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Meeting Children in the Margins: A Grounded Theory Study of Montessori Education's Global Reach

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ABSTRACT

Addressing education needs for children whose formal schooling options are limited due to geographical, socioeconomic, racial, or developmental barriers remains an enduring challenge, with global progress flatlining over the last two decades. Although most nation states have adopted right to education mandates, meeting holistic education needs of children requires schooling opportunities to be *available*, *accessible*, *acceptable*, and *adaptable*. Addressing these collective needs calls for solutions that are rigorous, flexible, and adaptable to diverse context-specific and individually defined learning needs of children worldwide. Although Montessori education methods and philosophical underpinnings hold promising solutions to meet global education needs, its diverse application and use remains underrepresented in the literature. This constructivist grounded theory explored diverse application of Montessori programs worldwide. Analyses were informed by a multi-phase, multi-year investigation from 34 interviews with practitioners ($N = 31$) in 14 countries to understand *where* (contexts), *why* (purposes), and *how* (processes) the Montessori approach was applied. Resulting theoretical models demonstrate diverse application, adaptation, and implementation processes evident in Montessori settings. Within the context of its vast adaptability, Montessori education may be aptly applied to meet the learning and development needs of children in any setting and under virtually any condition.

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Early childhood; elementary; global education; informal school; Montessori; under-resourced

Current data analyses purport that for millions of children around the world access to an equitable education remains out of reach – a problem that disproportionately impacts low-income countries where estimates of children out of school continue to rise (United Nations Children's Fund [UNICEF], 2019; United Nations Educational, Scientific and Cultural Organization [UNESCO], 2019b; The World Bank, 2022). Formal education is broadly considered a human right, an essential skill for success in our current global economy, and fundamental to living a life of value (Robeyns, 2006; United Nations Educational, Scientific and Cultural Organization, 2016, 2019c). Yet, despite human rights justifications and the extensive work of governments and ministries of education, nongovernment organizations (NGOs), and national and international mandates, formal education for every child remains an elusive goal (e.g., United Nations Children's Fund, 2019; United Nations Educational, Scientific and Cultural Organization [UNESCO], 2016). For children in the margins – those who are least likely to have access to equitable education opportunities – specific needs and circumstances that challenge conventional methods of education (e.g., remote, under-resourced, and/or conflict-ridden geographies) inhibit sustainable implementation of formal

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schooling (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2019a). Thus, innovative, adaptable, and culturally sustaining approaches are needed to tackle the unique needs of children residing in these settings. One promising approach may be found in Montessori education.

Existing for over a century, Montessori education practices incorporate unique methods that may better align with marginalized circumstances than conventional methods of education (e.g., Holmes, 2018; Schonleber, 2014; Tschurenev, 2021). Such current and historical applications of Montessori education highlight potential strengths in addressing unique education challenges; however, the current landscape of Montessori application in diverse settings is underrepresented in academic literature. The purpose of this study was to explore the diverse application of Montessori education to understand its potential in meeting the unique needs of children in the margins within the context of global education.

Educations as a right, a tool, and a way of life

Education involves both learning *and* schooling – both actionable behaviors that often co-occur but remain distinct. While this inquiry does not attempt to disentangle the political, economic, social, or philosophical complexities that abound on the topic of education, it is critical that any discussion of global education, or meeting the global education needs of children, centers around a philosophical reflection of what is meant by "education." Here, education is viewed as an acquisition of knowledge that emerges from both the inherent human capacity for learning, and the practical method of transferring knowledge or facilitating discovery through intentional interactions (e.g., Lancy et al., 2010; Nussbaum, 2013; Sen, 1997).

Education as an inherent human right has been upheld by countries of the world for decades, reinforced by the *1948 Universal Declaration of Human* Rights – a global initiative spearheading free and compulsory universal education for children around the globe (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2019c). Numerous acts, declarations, treaties, and government regulations have followed (e.g., Convention Against Discrimination in Education, 1960; The Convention on the Rights of the Child [CRC], 1989; United Nations Declaration on the Rights of Indigenous Peoples, 2007), undergirded by annual spending of trillions of dollars across nation states (UNESCO, 2019a). The "right" to education, however, is a complex and theoretically entangled pursuit that is both contextually and philosophically driven – there are rights *to* education, rights *in* education, and rights *through* education (Babaci-Wilhite et al., 2012; Robeyns, 2006; Tomaševski, 2001). The right *to* education behooves communities, governments, and nation states to provide formal education opportunities to children in their care, whereas rights *in* and *through* education are variably defined, extolling a range of outcomes that extend from national economic gain (i.e., human capital) to human capability (i.e., instrumental and intrinsic value for the individual; Becker, 1993; Robeyns, 2006; Sen, 1997, 1999). Unfortunately, rights *in* and *through* education tend to be less explicitly scrutinized, an oversight that may undermine well-intentioned efforts to ensure rights *to* education (e.g., compulsory schooling resulting in financial burden to parents and cultural oppression; Babaci-Wilhite et al., 2012; Black, 2017; Leach & Little, 2016; McCowan, 2010, 2011; Robeyns, 2006; Tikly & Barrett, 2011; Tomaševski, 2008).

Learning is a layered process, both within individuals and across generations; children whose parents are educated have greater chances for educational success, and early educational experiences build a foundation from which a greater acceleration of knowledge can be acquired (Ausubel, 1962; United Nations Children's Fund, 2019). Furthermore, inequities of educational skills and funds of knowledge grow ever wider between populations who have access to high-quality education opportunities and those who are relegated to poorly constructed schooling systems or an absence of opportunities overall (e.g., Rolleston, 2014). Thus, the consideration of children and youth who have marginalized opportunities to access quality education are paramount in the work of global education, and the impetus for this study.

Children in the margins

Meeting children in the margins has evaded ministries of education, policymakers, and systems of education for decades, if not centuries. Recent statistics published by the United Nations (UNESCO, 2019b) indicate that approximately 258 million school-age children are not enrolled in formal education and approximately 48 million children have been forcibly displaced (United Nations High Commissioner for Refugees [UNHCR], 2024), compromising and disrupting their access to quality education. Perhaps even more disconcerting, projected statistics indicate that by the year 2030, 63% of the world's children will reside in countries with the poorest access to formal education and an estimated 420 million children will leave primary school without acquiring basic skills (United Nations Children's Fund, 2019). Trend analyses conducted by The World Bank (2022) show a steady improvement for children attending primary school from 1970 through the early 2000s, but progress has essentially flatlined – even trending backward – over the last two decades. While the COVID-19 pandemic exacerbated the situation (Callaghan et al., 2021), this trend existed prior to that event. Considering reviews and reports on education status for children in underdeveloped, under-resourced, and unstable (e.g., refugee, displacement status) circumstances, it appears that this flatline in progress may be due to the fact that current global education advances call for increasing access to quality education among the most difficult-to-reach populations – children in the margins.

Children in underdeveloped, under-resourced, and unstable circumstances face common and unique challenges that threaten access to formal education and quality learning experiences. These challenges are addressed in Tomaševski's (2001) 4-A education framework, asserting that education needs to be *available, accessible, acceptable*, and *adaptable*. UNESCO's (2019c) application of this framework leans on governments to provide education systems with sufficient quantity for children of all grade levels to participate (i.e., available) while adhering to principles of nondiscrimination (i.e., accessible), regulated to ensure standards of quality (i.e., acceptable), and meeting the unique needs of individuals (i.e., adaptable). Unfortunately, bringing evidence to bear on the current landscape of global education, we see that, particularly for children in the margins, education opportunities may be inaccessible even if they are available (Tomaševski, 2008), prove far from acceptable by many academic standards (United Nations Children's Fund, 2019), and are frequently inadequately adapted to the local context and population (e.g., Leach & Little, 2016).

