray, 2011).

Observational assessments are used to help students develop individual work plans in the elementary grades (Montessori, 1964; Montessori, 1966). Montessori students set their own learning goals on work plans and “are held accountable for progress toward them” (Murray, 2011, p. 27). Montessori suggested that students are intrinsically motivated to learn from this type of feedback (1964; 1966). Many educators outside

of Montessori education agree that feedback is necessary for student achievement (Bloom, Hastings, & Madaus, 1971; Brookhart, 2009; Gareis & Grant, 2015; Guskey, 1997; Guskey, 2014; Hattie, 2012; Klinger et al., 2015; Waugh & Gronlund, 2013). According to Guskey (1997), “providing feedback to students helps them identify what they learned well or mastered, and what they need to spend more time learning” (p. 97). Hattie’s research suggested that feedback has “twice the average effect of all other schooling effects” on student learning (2012, p. 130). Therefore, Montessori education employs many of the concepts of assessment that opponents of overreliance on standardized academic assessments support.

Montessori Student Achievement

Many studies show that Montessori students consistently score well on standardized tests, even though Montessori education downplays the role of high-stakes assessment (Lillard & Else-Quest, 2006). Results from a study that contrasted Montessori preschool children to non-Montessori preschool children showed that the schools with a close application of the Montessori Method demonstrated higher growth in reading, math, and vocabulary as well as social problem-solving (Lillard, 2012). Lillard and Else-Quest (2006) conducted a study to examine academic performance among Montessori students, the experimental group, and a control group of non-Montessori students. They found several differences between 5-year-old Montessori students and same-aged non-Montessori students. The Montessori students scored better on standardized tests, Woodcock–Johnson Letter-Word identification, Word Attack, and Applied Problems. In the same study, at age twelve, the two groups performed similarly on the Woodcock–Johnson tests. However, Montessori students wrote essays that were rated higher for innovation and written structure (Lillard & Else-Quest, 2006). Relatedly, district-level standardized test data from metropolitan public schools in Milwaukee, Wisconsin; Cincinnati, Ohio; Hartford, Connecticut; Denver, Colorado; Dallas, Texas; and Chicago, Illinois, show that Montessori schools demonstrated scores that were an average of 20 percentage points higher than non-Montessori schools (Murray, 2015). A larger proportion of public Montessori students in third through sixth grades scored “proficient” or higher than non-Montessori school students in mathematics and English, compared to district averages in four large cities (Murray, 2015). According to a study conducted by Dohrmann, Nishida, Gartner, Lipsky, and Grimm (2007), students who had attended Montessori schools scored as well as peers on most measurements and even better on math and science scores, subtest scores for the ACT, and the Wisconsin Knowledge and Concepts Examinations.

Evidence suggests that Montessori students achieve success on standardized measures, but the preferred methods of assessment in the Montessori classroom differ from standardized assessment methods. The pressure to focus solely on the areas covered in standardized tests and on a predetermined timetable risks compromising the individualized nature of the Montessori Method. Furthermore, the whole-child focus that is the foundation of Montessori education emphasizes the importance of the affective behaviors. Finally, the educational focus on high-stakes standardized testing does not seem to address some real issues teachers face: Does a standardized test measure the curriculum teachers actually teach? How do teachers use curricular standards to design classroom-level curriculum, instruction, and assessment? How do teachers use standardized test scores to design curriculum, instruction, and assessments? (Gareis & Grant, 2015; Guskey, 2005; Kifer, 1997; Madaus & Russell, 2010/2011; Waugh & Gronlund, 2013). There is a disconnect between the Montessori approach of performance assessments, which are grounded in observational ratings, and the increased use of multiple-choice type items in current testing practices. This disconnect begs the question driving this research: How does a public Montessori school reconcile testing pressures while implementing the Montessori Method?

