

Authentic Montessori and Contemporary Considerations

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Authentic Montessori

The Montessori Trinity¹

“I have studied the child. I have taken what the child has given me and expressed it, and this is what is called the Montessori Method” (Montessori, 1961/2007, p. 2).

Dr. Maria Montessori developed a form of education in the first half of the last century that came to be called by her name. She evolved principles and practices over her lifetime “by following the child and his psychology” (Montessori, 2012, p. 7). In the years since, tens of thousands of schools worldwide have called their programs Montessori, yet implementations vary widely.

Theoretically, authentic Montessori (as described in her books and writings) might or might not be the best Montessori; that is an empirical question. In fact, a tenet of Montessori was to evolve the approach constantly, in response to the children and the ever-changing world. However, many different interests have changed the Montessori system in different directions, and not always for the better (Lillard, 2012; Lillard & Heise, 2016).

Our main endeavor is to provide researchers, policy makers, administrators, teachers, and parents with a benchmark from which variations on Montessori can be measured. For now, we believe that the evidence and our experience supports treating authentic Montessori as the right starting point for any discussion about the best Montessori. Here, we use Montessori’s books and transcribed lectures to determine what is authentic Montessori, in the sense of “done in the traditional or original way.”

Montessori Children: The Outcomes

Montessori children are active—their activity leads to joy and equanimity.

“Left to themselves, the children work ceaselessly [...]. The children find joy, satisfaction, and exhilaration in work.” (Montessori, 1961/2007, p. 87).

“The children go about their work, independently, calmly, and happily” (Montessori, 2012, p. 156).

Children in authentic Montessori classrooms concentrate deeply. In keeping with this, several studies have reported higher executive function in Montessori children (Culclasure, Fleming, Riga, & Sprogis, 2018; Denervaud, Knebel, Hagmann, & Gentaz, 2019, Kayılı, 2018; Lillard, 2012; Lillard & Else-Quest, 2006).

¹ Adapted from Lillard, A. S., & McHugh, V. (2019). Authentic Montessori: The Dottoressa’s view at the end of her life part I: The environment. *Journal of Montessori Research*, 5, 1-18. doi: <https://doi.org/10.17161/jomr.v5i1.7716> and Lillard, A. S., & McHugh, V. (2019). Authentic Montessori: The Dottoressa’s view at the end of her life part II: The teacher and the child. *Journal of Montessori Research*, 5, 19-34. doi: <https://doi.org/10.17161/jomr.v5i1.9753>

“[L]ittle children have demonstrated the capacity of working for long periods of time without tiring” (Montessori, 1956, pp. 158-9).

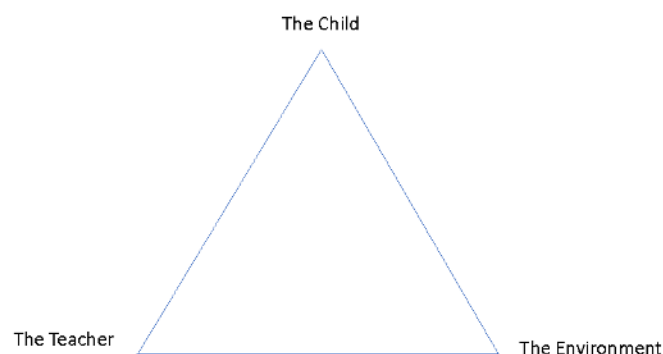
Research shows that children in authentic Montessori classrooms tend to be more creative than non-Montessori-schooled peers (Besançon & Lubart, 2008; Besançon, Lubart, & Barbot, 2013; Denervaud et al., 2019; Fleming, Culclasure, & Zhang, 2019).

Montessori children have positive social and moral characteristics. They show care and kindness for others. Research shows that children in a Montessori environment have superior social competence and emotion regulation, creating a more positive social environment (İman et al., 2017; Lillard, Heise, Tong, Hart, & Bray, 2017; Lillard & Else-Quest, 2006; Rathunde & Csikszentmihalyi, 2005b.).

“The idea of respecting others, and of waiting one’s turn, becomes a habitual part of life which always grows more mature” (Montessori, 1967a, p. 224).

When someone has an accident, “They all run to help [...] encouraging and comforting them” (Montessori, 1967a, p. 240).

What brings these characteristics about is setting *children* free in a *prepared environment* with a *specially trained teacher*. This is the Montessori trinity (See figure).



The Prepared Environment

Montessori environments are carefully “prepared” by the teacher to provide opportunities for children’s development while protecting them from obstacles to that development. Children are then free to pursue their natural interests with their innate drive to work.

The Material Environment

The material environment consists of the physical space and its contents. In Montessori, children’s mental development and learning come from directly interacting with the Montessori materials during all planes of development. The classroom space and its contents suit children of the ages being served, include a predetermined set of materials, and are beautiful, inviting, and systematically organized.

“Place everything necessary in the environment, and then leave the children free to function according to the laws of nature” (Montessori, 2012, p. 186).

Suited to the Child

“[A teacher must] conscientiously prepare an environment, placing educational materials about for some clear purpose and introducing the child with great care to the practical work of life” (Montessori, 1956, p. 76).

Dr. Montessori’s description of the furnishings of the 3 to 6 classroom makes clear how everything is selected with the child’s abilities in mind (Montessori, 1917/1965, p. 151).

Montessori materials are logically and neatly arranged on low shelves, facilitating children’s ability to find and use them.

The Montessori “Exercises of Practical Life, which have a useful aim” (Montessori, 1994b, p. 11), use such miniatures to encourage intelligent activity of the hands guided by the mind. “Small children [in traditional cultures] have a tendency to work in their play, imitating the actions of the adults. They don’t consider what they do to be play” (Montessori, 2012, p. 151).

Research has shown that given a choice of pretending to do activities like feed babies and wash dishes, versus really doing them, even American children today prefer to really do things (Taggart, Heise, & Lillard, 2018).

The Montessori environment includes objects that are light and fragile because children “will only perfect [their movements if they] can move among fragile objects” (Montessori, 2013, p. 110).

The environment for each age level (for example, 0-3 or 3-6, and so on) corresponds to core characteristics of children at that stage (discussed in a later section). Dr. Montessori experimented by giving children of different ages the materials, and she designated the materials for ages of children for whom they were best suited.

“The task of education is to supply the needs of every stage from the beginning” (Montessori, 1961/2007, p. 53).

“One of the problems of teaching is thus to discover the subjects best suited to children of different ages [...] to their different interests.” (Montessori, 1972, p. 96).

Specific Materials

Montessori has a specific set of materials for each age level, grouped into curricular areas (Language, Sensorial, Cultural, Math, Geometry, Science, and so on). The materials are interdependent within and across those areas, as well as within and across age levels.

The materials are “*the means of development*” (Montessori, 1917/1965, p. 86).

The material sets were carefully developed to assist many aspects of children’s development. Hence there are objects to assist the development of concentration, organization, movement, and independence for children ages 0-6 (especially Sensorial and Practical Life); and to assist with development of reading and language and math, of understanding the biological, physical, and the social world, and so on, at all levels. The materials for the 6- to 12-year-olds also satisfy their reasoning mind and fuel their understanding through the use of the imagination.

“We must not abandon the child to a haphazard choice of objects” (Montessori, 2012, p. 179).

The Montessori environment has work known as “The Line” where children can choose to walk in a specific way on an ellipse painted on the floor to learn to control their movements. It is a gross-motor activity that involves the whole body. It is centering work for the child at any age.

A line in the shape of a long ellipse is drawn in chalk on the floor, or painted to make it more durable. [...] The first thing that a child has to be shown is how to place his foot exactly upon the line so that his heel and toe are both on it. [...] When a child begins to walk confidently, he is then taught how to overcome another difficulty. He has to walk in such a way that the forward foot is placed with its heel in contact with the toe of the rear foot. This exercise not only demands an effort on the part of a child to keep his balance, but it requires close attention so that he places his feet in their required positions. [...] It [...] explains the keen interest which the children take in performing this exercise on the line [...]. (Montessori, 1967b, p. 89)²

The Montessori materials incorporate what Dr. Montessori called Control of Error—the materials themselves make clear to children when an error was made. Children are naturally inclined to correct their own errors, reflecting natural human tendencies towards precision and perfection (Kubovy, 1999).

Authentic Montessori classrooms shun busywork and worksheets; everything provided is real and purposeful. Montessori herself removed materials that were not useful from the set.

“The material of our schools today is based on the selection that the children have voluntarily made themselves from the mass of things that was placed at their disposal” (Montessori, 1989, p. 64).

An authentic Montessori classroom has one complete set of Montessori materials for the age level, no less and no more. An incomplete set jeopardizes the child’s developmental possibilities, since the materials are designed to work together within and across areas of development. If a material is missing, aspects of development could be compromised.

² Consistent with Dr. Montessori’s convention and for simplicity, throughout this document the teacher is referred to as “she” and the child as “he,” but with no implication that either role is gender-restricted.

Montessori did not leave lists of the materials for each age level, but there are descriptions in the books. For example, *Psychoarithmetic* details all the math materials and *Psychogeometry* the geometry ones; *The Advanced Montessori Method II* describes the Elementary Materials; *Creative Development of the Child* details many of the Primary (and some Elementary) materials, as do *The Montessori Method* and *The Discovery of the Child*.

In addition to not omitting any material, an authentic Montessori classroom does not add material to the sets developed by Dr. Montessori. Research supports limiting the materials. Children in Montessori classrooms holding only authentic materials performed better on many measures than children in classrooms that supplemented them with a variety of other materials (Lillard, 2012; Lillard & Heise, 2016).

If one were to add materials, then there would be too much to accomplish in the three years, and children would likely spend less time with the materials Dr. Montessori and her collaborators developed. In addition, given how carefully worked out the sequences of materials are, with one material building skills that are applied with subsequent materials (sometimes in other parts of the curriculum), it is unclear where new ones would fit. Finally, there is value in parsimony; too much choice is problematic (Schwartz, 2004).

“Overabundance debilitates and retards progress” (Montessori, 1917/1965, p. 79).

“This selection [of materials by the children] brought to us the conception that there must be just that amount and no more” (Montessori, 1989, p. 64).