Available education

Making education available to children in the margins proves to be a major challenge when children reside in remote or poorly accessible geographical locations (Muralidharan & Prakash, 2017), areas ridden with violence and internal conflict (e.g., Dryden Peterson, 2011), or settings contextualized by low socioeconomic standards and minimal access to resources deemed necessary for formal schooling (e.g., infrastructure, classroom furniture, curriculum materials, trained teachers; Ganimian & Murnane, 2016; Hockett, 2021; Mbiti, 2016). Although free public education may be technically provided by a nation state, the practical realities of a child's situation may inhibit participation, leaving such opportunities far out of reach (Tomaševski, 2008). This may be due to a dearth of teaching professionals, inaccessible locations, families' limited access to transportation, inequitable dissemination of funds, and insufficient capacity (e.g., Davidson, 2007; Hockett, 2021; Magayang et al., 2020; Muralidharan & Prakash, 2017; Tomaševski, 2001, 2008; Wotherspoon, 2008).

Accessible education

Accessibility is demonstrated in the context of real opportunities – whether children are able to fully participate in schooling opportunities. This challenge may be manifested in numerous ways, including overcrowded classrooms and absentee teachers, insufficient training and resources for varied learning abilities and diverse children, differences in language of instruction and children's home language,

teacher-centered vs. child-centered approaches, experiences of discrimination, textbooks that are outdated and out-of-context, and inadequate early learning opportunities and home support (e.g., Babaci-Wilhite et al., 2012, Dryden-Peterson, 2016; Ganimian & Murnane, 2016; Mbiti, 2016; Mendenhall et al., 2017). Accessibility is further exacerbated by gender disparities, negative parental views on education, and the particular needs of children with disabilities, calling for education curriculum and practices that are adaptable and inclusive (Leach & Little, 2016; United Nations Educational, Scientific and Cultural Organization [UNESCO], 2020).

Acceptable education

In the context of acceptability, international governance leaves the construction of education – and subsequently, quality standards – to the states (UNESCO, 2019c). However, the United Nations has emphasized that education content should facilitate learning in knowledge and skills, including creative and emotional growth, as well as responsible citizenship (UNESCO, 2019c). The Convention on the Rights of the Child (CRC, 2001) also lends weight to state responsibilities, clarifying that in addition to academic skills (e.g., literacy and numeracy), education should deliver necessary life skills that promote healthy living, creative talents, social relationships, and tools for pursuing personal goals (UNESCO, 2019c). Importantly, the CRC (2001) specifically underlines the necessity of undergirding curriculum with the child's cultural, economic, social, and environmental contexts (UNESCO, 2019c).

Adaptable education

The needs and consequences of education for children in the margins arguably position *adaptability* at the forefront of the conversation on global education for two reasons. First, the circumstantial challenges faced by vulnerable populations of children, such as the ones enumerated here, necessitate adaptable measures and application to address the *availability*, *accessibility*, and *acceptability* of education opportunities. Second, adaptability in educational approaches and methods is critical from a rights-based perspective to meet the learning needs of the most marginalized among children – including working children, Indigenous and minoritized children, children with disabilities, children in conflict or emergency settings, and children with diverse identities (UNESCO, 2019c). Educational opportunities and experiences that are appropriately adapted to local circumstances provide both protection and navigable pathways for students. That is, when education is adapted to meet local and individual needs, it protects children from discrimination, cultural erasure, and human rights violations while laying the groundwork for feasible and applicable opportunities of academic growth tailored to the unique settings they call home (Kopnina, 2020). Furthermore, locally adapted education inherently orients focus toward the internal strength and assets of a community, as opposed to leaning on outside resources and influence.

Montessori as a potential solution

In the context of the challenges reviewed here, a global solution would need to be feasibly available regardless of limited resources for infrastructure and access to trained teachers; learning curriculum and content would need to be accessible for any language and learning ability, nondiscriminatory, child-centered, and feasible for mixed groups of children; it would need to facilitate academic rigor and holistic developmental experiences contextualized by both local and global opportunities; and finally, it would need to be adaptable to any local, cultural, and individual circumstance.

Although generally associated with Western, middle-class populations, Montessori education has been used for over a century across nations and among a wide variety of socioeconomic classes (Debs, 2019a; Kramer, 1988). Based on a unique philosophy developed by Maria Montessori in the early 1900s, its curriculum and methods differ from conventional or Western-based schooling but align

principally with prominent education theory and psychology (Lillard, 2017). One of the first female medical doctors in Italy in her time, Dr. Montessori spent her early career working with children isolated in institutions due to physical or cognitive disabilities and, using a biophysical framework to investigate developmental underpinnings of learning and acquisition of knowledge, garnered attention when her patients surpassed their typically developing peers in academic achievement (Kramer, 1988). Montessori later transferred her focus to early childhood development and education, working with unsupervised preschool-age children in the slums of Rome, who subsequently began reading, writing, and independently caring for themselves, their peers, and the environment (Kramer, 1988; Montessori, 1912, 1914). Although widely popular, her methods of education did not compete well with prominent educational theories of the time (e.g., Dewey's theories of education; Kilpatrick, 1914) and failed to take hold in academic institutions and literature – a space primarily dominated by men.

Thus, despite having engendered a program of curricular methods, child-centered environments, and unique learning materials informed by observations and analytical conclusions about typical and atypical development in children, Montessori philosophy and practice remain less represented in the field of education (Lillard, 2019). Yet, in the context of global education and the aforementioned challenges faced by children in the margins, several of the most prominent elements of her method may be particularly relevant – that is, nontraditional learning environments, hands-on learning materials, multi-age grouping, self-directed and individualized learning processes, and practitioner-designed content curriculum. Further, historical evidence on the philosophical practices and application of Montessori education emphasizes its strong potential for engendering peace-focused education, healing from trauma, and a strong sense of social responsibility for humanity and the environment (Moretti, 2021).

Study purpose

Although Montessori appears to be a viable option for meeting the educational needs of children in the margins across the globe, an investigative inquiry is needed to identify where and how Montessori education has been diversely implemented. Thus, the purpose of this constructivist grounded theory was to explore the application of Montessori education across diverse settings to ascertain its potential relevance in varied contexts. Specifically, the aim of this study was to develop theoretical frameworks for *where*, *why*, and *how* Montessori education was implemented by practitioners across the globe. The following research questions were used to guide this study toward that purpose:

Central question: In what ways is the Montessori approach applied in diverse settings around the world?

Sub-question 1: In what contexts is the Montessori approach applied (*where*)?

Sub-question 2: What are the purposes that initiate a Montessori setting (*why*)?

Sub-question 3: What are the processes involved in implementing the Montessori approach (*how*)?

Methods

This study was conducted as a culminating exploration of the diverse application of Montessori methods, derived from a multi-phase research investigation on Montessori environments conducted over 4 years, from 2019 to 2022, using ethnographic, multi-case study, and constructivist grounded theory methods. Across the four-year period, data were collected in multiple phases, initiated by a Pilot Phase followed by two subsequent phases (Phases I and II). Table 1 explicates the research questions, methods, and findings from each, whereas Figure 1 is a visual representation of the overall study design. This investigation focuses on Phase II, only, with brief background on the Pilot and Phase I included to contextualize the current study. The research questions for this study (as delineated above) were conceptualized from data collected and analyzed in the Pilot and Phase I and as a result of iterative analysis

Table 1. Research phases.

