The Montessori method and its impact on intrinsic motivation and social-emotional development in the United States: a review

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Introduction

The effect of different education systems on children's development has been studied by researchers for decades. One of the most studied education systems is Montessori education. First created by Maria Montessori in the early 1900s Italy, the Montessori method has had a large impact on how education impacts childhood development. Maria Montessori was one of the first female doctors in Italy. During her time as a doctor, she joined a research program centered around pediatric psychiatry. This program placed her in a mental asylum for youth, where she learned the effect that the environment has on behavior. After that program, Montessori joined the Orthophrenic School for two years. The school hosted children with varying disabilities; it was during her time at this school that Montessori began her pedagogy focused on education geared towards children with mental disabilities. Montessori used a certain environment and materials to foster education, which were designed to coincide with the stages of childhood development. Eventually, Montessori opened her first Casa dei Bambini (Children's House), and the Montessori method only grew. Montessori ultimately published her pedagogy, and the Montessori method was implemented in schools around the world. The Montessori method can now be found in at least 110 countries.

The stages of childhood development have been researched by many scientists. Two main emerging theories were Erik Erikson's psychosocial theory and Piaget's cognitive developmental theory. Erik Erikson's psychosocial theory emerged in the 1950s and has eight stages[1]. The stages consist of two opposite tendencies. One tendency is positive and can be attained during that period of development, and the other tendency is negative and can also be attained during that period of development. This theory suggests that the individual has the opportunity to adopt a developed virtue or a maldeveloped virtue. The eight stages are: Infancy (Trust vs. Mistrust), Early Childhood (Autonomy vs. Shame), Play Age (Initiative vs. Guilt), School Age (Industry vs. Inferiority), Adolescence (Identity vs. Identity Confusion), Young Adulthood (Intimacy vs. Isolation), Adulthood (Generativity vs. Stagnation), and Old Age (Integrity vs. Despair). Piaget's cognitive developmental theory emerged in 1936[2], 14 years earlier than Erikson's. Piaget suggested that during childhood cognitive development, children take in new information and change their previous knowledge to fit the new information. Piaget's stages are: Sensorimotor stage (birth to two years), Pre-operational stage (two to seven years), Concrete Operational stage (seven to eleven years, and Formal Operational stage (12 years onwards).

In this paper, I will compile and analyze pre-existing studies that compare Montessori education to standard education. Any studies reviewed in this paper will use data from the United States because comparing the two different education systems in different countries could result in biased information due to different funding, different resources, and different priorities within the education systems. I will also look at the data and see how each different educational method coincides with the stages of development, as that would be what most benefits the child. There

is a lack of literature examining the Montessori education method, as well as comparing the Montessori education to standard education. Therefore, there has been no consensus as to which education better suits child development. This literature review aims to examine how the Montessori Educational method impacts children compared to the United States standard education system through social development, intrinsic motivation, and emotional development.

Intrinsic Motivation

A study performed by Kevin Rathunde in 2003 examines potency, intrinsic motivation, and flow experience in Montessori middle schools vs. traditional middle schools[3]. The study looked at 6th and 8th-graders in Montessori and traditional middle schools. The Montessori school had 150 6th and 8th-grade students, while the traditional school had 400. The study split the findings into two parts. Part 1 compares the two groups' quality of experience. Part 2 compares the social contexts of the schools and the effects on a supportive environment.

Part 1 explains how the traditional middle school setting does not coincide with adolescent development. They explain how adolescents look for peer feedback and collaboration; however, most middle schools limit collaborative work, making it an environment not suitable for adolescent development. Additionally, adolescents become more self-conscious, which is only emphasized by the "increased public evaluation and focus on grades"[4]. The study focuses on goal theory, which compares task goals (correlation with intrinsic motivation) and performance goals (pressure from public evaluation), as well as flow theory, which describes the concentration given to an intrinsically motivated task. Flow is beneficial to the educational experiences, as it causes students to continue engaging in certain activities. The students participated in the Experience Sampling Method (ESM), which is an activity that takes place 8 times a day, for a full week. Each time a watch beeped, students took out a form and described how they were feeling in that moment. The forms focused on: mood, potency, salience, intrinsic motivation, and flow.

Part 2 focused on the social contexts of both environments and how they affected the overall learning environment. Specifically, they examined the problems of diminishing student-teacher relationships, lessening peer interactions, and more focus on one-way teaching (lectures). These three problems do not align with adolescents' needs at their stage of development, and could be contributing to lower motivation, achievement, and overall experience. Teachers were measured in three categories: supportive, orderly, and safe. Peers could be described as classmates, classmates - friends, or friends. This was measured by incorporating an additional response to the ESM, which asked students to describe how they felt about their classmates. Finally, the ESM test also included a response that details classroom activities such as collaborative work, passive listening, watching media, and individual work.