If one deeply understands the materials and how they work together within and across classroom levels, it stands to reason that improvements are possible. Some changes have been made by the pedagogical committee of the Association Montessori Internationale (AMI), the organization Dr. Montessori founded to carry on her work—but authentically, with deep knowledge and close consideration of the whole set of materials. Any materials that are added conform to the Montessori standards of beauty and simplicity and are chosen with sensitivity to the entire set of materials and the three-year cycle in which children master all the materials in the classroom. This issue is discussed further in “Adding Materials to the Environment.”

In addition to not adding different, non-Montessori materials, authentic Montessori has just one set of each material. Developing courtesy and respect for others results from this limitation.

“In many schools the teachers that came from our courses thought it would be better and give greater scope to have two whole sets in the school [...]. But it became evident that the discipline of the school is hereby slackened; and if one lessens the number of sets the discipline returns” (Montessori, 1989, p. 64).

Beauty and Organization

Montessori classrooms are aesthetically pleasing, simple, clean and uncrowded, a feature also supported by research (Fisher, Godwin, & Seltman, 2014).

The teacher “must put everything in order in the environment. She must see that the material is in perfect order. She must see that everything is attractive so that the children will like the environment as soon as they enter it” (Montessori, 1989, p. 14).

There is abundant research on the positive effects of order on children’s development (Lillard, 2017, Chapter 10).

Access to the Other Spaces

Dr. Montessori lectured repeatedly on the benefits of children being in nature, exposed to animals and plants, fresh air and sunlight (Montessori, 1961/2007, p. 87).

“A child, who more than anyone else is a spontaneous observer of nature, certainly needs to have at his disposal material upon which he can work [...]. Children have an anxious concern for living beings, and the satisfaction of this instinct fills them with delight. It is therefore easy to interest them in taking care of plants and especially animals” (Montessori, 1967b, pp. 70-1).

Recent research shows the strength of young children’s interest in animals: when attractive toys and animals were available in a free play room, children spent much more time interacting with and talking about the animals (LoBue, Bloom Pickard, Sherman, Axford, & DeLoache, 2013).

Dr. Montessori noted that “the good we receive from nature is not alone a material benefit, it is also a great intellectual, and moreover, a spiritual benefit” (Montessori, 2013, p. 179).

Research shows that nature confers health and cognitive benefits on humans (Berman, Jonides, & Kaplan, 2008; Kabisch, van den Bosch, & Laforzezza, 2017).

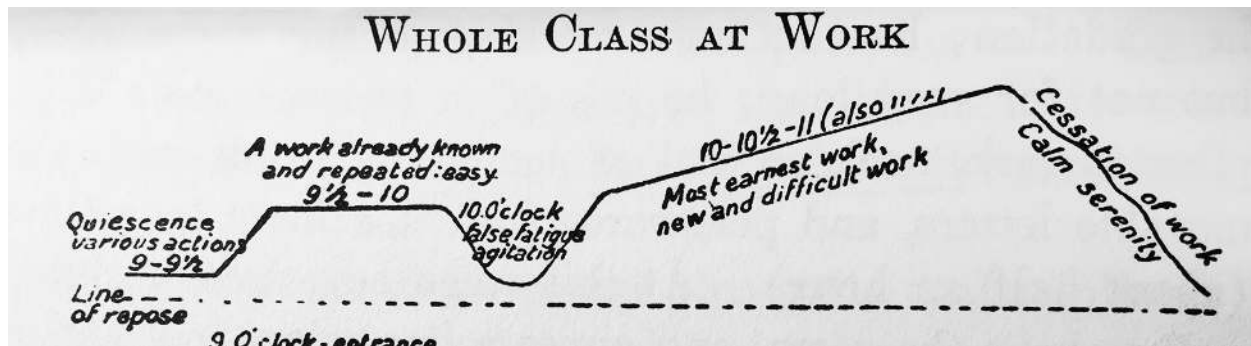
Dr. Montessori also suggested that schools ideally have fairly open access between classrooms, so children can freely pass into and observe in other classrooms.

“The open door to the other rooms gives a freedom of circulation, between the different [levels], and this circulation is of the utmost importance for the development of culture” (Montessori, 1989, p.65).

The Temporal Environment

Authentic Montessori classrooms provide uninterrupted three-hour work periods (See figure).

“Our schools start with three to four hours of work and remain open longer and longer” (Montessori, 2012, p. 192).



Montessori activity curve. From Montessori, M. (1917/1965). *Spontaneous activity in education: The advanced Montessori method* (F. Simmonds, Trans.). p. 98. New York: Schocken.

Three uninterrupted hours in the morning and the afternoon give children time to become deeply absorbed in work and to develop self-awareness to guide further activity.

Children “remain an hour, an hour and a quarter on the same exercise, at an age when [... adults typically] want to limit his work to ten or fifteen minutes. [Children return to the exercises, ...] working for whole days” (Montessori, 2013, p. 22).

Having sufficient time to become absorbed in work is essential to Montessori.

“When a child is continuously interrupted while fulfilling cycles of activity, the child gradually [loses] the courage, the constancy, and the determination necessary for achievement [... and] fails to acquire a habit of applying himself to purposeful ends” (Montessori, 1961/2007, pp. 53-4).

Cycles of deep concentration instigate a series of positive personality changes that Dr. Montessori called “normalization.” Dr. Montessori’s observations are consistent both with work on “flow states” and with research on task fragmentation in the workplace (Csikszentmihalyi, 1990; Mark, Gonzalez, & Harris, 2005; Mark, Gudith, & Klocke, 2008; Mark, Iqbal, Czerwinski, & Johns, 2014).

Authentic Montessori classrooms do not include a “recess” time in their schedules unless “the morning is very long” (Montessori, 1994b, p. 56). By “very long” she likely meant over three hours since in describing the activity curve she said false fatigue would lead some teachers mistakenly to insert a recess (as per above figure).

Children in Montessori environments are free to choose active work, even to take a soccer ball outside with friends, and to move around at will. She held that exercise comes in the normal course of activities, except in schools that unnaturally require children to sit much of the time. If parents asked about a gymnasium, “this is because they have not understood fully. If the children [in a Montessori classroom] are not getting enough exercise, [the teacher] must give them more work to do” (Montessori, 2012, p. 163). Research has shown that children in a Montessori environment move much more than conventional environments (Pate et al., 2014).

Authentic Montessori programs also do not break for “specials”; special subjects (art, music, drama, foreign language) are typically integrated into the classroom—although the elementary classes might break for a special during just one of the weekly work periods.

Such interruptions would be infrequent, as a “negative action is the interruption of work at fixed times in the daily program. They say to the child, ‘Don’t apply yourself for too long at any one thing’” (Montessori, 1967a, p. 241).

Sources suggest that in authentic Montessori classrooms children come to school at the same time each day for several days in a row. A regular daily school schedule establishes order. “Repetitions awaken [a child’s] interest. To create a cycle of relationship, it is advisable to take the child regularly [to the same environment]” (Montessori, 1961/2007, p. 22). “The tiny child’s basic need for order takes priority over all other social claims that the world may make of him” (Montessori, 1967a, p. 135).

Once a routine is established, children know what to expect daily, which gives a sense of security, and children thrive on routine (Lillard, 2017, Chapter 10).

The Social Environment

The social environment of a Montessori classroom includes a relatively large (by American standards) number of children in particular ages ranges. Once children begin to concentrate on work, Dr. Montessori found they easily adapt to and indeed thrive in this social environment (Montessori, 2012, p. 233).

Three-Year Age Groupings

Montessori classrooms are prepared for a three-year age mix. One reason is that children can learn from and teach near-peers.

“The older ones help the smaller ones and the small ones help each other. They show respect for and interest in each other” (Montessori, 2012, p. 233).

Research strongly supports peer learning (Lillard, 2017, Chapter 7).

Mixed age groups also reduce the competition that characterizes middle childhood.

“Not only are these children free from envy, but anything done well arouses their enthusiastic praise” (Montessori, 1967a, p. 231).

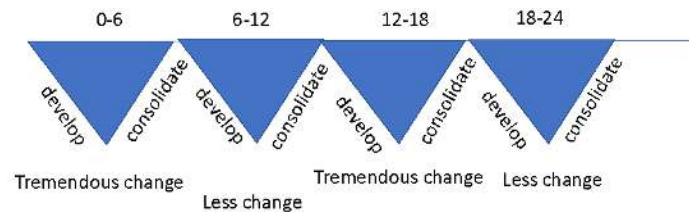
“There is love and admiration on both sides [younger and older children]” (Montessori, 1967a, pp. 226-7).

Another reason for the age mix is variety.

“The charm of social life is in the number of different types that one meets” (Montessori, 1967a, p. 226).

Specific Age Spans

Authentic Montessori does not mix just any ages—it recognizes four stages or “planes of development”: 0-6 years, 6-12, 12-18, and 18-24.



Montessori’s Planes of Development.

Dr. Montessori described specific features of children in each stage of development (discussed more in the section on The Child). The first and third stages are times of tremendous change; the second and fourth are calmer. In addition, the first half of each stage entails more change, and the second half consolidates those changes, so she also divided each stage in half, making eight three-year spans: 3 to 6, 6 to 9, and so on. During each distinct span, developmental characteristics are similar, and therefore a classroom can serve the needs of children within that age range all together. In a smaller school, children in the second plane (6 to 12) can do well in a single classroom.

“We cannot treat children the same way in the different developmental periods. They do not need the same care, the same environment, the same methods. If education is to be based on life, it must be adapted to all these differences” (Montessori, 2012, p. 24).

Class Size

Montessori clearly stated her views on class size.

“In its best condition the class should have between thirty and forty children, but there may be even more in number. [...] [T]wenty-five is a sufficient number, and forty is the best number that has been found” (Montessori, 1989, pp. 64-5).

She believed development was best helped “when the children are many and the teacher is only one” (Montessori, 1994a, p. 181).³

Class sizes in the US have reduced dramatically since the 1960s, with no increase in performance on tests like the PISA (Program for International Student Assessment), although this might partly be due to inclusion and global migration simultaneously increasing the range of children in each

³ It is now customary in the U.S. to have an “assistant” in the classroom, particularly in the Primary (3-6) class. The assistant aids the trained teacher in preparing the physical environment for the children and helps maintain it throughout the day. The assistant also helps with classroom management and supports the teacher in non-teaching activities.

classroom. Still, studies of experimentally reduced class sizes do not clearly demonstrate that smaller classes are better even in conventional school models (Hoxby, 2000; Stecher, Bohrnstedt, Kirst, McRobbie, & Williams, 2001; Whitehurst & Chingos, 2011).