Research Phase	Research Question(s)	Research Methods/Process	Findings
Pilot Study	In what ways, if at all, does Montessori education support self-regulation among students?	Ethnographic observations (three, 3-hour observations) in a public preschool-kindergarten classroom in the Midwest, United States; two interviews with one participant, the lead teacher.	Children in the Montessori environment were developmentally supported to acquire self-confidence and self-determination, and to exercise self-regulation. However, Montessori is a complex and unique cultural approach to education, with vast breadth in how it is operationalized and conducted.
Phase I. Ethnographic Observations & Interviews	What is Montessori? How does it support socioemotional development? Can it be applied in diverse settings?	Ethnographic multi-case study of three different Montessori environments in the Midwest, United States conducted over the course of one year. Three-hour observations were conducted each week, rotating across the different sites. Interviews with directors and staff were conducted virtually, after the onset of the COVID-19 pandemic.	Montessori functions in distinct, unique, and somewhat mysterious ways in the context of youth education. Observational data indicated strong emphasis on socioemotional development via intentional teaching practice and organization of the environment. Iterative analysis suggested that Montessori schools can be broadly diverse yet maintain common principles. Further investigation is needed to determine appropriate fit across varied environments.
Phase II. Grounded Theory Interviews	What are the common methods and practices used in diverse Montessori school settings around the world?	Grounded theory interviews, conducted virtually, with participants from diverse locations worldwide.	A Montessori setting is not limited to a "school"; potential for adaptability in different settings requires broader exploration of application.
Phase II. Grounded Theory cont.: Theoretical Sampling	In what ways are Montessori principles and practices applied in varied settings worldwide?	Grounded theory interviews, conducted virtually, with participants from diverse locations worldwide.	Montessori is implemented in conventional and nonconventional ways, adapted to the local context. Although vastly diverse in expression, core philosophical principles are consistently emphasized and undergirded by common processes. Participants speak highly of its appropriateness for unique circumstances and its ability to address local, developmental, and societal needs.

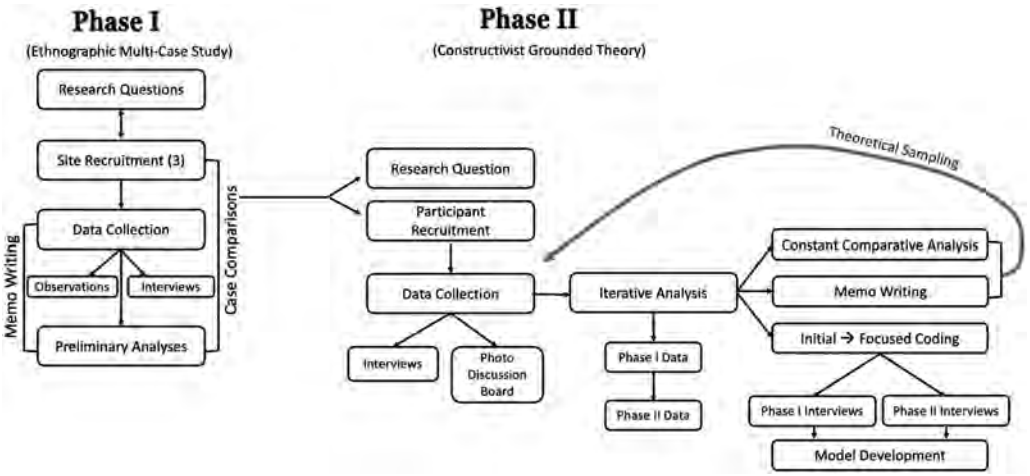

Figure 1. Overview of the study design.

and ongoing data collection, forming the research focus in Phase II. Thus, the methods of collection and analysis described here will address the research questions stated in the study purpose only.

Background: Pilot and Phase I

In the Pilot Phase, a micro-ethnographic investigation revealed the vast applicability of the method with flexibility in adapting for localized needs, indicating opportunity for further research. Phase I (2019–2020) data collection included an ethnographic multi-case study of three contrasting Montessori schools located in a Midwestern region in the United States. Preliminary analyses of those data identified the need for global investigation, spurring the second phase of data collection. Both the Pilot and Phase I intentionally incorporated socioemotional practices in response to recent appeals for education solutions that could address social and emotional needs of vulnerable children (Serazin et al., 2019). A detailed description of the methods used for data collection and analysis pertinent to Phase I are included in Appendix. In Phase II (2021–2022; described here), grounded theory methodology was used to identify elemental actions and processes for theoretical models of Montessori application and implementation common across diverse Montessori settings.

Procedures

Grounded theory methodology is designed to generate theory grounded in and explained by the data itself, with the constructivist approach promoting deeper and more contextualized understanding through interpretative processes and perspectives (Babchuk & Boswell, 2023; Bryant & Charmaz, 2007). This was particularly relevant for this investigation, as Montessori education is perceived in vastly different ways in the field of education (Lillard, 2019), and little is known about its use in remote or under-resourced settings. Thus, further study of this phenomenon, as well as its potential application for children in the margins, requires a theoretical framework grounded in the experiences of practitioners. Constructivist grounded theory emphasizes the perspectives and interpretations that the researcher brings to the table, as these shape what the researcher sees in the data and influences the theory-development process (Bryant & Charmaz, 2007). Although ethnographic field notes were collected during Phase I and informed subsequent data collection and the iterative investigation inherent in the qualitative design, only participant interviews were included for this investigation using constructivist grounded theory analysis.

Participants

To explore this phenomenon, this investigation analyzed interview data from participants recruited in Phase I and Phase II who had experience implementing Montessori across a wide variety of settings. In Phase I, purposive sampling was used to recruit participants from three Montessori programs; Montessori practitioners were invited to participate based on recommendations provided by site directors (see Appendix for more detailed information on Phase I recruitment). Participants from Phase I included eight teachers, guides, and directors (Females = 7, Males = 1), six of whom were also parents of children who benefited from Montessori education. Participants in Phase I were not offered compensation.

Maximum variation and snowball sampling were used to recruit participants in Phase II, primarily through an online global Montessori networking group. Individuals were invited to participate via public posts and one-on-one invitations, with additional participants joining per recommendations of research participants and Montessori practitioners. Participants in this phase included 23 individuals (Females = 20, Males = 3) from five continents (i.e., Asia, Europe, Africa, North America, South America) and 15 different countries, serving in varied roles in their Montessori settings. Many (n = 12) were parents of children who were, or would be, enrolled in a Montessori program. As a token of

gratitude for participation, participants in Phase II were offered a publication of their choice authored by Maria Montessori valued up to 20 USD.

In sum, 31 Montessori practitioners were interviewed for this study. Participants were eligible to participate if they were 19 years of age or older and currently or previously involved in using Montessori education. See Table 2 for Montessori setting contexts, countries, participant roles, and the number of participants per region. Personal demographic data were not reported by all participants; however, with the exception of three participants, all participants were native to or currently residing in the country where sites were represented (exceptions included unique projects, such as a refugee camp). Years of involvement in Montessori education ranged from 1 to 40 years across all participants, with variation in training backgrounds (e.g., programs, certification, age levels). IRB approval was granted by the first author's affiliated university for each phase of data collection and proper consent procedures were followed alongside ethical practices to honor the comfort of each participant. Pseudonyms have replaced participant names to safeguard privacy.

Data collection

Data were collected via interviews, conducted virtually using Zoom and WhatsApp communication platforms by the first author. A total of 34 interviews were conducted with 31 participants in both Phase I ($n = 12$) and Phase II ($n = 22$) and ranged from 41 minutes to 2 hours ($M = 81$ minutes). Interviews were conducted in English; although English was not the first language for all participants, each participant was sufficiently fluent in English or was accompanied by a colleague who assisted with translation as needed.

Interview protocols for Phase I and Phase II were semi-structured, guided by ethnographic methods (Spradley, 1979/2016) and constructivist grounded theory methodology (Charmaz, 2014), respectively. Protocols evolved from Phase I to Phase II to reflect the theoretical development of the investigation – that is, from a cultural view of Montessori settings to a more nuanced understanding of the variations with which Montessori was applied (see Table 1). Thus, Phase I questions emphasized generalities related to practice (e.g., "What does a typical day look like?") whereas Phase II interview questions were structured to prompt meaning-making reflection with emphasis on actions and processes related to the participant's experiences with Montessori use and implementation. In this phase, interview questions were tailored to align with the context of each participant's Montessori background (gathered from online information about their setting or from introductory information shared by the participant). For example, "Why [did you choose] Montessori?," "How did you find Montessori?," "How is it used in your setting?," "What is your role?"

