Spring 4-22-2021

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Early Childhood Education

Submitted in Partial Fulfillment of the
Requirements for the Degree of Bachelor of Arts
In the HTC Honors College at
Coastal Carolina University

Spring 2021

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Introduction

One of the hallmarks of a Montessori education is the development of children's social and emotional regulation skills. Embedded within the Montessori curriculum are opportunities for students to engage in regulating behaviors; for example, through the Montessori work cycle, children are able to learn to develop a plan of action and enact that plan for getting work done. However, what happens when the Montessori curriculum is interrupted due to the onset of COVID-19? Does the transition to online learning impact student opportunities for social and emotional self-regulation? This exploratory case study attempts to examine the ways in which a school's lower and upper elementary Montessori teachers adjust their instruction to meet student needs online, and the benefits and challenges they experienced as a result.

Literature Review

Because our research focused on Montessori curriculum, virtual learning, and self-regulation, we provide a literature review of each of these topics, examining previous research on how the Montessori curriculum allows for self regulation, and the ways in which this might change through virtual program implementation. It was important to determine how use of virtual programs might complement or interfere with key features of Montessori theory.

Montessori Curriculum

The Montessori classroom provides opportunities for students to engage in a multiage learning environment; primary classes consist of children aged 3 through 6 years, lower elementary serves grades 1 through 3, upper elementary serves grades 4 through 6, and middle school includes grades 7 and 8. Age groups are strategically designed to align with what Maria Montessori referred to as *sensitive periods*, times when children would undergo developmental milestones and significant learning. These sensitive periods affect children's academic understanding in addition to their social growth, which includes learning how to work as a community and collaborate with peers (Lillard, 2016; Zimmerman & Schunk, 2014).

Montessori teaching methods focus on the teacher, the learner, and the environment. The classroom allows opportunities for work cycles, which are long periods of uninterrupted work, and choice in work activities. Many of the lessons utilize concrete materials to enhance student understanding of abstract concepts. The environment provides access to needed Montessori materials and an open space for work completion, as well as the opportunity to work with others. During instructional periods, the teacher serves as a guide fby assisting in developing work plans, teaching lessons, and overseeing student progress (Lillard, 2016).

Over the last eight years, Montessori research has focused primarily on teacher autonomy in the classroom, examining how Montessori teachers use Montessori methods to meet the needs of diverse students (Ansari & Winsler, 2014; Carver-Akers, 2013; Danner & Fowler, 2015; Debs

& Brown, 2017; Donne & Briley, 2015; Lillard & Heise, 2016; Peng & Md-Yunus, 2014; Steiner, 2016; Tobin, Boulmier, & Zhu, 2015). Another research strand focuses on the use of Montessori methods to develop play and physical motor skills in young students (Bhatia, Davis, & Shamas-Brandt, 2015; Lillard, 2013; Pate, O'Neill, & Byun, 2014).

Montessori and Self-Concept

The Montessori Method is an educational approach that allows for children to develop self-regulatory skills through individualized and idiosyncratic lessons. The aim of the method is to support the development of the whole child while promoting independence, responsibility, an individual who has the utmost self-respect for oneself, and has the ability to rely on their own intrinsic motivation to guide themselves through decision making. As stated by Melanie Thiesse, "rather than simply filling children with facts, Montessori education strives to nurture each child's natural desire for knowledge, understanding, and respect" (American Montessori Society, n.d).

Montessori education strives to promote development of a child's social competence. In early childhood, social competence can be defined as the forming and maturing of the development of social skills, social communication, emotional regulation, as well as the ability to effectively produce and maintain interpersonal relationships. Between the ages of 3-5 children began to become aware of their own emotions, others emotions, and eventually that more than one emotion can be experienced in a complex situation (Dereli Iman, Danisman, Akin Demircan, & Yaya, 2017). In a Montessori classroom, preschool aged children depend on the relationships that they form with their classmates, their teacher, as well as their interactions with the environment to help foster these social and emotional skills. Children learn how to subside and cope with negative emotions as well as maintain positive emotions through these interactions and relationships in the classroom. Essentially, the regulatory skills learned through these preschool aged years are essential to success in higher education as well as an everyday life. "The ability to effectively navigate social situations for positive developmental outcomes" is a dynamic process in which there are crucial or sensitive periods (Dereli Iman, Danisman, Akin Demircan, & Yaya, 2017). By implementing the Montessori method within these sensitive periods of a child's development, educational characteristics such as independence, freedom of choice, the development of effective friendship, responsibility for one's own actions, as well as self-confidence are blossomed. Based on this information, as well as other relevant literature, the Montessori Method positively impacts the development of specific social skills, independence in and outside the classroom, and social competence (Kayili & Ari, 2011).