Dr. Montessori's recommendation for class size was developed through observations and testing; she found that with her method, larger class sizes better supported children's learning. Montessori children learn in part via observation and imitation, and in larger classes there are more examples to learn from. Larger class sizes also support social development, just as three-year age spans do.

"When classes are fairly big, differences of character show themselves more clearly, and wider experiences can be gained" (Montessori, 1967a, p. 225).

Other references (Montessori, 1961/2007, p. 55) suggest that sometimes in its very first year, a new classroom might have fifteen or so of the youngest age group, and then expand each year as those children age. But once established, 8-13 children at each of the three ages in a classroom is authentic Montessori.

Adult Visitors

Montessori asked that classroom visitors sit quietly and merely observe to give the children's work the utmost respect. Because most adults are not familiar with the nature of a Montessori classroom, it is important that visitors are educated on how to observe without interrupting the children.

"When we have visitors [they] come as guests and we expect them to respect our children as guests respect their hosts" (Montessori, 1989, p. 8).

"[W]e recommended [...] that the people should be quiet" (Montessori, 1989, p. 67).

The Role of Parents

Dr. Montessori believed that parents play a critical role in their child's education.

Parents were expected to meet regularly with the teacher to give an account of the child's home life and to get advice from the teacher. Parents were expected to send their children to school on time and well-groomed, "to cooperate with the Directress in the educational work" (Montessori, 1964, p. 61) and to "show the greatest respect and deference" (p. 71).

Dr. Montessori clearly thought it important that parents understand the Montessori approach, and she lectured to and wrote articles for parents throughout her life (Montessori, 1956, 2017).

Dr. Montessori believed that children should have their own space, free from their parents, hence the 3 to 6 classroom is named "Children's House," "where children are masters of the house" (Montessori, 2017, p. 2).

Research shows that the strongest effects of “parent involvement” are seen when it translates to parents having high expectations of children’s academic achievement; the weakest (sometimes negative) impacts are when it translates to parent help with homework (Wilder, 2014). This is consistent with Montessori, in that parents can have high academic standards, and there typically is no homework for parents to be involved in.

The Teacher

“Our care of the child should be governed, not by the desire to ‘make him learn things,’ but by the endeavor to always keep burning within [the child] that light which is called intelligence” (Montessori, 1917/1965, p. 240).

The teacher has three primary tasks: to prepare the environment, to set the children free in it, and (once children begin to concentrate) to observe without interfering in children’s self-construction.

“The first step to take in order to become a Montessori teacher is to shed omnipotence and to become a joyous observer. If the teacher can really enter into the joy of seeing things being born and growing under his eyes, and can clothe himself in the garment of humility, many delights are reserved for him that are denied in those who assume infallibility and authority in front of a class” (Montessori, 1948/1967, p. 122).

The teacher (unbeknownst to the children) evaluates on an ongoing basis, and introduces new work to children at appropriate times. This requires special training, briefly described at the end of this section.

The Teacher’s Role

Preparing the Environment

The teacher’s first major task is to prepare the environment in which to set children free, and she herself is a major element of this prepared environment.

“The teacher [...] must be well cared for and well dressed,” (Montessori, 1989, p. 14). She is “warm, caring, and understanding” (Montessori, 2012, p. 114). She shows “respect [and ... is] humble” (Montessori, 2012, p. 34). However, teachers are also clearly the leaders in the environment. “If they have no authority, they have no directive” (Montessori, 2012, p. 230).

The teacher’s attitude toward the children is founded on a desire to serve humanity, and a willingness to step out of the limelight to allow the children to reveal themselves through their work.

The greatest sign of success for a Montessori teacher is to be able to say, “The children are now working as if I did not exist” (Montessori, 1967a, p. 283).

Indeed, in well-functioning Montessori classrooms, children do not change their behavior when the teacher is absent; they continue working, conversing, and taking responsibility (Montessori, 1939, pp. 165-166).

Setting the Children Free

Once the environment is prepared and the children present, there is a preliminary period that Dr. Montessori referred to as “the collective stage of the class [when, for first plane children,] the teacher can also sing songs, tell stories, and give the children some toys” (Montessori, 1994a, p. 183).

After this period, the teacher begins to show children how to use Practical Life materials, conveying “interest, seriousness, and attention” (Montessori, 2012, p. 75)—but if there is mayhem, they get the group of children engaged in an activity like clapping or moving chairs together (Montessori, 2012, p. 230).

“The teacher must first study how to help the children to concentrate” (Montessori, 2012, p. 224).

In *The Discovery of the Child* she discussed some of the difficulties encountered at this stage, and how to respond (Montessori, 1967b, pp. 50-55).

One by one the children start to become absorbed in activities, and their personalities begin to change.

“After the children concentrate, it is really possible to give them freedom. The teacher must [...] give them many opportunities for activity. The teacher must see that there are many possibilities for work in the environment” (Montessori, 2012, p. 232).

Non-interference

Once concentration begins, Dr. Montessori was very clear: Teachers must not interrupt.

“The teacher must recognize the first moment of concentration and must not disturb it. This is very difficult because the teacher has to interfere at every moment before the child is normalized” (Montessori, 1989, p. 15).

Dr. Montessori observed that teachers typically try to do too much; it is difficult for them not to interfere—they praise children, or correct mistakes.

She gave teachers some hints as to how to hold back—wait two minutes, or count a string of beads (Montessori, 1994b, p. 34).

Two other aids to reducing adult interference are large numbers of children (as described in the last section) and small numbers of adults.

Dr. Montessori's books almost always describe classrooms with only a single teacher for the 30 to 40 (or even more) children.

"In our schools the environment itself teaches the child. The teacher only puts the child in direct contact with the environment, showing him how to use various things" (Montessori, 1956, p. 138).

Presentations

Continuous, close and sensitive observation, record keeping and lesson planning are also required.

Besides tending the children's environment, and respectfully giving children freedom to self-construct, a teacher's role is seeing what each child is ready for next, and introducing the right activity at the right moment in a captivating way, "as something of great importance" (Montessori, 1994a, p. 194).

Evaluation

Dr. Montessori did not support the idea of tests as commonly conceived (e.g., typical multiple choice tests).

"How can the mind of a growing individual continue to be interested if all our teaching is around one particular subject of limited scope, and is confined to the transmission of such small details of knowledge as he/she is able to memorize?" (Montessori, 1948/1967, p. 6).

Of course a teacher must evaluate student progress. A Montessori teacher does this in three ways. First, he or she observes children intensely. The second means is to check, via observation or discussion, children's knowledge prior to presenting a new lesson. The third means of teacher evaluation is the Three Period Lesson (Montessori, 1994a, p. 204). This is expanded on in "Standardized Assessments."

Authentic Montessori actually has efficacious non-stressful testing forms built in. As just noted, the second two periods of the Three Period Lesson are recognition and recall tests. In addition, when children are learning material, they try to recall what they can. A third type of recall test that children repeatedly engage in after age 6 involves presenting material to others, as when giving oral reports.

Future retrieval of knowledge is improved not by further study, but by repeated further testing of the material, where testing is broadly construed to include giving presentations and teaching one's peers (Karpicke & Roediger, 2008).

Teacher Training

Dr. Montessori believed teaching with her method required self-study and conversion.

“A Montessori teacher must be created anew, having rid herself of pedagogical prejudices” (Montessori, 1946/1963, p. 86).

She spoke repeatedly of teacher training involving spiritual or moral transformation, cultivating humility.

“This method [of education] not only produces a reformed school but above all a reformed teacher, whose preparation must be much deeper than the preparation traditionally offered. [...The] mission is to be a scientist and a teacher” (Montessori, 2013, p. 276).

“It is not so easy to educate anyone to be a good teacher...we must make a long study.

Conversion cannot come to everybody. Our conversion must be in the heart” (Montessori, 2012, p. 26).

The teacher training Montessori arrived at over her lifetime involved 50 hours of lectures on theory and on the materials and their use, followed by opportunities for questions. At its most developed (see *The 1946 London Lectures* and *The Creative Development in the Child*), each material was presented for the age range with specifics about its presentation, the material's direct and indirect aims, target age range, and how it controls error. There were also 50 hours of “practicals” with the materials, in which teachers-in-training repeatedly practice how to present the materials to perfection, and also thoroughly experiment with alternative ways of using the materials.

“She must practice repeatedly in order to experiment and discover within herself the difference between using the material incorrectly and using it with exactness” (Montessori, 1994b, p. 107).

Training also required 50 hours of observation, to learn to really see children and detect their needs (objectively).

“The eyes of the teacher must be trained. A sensitivity must be developed in the teacher to recognize this ephemeral phenomenon of concentration when it occurs” (Montessori, 2012, p. 226).

She must have “an insatiable eagerness in observing them[;...] at this point she will begin to become a ‘teacher’” (Montessori, 1917/1965, p. 141).

There were written and oral exams.

Also to help learn material, and to provide a manual and guide for their later teaching, by the late 1930s students were required to create reference books, often referred to as albums, rendering their lecture notes complete with illustrations, which the teacher trainers read for accuracy and understanding. Supporting this practice, research suggests that writing one's own notes—and by

hand, not with a computer—results in deeper conceptual understanding of the material (Mueller & Oppenheimer, 2014).

During her lifetime courses were often 3 to 5 months long, but Mario Montessori found later that course lengths of one year, and in some cases 2-3 years, were needed to really train teachers well (Mario Montessori, 1976). A longer period of time is necessary for the transformation of the adult to take place.

She held that even the intensive teacher training courses were not necessarily enough to prepare a teacher.

“She may need a long period of training in order to change her spirit and give it another form. This comes with practice, contact with children, and experience” (Montessori, 1994a, pp. 104-5).

Dr. Montessori did not consider having taken her course to be sufficient for becoming a trainer of others. Further study and practice were required for this work.

The Child

Montessori believed that development occurs by self-construction. She held that there is a blueprint that guides self-formation with mental powers that are unique to each developmental period.

Language is a supreme example of how children self-construct when their environment provides them appropriate raw material and the freedom to develop themselves. Research shows that children gravitate to their “zone of proximal development,” or what is just beyond their current level of development; for example, infants seek out stimuli that is challenging (but not too challenging) for them to perceive, a phenomenon known as “The Goldilocks Effect” (Kidd, Piantadosi, & Aslin, 2012, 2014).