The results of part one signified that Montessori students had a significantly better quality of experience than that of the control group. The Montessori group reported significantly higher marks for potency, affect, and intrinsic motivation. The traditional group reported higher salience, but the report was false because they had lower feelings of intrinsic motivation. For flow, Montessori students had a higher sense of flow for academic activities, but lower than traditional

students for non-academic activities. The results of part two also favored Montessori students. Montessori students reported positive feelings about their teachers as well as the student-teacher relationships. While the traditional students did report lower on this, their reports were closer to Montessori students regarding feeling safe with their teachers. There was the biggest difference between the two groups' answers with teacher support, with results favoring Montessori. For social contexts, Montessori students reported that they view their classmates as classmate-friends, while traditional students view them as classmates only; however, this may be due to the organization of the schools. In the overall study, all results were in favor of the Montessori students.

The results from this study provide perspective and possible solutions to the problem of the current traditional school setting. The study states that the Montessori students will do better because of their intrinsic motivation and its effect on achievement, because they have been discouraged from performance-based academics. These results could signify the importance of moving away from grade-based education to education that focuses on creating a student with intrinsic motivation, which will serve them well in their future. In order to continue understanding the effects that primary education has on future success, studies could be conducted that examine Montessori students vs. traditional students and their career outcomes. This could measure if the Montessori's implementation of intrinsic motivation has a significant impact on future success.

Another study, conducted by Victoria A. Fitch in 2013, examined how goal setting impacts intrinsic motivation in Montessori classrooms[5]. The study was conducted by focusing on Hockessin Montessori School in Suburban Delaware. The school population starts as early as 14 months and goes until 14 years. The experiment performed was set up to be quasi-experimental, so there was a pretest and a posttest before the main study. The pretest and post-test were questionnaires that measured students' perception of teachers' goal orientation. The pretest and posttest were split up into different sections: learning strategies, task persistence, and classroom attitude.

The main intervention performed was focused on "the significance of goal setting on intrinsic motivation, in a Montessori environment"[6]. 14 students participated in the pretest, but only 7 were chosen to participate in the intervention. These 7 children participated in a one-on-one meeting where they discussed their strengths, areas of improvement, and two goals they can achieve to improve those areas. After students set the goals, their performance would increase. For example, the study states that student S.S. set a goal to turn in her sentence analysis on time; the study reported that this was accomplished 100% of the time. Another example was when student M set a goal to achieve a 90% or higher on his unit test. The student did this successfully three times. Even though the improvement was not 100%, it did occur, and this can be seen for every student involved in the intervention. Even if the student did not completely accomplish their goal, improvement was seen in some capacity. This example of improvement after setting a goal was seen in all students who participated in the intervention. The study stated: "It is empirical that the goal-setting intervention did have a positive effect on the intrinsic motivation."[7]

The study then proceeds to explain that in an environment where students prioritize intrinsic motivation rather than extrinsic motivation, the overall motivation of the student improves. Because this concept most aligns with the Montessori education, it is clear to see the benefits that the Montessori education has on students, specifically in developing motivation.

As seen in these two studies, the Montessori method of education focuses more on mastery-based learning, rather than performance-based learning. Mastery-based learning is a student learning to get better in a subject, not for a grade, but for the sole purpose of trying to further develop their skills. Performance-based learning is when students learn only to meet a certain grade. This develops extrinsic motivation, where mastery-based learning develops intrinsic motivation. Not only will the development of intrinsic motivation better serve children throughout their education journey (as it teaches students to create a stronger bond with the knowledge), but it also helps these individuals outside of school, as grades are not given in the corporate world, so extrinsic motivation loses importance in adulthood. Finally, the form of mastery-based learning better fits the child development needs, rather than performance-based learning. This makes the Montessori classroom a better fit for children and adolescents, as it coincides with their developmental needs and prepares them for the future. While there is a lack of studies on the benefits of Montessori education, the studies that are present consistently show that Montessori education has more benefits for the student, rather than a traditional education. Therefore, it can be deduced that Montessori education is a better education system for children, as it better correlates with development and creates stronger intrinsic motivation, better serving them in the future.

