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What We Know About What We Do

THE EVIDENCE BEHIND MONTESSORI PRACTICE



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As part of MPPI's 2015 inaugural efforts to establish a unified voice for Montessori policy advocacy, the MPPI Council developed the foundational MPPI Montessori Essentials. This concise list outlines the core elements that define a high-fidelity Montessori program, providing a clear framework for policymakers to understand what Montessori is, and why Montessori advocates call for specific reforms that promote the growth and accessibility of high-quality Montessori education.

The Montessori Essentials were created in collaboration with MPPI's founding organizations, the American Montessori Society and the Association Montessori Internationale – USA, Montessori pedagogical standard bearers.

To further the impact of the Essentials, MPPI has partnered with UVA's Montessori Science Program to release the following series of literature reviews. These reviews compile and evaluate the evidence from wide bodies of educational, developmental, and psychological research to establish what is known about specific elements of Montessori practice. In doing so, they provide evidence in support of the MPPI Montessori Essentials and offer specific policy recommendations that align with current data, reinforcing the case for high-fidelity Montessori education. These user-friendly one-pagers can be used individually or combined into a longer publication titled *What We Know About What We Do: The Evidence Behind Montessori Practice*.

Mixed-Age Classrooms

Montessori Practice

Montessori classrooms are organized according to specific 3-year mixed-age groupings that allow children to interact with peers both younger and older than themselves, and therefore encourage natural and widely supported practices such as imitative learning, collaboration, and peer tutoring.¹ This mixed-age design is developmentally inclusive, allowing children to receive additional support or accelerate their learning while remaining in the classroom with their social peers. In many states, however, diverse policies related to teacher licensure, funding, and childcare licensing can prevent Montessori programs from grouping children in ways that align with the Montessori approach and provide tremendous benefits to students.

What the Research Says

Important developmental theorists, including Piaget and Vygotsky, have emphasized the importance of learning from peers. In particular, Vygotsky emphasized collaboration with just-older peers, who can help a child with tasks in their “zone of proximal development,” meaning anything that they can do with support but not yet independently.² That said, research on mixed-age classrooms in conventional settings, where the term typically refers to 2-year spans, is mixed, inconclusive, and not typically applicable to the structures and practices of Montessori classrooms. Some studies indicate benefits for all, or at least younger, students in such settings and others indicate drawbacks for older students. To illustrate, in support of mixed-age classrooms, some researchers have found advantages for children’s language development.³ While overall, gains are sometimes isolated to the younger children, teachers’ classroom management skill appear to be a crucial factor as to whether that is the case. In fact, one study found that the largest vocabulary gains of all (for both younger and older children) were found in mixed-age classrooms led by high-skilled teachers.⁴ This is an important nuance, given the fact that Montessori teachers receive specific training to manage larger, mixed-age groups of children. In some studies, only the younger students in mixed-age classrooms showed benefits like more goal-direction, peer interaction, and longer attention-spans,⁵ and exhibited fewer off-task behaviors and negative interactions with peers and teachers⁶ than students in same-age settings.

In other studies, social-emotional benefits extended to *all* ages of students, with children in 3-year mixed-age classrooms experiencing more extended peer interactions, more frequent positive (as well as fewer neutral to negative) interactions,⁷ and less loneliness, aggression, and behavioral problems⁸ than their same-age grouped peers.

“Mixed-age classroom design allows children to interact with peers both younger and older than themselves, and therefore encourages widely supported practices such as imitative learning, collaboration, and peer tutoring.¹”

Research specific to Montessori contexts has reinforced the notion that mixed-age settings bolster language development for younger students. Here, researchers hypothesized that the mixed-age grouping of Montessori classrooms may promote more frequent peer-to-peer talk on the part of younger students via modeling by older students.⁹ Montessori students do, in fact, consistently outperform their peers on tests of language and literacy,¹⁰ and while many factors might contribute to this advantage, mixed-age settings are one plausible reason. In addition, Montessori students have been found to exhibit advanced social understanding, a characteristic that researchers often

attribute to the fact that the mixed-age classroom requires students to assume a wider diversity of perspectives over the course of their day.¹¹