Planes of Development

The First Plane: The Absorbent Mind

Dr. Montessori observed that during this stage children effortlessly absorb many aspects of the environment, including language and culture, and that they do so without fatigue.

During sensitive periods, particular elements in the environment evoke very strong interest, facilitating learning. For example, Dr. Montessori described the age of 2 as a sensitive period for order; children who notice things out of place get upset, and try to restore order (e.g., Montessori, 1967a, pp. 134-5).

Authentic Montessori capitalizes on such sensitivities, for example showing young children precise ways to use and store materials.

“Little children have, during their sensitive periods, powers that disappear later on in life” (Montessori, 2012, p. 18).

The Second Plane: The Reasoning Mind

During this period, children have an insatiable appetite for knowledge and are eager to explore with a reasoning mind. No longer satisfied in a small community of the family and the preschool classroom, the individual worker of the first plane is replaced by the one who wants to be part of a group. The Montessori system accommodates this in part with the Going Out program of the Elementary level class, in which children venture out of the classroom to do research for reports on topics they find interesting, which they regularly create for presentation to the class.

“The passage [from the first] to the second level of education is the passage from the sensorial, material level to the abstract” (Montessori, 1948/1976, p. 11).

Dr. Montessori’s overarching educational plan for the second plane is called “cosmic education.” Cosmic education allows for the use of the imagination and abstraction; stories and experiments becoming the new tools for learning. Children of this age seek to understand their place in the universe and also begin to think about justice.

The Third Plane

She noted that 12-18 years is a period of great transformation, both physical and mental, when character is formed.

Psychologically, the adolescent experiences “doubts and hesitations, violent emotions, discouragement and an unexpected decrease of intellectual capacity” (Montessori, 1948/1976, p. 101).

Children are preparing for their adult roles in society, and need to practice adulthood in a safe place, both physically and emotionally. *Real* work was essential, but with *real* practice in society. This entails big muscle work and practical use of skills, for example apprenticing with a craftsman, or running a small business on a farm. Academic studies continue, but with a connection to self-generated useful occupations.

The Human Tendencies

A central tenet of Montessori theory is that throughout life, human beings the world over exhibit certain tendencies on which education can capitalize.

Humans, like many animals, have a tendency to **explore** their environments and also to **orient** in the environment. Montessori gives children the freedom to explore in orderly places in response to these tendencies. Children also have a natural tendency to be **active**, and to engage in **work**.

This work often takes the form of **manipulation**. Humans also respond well to **order**, and seek to put things in order, to classify and categorize. In all this, there is a drive towards **precision**, and **self-perfection**, accomplished through **repetition**. Finally, humans also have tendencies to **abstract**, and to **communicate**.

Abstraction: This tendency consists of the ability and the urge to look at part of the world and understand its abstraction. It is the tendency to want to have the world in our mind.

Activity: This is a person's tendency to act upon the environment and change his world, usually to suit his needs. It can manifest itself in physical activity but also in intellectual work.

Communication: Humans desire to express themselves and to understand the expressions of other humans. This tendency does not always require language. The young baby communicates, and all people can communicate with facial expressions and gestures.

Exploration: This refers to a person's tendency to explore and learn about the environment through many capacities. Young children explore mainly through the senses. After the age of six, the child can explore via imagination. Adults also explore—physically, but also through means such as books and conversation.

Manipulation: This tendency drives people to use their hands in productive ways. From the time children are little, they want to use their hands to explore, manipulate, and build.

Order: Order arises from the tendency to understand one's own environment. This tendency drives a person to make categories for the items in his surroundings, and to search for patterns among those categories. Order allows a person to make sense of their surroundings.

Orientation: All animals need to know the relation between themselves and their environment, including how they relate to objects or others.

Precision: This refers to a person's desire to reach personal goals and to create something that is exactly like what is in their own mind. It refers to someone's desire to match the exterior world to a specific internal idea.

Work: The urge to work is a person's drive to engage in meaningful activity. From a young age, people want to be active with a purpose.

Repetition: This is the tendency to repeat any given activity until a person has reached a specific level of satisfaction with the work. It aids in the reaching of goals.

Self-Perfection: Humans want to better themselves. They want to improve themselves in who they are, what they do, and how they do things.

Summary and Conclusion

Montessori education derives from the trinity of the child, the teacher, and the prepared environment. A trained teacher who executes the system as directed, preparing the environment to specification and setting children free, observes the outcomes described in the first section. This occurs because the characteristics of children at each stage of development, including the

overarching human tendencies, were responded to. The system involves a grand vision and a unique view of the child and the purpose of education.

To those seeking to change the Montessori system away from the authentic version, we note that Dr. Montessori tweaked it with a full and deep understanding of what it was, and one might do well to study it fully and understand it deeply—including many years of practice in the classroom—before changing it.

Much more empirical research is needed on the outcomes of this educational system, but existing empirical evidence (Lillard, 2017, chapter 11; Lillard et al., 2017; Marshall, 2017) suggests that when authentically implemented, at least, Montessori education has very good outcomes.

Having been in the thick of two horrific world wars, and yet having seen beautiful outcomes in children in schools implementing the system children inspired her to design, Dr. Montessori had grand views of what education might accomplish:

“This is education, understood as a help to life; an education from birth, which feeds a peaceful revolution and unites all in a common aim [...]. This is the bright new hope for mankind [...] a work of formation which brings out the immense potentialities with which children [...] are endowed” (Montessori, 1967a, p. 17).

Questions for Discussion

The Prepared Environment

What is your role as the Lead Teacher in preparing the environment? What do the other adults do in this regard?

What are the characteristics of high-quality classroom assistants and fellows in an authentic Montessori classroom? What are their duties and reporting structure models? How do you retain those who are a good fit?

Why should there be only one complete set of materials in the environment? Do you strive to make sure all materials are present for the children? What are the challenges?

Have you added any materials to your environment? Which needs were not met by the materials presented in your training? What questions do you ask yourself to consider whether the material is relevant, necessary, and in keeping with the Montessori qualities of beauty and simplicity?

How do you incorporate time at the playground in your schedule? Do you still maintain a three-hour work period?

The Teacher

What are the guiding principles that comprise authentic Montessori? Which ones are most challenging? Which ones are easiest for you to implement? Why?

Why is observation at the center of teaching practice? How often do you observe and how do you use your observations?

In making decisions, how do you prioritize the needs of the children? How do you make sure that their needs are represented in discussions with parents and administrators? When you are making a decision between their needs and yours, how do you find the balance? What aspects of your administration and school support you in prioritizing their needs?

Non-interference requires patience and practice. How do you practice this so that it becomes a habit?

What do you do consistently to prepare yourself for the children? What steps do you take to be refreshed about the essential elements of authentic Montessori? Do you refer to your albums and Montessori's work? Why or why not?

The Child

What are the *sensitive periods* and *psychological characteristics* for the age level that you teach? How does your understanding of these special traits help you in supporting the children in their development?

Do you capitalize on the *human tendencies* in your class? If so, how do you accomplish this?

Are you aware of any personal bias that you might have regarding any children in your class, especially the children who present challenges? Do you treat them differently? What are some reasons that children may present a challenge to you?

How does concentration evolve? What are the signs of it?

How does the will develop? How does this development affect discipline?

How do you identify and understand children with special needs? What are the implications of this in your class? When should you seek external support? How do you communicate this with parents and caregivers?

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Contemporary Considerations

Diversity

Maria Montessori gave us a pedagogy equipped for our culturally diverse world. She understood the natural friction that many adults experience as they are pulled out of their comfort zone to make way for the authentic self-expression of others. She got her inspiration from the youngest most economically disenfranchised members of society and left us with clear instructions as to how the inner transformation and self-preparation of adults leads to the empowerment of youth. The tumultuous times she lived in gave her a keen sense of the insight needed for societal change to take place. Her pedagogical philosophy is rooted in peace and in an astute dedication towards the fulfillment of the individual human potential.

Dr. Montessori was also well aware of the societal tensions apparent during the times in which she lived. She realized that the complete liberated expression of some might disturb the power structure of others. She also realized that many of these social tensions were due to unfortunate divisions drawn across lines of power and privilege, class, gender and culture. Her pedagogy implores us to honor the individual's fundamental need in the context of the unique expression of their identity regardless of where they fall along these lines. Her pedagogy also encourages us to become celebratorially aware of that which differentiates us from one another. She summed this up well when she said, "The needs of mankind are universal. Our means of meeting them create the richness and diversity of the planet. The Montessori child should come to relish the texture of that diversity."

Empowerment

In opposition to authoritarianism, Montessori created a classroom environment that allowed children to become empowered by autonomously solving problems in their environment and advocating for themselves. She trusted the importance of following the innate needs of the child and the ability of the child to express these natural needs. The Montessori teacher realizes that children who are vulnerably positioned within the inequitable socio-economic landscape may need the opportunity to tend to their wounds when they enter the classroom. For example, a child who walks into the classroom injured by interpersonal or institutional acts of racial or cultural discrimination may need an opportunity to do something that is healing. They may need to choose work that will help them reach an emotional or cognitive equilibrium, rather than following a routine required by the teacher. An authentic Montessori classroom provides a pedagogy and an environment that allows all children to deal with their social and emotional needs, to take ownership and engage with self-agency.

Culturally diverse Montessori students often sense the visceral reality of what it means to live in a society dominated by cultural and racial norms that suppress their own light. In the same way that the sensorial skills develop conceptual knowledge and confidence, having the space and the tools to express the acute discomfort that they feel as a result of racism allows children to feel

seen and heard. When race is not acknowledged or talked about, shameful feelings emerge in children of all races and, in the silence, children fill in the blanks with bias.

Dr. Montessori trusted the innate tendency that humans have to bond in unity when they courageously relate to each other with empathy and compassion. She believed that relationships were a critical foundation for empowerment—that without establishing real connections across lines of difference during the formative years, humans would not be able to understand each other. In a lecture in London after World War II, Dr. Montessori said, “If different cultures are to understand each other, to be in sympathy with each other, they must be together at this age. Understanding is no abstract idea. It is something vital. It must develop during the period of the formation of man” (Montessori, 2012, p. 149).