Methodology

This case study was conducted to examine the ways a public Montessori elementary school responded to the analysis of its high-stakes test scores. The case study is a general umbrella under which various qualitative research methods are used together (Hamel, Dufour, & Fortin, 1993; Miles, Huberman, & Saldana, 2014; Patton, 2002). This study was conducted at a public Montessori elementary school in a

large urban district. It was a neighborhood school, not a magnet or charter school. To protect participants' identities, the names, documents we employed, and specific aspects of the school are not provided.

The school had been organized into three distinct educational programs: Montessori, gifted, and regular education. Table 1 shows a timeline of significant events for the case study. Montessori and gifted students had been scoring higher than regular education students on state assessments, so school administrators decided to change the school to better serve the needs of each student. Students were then integrated into one school-wide Montessori preschool and elementary program three years prior to the case study. When the entire school adopted the Montessori approach, state test scores dropped. This drop was attributed to the curricular change from regular education and gifted education programs to one school-wide Montessori approach. Montessori student assessment scores had been high before the change, and school administrators believed that scores would increase once teachers and students had had a few years to acclimate to the school-wide Montessori approach. Indeed, the school saw higher scores after the school-wide implementation of the Montessori approach, but not at the pace expected by the state. The case study began three years after the school-wide Montessori implementation. Although the majority of teachers were not new teachers, most teachers were new to Montessori when the transition occurred.

Table 1

Timeline of Events

Time	Event	Significance
7+ years before study	Three school-wide educational programs	Montessori, gifted, and general education programs
3.5 years before study	State-testing score analysis	Montessori and gifted programs had acceptable scores. General program had low scores.
3 years before study	Montessori school-wide	Integrated school with one educational program to increase school-wide scores. The principal led the effort to become Montessori school wide.
2 years before study	State-testing score analysis	High-stakes test score analysis facilitated the need to align the curriculum
1 year before study	Montessori alignment to state curriculum	A company was hired to align state curriculum to Montessori curriculum.
Summer	Case study begins	Examined use of standardized test scores for curriculum, instruction, and assessment practices
Fall	School receives high-stakes scores from previous academic year	Scores were in the <i>acceptable</i> category but were close to the <i>needed assistance</i> category.
Fall to early spring	Case study continues	Interviews, observations, and document analyzed
Late fall to early spring	School analyzes high-stakes scores	State-, district-, and school-level score reports were analyzed
Spring	Case study concludes	Annual high-stakes test
Fall	Denouement	Increased test scores

Note. Table 1 is a timeline of significant events that transpired before, during, and after the case study.

The school's grade-levels were configured to lower elementary (first through third grades) and upper elementary (fourth and fifth grades) at the time of this investigation. The school also had a tuition-based preschool program. In a Montessori school with high fidelity of implementation, sixth grade would be

included in the upper elementary grades (Lillard, 2013; Lillard, 1996; Torrence & Chattin-McNichols, 2012). However, sixth grade marks the first year of middle school in this school district. Table 2 displays demographic information about participants, including names (pseudonyms), role in the school, grade levels taught, and whether they were Montessori certified. Among the participants were two upper elementary teachers, three lower elementary teachers, a parent member of the school council, the librarian, and one principal. Four teachers had Montessori training, and one teacher had yet to become Montessori certified. Two of those four Montessori-trained teachers had transitioned from traditional approaches of teaching to Montessori. Two teachers were initially certified as Montessori teachers.

Table 2

Demographic Information

Pseudonym	Role	Montessori Certified	First Type of Certification
Giselle	Lower teacher	Yes	Montessori
Lynn	Upper teacher	In progress	Traditional
Martha	Lower teacher	Yes	Traditional
Rebecca	Upper teacher	No	Traditional
Vanessa	Lower teacher	Yes	Montessori
Rachel	Parent, school council member	No	None
Grace	Librarian	No	Traditional
Dirk	Principal	No	Traditional

Note. This table displays teacher names (pseudonyms), grade levels the teachers taught, and whether the teacher is Montessori certified.