The primary aim of these interviews was to hear each participant's unique story in its fullness, identifying theoretical points of interest for further elaboration and making sense of participant experiences through a constructive meaning-making process (Charmaz, 2014). This process was undergirded by theoretical sampling (Charmaz, 2014) – a process wherein theoretical concepts (e.g., improvisation of materials, local adaptation, child as the teacher, Montessori is more than a classroom) identified in preliminary stages of analysis were pursued in future interviews as the investigation progressed.

Data analysis

Constructivist grounded theory methodology involves three primary strategies for analysis: memo writing, theoretical sampling, and coding. These were conducted by the first author via a constant-comparative process leading to model development (Charmaz, 2014). *Memo writing* played a fundamental role in analyses during both phases of data collection, where general memo writing exploring theoretical points of interest was reinforced by interview memos, written immediately following each interview. This process served as a fundamental point of analysis – exploring theoretical concepts (specifically, those driven by or related to actions and processes), comparing and

Table 2. Participant affiliations organized by country.

Country (Region)	Participants[a] Represented	Affiliated Roles	Affiliated Contexts[c]
Phase I Participants			
United States (Midwest)	8	Director Guide/Teacher Assistant	Early childhood/preschool centers (private) Private elementary schools (3)
Phase II Participants			
Afghanistan	3	Director Guide/Teacher[b]	Orphanage Early childhood learning center (supported through donations)
Austria	2	Guide/Teacher	Refugee community Early childhood center/preschool (private) Private school (adolescents)
Canadian Arctic (Nunavut)	2	Director Guide/Teacher Teacher Trainer	Indigenous community preschool (public/grant funded) Integrated teacher training center
Canada (Ontario)	2	Director/ Entrepreneur Guide/Teacher Parent	Early childhood/preschool center (private) Private learning center (K-8)
Colombia	1	Director/ Entrepreneur Parent	Early childhood care center Private school (Pre-K) Home applied environment
Denmark	2	Director Guide/Teacher Volunteer	International preschool International Catholic school Early childhood/preschool center (private) Refugee camp International outreach
Ghana	2	Director Guide/Teacher Consultant/ Educator	Private school (PreK-6) Consulting organization (2) Low-cost schools
Kenya	1	Administration	Internally displaced persons [IDP] community school Mobile early childhood and elementary schools (nomadic & pastoralist tribes)
Japan	2	Director Guide/Teacher Parent Community Organizer	Early childhood center (private) Parent community organization After-school elementary club Cruise ship (children's setting)
Lebanon	1	Community Organizer Parent	Parent community organization Private school (PreK-3) Home applied environment
Mexico	3	Director Guide/Teacher National Organization Administrator	Private school (PreK-8) Adolescent farm school Early childhood center (private) Indigenous community schools Mother-child prison program
Paraguay	1	Community Organizer Director/ Entrepreneur Parent	Early childhood center/preschool (private) Parent-child learning center Home school Advocacy organization
Thailand	1	Volunteer	Cambodian refugee camp (informal school)
United States (Midwest)	1	Advocate Parent Teacher trainer	Charter elementary school Advocacy organizations
United States (Northeast)	1	Guide	Early childhood/preschool center (private)
United States (Southwest)	1	Administrator Teacher	Charter early childhood/elementary school (18 mos-12 years)
Zimbabwe	1	Director Guide/Teacher	International preschool Rural early childhood care center

Note. [a]Total participants = 31; Some participants were involved with multiple sites/countries and may appear more than once in the table. [b]Staff members are referred to as teachers or guides depending on individual setting; they are referred to as "educators" in the text. [c]Per interview data; not an exhaustive list.

contrasting theoretical points of interest, analyzing relationships across common themes, and identifying questions for further investigation. This was particularly useful for identifying commonalities and contextualizing them across the varied perspectives and experiences of the interviewees, as shown in this research memo excerpt:

> Something she said made me wonder—is there something grander in this process that speaks to the transformation, where it becomes part of you? While I could see this being true, I don't know that the settings where Montessori is only partially practiced have not experienced some kind of transformation; in fact, Adelia alluded to that when she said that you only need "one piece" to experience a transformation. I've also seen this transformation evident in individuals who are not Montessori trained at all. Like with Lucas, who talked for an hour about this transformation but who has only been informed through what he has read and been taught by his son's teacher/school director. (Memo dated 23 March 2022)

Theoretical sampling involves intentional inquiry to further unravel key areas of interest identified during data collection (Charmaz, 2014). This was conducted iteratively throughout the data collection as preliminary findings spurred deeper investigation into the diverse conceptualization, application, and associations across Montessori settings – broadening the investigation and theoretical analysis to incorporate the range of relevant variations and nuances that fell under the umbrella of "Montessori setting." For example, during each interview, theoretical points of interest were identified then further explored in interview memos, serving as an analytical framework for subsequent interviews. One of the earliest interviews in Phase II with Merriam (Pond Inlet, Nunavut) presented the potentiality that "Montessori practices [might be] *designed to be adapted* to the child's local/cultural environment" (Interview Memo, 1 February 2022). This theoretical point of analysis set the stage for further exploration in subsequent interviews, initiating adaptation-related inquiry and facilitating the identification of related actions and processes.

Following data collection, *initial and focused coding* were conducted according to the guidelines of constructivist grounded theory (Charmaz, 2014) assisted by MAXQDA software. Initial coding was conducted by applying line-by-line heuristic codes using gerunds (Charmaz, 2014) to three contrasting interviews (i.e., a father and budding Montessori entrepreneur in Colombia, a Montessori director and consultant in Ghana, and a seasoned guide who had worked in several sites in the United States and Europe). These were selected for initial coding due to their highly contrasting nature in years and type of experience, geographical location, implementation of Montessori education, and working roles. Line-by-line codes were then imported into MAXQDA and organized according to three categories: *context, purpose*, and *process*. Each category was analyzed to identify focused codes, which were then compared against initial codes to ensure adequate representation. Focused codes were then applied to the full set of interviews ($N = 34$), following an initial test of the codes to include any additional relevant codes not previously identified.

The final step of the analysis involved model development generated from further immersion in the data, memo writing and review of prior memos, exploration of relationships across codes and categories using MAXQDA analysis tools, and testing multiple iterations of preliminary models via constant comparative analysis of the coded data. For instance, preliminary models were revised by analyzing areas of emphasis identified by focus codes to explore relational components to other themes and returning to relevant line-by-line codes and interview data to ensure trustworthiness between data and identified phases and categories illustrated in the implementation model. Final iterations were further tested using a process of comparing incident with incident codes (Charmaz, 2014); here, five contrasting incidents differentiated by geography (i.e., Afghanistan, Canadian Arctic, Colombia, Japan, Lebanon) and application (i.e., orphanage, indigenous preschool, home environment/parenting, elementary club, parenting community group) were applied to test and refine model development. This resulted in a primary model demonstrating processes of implementation in Montessori environments supported by auxiliary models explicating inherent components of this

model: the spectrum of application and adaptation to local context. For the purpose of this article, models of implementation and localized adaptation are included and discussed.

Ethical considerations

Validity and quality

The validity and quality of this study were guided by intersecting four criteria of quality (i.e., credibility, originality, resonance, and usefulness) for grounded theory identified by Charmaz and Thornberg (2021) with validation strategies for qualitative studies identified by Creswell and Poth (2018). Credibility was addressed through prolonged engagement and interaction with participants, systematic inquiry, researcher reflexivity and transparency, ongoing comparison of the data, triangulation of multiple and diverse data sources, and testing emerging theoretical ideas with participants during the data collection process. Originality was incorporated via a unique approach to the global education crisis and providing a new lens on Montessori environments. Resonance was rendered through participant feedback and co-construction of the data as well as rich and thick description. Finally, the usefulness of the study is addressed in the discussion and implications, identifying the ways in which this study makes important contributions to both policy and practice – both in global education and within the global Montessori community – by explicating an under-studied topic.