Normalization

The self-esteem of racially diverse children is a casualty of racism. Racism is a subtle social toxin that corrodes the self-image and self-esteem of the children. Self-esteem is directly correlated with self-expression and strong academic outcomes. Luckily, Maria Montessori’s gift to all of us was in her ability to show children how to heal and construct their positive identities through work and to discipline themselves through the freedom of choice. Cycles of deep concentration instigate a series of positive personality changes that Dr. Montessori called “normalization.”

Normalization is the concept that Dr. Montessori used to talk about the natural state children emerge into when they are free of distraction and can attend to their work with a purpose that nourishes them. She was clear that the idea of normalization is far from the concept of meeting a norm. She was also clear that some of the standard and expected behaviors of children are created within them and are not normal—she called these behaviors deviant. These “personality defects” that result from inadequate psychic life and mental starvation line up well with symptoms of internalized racial oppression (IRO) and internalized racial superiority (IRS).

A starved mind, one without emotionally satisfying social and mental work, is the main cause of these personality defects; social inequities are contributing factors to this state of being. In *The Absorbent Mind*, Dr. Montessori described non-normalized behavior and categorized two main groups of faulty characteristics. She refers to these deviations from the norm as the “strong” and the “weak” (Montessori, 1967/1995, p. 282).

According to Dr. Montessori, strong children manifest: “Violent tantrums, anger, acts of rebellion, aggression, disobedience, destructiveness, selfishness and envy; incapability of attention... they frequently shout, shriek and make loud noises; they interrupt and they tease and torment and often are cruel to the weak and to animals” (Montessori, 1967/1995, p. 282).

Weak children are described as passive, with such negative characteristics as “sloth, inertia, crying for things and wanting people to do things for them; they want to be amused, are easily bored. They have a fear of everything and cling to adults” (Montessori, 1967/1995, p. 283).

Montessori clearly points out how these symptoms can be direct results of gestational and early childhood trauma. Both sets of characteristics are apparent in students with internalized racial oppression (IRO) and those with internalized racial superiority (IRS). But it may be more likely to see those suffering from IRO exhibiting inhibition to challenges, lack of focus and unusual outbursts, while those suffering from IRS might be cruel to those weaker than them and have an insatiable desire to be amused. Montessori warns adults about the false sense of superiority in children when she says, “Other traits still are considered as signs of superiority; children who are always bustling about, are extremely healthy and have vivid imaginations are all considered superior. They usually pass from one thing to another (having a difficult time concentrating). The job of teachers is to create an environment where students can work through and overcome these barriers to normalization” (Montessori, 1967/1995, p. 288).

Normalization can be described as a natural process that children go through when they move into self-actualization and become internally motivated. That is when they discover who they are and find their unique self-expression.

Self-Reflection

The job of teachers is to create an environment where students can work through and overcome these defects or barriers to self-discovery. So the question for today’s Montessori teachers and educators becomes, “How does one view these behaviors within a larger context that doesn’t equate a child’s trauma to their culture and doesn’t isolate the child, thereby reducing the child to their trauma?”

It is easy (and common) for educators to see the problematic behaviors of the strong and weak types as linked to character cultural or deficits, and to imagine the solution to be assimilation to the dominant culture. It is similarly easy to mistake behaviors that are different from the dominant culture as problematic behaviors, when this is not always the case. This theoretical framework has been the rationale for a lot of harmful and dehumanizing racialized school policies.

Dr. Montessori wrote:

Human history teaches us that *peace* means the forcible submission of the conquered to domination once the invader has consolidated his victory, the loss of everything the vanquished hold dear, and the end of their enjoyment of the fruits of their labour and their conquests. The vanquished are forced to make sacrifices, as if they are the only ones

guilty and merit punishment, simply because they have been defeated. Meanwhile, the victors flaunt the rights they feel they have won over the defeated populace, who remain victims of disaster. Such conditions may mark the end of actual combat, but they certainly cannot be called peace. The real moral scourge stems in fact from this very set of circumstances. [...] And since the history of every people on earth is marked by one wave after another of such triumphs and such forms of injustice, as long as such a profound misunderstanding continues to exist, peace will definitely fail to fall within the range of human possibilities. (Montessori, 1949/2007, p. 6-7)

Teachers must be prepared and carefully trained so as not to fall into these societal traps. Dr. Montessori lays out her thoughts about the self-reflective work teachers need to do here:

The first essential is that the teacher should go through an inner, spiritual preparation—cultivate certain aptitudes in the moral order. This is the most difficult part of her training, without which all the rest is of no avail... She must study how to purify her heart and render it burning with charity towards the child. She must “put on humility,” and above all, learn how to serve. (Standing, 1998, p. 298)

Teachers have to be spiritually prepared to bring out the light of intelligence in each child. Dr. Montessori implored all Montessori teachers to be what she called saints, scientists, and servants (Montessori, 1917, p. 137). As saints, Montessori educators are humble in their relations to children. With introspection and humility on their part, teachers are able to tap into their own inner light, giving them greater clarity to recognize and tend to the light within the child. As scientists, they study the children closely, seeing who they are. Teachers must recognize the impact of their individual cultural perspectives on their classroom practices. As servants, educators sacrifice their own needs to serve the needs of the children.

A big part of teaching in an authentic Montessori classroom is the teacher’s ability to see the child’s light through introspection of the teacher’s own inner landscape. Acknowledgement of the teachers’ social-emotional climate and cultural background as well as the ability to see and recognize their own positionality in regards to power and privilege creates a window of opportunity for teachers. This window broadens teachers’ scope of vision and allows them to support and nourish an array of culturally diverse learners.

When properly prepared, teachers are unchained from their own internal biases. This is an essential aspect of a Montessori classroom that is embedded in her philosophy and not always explicitly taught in the training centers. An authentic Montessori philosophy is practiced when educators liberate themselves from their particular cultural perspective, if only for a moment, and look at the child for who they are. With enough introspection a teacher can see not only who they are but how their identity has been socially constructed. Nothing and no one is formed in a

vacuum. In fact, everyone's identity development is shaped by their outside socio-cultural environment. This is particularly important for teachers who identify with the dominant culture, who may have much less experience recognizing the features of dominant culture as anything other than "normal."

As Montessori teachers begin to prepare themselves by understanding their own biases and the development of their personal identity development, they can also see more clearly the influence of their perspectives on their pedagogical practices. They are then able to truly embrace the racial and cultural diversity that is all around them. This clarity is gained through the transformation that Maria Montessori talks about and the natural paradigm shift that accompanies it. Once teachers gain sight of their own biases and can view certain problems of social inequity as their own, they can work to solve the problems, becoming agents of social change.

Constructionist, Child-Centered, and Collaborative

The Montessori classroom is equipped with the three building blocks of a culturally relevant pedagogy: constructionist, child-centered, and collaborative. Children in authentic Montessori learning environments are able to utilize their cultural context (often embedded in the practical life materials) enough to serve as a launching pad to explore who they are and learn about the world around them, as is done in a culturally responsive classroom.

A culturally responsive pedagogy like Dr. Montessori's has intentionality and purpose as its backbone. Its environment is primed for the students to build and construct their own meaning. Once the cultural backgrounds of the students are recognized, the structure for the students to use their previous knowledge to construct their own meaning emerges.

Being culturally responsive, Montessori teachers prepare an environment filled with experiences that are personalized, contextualized, and authentic. A wealth of literature in the field of multicultural education supports fostering independence through student pacing and expressing a belief in all children (Massey, 2006). In an authentic Montessori learning environment, the students have liberal opportunities to make choices that develop their own self-expression and identity. The environment also helps children acknowledge and appreciate an understanding of the world's differences.

Children in a Montessori classroom collaborate not only in the small groups in which they are taught, but also in the working groups they often organically form. Collaborative work is a feature of culturally relevant pedagogy and supportive of cultural diversity. Children not only have an opportunity to work within groups that otherwise may be "silo-ed," (composed of people who come from similar backgrounds), but they also are challenged to work closely with people with different backgrounds due to the interdependent nature of the Montessori learning

environment. Montessori teachers have a unique opportunity to create both intentional and organic space for children to connect, engage in dialogue, and openly collaborate.

Finally, Montessori students experience the global interdependence of the world through her peace curriculum. The Montessori curriculum provides globally-centered opportunities for connections between the classroom environment and the surrounding community through the cosmic curriculum and field trips. When the children choose field trips they are often able to search for something meaningful that connects with what they are learning about the diversity of the world and each other. This helps children to construct their identities and social awareness within a context that is relevant to them. The cosmic curriculum is an entry point for teachers to talk to children with a critically conscious lens about different creation stories from around the world and to help them understand the vast diversity of the earth and the people on it.

A Humanity-Centered Education

Asa Hilliard, an African American educational psychologist and Montessori theorist, believes that Montessori is a “human metaphor” because it “responds to who children are and what they need” (Hilliard, 1996, p. 108). He noticed that in many schools there are humans but no humanity. That is to say, school systems, especially in Western countries, have traditionally functioned to support whatever political and economic needs were present at the time and have failed to uplift and honor the human spirit. However, Montessori is time-tested and always relevant in the changing times, because it is a pedagogy that services humanity.

The Montessori philosophy honors the genuine meaning of “education,” derived from the Latin root “educare”—to unleash that which is within, the eternal sacred humanity, the inner genius. Maria Montessori’s work gave us an integrated view of humanity and the cosmos, and, in so doing, she let us know the potential of all human beings.

Conclusion and Implications

Dr. Montessori left us with the fundamental building blocks for the formation of diverse, equitable, and inclusive learning environments. The Montessori pedagogical framework naturally inculcates a reverence for humanity by creating space for children to heal; to develop choice, interdependence, and collaboration; and to construct positive identities.

When teachers are able to recognize and remove the walls or barriers that surround their worldview, they can better see the children’s needs and their light within. There is also an opportunity for the teacher to see clearly the cultural, emotional, personal identity, and needs of the child through a purified lens and finally have a chance to serve the child’s needs and strengthen their identity.

The authentic Montessori teacher's transformation is a critical part of the anti-bias work and is foundational, especially for teachers in culturally diverse classrooms. Montessori's emphasis on constructionist, child-centered, and collaborative education creates a space for every child to be salient in the construction of their identity and the preservation of their inner light. Consequently, today's Montessori teachers are charged with a duty to serve that inner light and genius within each child.