Although the American Montessori Society (AMS) has developed some suggestions for teachers on how to develop effective teaching videos to share with students, neither AMS nor Association Montessori International (AMI), provide teachers extensive information on how to translate the Montessori learning environment to online instruction; nor are there resources to discuss how these transitions impact students' self regulatory skills. In addition, research is currently unavailable on how teachers are navigating these changes to the curriculum. Therefore, this study attempts to fill a gap in the literature by addressing the following questions: In what ways are Montessori teachers able to address self-regulation in virtual instruction? What changes have they seen in students' self-regulatory abilities since transitioning to virtual instruction?

Methodology

Context

This study took place in a public charter school located in the southeastern United States. The school district serves 8,479 pre-K–12 students and includes eleven elementary schools. The school is the only charter school in the district, which opened in 2012 and serves 236 students in grades 1 through 8 (ages 6-13 years). As a charter school, teachers are allowed autonomy in classroom structure and planning, provided they follow the Montessori principles and learning cycle. The school is held to the same accountability standards as traditional schools across the district. The school follows a 3-year learning cycle with its students; students remain in the same classroom for 3 years.

Participants

Four teachers from the school participated in the study, two from the lower elementary level (grades 1-3) and two from the upper elementary level (grades 4-6). All four teachers taught using virtual instruction during the study. Information regarding each participant can be found in Table 1:

Teacher	Grade Level	Years at the Montessori School	Total Years Experience	Certifications
Cecilia	Lower elementary (1-3)	6	27	Elementary I Montessori; Grades PK-3 (state); Gifted and Talented
Deb	Lower elementary (1-3)	5	20	Elementary I Montessori; Grades PK-3 (state)
Chelsea	Upper elementary (4-6)	10	13	Elementary II Montessori; Grades 2-6 (state); Gifted and Talented
Kate	Upper elementary (4-6)	10	31	Elementary II Montessori; Grades 2-6 (state); Gifted and Talented

Table 1. Teacher Demographic Information

Data Sources

Focus Group Interview. A focus group interview was conducted with three of the four participants via Zoom. The interview was recorded and transcribed. Interview questions were semi-structured to allow open ended responses for participants. For a copy of the interview questions, please see appendix A.

Email Correspondence. Due to scheduling issues, the fourth teacher shared her responses to the interview questions via email, with follow up questions also answered via email.

Teacher Artifacts. Two of the teachers shared examples of student assignments and student responses to those assignments. These included videotaped lessons made to share with students, photographs of student projects, and information from their conversations with students in the classroom.

Individual Interviews. Individual interviews occurred with the two teachers that shared teacher artifacts with the researchers, to review the lessons taught, student outcomes, and

Data Analysis

Interview data and email responses were analyzed by segmenting the responses into coding categories. These categories were developed by using common themes found across each participant's responses (Yin, 2003). The teacher artifacts were then used to provide concrete support for the codes identified across the interview data. Data were first coded independently by each researcher. Next, the researchers met to discuss findings and revise codes as needed. Once the set of themes was agreed upon, the researcher then rewatched the focus group interview video and rechecked the emailed correspondence again to confirm the findings.

Findings

When examining teacher responses in the focus group interview, four major themes emerged, each of which is described in greater detail below: creating a safe space, resiliency, student accountability, and environmental influences.

Creating a safe space. All four teachers noted that their goal was to create a safe space in their virtual classrooms to help students deal with self regulation and emotional development. This occurred through a variety of formats; one teacher does a "Wednesday lunch" with her students so that they can log on and eat lunch together. The other three teachers noted that they also provided support at nonacademic times, so that students can log on, ask questions, and hang out. As shared by Kate, "Once a week we have our students come together as a cluster of kids where they can share their cats and show their gardens. Whatever they feel they need to do" (Kate, focus group interview, 3/8/2021).