Researcher positionality

The first author conducted this research as a White, English-speaking female residing in the United States. Rooted in her work as a developmental scientist with emphasis in social-emotional development, she initiated this research with personal experience in Montessori teacher training, involvement in worldwide Montessori networks, and a childhood background of informal education.

Findings

This investigation sought to identify ways in which Montessori education has been diversely used around the world, by developing theoretical models to elucidate how the Montessori approach has been implemented and adapted. Overall, the findings from this study revealed a vast diversity of Montessori implementation worldwide in both setting and application, anchored by common practices rooted in worldview perspectives about children and learning capabilities. To address the points of this research, descriptions, theoretical models, and tables are presented here according to: (1) contexts in which the Montessori approach has been applied (where), (2) pursuits that initiated implementation (why), and (3) processes involved in implementing Montessori education (how).

Montessori initiators

Although not originally pursued in the research questions, findings regarding where Montessori was applied provided insight into *who* implemented or initiated a Montessori program. An overview of origination stories from participants indicated that the programs and roles represented in this study were initiated primarily by ordinary men and women – frequently parents – who saw a need in their community and decided to address it, often without formal training, resources, position, or recognition. While some had an initial interest or background in education, many of them did not. In some cases, this meant walking away from higher-income careers and making extensive investments of personal time, effort, and finances. For them, Montessori offered a constructive tool they could wield to serve their children and community in practical ways regardless of their background or prior training.

Contexts in which Montessori is applied (where)

Early findings during Phase I of this study alluded to immense variation across Montessori sites in cultural expression; it appeared that the cultural undertone for each setting was dictated by the community of children, parents, and staff, and strongly influenced by the overarching mission of the school. Notably, these cultural differences were not driven by the method itself. In each setting, specific Montessori practices, learning materials, and principle-driven decisions were both commonly applied and unanimously praised as essential pillars of their learning community. Findings derived from Phase II corroborated these preliminary interpretations, expanding the conceptualization of "Montessori education" to the extent that it was no longer appropriate to reference Montessori application in the context of "school" or even "learning environment." The application was so broad and diverse that the potential for ways in which Montessori could be used to enhance and support learning and development of all ages within any context seemed endless.

For instance, Amy, a founder and educator, found it to be the perfect solution to provide a healing home and successful education for children orphaned in Afghanistan. Another educator and founder explained that it was perfectly attuned to support and reflect ancient, indigenous-based practices and language preservation among an Inuit tribe in the Canadian Arctic of North America. Lucas, a father and entrepreneur in Colombia, explained that its application changed his home life, enabling him and his wife to reverse pain-inflicting patterns of parenting and provide a means for their son to be educated in ways that honored his potential and unique interests. Angela, an educator and advocate in Ghana, explained how it guided her consulting practice for other Montessori schools and how she was striving to "Ghanalize" Montessori to meet the specific cultural needs and expectations of her community. As demonstrated here, Montessori education was used diversely across geographical contexts and setting type, in both conventional (e.g., private or public school, childcare center) and nonconventional ways (e.g., elderly care, parent education, playgroups).

Conventional application

Although a distinguishing line between "conventional" and "nonconventional" application would be arbitrary at best, a differentiation is attempted here to illustrate the variation with which Montessori philosophy was used to support educational opportunities. Here, conventional applications are conceptualized as school-like settings, such as private or public schools, childcare centers, or informal school settings – with several variations evident in the data. For instance, formal school settings included expensive, private-school institutions, nature-based and farm settings, rented or converted spaces in church buildings or home residences, public and publicly funded charter schools, and a community-designed program within an internal displacement camp in Kenya. Childcare centers were embedded in both Montessori- and non-Montessori-based education settings, or existed as stand-alone early childhood centers — one of which was integrated into a prison in Mexico, where incarcerated mothers were trained as Montessori guides. In another setting, Mexican adolescents learned land-based pedagogy and agriculture through an expanded learning environment that incorporated farm life. The students were learning how to not only grow and harvest food but also market and sell the produce through entrepreneurship.

While it is difficult to distinguish formal vs. informal settings due to its vast variation, less formal school settings involved extensively diverse application. One Montessori program was integrated within an orphanage in Afghanistan that was later converted to an early childhood center due to political conflict and forced relocation. Another was designed to align with the nomadic patterns of an indigenous tribe in a remote area of Kenya – with outdoor learning spaces in large mobile tents. This category also included homeschool settings, such as one in Paraguay that a mother designed to address the learning needs of her five children during the COVID-19 pandemic. In a Cambodian refugee camp, refugees bravely contributed diverse skills and experience to support a child learning center initiated by a volunteer. Here, learning materials and a play area were constructed from any locally

available resources, such as bamboo, food containers, seeds, and tires; a traditional weaving school was integrated in the setting so children could watch their mothers weave kramas – a versatile cloth with cultural significance.

Nonconventional application

Nonconventional applications included those that stretched the definition of "Montessori education" outside the parameters of what might be conceptualized as a school. For instance, participants used Montessori philosophy, practices, and methods to address community needs in their volunteer service – such as tutoring immigrant teens in Austria, addressing childcare needs for refugee mothers in Denmark, and organizing parent education groups in Japan and Lebanon. A Montessori school director in the southwest United States described how she applied the theoretical concepts and principles embedded in Montessori philosophy to define her administrative processes, guiding organizational structure and providing autonomy for her staff. After discovering Montessori in a magazine article, a mother in Japan acquired a foundational understanding and then used that knowledge to organize an after-school elementary club where young children initiate, organize, and implement environmentally focused community improvement projects. Some participants used Montessori worldviews as the framework for child advocacy work and social change, whereas others applied its principles closer to home – transforming their home environments to support learning and development for their children. In other instances, Montessori education methods were described as an answer for addressing needs in elderly care or for biologically driven learning disabilities.

Geographical variation

In addition to contextual variations in application, the geographical variation in implementation is indicative of a vast and diverse spread across the world. As noted in Table 2, individuals and communities implementing Montessori hail from all walks of life and an endless variety of backgrounds. Participants from all around the world used (and lauded) the same essential Montessori practices (e.g., materials, mixed-age classrooms, observation, prepared environments, child-driven choice, practical life activities, grace and courtesy lessons) in ways that reflected and promoted culturally specific interests contextualized by each setting, illustrating a remarkable fluidity and flexibility with which the Montessori approach both merged with and undergirded any setting in which it was applied. The visual diagram presented in Figure 2 illustrates the differentiated applications of the Montessori approach from micro to macro levels – extending from an individual level to an organization level.

As demonstrated here, participants described unique applications determined by the needs, resources, and valued pursuits of the local context – ranging from one-on-one education opportunities (e.g., tutoring an immigrant teen) to applying Montessori philosophical principles in social advocacy efforts or administrative organization.

What defines a Montessori environment

Although outside the scope of this manuscript, the variations with which Montessori education were implemented highlight the question of what qualifies as a Montessori environment. As a qualitative study, this investigation sought to understand Montessori education implementation from the views of participants themselves and does not attempt to define what makes a program a Montessori environment. However, common areas of emphasis shared by participants demonstrate specific elements worth noting. Fundamentally, participants embraced the philosophical tenets or principles originating from Dr. Montessori that guided practice and informed curricular methods and materials. These commonalities fell into three distinguishable categories: philosophical principles rooted in human development, specific practices guided by these principles, and curricular materials and lessons.