Questions for Discussion

In this process of unbinding themselves from social and cultural conditioning, Montessori teachers should ask questions like these of themselves and the children in the classroom:

1. How is your communication style informed by your culture? (e.g., direct or indirect, how and when you speak, volume, etc.)
2. How is your vision of success informed by your culture?
3. How are three of your most important social norms informed by your culture? (e.g., physical contact, physical space, eye contact, etc.)
4. How is the amount of help you naturally give children at home informed by your culture?
5. How might a child who comes from a culture with a history of oppression or a history of oppressing react to the Montessori principles in your practice?
6. Would your own or your students' familial values encourage or discourage asking of questions?
7. How does a child's culture inform the way he or she responds to free choice?
8. What culturally specific language and directives do the children in your class respond to?
9. When children dress in ways that are not familiar to you, does it make you uncomfortable? Why?
10. When children speak in a colloquial cultural dialect or another language, does it make you uncomfortable? Why?
11. Name four ways that you identify (e.g., race, gender, sexuality). Which of these identifiers do you think about all of the time? Which of these identifiers do you rarely think about? Analyze your results by recognizing that those you think about all of the time may be those areas where there may be an oppressive shadow on your identity, and those areas that you think about least are those areas where you might cast a shadow over the light of another's identity.
12. How much time do I spend in environments where my culture is the dominant culture? How much time do I spend in environments where my culture is not the dominant culture?
13. What racial reflection work have I done to understand my racial and cultural identity?

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Inclusion

The Montessori environment has many valuable tools and opportunities for children with learning differences. The method itself was designed to meet an array of children's needs and stages of development, and therefore has flexibility built into the curriculum. In fact, Dr. Montessori originally began developing the method while working with children who had learning differences and disabilities of many degrees, and she celebrated the impact her system of education had on their lives. No child is the same, and the Montessori classroom is inherently inclusive.

The Teacher's Work

First, the teacher must understand the child's diagnosis and needs, and then *observe* without bias. It is important to know the child before he comes into the classroom, but then the teacher also must observe him in the Montessori environment. Many children present very differently in the unique Montessori classroom because of its built-in differentiation (possibilities for modification) and because it is so carefully prepared to meet the development needs of children in general. For example, the longer work cycle reduces transitions, and can eliminate challenges for many children.

It is helpful to have a group of adults who meet regularly to discuss students who exhibit concerning learning behavior. Often, the primary level teacher is the first to observe these behaviors. It is critical that a protocol is established that includes data collection, classroom modifications attempts, parent involvement, and a team to discuss the child and their progress. Implementing this protocol will help get special education services (if needed) in a timely manner.

If a Related Service Provider (RSP) is involved in serving the child, the teacher can ask her to observe the class before becoming involved so that she sees how the Montessori trained teacher interacts with the child, how the classroom operates, and how the child behaves and works in this environment. The RSP can be educated on observing before creating an intervention.

The teacher can meet regularly (monthly) with the child's specified RSPs. Here, the adults share observations. The teacher can show them how the materials work in the classroom and understand what the RSP is working on with the child. They will make connections between the work and the child so that there is consistency and so that progress can be monitored.

The adults who regularly interact with the child are an important resource for serving him. Frequent discussion and sharing of ideas and observations will help the work stay relevant and helpful. No single adult who works with the child will have all the answers. It is important to continue observing, sharing, and seeking constructive activity and interaction for each child. This monitoring will indicate whether or not goals are being met, and help to avoid wasting time on ineffective strategies.

Amidst this, it remains important to think of the child as any other child, except that he may need more connecting to the work in the environment. When the teacher recognizes the child's needs and challenges, she asks herself: What do I know? What have I seen? What are the signs that this child needs something more or something else? How can I connect them to something that is already in the environment? What leads me to believe that the child will not normalize under present circumstances?

The child will continue to change and must be reassessed at each transition. A child who can do well in a primary classroom may need different support in an elementary classroom, and a child who struggled in the primary may end up needing little or no extra support in the elementary.

Classroom Considerations

Each classroom must have the right balance of children with special needs. This will depend on the capacity of the teacher, the support system available, and the types and degrees of needs that the children have.

In a large class (30 or more), with a great number of children with needs, it may be necessary to have a third adult in the classroom along with the teacher and assistant. Ideally, this third teacher has Montessori training and may also have training for working with children with special needs. In any case, it is important for this third adult to understand the Montessori approach, including the practice of non-interference. When this teacher is not working with a child who has special needs, she or he should be sitting in a chair, observing inconspicuously.

An IEP may dictate that an RSP come into the classroom for services inside the Montessori environment. When they are in the environment, they will need guidance about how to avoid being disruptive. In some situations, it may be appropriate for the RSP to find another space in the school to work with the child, for the benefit of that child and for the children already in the environment.

Materials

The child's teacher must match the materials to the child's needs with trial and error through observation. She can ask questions about what the materials are for and use those answers to determine what to use for each child: Why didn't it work? Was it serving a different need? Does this material do something different? Was the problem the area of the classroom? Was it the noise at that time? Is it just a problem with this one day?

Tools can be added to the classroom for children with special needs: Visual reminders, a visual schedule, and/or picture cards of materials (offer a limited number which the child can choose from). Some children may need these tools at the beginning of the year but then can learn to operate without them.

Additionally, most Montessori activities can easily be modified to suit the needs of the child. If a child has developmental delays, for example, materials can have fewer materials or steps, and the child may gradually work up to the activity in its entirety. Constant observation will allow work to stay relevant to where he is.

The Child (Examples)

A child with a sensory processing disorder may need more directing and connecting with work that provides organized sensory input. Practical Life is an especially valuable area of the classroom for these children, and mirrors many occupational therapy practices. They also may work best in a space with less stimulation—a low traffic area that is still a part of the community.

Some children with behavioral issues are overstimulated by large groups or by being directed. They need more time to do everything. The three-hour work cycle works well for them because it allows them to pace themselves. Freedom of choice allows them to relax and accept the classroom activities.

Children with language disabilities may need a modified version of lessons, particularly three-period lessons. For example, a child who has apraxia may have limited language. The teacher will need to observe to check for the child's knowledge because he cannot say the words to express that he knows something. The beauty of the language materials is that the Second Period of the Three Period Lesson can assess the child's receptive language if there are limitations to expressive language ("Point to the triangle. Point to the square." The child indicates with his hand that he knows the shapes.)

A child who struggles with executive function will benefit from the Montessori curriculum. The Montessori environment asks that he wait his turn to use materials, practice mindfulness and meditation by walking on the line, engage in peer-to-peer learning, and receive lessons and instruction when the teacher determines he is ready. All of these practices enhance executive function (Diamond and Lee, 2011).

The Montessori environment is naturally designed to support the child with dyslexia. Current methodology shows that this child needs "sequential, multisensory, and explicit experience with the sounds and symbols of their language" (Awes, 2014, p. 187). This is the foundation of language in the primary classroom, and for the child with dyslexia, the same materials and work will support his learning, but he will need more regular and sustained experience with each phase of the material (Awes, 2014, pp. 187-188).

Rarely, the Montessori classroom may not be the best place for a particular child's needs. For example, it may have too much freedom, it may require too much control of movement, it may be too distracting, or the school may not have resources for an extra trained adult which a certain disability requires. The reasons why a classroom may not be good fit are very specific to a particular child's individual needs, and must be assessed on a case by case basis. That decision can be made after thorough observation by and interaction with multiple adults. The child's needs should always be placed first, even if this means moving to another environment.

Conclusion

The Montessori curriculum is flexible and dynamic, and the environment is designed to meet the needs of many different kinds of children. The teacher has many options within the environment to modify for children with different needs. Principles of inclusion are at the heart of the Montessori method.

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Resources

Applied Behavior Analysis (ABA) for children with autism and behavioral issues

Conferences on integrating differently-abled children, in services through public school districts

Connecticut government website on Scientific Research Based Interventions

(<https://portal.ct.gov/SDE/SRBI/SRBI---Scientific-Research-Based-Interventions/Related-Resources>)

Local organization of public Montessori teachers

National Center For Montessori in the Public Sector (<https://www.public-montessori.org/>)

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Other Montessori public and charter schools nationwide

Training centers

Standardized Assessments

Standardized assessments are not integral to the Montessori method. There are natural ways to assess children, which are all inherent in and necessary to the curriculum. The teacher verbally checks children's knowledge during the Three Period Lesson and observes whether children appear to be understanding. In addition, children are frequently in the position of teaching other children in the class—an experience that solidifies the understanding of any concept or material. Likewise, research shows that standardized assessments are adequate, at best, for indicating a child's ability (see the Trinity section). Colleges as selective as the University of Chicago are removing the requirement from their admissions process.

Overly frequent assessment occurs when adults lack faith in and cannot find better ways to track children's development. Margaret Stephenson, a lifelong educator who was trained directly by Dr. Montessori, encouraged teachers to sow the seeds of knowledge, but reminded them “not... to dig them up to see if they are growing” (Stephenson, 1986, p. 7). The quote is a reminder that repeated assessment can itself inhibit the very growth that one hoped would occur. When there are other ways to determine knowledge and mastery, teachers should use them.

Assessments the Montessori Way

Observation and record-keeping take the place of standardized assessments in the Montessori environment. Observation is an integral element of Montessori teaching. As a discipline, it should be practiced daily, both informally and formally. In a formal observation, the teacher sits to the side with a paper and pencil and dedicates a portion of time to observing various elements of the classroom. This may be a particular child, an area of the classroom, a subject area, a specific material, or any other relevant aspect of children's education. As it relates to assessment, this allows the teacher to focus entirely on whatever element of the classroom needs to be tracked. It will change daily/weekly/monthly to allow the teacher to maintain an awareness of all aspects of the classroom. Through this observation, she will determine where children are academically, both in what they are currently practicing and what she can see they have mastered.

Informal observation occurs regularly throughout every day. Such observations occur for varying lengths of time during the ongoing flow of the classroom. The teacher keenly focuses to determine the activity of a child, materials, or the classroom in general. She can write down her thoughts throughout the day as the need arises. It is through such moments of observation that a teacher can see where a child stands with the materials on the scale of mastery.

The first and most obvious way that observation will indicate children's mastery is during a Three Period lesson. As mentioned in the Trinity section, during the third period, the teacher asks

the child to recall information (e.g. “What map piece is this?” “Which is one hundred?” “What is 6x7?”). By their answer, she learns what they know.