When asked if they felt that their methods were effective, the teachers agreed that, for the most part, they seemed to help students to build a sense of community in a virtual setting. One teacher commented that students sometimes lingered online after class to talk with her, and that they sometimes shared information that they never would have shared in person. However, there were some concerns, particularly with dealing with students that would get frustrated by content difficulties or technology issues. While the teachers shared that they appreciated how they were able to allow a student to log off to gather themselves and rejoin the group when ready, they also recognized that students may be showing signs of frustration (e.g., watering eyes) that can be missed when looking at twenty-four faces on a computer screen. One teacher shared that she tried to watch body language with two students that she knew had difficulties with self-regulation. The teachers explained that their goal was to provide students those other moments, such as free time to log in and just talk, so that students will hopefully feel more comfortable sharing their frustration in class so that they can work through it together.

Resiliency. A major concern and topic of conversation among many adults is how the 'COVID generation' of children will bounce back following their extended absence in an educational setting. How ever will students rebound after they miss so many opportunities for growth and development in school? While it may be surprising, a commonality among all four teachers was that the majority of children in their classes were unaffected. As explained by Chelsea, "For me as the adult, I know how much we're missing because we're virtual. Because I know, I've been missing that (the building of student teacher relationships) a lot. But in the students' minds we still have a close relationship. We are still making the impact socially and emotionally, it's just not the one teachers are used to. The students are content with the friendships and relationships they have developed" (Chelsea, focus interview group, 3/8/2021).

The other party that typically has concerns regarding resiliency is the parents and families of students. Because most families have been through the traditional education system, they are likely comparing the experiences they had in school to the virtual experience their children are currently having. Families picture the typical general education classroom, prior to the coronavirus, when imagining what they feel the educational needs for their children are. The reality of the situation is that regardless of if children are in school or virtual, their education will be different than precovid times. Cecilia shared, "unfortunately, in-person is far from "normal" right now, so they're not really missing what they *think* they might be missing" (Cecilia, email, 3/8/2021). At present, students attending school in person are in a scenario unlike prior school years. Students are wearing masks and socially distanced. Group work is extremely limited, students sit within plexiglass barriers, and students would not be allowed to intermingle with other grade level classes. Because of these restrictions, Cecilia brings up the argument, "the needs of students with existing social and emotional regulation skills might be better met in the "in-person" option, but maybe not. Is it better to be in a tiny box on a screen or in a tiny plastic box in the classroom? I really don't know" (Cecilia, email, 2021). Both Cecelia and Kate shared examples of the lessons that their students were completing at home, which allowed opportunities for movement, STEM (for example, building a robot out of recycled goods and writing about what the robot did), and hands-on math that would not be completed in the school building due to corona-based safety restrictions. So while children may be missing some of the typical in person educational opportunities that their families experienced, their virtual environment may be less restrictive than that of the in-person options available.

Student Accountability. Working with students on developing personal accountability, an important component of self-regulation, was a common concern for participants. As shared by Chelsea, "We have kids who are relying on us to give them skills to be self reliant" (Chelsea, focus group interview, 3/8/2021). The teachers shared that many times student frustration came not from the content, but from students not turning their work in or choosing activities such as playing video games during class break times (when they should be completing independent assignments). Chelsea further explained, "Once the excuses go, the students we are meeting with are the ones who decided to play video games during the school day and didn't come to class. Then what we are combating with are things that the students have messed up for themselves" (Chelsea, focus group interview, 3/8/2021). For both Chelsea and Kate, this appeared to be a greater issue, perhaps because these teachers are working with students in upper elementary grades.

All of the teachers indicated that it was generally evident when students had support at home to aid them in personal accountability, and when they did not. Differences in student

responses (avoidance of work versus no parental help) were easier for the teacher to detect based on how students responded when asked about absences or missing assignments. Across both age bands, student concerns over missing work were exacerbated by parental decisions to have the students miss school, such as booking a doctor's appointment in the middle of the day. These situations appeared to upset students more than the times when their absences were their own fault (such as when playing video games), due to the fact that these absences were beyond their control. However, regardless of age group, the teachers agreed that students recognized the need to be accountable for their own actions, especially if contact with parents was involved: "Parents are expecting to hear from us, so when they don't, no news is good news" (Chelsea, focus group interview, 3/8/2021).