Among these commonalities, principles of Montessori education, in particular, served as a driving momentum for supporting children in leading autonomous roles – an area of emphasis highlighted in

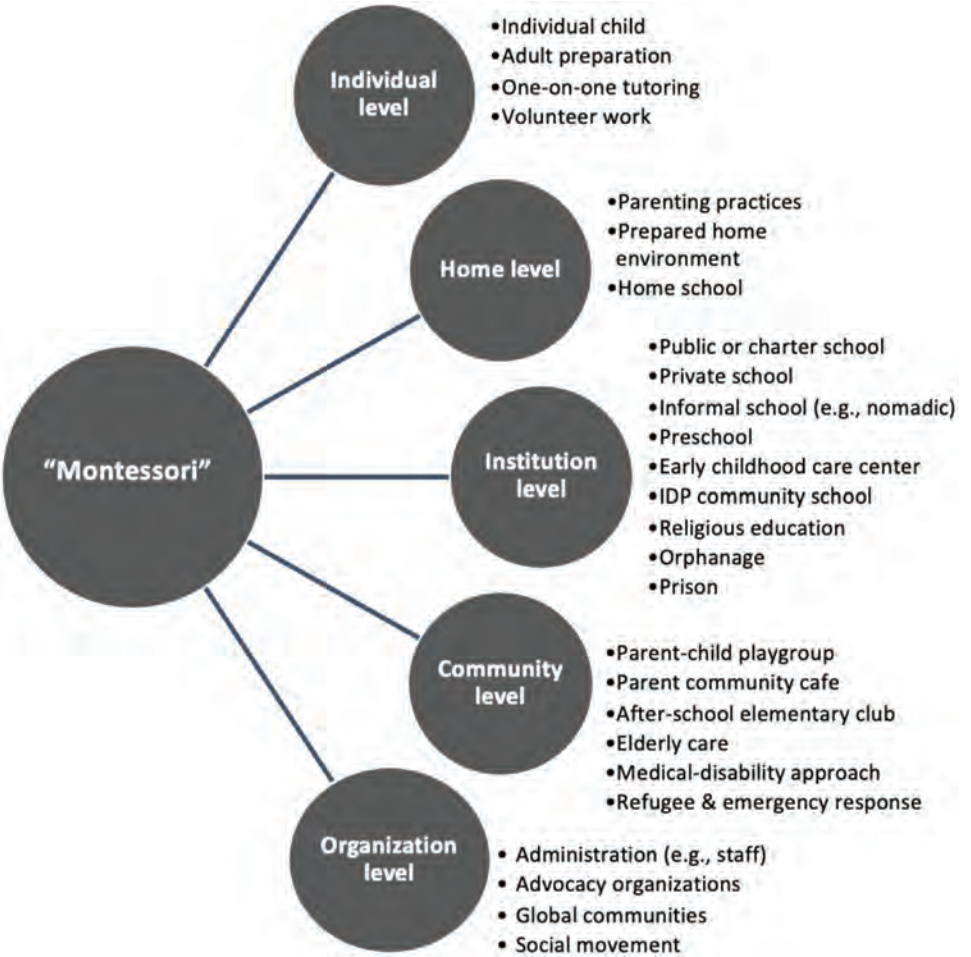

Figure 2. Examples of varied contexts where Montessori is applied worldwide.

the implementation model and discussed further, below. Guiding principles such as freedom and responsibility, independence and interdependence, grace and courtesy, were intertwined with tenets of human development (e.g., developmental planes, absorbent mind, hand-brain connection) to inform specific practices used to support children in their learning and growth. Practices emphasized by participants included observation, preparation of the adult, following the child, preparing the environment, mixed-age groups, and education focused on preparation for life. Participants in this study also referenced the use of Montessori materials – didactic, hands-on learning materials that are unique to Montessori education – and the parallel curriculum or lessons associated with those materials. Thus, while variations across settings seemed limitless, there remained across participant examples core beliefs and practices that consistently overlapped.

Why Montessori environments emerge (why)

The initial purposes that motivated individuals and communities to implement a Montessori setting were as unique as the settings themselves. However, all initiatives revolved around addressing a need within three categories: developmental, local, and societal. Developmental needs were perceived as children's needs that were unaddressed or under-addressed by current societal institutions, such as

failing to prioritize socioemotional development. Local needs included situations where individuals and communities sought solutions to serve an external, locally driven goal or situation. Societal needs were embedded in the Montessori philosophy itself, or (alternatively) aligned with an individual's worldview of how societies can and should be improved – such as engendering cohesive, interdependent, and peace-based societies.

Addressing developmental needs

Participants described a plethora of reasons for why Montessori was a more fitting solution to provide education for children, with an overarching emphasis on meeting the holistic developmental needs of each individual child. This was shaped by the unique view of children that the Montessori philosophy engenders – portraying children as inherently capable beings who can contribute to their world in meaningful and self-determined ways. Montessori education was seen in this context as a way to address the social, emotional, physical, and cognitive development needs of children in ways that honored personal choice and the intuitive interests of individual children. Often, this was motivated by a perceived gap in local educational offerings. For example, Lucas (father/entrepreneur, Colombia) described this in his wishes for his young son: "We don't want [traditional education from our own experience]. We want him to be happy, to be motivated. We want him to develop his potential." Others saw Montessori as a way to re-instill or preserve a personal (intrinsic) interest in learning, as Jennifer (director, Midwest, United States) described: "I think that it presents them with a way to be excited about learning their own way."

Fundamentally, the developmental concerns that motivated interest in Montessori practices were fed primarily by child-centered ideals: meeting children where they were at (individually), providing an environment where children could learn for themselves in agentic ways, having opportunities to support them through close relationships, and having the materials and practices that would address their learning needs purposefully and successfully. Incorporated in these views was a strong emphasis on preparing children for life, beyond providing an education. Aina, an early childhood teacher in Afghanistan, explained:

> Montessori is special not just for a lesson, for a school—[but] for *all* [of] life! Montessori will help us [learn] how to live in the world, how to join the peoples. Montessori teaches how to learn not just one thing—just like engineering or other [subjects]. So Montessori teach people *everything*; our people must learn everything.

Addressing local needs

Closely intertwined with developmental needs, many participants expressed reasons for implementing Montessori that were directly linked to local needs, goals, or initiatives. Amy (director/educator, Afghanistan) saw Montessori principles and practices as the best way to nurture neglected and orphaned children that would prepare them to lead successful lives and understand their worth and potential in order to contribute to a more peaceful world. In the Canadian Arctic, Nichole (director/founder) and Merriam (teacher trainer) identified Montessori as the best way to reinforce Inuit values and practices, construct curriculum for indigenous language preservation, and to promote healing from intergenerational trauma incurred by colonialization. Angela (director/educator) and Charlotte (educator/consultant) applied Montessori at organizational levels in different regions of Ghana to support and improve local early childhood centers that lacked authentic training. In Zimbabwe, Phyllis (educator) addressed a dearth of childcare options by organizing early childhood settings in urban and rural areas – adapting to the resources available in each location. When the Red Cross asked Tiffany (educator, Denmark) to assist a refugee family with young children, she soon found herself organizing a Montessori center in the foyer of a building to provide much-needed childcare for the parents of small children in the refugee camp. Celeste (organization administrator) described how a community-based school was implemented in an internally displaced persons (IDP) camp in Kenya to meet the socioemotional and learning needs of children whose families had been displaced due to local political conflict. In Japan, Himari (parent) found she could address needs of children who felt

stifled in the intense academic culture of their traditional Japanese schools with a Montessori-based elementary club. Despite ongoing challenges, Ashley (director/educator, Midwest, United States) explained why she persevered with her small school, "I know I have to do it because … [this] is a thing that is good for [our local area]. It is good for our community and it is good for these individual children and it needs to be done."