The teacher also should observe children as they use the materials to see if they are making errors. If a child is using materials incorrectly, then he may need another presentation on the use and concept of the work. This is a careful decision, because sometimes control of error built into the materials themselves will guide the child towards proper use. Other times the child needs intervention. It is the teacher’s careful observation and experience that will indicate which path will be more successful.

Alternatively, if a child is using materials incorrectly, it may be because he has not fully mastered the work that came before it in the curriculum. Montessori’s curriculum is hierarchical and builds on itself. If a child has not fully mastered the work leading up to a presentation, that child will not be able to successfully engage with the subsequent work. Errors with materials can indicate that a child needs further work with the previous materials in order to obtain mastery. Again, it is observation that will guide the teacher towards the next action.

Teachers must be aware of their own subjectivity as they engage in this observation. They need to be aware of their own race, culture, and class and how these affect the way that they relate to students of similar or different backgrounds. They need to examine themselves thoroughly for bias toward, preference for, or judgement of their students. It is beneficial to have other adults observe in classrooms and share observations to help a teacher see the students from other perspectives, and shed a light on their own inherent prejudices, both positive and negative. The assistant, if the classroom has one, can also contribute in this capacity.

It is inadvisable to recommend an exact guideline for observation itself and for the balance between informal and formal. Certainly, informal observation should occur every day and throughout the day, and formal observation should occur at least several times a week, if not daily. The exact breakdown will depend on the teacher herself and how she observes most accurately, the number of children in the class, the degree of normalization in the class, as well as numerous other variables. Suffice it to say, Montessori spoke repeatedly about the importance of frequent objective observation in her training courses as a tool for teachers.

The second element of the alternative to standardized assessments is record-keeping. A teacher should keep exhaustive and specific records for all the children in her class. This can be done on paper or electronically, and indicates if a child has been presented a material, if he has worked on the material, and if he has mastered it. This is a daily, or at least a weekly, discipline.

As a part of record-keeping, in the elementary classrooms only, the children keep journals where they record their work for the day as well as the amount of time they spent on each activity. The

teacher then conducts a weekly one-on-one meeting with each of her students. During these regular meetings, the teacher will discuss with her students what they have accomplished during the week. She will bring their attention to areas of the curriculum that need more time and work, and she and the student together will come up with a plan for how to make sure that the necessary areas of the classroom are all covered. From these meetings, the teacher will make her own notes to stay updated in her records, and remember what to address in the child's next meeting. These meetings are not intended to keep the students moving in lockstep, or to prescribe rigidly to some allocation of time per subject. But they allow the children to be responsible for their own knowledge and education, and they help ensure that a child is moving along at a reasonable pace in all areas of the classroom.

With these activities, a teacher should have a reference of where each child in her class stands in all areas of the curriculum in any given week. It is this union of observation and record-keeping that allows a teacher to produce an official assessment of each child's academic achievement and the achievement of her class as a whole.

Montessori has a thorough and specific curriculum, and teachers should look for children to obtain mastery of each lesson and concept during the three years they are in each environment. If a child does not master every concept of the curriculum for the three-year age span, then it is the teacher's responsibility to understand why he did not. There are a variety of reasons this can happen, as unique to the particular situation as the child is. The teacher can study her observation notes, engage in further observation, request other adults to work with and observe the child, talk to the child's parents, and also examine her own actions and beliefs to determine why a student has fallen behind. If there is a particular concern about a child who is moving to a new classroom, the teacher should engage in positive communication about this with the teacher in the environment where the child is transitioning.

Reasons to Assess

All this being said, a standardized assessment may be required for a variety of reasons. Public schools need to meet mandated standards to demonstrate appropriate growth and achievement. Private schools may need them to prove to parents the validity and competence of the Montessori method. Ideally, the teachers and administration can minimize the required standardized assessments from their jurisdiction. Before assuming that all mandated testing will be required, the Montessori school can first pursue other options. For example, Montessori schools with similar interests can form a coalition and create a position paper explaining why these assessments are not necessary for the method. They may possibly find a compromise with local government and find other means of determining the students' knowledge and mastery.

Assessment Options

There are a selection of standardized assessments to choose from. Some are observation-based and almost completely unobtrusive. This is a great option for Montessori children. However, many require the child to stop working and leave the classroom for testing. In these instances, it is beneficial to choose an assessment with some timing options. For example, there are tests that are designed to be taken during a larger window of time than the test requires. Given this designation, the teacher has some flexibility as to when to administer them. Testing for a period each morning allows the remainder of the day to be consolidated, thus reducing interference with the three-hour work period. Likewise, if a child is engaged in work, the teacher may choose to allow the child to finish what they are doing before starting their test. Additionally, when the test can be given in a window of time that is wider than the test actually takes, the teacher may choose to skip a few days to allow the children to normalize themselves with work before continuing with the testing. It also is important to find a test that is suited to the student population, as well as the community needs. It should match the abilities of the students and also reveal the essential data. These tests seek to measure more than just what a child has been able to memorize. They also are able to assess constructive responses, general comprehension, and more.

Preparing Children

The main challenge for the teacher who must administer standardized assessments is that she has to balance the required assessment with the Montessori philosophy. In order to prepare children for a test, the teacher must inevitably control the pacing of the curriculum. This is not ideal for a Montessori classroom, and the teacher's charge here is to not sacrifice too much of the Montessori method for the practical need for testing.

Testing is a skill. It behooves the teacher to instruct her students on how to take the test. A fine approach is to consider this work as Practical Life work. Introduce the concept as "This is how to take a test." Similarly, "This is one way to get ready for Elementary" (Or Upper Elementary, or High School, etc.). Selecting a testing administrator who is committed to authentic Montessori will allow the school to do a non-Montessori activity in a Montessori way. During these instruction periods, the adult can teach the child practical skills such as how to color in test bubbles and how multiple-choice questions work, as well as more abstract skills, such as how to answer critical thinking questions. She also will instruct the child on the vocabulary of the test, such as noting that "units" and "ones" mean the same thing. Similarly, the administrator can teach the child how to imagine or even draw the Montessori materials on the paper (for example, the Golden Beads) in order to use them to answer questions. This preparation may also involve computer literacy, if the tests are administered on a computer. Then, practicing taking a test can be an activity the students choose in the classroom.

At a certain age, it is appropriate to include the children in the conversation about the standardized assessments. Explain to them why the school needs to test the children. In an age-

sensitive way, help them understand why their results matter and what the relevant consequences are. When testing is a regular part of the students' year, the teacher can also set individual goals with each child, supporting them in taking ownership of their assessment. In this way, the children are empowered in the testing experience.

During the assessment, there are ways to make the environment child-sensitive. For some tests, the teacher may have the option to administer them in the classroom. Providing a familiar setting for an unfamiliar activity can give the children security. When this is not possible, and the testing takes place in another environment, the teacher can expose the children to the testing room throughout the year, so it is a familiar place for them. It can be a quiet and comfortable area. Additionally, most tests only allow for "Bathroom Breaks" for the child to take a break. Make sure the children know that they can utilize these breaks to gather themselves during a long testing period.

Conclusion

Ideally, a Montessori school will not have to administer standardized assessments for their students. However, reality often dictates their use. In these cases, teachers and administrators are charged to find "a Montessori way do to a non-Montessori thing." It is a testament to the creativity and humanity of the Montessori curriculum that there are, in fact, ways to soften the experience and bolster student confidence and ability through the method. With this approach, children will have the opportunity to build a healthy and realistic relationship with assessments.

Whether a school administers standardized assessments or not, teachers and administrators should have knowledge about how children and classrooms are progressing. The information gathered through any kind of assessment should not be used to penalize or reward students or teachers. By examining the information from multiple perspectives, adults can further understand who is excelling in the Montessori environment, and who is not. Then the discussion about why children stand where they are in the curriculum can take place, and the answers may be both specific and global. This must be a thorough and balanced conversation, involving multiple adults with different experiences and backgrounds. It is only from these comprehensive discussions that teachers and administrators can draw valid and relevant conclusions from the information the assessments reveal.

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Resources

Conferences for public Montessori teachers

Local organization of public Montessori teachers

National Center for Montessori in the Public Sector (<https://www.public-montessori.org/>)

Other Montessori public and charter schools nationwide

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Computer Technology

Technology may be considered the most contentious and mysterious topic for Montessori educators. It is widespread in modern culture, but its forms have changed vastly since Dr. Montessori was developing ideas about children and education. To this end, educators and parents alike ask themselves, “What would Dr. Montessori have said or done about computer technology in the classroom and children’s lives?” How can the current forms of technology be incorporated into children’s lives in a way that is helpful and constructive, not harmful or destructive?

Technology From a Montessori Perspective

Dr. Montessori’s ideas about education and children in general provide a helpful framework for considering computer technology.

On the one hand, Montessori was a believer in innovation and societal progress. She celebrated human progress and wanted children to have access to science and technological improvements. She emphasized creativity and exploration. On the other hand, she believed that children built their own intelligence from real experiences with the physical world, ideally through as many senses as possible.

Perhaps the most valuable approach for considering technology is to look at it as Montessori would have: An additional material added to the classroom. From this perspective, educators can ask themselves the questions she asked as she considered what materials to include in the curriculum:

1. What needs are not being met by the current materials and require an addition?
2. Do the children choose this work at the detriment of other essential work?
3. Does normalization follow use?
4. Is it beautiful? Is it simple?

Cautions

There are a number of cautions to be aware of when considering computer technology in the classroom. First of all, Montessori’s curriculum assumes a gradual process towards abstraction. Abstraction must start with sensorial experiences for the child to take into his mind through the work of his body. The computer begins with abstraction. It is, in itself, an abstraction. Humans relate to it primarily by means of a keyboard, and output is generated on a flat screen, occasionally with audio feedback.

Secondly, Montessori believed in giving children physical and intellectual freedom to choose their own work, which they do for its own sake. The computer operates in a predetermined

program with limited opportunity for physical movement and free choice, and often supplies extrinsic rewards for activity.

Thirdly, Montessori held firmly to the value of normalization (self-discipline, joy, love of work, concentration) for the process of human development. She gives repeated examples of normalization throughout her work—all occurring after repeated experiences with physical manipulatives. A computer does not create this same opportunity.