Data for the case study were gathered through interviews, field observations, and document analysis. All data were collected over a 10-month period. Interviews offered first-hand descriptions of school processes. The wording of the interview questions was open-ended. Open-ended interviews were conducted because they “permit respondents to describe what is meaningful and salient without being pigeon holed into standardized categories” (Patton, 2002, p. 56). The open-ended design allowed participants to raise concerns about how the school was reconciling its unique teaching and learning approach with the high-stakes testing designed for a traditional public school curriculum. Twenty observations were conducted while teachers analyzed test scores and used their analysis for curricular and instructional planning. In addition, 197 class instruction hours were observed. Documents were analyzed following a standardized protocol that recorded the following: title of the document; the source, state, school, and district; the intended use of the document; and a summary of the document (Miles et al., 2014; Patton, 2002). State, district, and school documents reviewed were: high-stakes test reports, released test items, curricular documents, protocols for score analysis, academic year goals, school council minutes, school council agendas, and the school’s Montessori and state curriculum-alignment documents. Member checking is a qualitative method that allows each participant to review the researcher’s work for accuracy and representative content. Member checking was implemented to allow each participant to review the findings for accuracy and representative content (Creswell, 2012; Miles et al., 2014; Patton, 2002). Member checking is a qualitative approach to establish the validity of research findings. Employing these methods, interviews, observations, and document analysis blended and triangulated findings related to the ways the school analyzed state-level standardized test scores and used them to impact implementation of the Montessori Method.

Findings

Case study participants suggested that the Montessori Method was not implemented with fidelity. Changes in the implementation of the Montessori Method generally fell into one of three areas: modifications to Montessori practices, modifications to Montessori curriculum, and modifications to Montessori assessment practices. The section concludes with a discussion of the results of these modifications.

Modifications to Montessori Practices

Modifications to Montessori practices included a shift from student-directed learning to teacher-directed strategies, including the enforcement of more rigid timetables and an emphasis on time-on-task. Teachers began developing work plans for students and shifted to explicitly teaching material to individual grade levels within mixed-age classrooms. Finally, test-taking practices aligned with standardized types of assessment were also implemented. These changes are discussed in more detail in the paragraphs that follow.

Self-directed. Pedagogically speaking, Montessori teachers in traditional Montessori schools coach students about their decisions. Montessori classrooms are child centered, not teacher centered. Teachers in the Montessori school in this case study shifted the classroom focus away from student-directed learning to teacher-directed learning. In an interview, “Rebecca,” an upper elementary teacher, discussed her perceptions of differences between public and private Montessori schools. She believed the pressure for higher assessment scores affects public Montessori curriculum and instruction more than it does private Montessori curriculum and instruction. Rebecca observed a private Montessori school classroom in which a student spent 45 minutes of class time seemingly off task. “We don’t have time in a public Montessori school to twirl beads for 45 minutes. We are driven by test scores and where scores have to be,” Rebecca stated. She also indicated that, although Maria Montessori had suggested teachers watch students and write lengthy descriptions of what they had learned and what they still needed to learn, she thinks public Montessori teachers don’t have the time to do so.

Work plans. Each student creates his or her own work plan in elementary Montessori classrooms with high fidelity of implementation. Teachers use student-developed work plans to provide feedback for each student about progress towards meeting curricular goals. In this public Montessori school, however, teachers drafted work plans and distributed them to students at the beginning of each week. Students were expected to complete the work plans within the week. Work-plan construction was determined by each individual teacher and therefore varied by teacher. According to “Giselle,” a lower elementary teacher, work plans were designed for each individual student. In contrast, “Lynn,” an upper elementary teacher, noted that teachers grouped students and work plans based on similar grades and content needs.

Rebecca reported that the pressure to move through the state curriculum resulted in teacher-directed work plans on a strict timetable. She explained that teachers in the public Montessori school directed students’ attention to the work plan more than teachers at a private Montessori school would. She believed that private Montessori teachers were more flexible and allowed students more time to complete work plans than public Montessori teachers were able to.