Environmental Influences. When discussing frustrations associated with the virtual learning platform, all four teachers mentioned one specific idea: influences in a student's home environment affect the way they develop. As educators in an online education system, one can only interpret what's seen on camera. As Chelsea explained, "There's no way to control what's happening at home. There are ways to help and assist, but ultimately everyone runs their homes the way they think is best" (Chelsea, focus group interview, 3/8/2021). Because student's home life and school day have merged together, their rules and ideas about education have as well. Families are having to balance work and family life, and their child's education at the same time. For some, this means that the child is unsupervised at home during the school day, while others have the resources to be home with their kids. The teachers noted that they try to stay aware of these circumstances, so that they can determine the best means by which to reach the students. As a teacher, one cannot control how much emphasis is put on the importance of education in the students' home. Because of this, ideals that are typically developed in the classroom such as the formation of self accountability, interpersonal problem solving skills, or even stamina could be lacking. These all develop on environmental influences in a student's life.

On the other hand, some children are thriving due to their new environmental influences. As stated by Deb, "the kids who are not getting the support at all are being impacted. The kids who are getting the support at home are being impacted, but in a positive way. It really depends on what happens when the students click 'end meeting'" (Deb, focus group interview, 3/8/2021). The teachers in the focus group interview also shared that they found themselves providing more educational resources to help families in building their child's self-regulation skills due to virtual learning, rather than having to focus on content alone. For example, one teacher provides articles and tutorials to explain to families "this is what it looks like to talk to an upset child, this is what it looks like to talk to a frustrated child, these are things you can do to help your child practice independence" (Focus group interview, 3/8/2021). Cecelia also shared examples of the work that she assigned students; rather than only assign projects that they had to complete on their own, the students in her class were encouraged to work with a sibling or family member to complete tasks such as making the longest paper chain using one sheet of paper. She noted that the kids were excited to involve others in their activities, and that it worked for her if it helped to keep the students engaged and involved (Individual interview, 3/21/2021). When families are provided the resources to engage in and support their child's social and emotional development, students were able to benefit.

Implications

While this study utilized a small sample size, and therefore cannot be generalized across all learning situations, the findings highlight some key themes for Montessori teachers working in the virtual environment. In many ways, virtual learning did not impact some aspects for helping students develop self regulation. Students were still held accountable for completing their work, and accepting responsibility for their work. They also displayed resiliency in handling changes to the learning environment - despite the classroom space no longer following the traditional model, the students were largely unaffected by the changes, unlike the teachers.

In other ways, the teachers shared that there were issues and concerns with aiding students in self-regulation skills that they would not have dealt with in the same way in an in-person setting. One concern for teachers was the difficulty in recognizing signs of frustration for all students in the virtual setting; it could be difficult to see when students were getting upset on the screen. In addition, the types of distractions that students dealt with at home (e.g., video games on break time) presented new challenges for teachers to handle as they tried to get students engaged in their work. Finally, providing parents support not only with the content taught, but also how to help their children develop self-regulation skills, became more prominent than in typical face-to-face instruction.

Each of these issues brings new implications for those working in the virtual learning environment as they help students to develop self-regulation skills. As teachers, moving forward it is important to continue to foster social and emotional regulation skills in students. Teachers should continue the supports they have developed in their virtual classroom, but also consider ways to extend them to ensure accessibility for all students. For example, it may be necessary to provide opportunities for students to make up lost classroom time that may be due to environmental factors. Creating time management plans for students who may be easily deterred from their school work or sending out weekly check-in surveys to gauge how students are feeling may help teachers to gain insights on students' emotional well-being, compared to having to guess through a screen.

While children need all of these supports it is important to keep in mind how much families influence their child's education. Teachers need to be providing opportunities for families to become more involved in their students' learning. Teachers should consider not only having a safe space for students, but also a space where parents can come and express their questions and concerns. By creating this space, teachers could potentially boost student learning and development from home by supplying another adult with the tools needed for success. Parental concerns should be asked for frequently by the teacher, so they can be addressed as quickly as possible. Provide classroom parents not only instruction, but assurance. Their children are not going to just get through virtual school, but thrive.

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Appendix A

1. What strategies if any have you implemented to help your students deal with frustrations from home?
2. Do you see signs that your students are becoming overwhelmed often due to the online platform?
    a. How frequent are these signs?
    b. What do they look like?
    c. Have you seen a difference in the amount from the start of online learning to now?
3. Do you feel your students are able to self regulate their emotions through the online platform?
4. How do you feel like the online platform has impacted students with delays in social and emotional regulation skills?
5. How are you promoting the development of social and emotional skills in your classroom?
6. Is your approach different online versus in class?