Addressing societal needs

Participants also viewed Montessori education and practices as way to address societal needs, or larger societal problems. This was referenced for both abstract, global needs (such as world peace) as well as more localized and tangible problems (such as national security). As Alicia (director, Midwest, United States) noted, "This is a way to be with young people in their developmental years and to change society." In a more localized perspective, Calista (community organizer) in Lebanon described how a consumerist mind-set, national financial instability, and the recent explosion in Beirut caused her to take a step back and consider her country's future:

> We really want our children to grow in this country … we want them to feel rooted. And if we're staying, we can't just sit and not do anything. And if there's anything to be done, then it has to be through education. And the current state of education is terrible! You know? So, what's [the] one education that could make a difference? And I had gone through the orientation courses for [Montessori] … and the [experience] was mind blowing to me because I was like, "Wow. So, you're teaching a 12-year-old that he has a, or she has a place in this world that they can contribute." And, "This is what we need."

Participants looked at Montessori as a way to guide children toward a more peaceful, equitable, and sustainable world – by decentralizing power from the adult and yielding it to the child through experiences that facilitated autonomy, interdependence, and a deep respect for the natural world. Beyond functioning as a system of education, Montessori was more comprehensively described by these practitioners as a vision of human development – an understanding of how children develop, a way to meet their human needs to facilitate an *unfolding* of their individual potential, and an environment that serves as a microcosm of society – all so that a child can *practice* the work of being human toward a realization of their *personal* and unique potential. Although participants did not always conceptualize a "better" society in the same terms, Montessori was an important precursor to creating it. For them, Dr. Montessori's view of the child promoted a vision of a new humanity, and a way of preparing children for a future that adults are unable to predict. As Alicia (director, Midwest, United States) noted,

> We have this fallacy of preparing children for the future. Well, we don't [have] any idea—today, more than ever; we don't know what the future's going to be like. So [it's about giving students] what they need right in the moment of their development and trusting them that they will be ready for whatever comes—because they have developed to their fullest potential.

Processes of implementing Montessori education (how)

The diversity of application evinced in the data demonstrated that there is no single recipe for establishing a Montessori environment. Montessori is not franchised or licensed and there is no mandatory guidebook, although training programs and accreditation organizations exist to facilitate some consistency. Maria Montessori's original writings are considered the most authentic authority on the approach – however, these may be difficult to acquire and are written in a writing style that can be challenging to decipher, with limited language translations. Thus, participants primarily relied on the information resources they were able to access – such as training programs, online resources, support mentors, or key principles and materials they were able to use – to implement Montessori in their community. This led to wide variation in both interpretation and application. Despite these

differences, however, coding and analysis identified commonalities in the data, illustrated in the Model of Implementation shown in Figure 3.

Every application was initiated for the purpose of addressing a perceived need, contextualized by the local area. This was predicated by the individual's personal paradigm of what Montessori had to offer – a paradigm that was differentiated across participants depending on their prior experience and exposure to Montessori philosophy, methods, and practices. The process of implementing, integrating, or constructing a Montessori setting involved building support networks, taking care of logistical needs, and adapting to the local context. This was followed by a recalibration phase, where two common components – competing with sociocultural norms and wanting to do Montessori "right" but needing resources – tended to result in a paradigm shift that subsequently influenced ongoing implementation processes. Participants' stories and examples demonstrated that, over time, this ongoing process led to increasingly adopting the Montessori approach as a worldview and providing increased support to children in leading autonomous roles.

Personal paradigms of Montessori

Perceptions of the Montessori approach varied among those who implemented it depending on the ways in which it was understood by the individual and the ways in which it aligned (or didn't) with their own philosophical worldviews. Some participants viewed it primarily as a method of education or a curriculum of sensory-based materials (e.g., a tool), whereas others pursued it as an answer to restore human dignity and elevate children and communities in interdependent and ecologically sustaining ways. Others held fast to their own ideological views and philosophies of child-rearing and education, but found that the Montessori approach offered strongly aligned principles and practices that supported those ideals and their learning setting. This spectrum of perception influenced the ways in which Montessori principles, practices, and methods were implemented or integrated, accounting for the first layer of variation in Montessori learning initiatives. As more experience with and exposure to Montessori environments and resources were acquired, however, participants tended to lean more deeply into adhering to or adopting the approach with a worldview mind-set. Whether seen as a tool or a worldview, applications were uniquely driven by the specific needs and circumstances of their context.

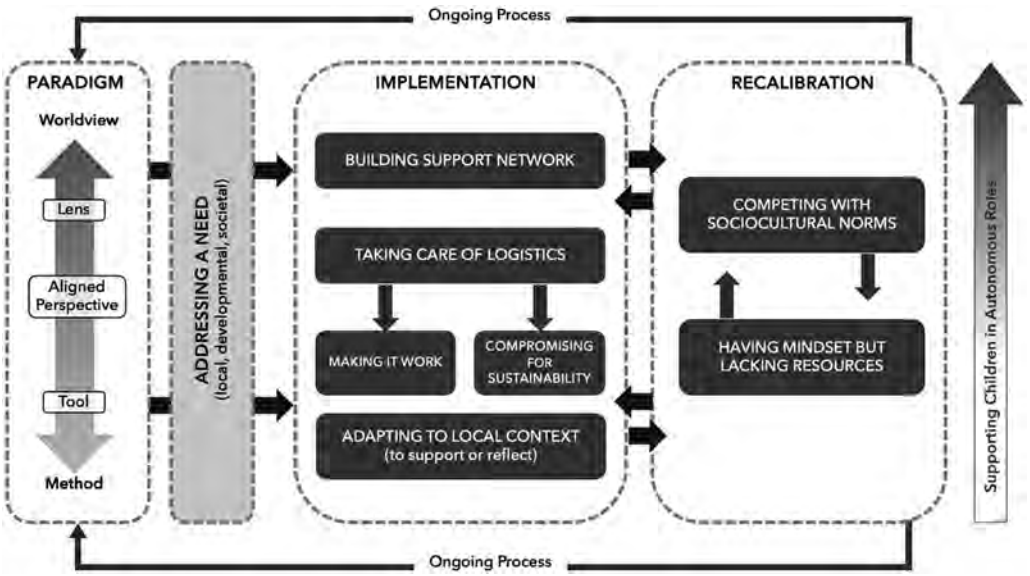

Figure 3. Implementation processes of Montessori education settings worldwide.

Addressing perceived needs

As noted above, the underlying purpose driving implementation centered on three categories of need: local, developmental, and societal. These differentiated purposes added yet another layer of localized variation as the integration of Montessori was dictated by the purpose for which it was employed.

Implementation phase

Building support networks. The processes involved in the main phase of implementation were fundamentally sustained, maintained, and reinforced by the key undertaking of building a support network. This step was strongly emphasized in the data, demonstrating that all other aspects of implementation (e.g., adapting to local context, taking care of logistics, recalibrating) leaned heavily on the community of supporters that were involved in the project. These support networks included mentors (e.g., seasoned Montessori guides, teachers, trainers), staff and stakeholders, parents, and even the children themselves – all of whom contributed in both shaping the initiative and impacting its sustainability and growth. Maintaining the support network sometimes relied on a delicate balance of adjusting and meeting varied expectations. If the support network faltered, losses could be detrimental (e.g., losing families and tuition funds). Variations that existed in these support networks also demonstrated vast ways in which individuals had autonomous opportunities to contribute to a greater whole with their varied backgrounds, abilities, and skills.