Multiage instruction. Classroom configurations in traditional Montessori programs include three-year age groupings, with students learning side by side. Lynn explained that upper elementary teachers taught direct content instruction, that is, one grade level at a time, because the instruction was teacher driven with one grade level, even though the classes were arranged into multiage groups. The upper elementary teachers separated the fourth grade for direct content instruction while the other teacher taught fifth grade. The lower elementary teachers had first, second, and third grades in one classroom. Teachers suggested that it is difficult in the lower elementary grades to find time for direct instruction to one class at a time. Lynn believed that curriculum alignment was an easier task for upper elementary teachers than for lower elementary teachers because the upper elementary grades had to teach only two grades—fourth and fifth. However, the lower elementary teachers had to teach three grades—first, second, and third. The lower elementary teachers separated each grade level of the regular classroom for direct instruction at different times of the instructional day. The teachers used both the state curriculum and the Montessori curriculum for direct instruction.

Since fourth- and fifth-grade teachers did not have a traditional Montessori three-year age grouping—because they taught only two grades of students, not three grades of students—they said that they had more opportunities than lower elementary teachers to select one grade level at a time for direct instruction of one content area for a specific grade level that was aligned to state standards. Five teachers acknowledged that direct instruction for one grade level at a time was not aligned with the Montessori Method but that they taught this way to cover the state content.

Test-taking practice. Test-taking skills are not generally a part of the Montessori curriculum. However, the state standardized test assesses student learning using multiple-choice questions and open-response questions. Accordingly, “Vanessa,” a lower elementary teacher, began teaching test-taking skills to her Montessori students. Second- and third-grade students were explicitly taught test-taking skills for one hour each day for six weeks in an attempt to raise the school’s assessment scores.

Modifications to Montessori Curriculum

Teachers, the principal, and council members described the state curriculum as horizontal because it was arranged by grade level for one academic year. The state curriculum defined what students needed to know by the end of each grade. The Montessori curriculum, in contrast, was vertical, or spiral, because it outlined what students needed to learn within three grade levels. Teachers spent a lot of time aligning curriculum. An aligned curriculum means that the content, instructional approaches, and modes of assessment provide sequential learning experiences without gaps or redundancy (Gareis & Grant, 2015; Guskey, 1997; Guskey, 2005; Kifer, 1997; Tyler, 1949; Waugh & Gronlund, 2013). According to Rebecca, they aligned the Montessori curriculum across the grades with the state curriculum. According to the teachers, as they aligned their Montessori curriculum with the public school curriculum, they decided that the school needed to incorporate traditional education terminology within the Montessori curriculum, filling the gaps between state curriculum and Montessori content.

Adapting vocabulary. The Montessori Method has its own unique script (Blank, 2009). Vanessa asserted that her students probably knew more mathematics than the state test results demonstrated. She reported that her Montessori students struggled to answer math assessment questions because it was difficult for them to convert Montessori mathematics language to the math language used in the assessment. The school principal, “Dirk,” addressed language issues in an interview: “Part of the problem is that Montessori is a language.” He believed teachers need to find ways to transform the Montessori language to the language used in standardized assessments. He continued, “Why call it a bead cabinet? Why can’t it be a base-ten cabinet?” However, some teachers expressed a desire to adhere to the Montessori approach, which included being true to Montessori language.

Rebecca, a Montessori fourth- and fifth-grade teacher, referred to the language issue as a vocabulary issue:

Montessori kids score better on open response than multiple-choice. Kids need to work on vocabulary about how things are worded in a multiple-choice question. We did a lot of practice last year. But the state curriculum uses words like *array*, which is a math multiplication thing. We don’t use that term in Montessori. We’ve had to go back and ask, what term are they using that we need to introduce? We are using different vocabulary, so the kids probably know the answer; they just haven’t seen it using that word.

The principal applauded faculty’s efforts to align language and vocabulary. He thought the task was complicated by time constraints, saying that changing the day-to-day practices of a whole school requires a great deal of time. Dirk also believed that there was a lack of district support for Montessori curricular alignment because the district did not understand the Montessori approach to teaching and learning. However, he suggested that, to raise assessment scores, teachers change Montessori language to assessment language to teach tested curriculum and tested vocabulary.