Social and Emotional Development

A study conducted by Angeline Lillard and Nicole Else-Quest evaluated the academic and social impact of a Montessori education in primary and elementary student age groups[8]. The control group was determined by students who were not accepted into a Montessori school lottery. The experimental (Montessori) group had 59 students, and the control group consisted of 53 students. The study evaluated academic/ cognitive, social, and behavioral success. The academic tests were done by using the Woodcock-Johnson Battery 7 test for each age group. Additionally, the 5-year-olds were given a test examining executive function, while the 12-year-olds were given an essay writing test. After all testing on both age groups was done, overall Montessori students had an 80% chance of passing any test, while the control group only had a 50% chance of passing. Social and behavioral tests were performed with a series of scenarios that students had to choose an answer to. Results for the primary-aged students (3-6) favored the Montessori group in all areas tested. The students ages 6-12 were favored in the social/behavioral tests, with results showing that Montessori students were significantly more likely to choose the positive response to a social scenario. However, in the academic tests, the Montessori students had significantly more creative essays, but grammar skills did not have a large difference from the control group. In the Woodstock-Johnson test, the outcomes were very similar for both groups tested. This may be due to a later start time in the Montessori program, for the 12-year-old students, or the control group had caught up developmentally.

In another study conducted by Lillard et al., the emotional changes between Montessori and non-Montessori preschoolers in the U.S over 3 years were examined[9]. The non-Montessori

children were spread across 71 different schools. The Montessori children were spread across two Montessori schools. Both schools are recognized by the Association Montessori Internationale. The children participated in a one-on-one meeting with one of 10 trained research assistants. During these meetings, children were tested on Academic Ability, Executive Function, Theory of Mind, Social Problem Solving, Mastery Orientation, and Creativity. These tests utilized 4 sets of materials, which rotated for each test. For academic ability, children participated in the Woodcock-Johnson III Tests of Achievement. These covered areas such as vocabulary, reading, and early mathematics. Executive function was tested using the Head to toes game, but children had to touch the opposite body part of what was being called out. They also used the Design copy subtests from the Visuospatial processing section of NEPSY-II. In the Theory of Mind, children participated in four tests from the Theory of Mind Scale. For social problem solving, students participated in Rubin's Social Problem-Solving Test, in which students described what they would do if another student had a swing for an extended period of time. To test students' Mastery Orientation, students were tested on two different types of puzzles, one which was fairly easy, and one which was much more complicated and unsolvable. Finally, for the test for creativity, researchers ran the Alternative uses test, where children were shown an object and had to say different ways they could use it, for example, a pencil. Additionally, children were asked questions to determine their overall feeling about school satisfaction. The researchers conducted this study over the course of three years to see the progression and overall impact of the two different academic settings. After three years, the researchers concluded that the Montessori students advanced at a higher rate than the students from other educational backgrounds. In the data analysis of the academic achievement test, researchers predicted that Montessori students would have a steeper growth curve in all areas tested. Researchers were able to see this by creating a graph of the composite Z scores of the control students and Montessori students. The overall Z scores were all greater than the mean, whereas the control students' Z scores were less than the mean, so the Montessori's predicted growth curve was positive. The researchers concluded that Montessori schools had better holistic development than the standard schools. There were differences in the majority of the areas tested, and if there was no difference, the students performed equally. The control group did not outperform Montessori students in any area.

As seen in these two studies, not only does Montessori education advance students at a quicker rate, academically, but students are also better developed in all areas, specifically their social and emotional areas. Both studies looked at how students would solve a social problem, and each experimental group chose the better answer, even when the experimental group was preschool-aged. This test demonstrates how Montessori instills within children, at a young age, the necessary social skills that help them navigate life the most diplomatically. As seen in the development of intrinsic motivation, students in Montessori experience and education, which matches their developmental needs. It explains why children develop a strong sense of intrinsic motivation, as well as a strong set of social and behavioral skills.

Conclusion

The goal of this paper was to compile past studies to find an answer to the question: How does the Montessori method impact children through intrinsic motivation, social development, and emotional development, compared to the United States standard education system? The paper

looked at studies that tested the development of intrinsic motivation in Montessori vs. non-Montessori students, as well as social and emotional development. All studies concluded that the Montessori method of education created intrinsic motivation in students, rather than extrinsic motivation, as well as better social and emotional skills. Studies also showed that Montessori students were more advanced academically. While education was not a focus of this study, it is an added data point that only reinforces the idea that Montessori education better benefits children and adolescents. Overall, after reviewing the studies in this paper it can be concluded that Montessori education leaves a more positive impact on intrinsic motivation, social/ emotional development, and the added academic development, on its students, compared to the standard education system in the U.S. This positive impact can be attributed to Maria Montessori's original pedagogy, and its ability to coincide with the developmental needs of children and adolescents, overall making it the better option of education in the U.S.

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