How do we reconcile this with research in typical environments that has found no significant differences in the outcomes of students from mixed-age vs. same-age groups,^{12, 13, 14, 15} and even some social, non-cognitive, and academic drawbacks,¹⁶ particularly for the older students?^{3, 5, 4, 17} A recent study suggests that some of those drawbacks are related to teachers' tailoring of the environment and learning materials to the perceived needs of younger students, and therefore neglecting those of the older ones.¹⁸ In Montessori classrooms, however, both the materials and instruction enable students to engage with concepts that extend well past expectations for their age, if they demonstrate readiness.¹⁹ Therefore, one would not predict the same disadvantages for the older children in mixed-age Montessori classrooms. On the contrary, existing research finds that Montessori kindergarteners (the oldest children in their preschool classrooms) typically outperform their peers on both academic and noncognitive measures.^{10, 20} Importantly, researchers point out that the predominance of mainstream mixed-age research focuses on narrow age bands (typically 18 months to 2 years), rather than the 3 years outlined in national Montessori school accreditation standards. As a three-year grouping allows children exposure to both older and younger classmates across their three years spent in a classroom, these researchers recommend further examination of varying degrees of age-variance.¹²

Furthermore, there are two salient features inherent to the mixed-age structure of Montessori classrooms that find broad and consistent support from research, namely the prevalence of peer-tutoring that occurs within this context, and the multi-year matching of child to teacher (sometimes referred to as "looping"). Regarding the former, opportunities for both formal and informal peer tutoring are an integral element of the Montessori approach to mixed-age classrooms. Younger students may observe, question, and imitate the work of older peers, for instance. Children may collaborate on work with a material; older students may even present some lessons to their younger classmates.¹ The effectiveness of peer tutoring is reliably supported by evidence demonstrating that peers make successful tutors,²¹ that benefits apply to a diverse range of contexts and students,²² across both academic^{23, 24} and social²⁵ domains for both learner and tutor, and that they persist through time.^{21, 26, 27}

In addition to peer learning, mixed-age groups also provide students with multi-year consistency of teacher, or "looping." The practice of looping is supported by evidence highlighting academic benefits^{28, 29} that appear

strongest amongst minoritized students,³⁰ as well as higher performance on measures of personal and social development,³¹ and lower rates of absenteeism and suspension.³² Furthermore, benefits to individual students increase in correlation with the proportion of looping students in a classroom,³¹ suggesting that Montessori classrooms (in which all students are looping) may reap maximum benefit from the practice. Research suggests that looping can benefit the classroom environment,³⁰ and that students, teachers, and principals credit the practice for both improved sense of community and increased academic achievement.³³ Importantly, most looping research examines a two-year match between teacher and student, leading some researchers to hypothesize that Montessori's 3-year match could confer additional benefits.³⁴

In summary, it is important to note that many researchers emphasize that a host of variables, such as classroom quality, level of teacher education,³⁵ level of peer skill,³⁶ classroom management,³ individual student engagement,⁶ and the degree of teacher-led activity,³⁷ need equal consideration as factors that shape whether and when mixed-age classrooms prove beneficial. Therefore, while studies that examine mixed-age groupings in isolation from other variables draw mixed and inconclusive results, research into some of the mechanisms known to facilitate the success of mixed-age groups (e.g., peer tutoring, teacher looping, student-lead learning, specially prepared teachers) may prove more enlightening. Given that those mechanisms are foundational to Montessori practice and teacher preparation, research supports the idea that Montessori classrooms are designed in ways that amplify benefits (and avoid suspected risks) of mixed-age groupings.

Recommendation

The wider body of educational research yields mixed results regarding multi-age groupings, but repeatedly emphasizes that *impacts are context specific*. Because Montessori classrooms implement the very practices known to optimize student success within mixed-age contexts (e.g., peer tutoring, looping, student-lead learning, targeted teacher preparation, individualized instruction), and avoid potentially problematic ones (catering to younger learners while neglecting to challenge older ones), **we recommend that policymakers allow Montessori schools to implement the 3-year age groupings aligned with their pedagogical standards.** This recommendation should be applied consistently across all regulatory agencies and within the parameters of all educational funding streams.

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