Supplementing with state curriculum. Teachers reported using curricular alignment documents that they created whenever they planned upcoming lessons and as they analyzed assessment scores. The state curriculum included mathematics concepts not found in the Montessori curriculum. According to Rebecca,

Now we teach state curriculum and use Montessori materials to teach state curriculum.

Teachers use Montessori pedagogy for classroom management. Some curricular items found in the state curricular documents are not addressed in Montessori. For example, there

is nothing in Montessori curriculum about probability. We use state curricular documents to teach probability.

When asked about alignment between Montessori curriculum and state curriculum, Giselle said:

Every teacher has her own way of doing that. Nobody is coming in, so far, and really mandating what to teach on what day. I think we are probably moving towards that in the future. I am a Montessori teacher, to the core. This is all I've ever done. I've taught Montessori for 27 years.... I am married to the Montessori curriculum. I'm glad the district has put together a curriculum. I think it's a wonderful thing for teachers who don't have Montessori training. Everybody has to have a curriculum to follow.

Giselle reported that she was able to turn any state curricular-based lesson into a Montessori lesson. However, other teachers did not articulate a similar level of ability to turn state curricular-based lessons into Montessori lessons. Most of the teachers said that they were able to teach only the state curriculum.

Direct writing instruction. Writing instruction had been embedded within the multiage classwork but was changed to grade-level direct writing instruction as a result of teachers' analysis of the school-level test scores. "Rachel," a parent and council member, said that since the school had implemented direct writing instruction as well as teacher-to-student writing labs, assessment scores had improved. Teachers allocated specific times within the school day for direct writing instruction. Students spent 40 minutes a day in single grade levels engaged in teacher-led grammar, sentence, and paragraph writing demonstrations.

Modifications to Assessment

Montessori teachers are taught to assess student learning through observation. Giselle, a teacher, described the systematic observational format for a typical Montessori lesson that seamlessly assessed student learning. She explained how a typical Montessori lesson begins with small-group instruction in a mini-lesson. Students are autonomous and engage in the coursework specified in their work plans. Even though these teachers suggested that observations of student learning were a vital element of the Montessori Method, they expressed challenges in finding the time needed to make quality observations while also moving through the expected pace of the state curriculum. According to Rebecca, state curricular pacing took precedence over the time needed to write detailed observational descriptions of student learning. Each of the teachers who participated in this study engaged students with direct teacher-led instruction, which changed their ability to write rich observational notes. Giselle believed she stayed more true to Montessori instructional methods than the other teachers, but she did articulate modifications to her instruction. Students engage in learning at their own pace in traditional Montessori classrooms, allowing teachers to make observational notes about student learning. Each of the teachers who participated in this study said that the curricular pace outlined by the school district and teacher-directed learning changed the amount of time teachers spent taking observational notes. Some teachers were able to make time when they conducted observations of students that they used to develop weekly student work plans.

Results of Modifications

Student assessment scores ultimately increased. School test scores had increased three points by the end of the case study. Increased scores eased some of the pressure on the school. Scores increased another four points one year after the case study, and then by two additional points two years after the case study.

The teachers had mixed reactions about the ways they changed the Montessori Method, but they shared concerns that the school would not remain a Montessori school if the scores did not increase. Rebecca, Lynn, and "Martha," lower school teacher, were in favor of the changes made. Giselle and Vanessa wanted to stay true to Montessori. Grace, the school librarian, believed the changes made the climate of the school negative. The principal, many teachers, and parents on the council were frustrated that students' needs were not adequately met because teachers were distracted by following two curricula. Dirk suggested the district

believed “there is one way of fixing everything, and there is not.” He added that the school had to implement state and district resources, which took away school autonomy. Rebecca said, “We compromise what we believe in. We compromise what we teach.” She added that some teachers were sad and disappointed. Grace believed the school struggled to keep the Montessori identity. She believed the school responded to assessment pressures and created robots out of the students. Giselle commented on the modifications required by the district:

I don’t mind amending a little bit, but when the district puts more and more on our list of requirements, the more and more we have to change our mode of operation and the less and less it becomes Montessori. I mean, I can do a couple of things different to supplement Montessori, but the more they ask, [the more] it makes it harder to do Montessori and be true to the way I think is best.