Technology today is dangerously addictive even for adults with fully developed brains. Articles and books abound that address how to unplug from devices and the negative effects on emotional health, physical health, and social relationships. There are disturbing statistics on the increased risk for depression and suicide with ties to smartphone use (Weller, 2017). Adults must be very careful how much they ask of children in handling these very powerful tools.

Some people express concern that children will not know how to use technology if they are not exposed early enough. The truth is that technology is becoming more and more intuitive. Many toddlers can successfully navigate an iPhone or an iPad. Similarly, most coding languages are based in logic, sequence, and progressive levels of all topics thoroughly covered in the Montessori curriculum. It is no small coincidence that some of the greatest technology inventions of our time were devised by former Montessori children (Larry Page and Sergey Brin of Google; Jeff Bezos of Amazon; Will Wright of Sim City). Tellingly, they chose not to expose their children to technology until they were older (Weller, 2017). And while not a Montessori child himself, Steve Jobs also warned of too much early exposure to technology and prohibited his children's use of the very same devices he invented (Weller, 2017).

All of this is primarily to say: Proceed with caution. Given the unknown effects of technology on the developing mind, and the negative findings discovered so far, many say it is better to err on the side of less technology rather than more.

Appropriate Technology for Different Ages

Because Primary children (ages 3-6)'s minds are immersed in the tremendously complex task of understanding reality, the concrete real world of sights, smells, sounds, and social interactions in which we are immersed, the abstract technology of the computer is probably not helpful to them.

Elementary children (ages 6-12) have an increased ability for abstraction and regulation, and may benefit from limited access to a computer to learn how to research topics online (after exhausting the books available to them) and to develop the ability to touch-type. Additionally, this is the age when they learn "Non-Decimal Bases." In this lesson, along with other bases, they will learn about counting in base two, which, as it happens, provides the basis for binary code. An elementary teacher, at this time, may tell her students about binary code as follow-up work

for this presentation. The students, then, have the opportunity to explore computer language, guided by their own interest, and rooted in the Montessori curriculum. They may pursue it as a research project, and even put together a Going Out (student-run field trip) to learn about it.

Early adolescents (ages 12-15) will have increased access to technology. Here, in the classroom they will use the computer for research, for typing papers, and they may have beginning exposure to *supervised* social interactions via technology. They may use the computer as a tool for photography, presentations, musical creations, or other similar uses. A student who is especially interested in the power of computers and the relationship between technology and electricity may even take apart a (retired) computer to better understand how the machine works. They also may begin to explore concepts about computer coding, and pursue this as a personal project in the classroom.

Late adolescents (ages 15-18) now will have many opportunities to expose and regulate themselves in the world of technology. They will research, create, explore, and plan with the computer. They have a more fully developed social mind, and can more accurately interpret the written word, as opposed to face-to-face interaction, in social situations. Additionally, their brains have reached a level of abstraction where they can manipulate and relate to computer technology with ease. They probably will be successful with further work in computer coding if they are interested. However, this is also an age where they have increased distractibility and, for this reason, adults can actively discuss and model how to make choices to set boundaries for technology use so that it does not dominate their lives to the detriment of other activities and interests.

Conclusion

In short, computer technology today is a mixed blessing. It offers many possibilities that are both positive and negative. Educators must weigh these benefits and their drawbacks, and make choices about including this tool based on what they know about children and how they learn. Computers themselves are changing in how they are created and in the manner in which they communicate. As new technologies develop, such as quantum computing and artificial intelligence, the very nature of skills such as coding and software development will change in dramatic ways. To this end, in service of innovation, Montessori educators are ultimately charged with helping children to develop minds that are logical, dynamic, and capable of the deep concentration necessary to learn, imagine, and create.

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Adding Materials to the Environment

While creating materials was an essential part of the development of Montessori's method, she did not say much about it in her writings or lectures. She left no lists of materials for each age level, presumably because she did not believe the material sets should be static. She probably expected that over time materials would be added to the environment and others removed, but she did not describe in any detail how to go about this. The most valuable and useful information she left regarding this topic was in her actions.

What did Montessori do?

While developing her curriculum, Montessori experimented with different materials and activities, observing how children worked with them. She brought work into the classroom, observed, and made choices for her curriculum based on those observations. She kept the materials that were most meaningful to the child. These were the materials that were used consistently and offered repetition, exploration, and independence. This is the kind of work that she saw lead to concentration and, ultimately, to normalization. In her observations, she asked, "Did the children express joy in their work? Were they calm and peaceful after using the materials?" All of these experimentations and observations occurred over many years, signifying that she came to no choices lightly. Research shows that children in classrooms that use only authentic materials perform better on many measures than in classrooms with supplemental materials (Lillard, 2012; Lillard & Heise, 2016). This is not surprising, given the care Montessori put into the materials that she chose to leave in the rooms.

The Wildflower Model

Wildflower schools believe in innovation. They are designed with the potential to act as lab schools. As such, they are environments conducive to experimentation. Wildflower seeks to balance the authentic Montessori environment with a scientific approach. Wildflower teachers have a protocol and support for considering relevant supplemental materials.

Considerations and Actions Before Adding

When a teacher, at any level, believes that there is a need in the classroom for a new material, there are steps to take before embarking on this. First, the teacher should fully conceptualize what need is not being met for her students. *What concept or category of information are the children not grasping from the environment?* Secondly, she should examine the list of authentic Montessori materials for her current age group. *Is there a piece of material that is already intended to serve this purpose?* Next, she should observe the classroom. *Are there materials that the children are not choosing? Why? How do these materials relate to the topic of concern?*

These initial information-gathering questions and activities should inform the teacher whether this issue requires an entirely new material or if it is an issue that can be addressed with the

materials she already has at her disposal. If the problem is that the children aren't choosing relevant materials then the teacher should first put creativity and effort into re-engaging her class. Sometimes this means re-presenting the materials or finding new ways to make the work enticing—perhaps by engaging the help of an older child, telling an interesting story around the work, or moving the work to a more appealing area of the classroom. Sometimes children stop choosing a material when it has become damaged, dusty, or the paint has chipped. The materials themselves may need care and refurbishment. The teacher also may simply need to practice presenting the material until she is more comfortable with it. Connecting the children to the authentic materials in the environment is the primary work of the teacher.

There are general considerations to make when considering a specific piece of material. Was it introduced at the right time in the sensitive periods? Has the presentation been repeated? Has the teacher introduced the Points of Interest (points related to each presentation that draw the child's attention to the correct or more detailed way to do the work)? Has the child mastered the preliminary exercises?

Sometimes moving forward in the curriculum and presenting the next piece of material can aid in encouraging a child to solidify and expand his knowledge base. For example, if a child is struggling to connect with the Sandpaper Letters, then presenting the Movable Alphabet and letting the child see how many sounds he knows can motivate him to go back to the Sandpaper Letters and reinvigorate his interest in learning.

Occasionally the issue is that children are not getting the right information from materials that already exist. When this happens, it can be tempting to introduce "teaching aids" (materials such as flashcards and worksheets). By and large, these materials are not necessary. If children are working with materials successfully, they will learn the appropriate information. The only time that materials like this may be required is for children in the elementary who are engaging in remedial learning and the appropriate time to work with a material has long since passed.

Discussions Before Adding

After this work, if the teacher still believes there is an area of the classroom that is lacking, she should invite her colleagues to join the discussion. Montessori did not do her work alone, and neither should today's teachers. She can start by asking them a series of questions: *How do they perceive the area of the classroom that may be lacking? Do they find the Montessori materials that address the specific concept effective? How do they present this material? How do the children react and progress?*

Once this conversation begins, the teacher can revisit the area of the class with each teacher's approach and understanding to build new enthusiasm in her own classroom. She also can invite

her colleagues to observe. Their observations will provide insight into what is happening in her room.

Developing Materials

If, after multiple conversations with many colleagues and more attempts with experimentation and observation, the teacher determines that there is an unmet need in the Montessori environment, she must then consider the material that she proposes to introduce into the environment.

As it is developed, questions to discuss are:

1. What is the conceptual purpose of this material?
2. How does it fit into the overall curriculum?
3. Is it just a teaching aid or does it build conceptual awareness?
4. Does the material meet the inner needs of the developing child? Is it appropriate for any relevant Sensitive Periods?
5. Is it hands-on? Does it allow for the child to manipulate the material independently?
6. Is it beautiful?
7. Is there a control of error? Can the child explore the material without the adult?
8. Is there nothing else in the environment that can satisfy this need?
9. Does this work duplicate a concept that is already in the environment?

Once the new material is created, the teacher can introduce it to her classroom and observe, observe, observe. She must ask herself the same questions that Montessori asked. Not only must she determine if the children are deriving the necessary concept from the materials, but she must also consider if the children were joyful in their work, if they exhibited concentration, and if they were peaceful once they walked away from it. She also must determine if having this new material dissuades children from other work and she must determine why.

Ideally, her colleagues should experiment with the material in their classrooms and share observations. It is only through a group effort with a great number of children and many hours of observation that a material should be considered an essential addition to the classroom.

Montessori Materials in Today's World

Some people suggest that with the new appeals of technology (screens, tablets, phones, etc.) children are different from when Montessori was developing her curriculum. They suggest that the materials need to be altered, enhanced, or supplemented in order to continue to appeal to modern children. This concern fails to recognize that children's inner needs have not changed. While, decades later, the culture is different, humanity's essential nature is not.

Certainly, there are different challenges that face today's teachers. But assuming that this means materials need to be different takes a narrow perspective. Montessori and the teachers who trained under her also had considerable challenges—neglected children, starving children, a world war. Her curriculum is designed to meet children where they are regardless of their experience or circumstance.

Given the distractions of today's culture, it may be harder to attract the children to the work, but this does not mean that it cannot be done. The distracting technology should not be in the classroom. Materials should be attractive and complete. Teachers need exhaustive observation and record-keeping to assess where children stand academically and developmentally so that they can choose the appropriate materials. It is in locating this perfect match of material to child and presenting in the work in an appealing way that the child will truly connect and engage. It is hard work but it is not impossible.

Conclusion

What can educators today derive from this? Montessori did expect that materials would be added or altered to the classrooms. But her own activity is a guide for how this should be done. She chose new materials based on a lifetime of experimentation and observation, and always fully considered how any new material fit into the curriculum at large before adding it to the repertoire.

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