The principal, several teachers, and a parent on the school council surmised that the school district would be pleased if the school ceased to operate as a Montessori school, based on the teachers’ analysis of the standardized test scores. The principal was concerned about the school losing the choice to be a public Montessori school: “In our building, the choice is being taken away. This is what scares me about public education—we are heading towards a menu and a cookbook for everything, and you have to follow that cookbook.” Giselle said she did not know what would happen to the school, but added, “If we keep our scores up, which means working really hard, I think we are fine because that is really all that matters.”

Discussion

The intent of high-stakes testing was to create an equitable school system (Hurley, 2004; Madaus & Russell, 2010/2011; Nichols & Berliner, 2007). However, fundamental Montessori practices were modified as a result of the pressure to raise test scores. Montessori’s foundational principle of mixed-age groups was not implemented due to direct instruction for one grade level at a time. Teachers covered grade-specific material according to the dictated state timetable with single-grade class instruction that eliminated the Montessori mixed-age groups. Teachers shifted assessing student learning from an individualized process of systematic observations to formal testing with multiple-choice items. Instruction became teacher directed rather than child centered to ensure that content was covered. Furthermore, teachers began to design student work plans, rather than students creating their work plans based on their own analysis of learning needs. Subsequently, teachers directed student attention to completion of work plans instead of allowing students to become intrinsically motivated to complete the work plans.

High-stakes assessments influenced curriculum, and teachers began to teach to the test. This finding is consistent with educational measurement concerns that teachers change what and how they teach (Madaus & Russell, 2010/2011; Nichols & Berliner, 2007). As a result, teaching test-taking skills and state-tested vocabulary became components of the Montessori curriculum. Teachers struggled to integrate assessment language into instruction. The pressure to raise scores was so intense that teachers thought it best to change the Montessori language to adopt testing language.

Not surprisingly, these strategies that narrowed the instructional focus with forced, rigid timetables resulted in improved scores on state assessments. Test scores improved, but no data were available to determine if these gains were made at the expense of student motivation, executive function development, or creativity. A quality Montessori education is designed to offer children opportunities to develop both cognitive skills and affective behaviors such as task completion. Unfortunately, such characteristics are not measured by the high-stakes testing that influences so much of public education today.

Limitations

A qualitative case study provides many unique advantages as a research approach; however, limitations also exist. This case study has limited generalizability because it investigated one school. Nevertheless, as stated by Creswell, “rather than reliability, one seeks dependability” of qualitative research

findings by adhering to systematic data collection methods (2012, p. 246). Qualitative researchers analyze situations, surroundings, and human interactions to draw conclusions. Interpretive conclusions drawn by this case study were well documented and triangulated from multiple data sources to be dependable (Miles et al., 2014; Creswell, 2012; Patton, 2002). In addition to adhering to systematic data collection methods and triangulation of findings, member checking was used to confirm dependability of the findings (Miles et al., 2014; Creswell, 2012; Patton, 2002).

Implications for the Field

The pressures of the assessment era restricted this school's ability to follow high-quality Montessori principles, begging the question: Is the result still truly Montessori? High-stakes testing clearly changed this public Montessori school, and the nature of these changes raises issues for any alternative educational approach in the public sector. According to Madaus and Russell (2010/2011):

The debate over the use of tests in the development of policy is really a debate over what we want from our schools. It is a debate over educational values and competing educational philosophies, and it is about means and ends. It is not a debate on technical matters related to testing. In fact, if testing is the answer, then we have done a poor job of stating the question. By merely focusing on the test results we sidestep the more crucial question of the proper role of testing (p. 28).

These issues are of growing importance with the increased interest in approaches such as blended and personalized learning programs enabled by technological advances. The impact of the high-stakes assessment era on alternative types of schools must be considered because it is contradictory to support the availability of educational alternatives, while at the same time pressuring these schools to conform to strict and narrow measures of success.

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