Taking care of logistics. Taking care of logistics involved all the expected aspects of creating and maintaining a setting, organization, or institution – such as government regulations, funding and financial sustainability, finding suitable locations, satisfying stakeholders, adjusting to local or global events, accessing/acquiring resources, and enrolling families. Here, adaptations were frequently made to work within the constraints or needs specific to their local context. For instance, practitioners responded to challenges by making it work (e.g., maintaining Montessori principles and practices via creative solutions), or compromising for sustainability (e.g., setting aside some of the principles, practices, or methods dictated by the Montessori approach to conform to local expectations or standards). For example, while concrete Montessori materials play a fundamental role in the learning process, they can be difficult to acquire due to expense and limited availability in some geographical locations; thus, many sites improvised by making their own materials with local resources and craftsman. In other situations, programs compromised Montessori principles to remain in business – such as when government regulations on teacher-child ratios for children under 6 induced some Montessori practitioners in Canada to split the classic mixed-age grouping of 3- to 6-year-olds into different age groups to avoid additional staffing costs.

Adapting to the local context. Adapting to the local context was a fundamental pillar of implementation evident throughout the data. This finding was prevalent and consistent across every participant's experiences. Although the Montessori settings reflected recognizable similarities, each was – in its own way – reflective of the context or cultural aspects shaped by its community and the support network that held it together. These adaptations could generally be attributed to two primary purposes: (1) to create environments that mirrored sociocultural expectations of the children's natural environment (e.g., incorporating bilingual lessons and materials to reflect language use in the region), and (2) to enhance and reinforce cultural practices and values of those involved (e.g., incorporating native speakers, materials, and lessons to support preservation of indigenous ancestral language). Regardless of geographical setting, training backgrounds, or accrediting organizations, variations and adaptations were evident in the materials, environments, and the ways in which principles and practices were implemented to meet individual and community learning needs across the multitude of environments and settings represented in the data.

Although interconnected, adapting to local context differed from modifications made to compromise for sustainability primarily based on motive. Compromising for sustainability involved necessary but often unwanted or reductive adjustments made to preserve the program and keep it running,

whereas adapting to local context generally involved intentional or additive adaptations to align practices and implementation with local needs and cultural context. For example, participants expressed regret at making modifications, such as using rote worksheets to address demands from parents (Ghana), including secondary language instruction that children were unlikely to encounter in their local region (Ontario, Canada), or implementing non-Montessori curriculum or teaching practices (Midwest, United States), but felt that these were necessary to meet local expectations and regulations. In other cases, as Charlotte (educator/consultant, Ghana) explained, creating Montessori materials within limited resources enhanced education opportunities but functioned as inferior solutions for learning when quality was reduced. In contrast, making adaptations to curricular content, such as adapting language and practical life materials to reflect local dialect and cultural practices, were intentionally implemented to enhance the learning experiences of children.

In sum, adaptations were evident in every stage of implementation and driven by two intangible driving forces in the implementation phase – *taking care of logistics* and *adapting to the local context*. Both explicitly and implicitly identified, these adaptations were motivated to address needs on three different levels of stakeholders: the individual child (student), the setting itself, and the broader community. Adaptations made to meet these needs were physically evident in three areas: adaptations to the materials, practices, and environment in the learning setting, all of which supported or undergirded the particular needs and pursuits of the individuals and communities involved. Said differently, the materials, practices, and environment served as tools to adapt Montessori education and philosophy for the individual setting or application in which it was used, driven by the impetus to meet localized demands and interests and to serve the unique needs of their served population. See Figure 4 for an illustrated model of adaptation processes and Table 3 for examples of adaptations in materials, environment, and practices or principles. In sum, these findings emphasize that Montessori implementation was consistently and uniquely tailored to the setting in which it was integrated.

Recalibration phase

Recalibrating experiences occurred concurrently with implementation processes, as participants faced the challenges of competing with sociocultural expectations and lacking resources that would allow them to operate their setting according to their ideals, often shaped by the perspectives, principles, and promises engendered by the Montessori philosophy. Whereas sociocultural expectations and norms

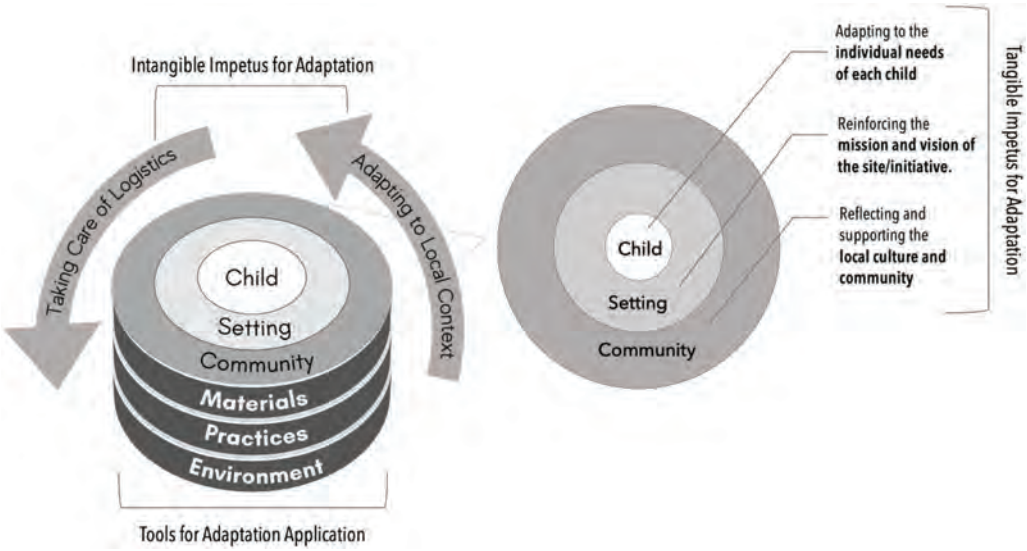

Figure 4. Model of localized adaptation in Montessori education settings.

Table 3. Examples of adapting Montessori materials, environments, and practices to reflect and support local context.

Adaptation	Examples	Quotes
Materials		
Constructing from whatever resources are available	Using rocks, sticks, beans, seeds, etc. from locally available resources Relying on local craftsman to create concrete, hands-on materials	"I am also working with my skills in woodworking. Making some Montessori materials. I made the Montessori tower. I made the . . . bead frame. . . . " (Lucas, Colombia) "Our teachers make their materials using [what is] locally available. Like you'd find in the classroom, instead of using some of the bought beads or what[ever] . . . . They use anything that is locally available." (Celeste, Kenya)
Making language-specific materials	Manufacturing "moveable alphabet," "sandpaper letters," "nomenclature cards," etc. in native languages and related alphabets/syllabics Altering nomenclature materials to include items children are familiar with in their natural cultural environment	"It was centered in the values of Inuit knowledge and Inuit philosophy, Intuit pedagogy. But then it was supported by the materials of Montessori to apply those things. So, I went on a mission to find out how we could get Inuktitut applied in the . . . sandpaper [letters] and movable syllabics, like [the] movable alphabet . . . getting all that in the syllabics in Inuktitut." (Nichole, Canadian Arctic)
Making materials to reflect practices and work of the local culture and community	Creating "practical life" materials that reflect the day-to-day work of the cultural community (e.g., a qamutiik [Inuit sled]) Bringing the work of adults (e.g., mothers weaving traditional cloth) into the environment	"You see children wandering around with these [machetes to cut grass] and they're very adept at using them. But you know, that kind of thing is – would be – Montessori in that kind of African context. It wouldn't be a nice little knife and fork laying the table set up, with a serviette and a glass, and a jug and all of that – it's [about] survival stuff." (Phyllis, Zambia)
Environment		
Fitting it to the available context	Using the available environment (e.g., a coat closet, a rented room, a mobile tent, a community center, a home) Expanding access to Montessori environments by bringing them into community spaces (e.g., cafés)	"The other day, someone who was involved in our courses actually said, 'I've always dreamed of opening a coffee shop.' So why not do a coffee shop where the parents can come and then the children can have a space of their own? And so we started discussing that and saying, 'Oh, that's a good idea.'" (Calista, Lebanon)
Shaping it to mirror cultural practices and traditions	Incorporating a "weaving school" into the environment so children can watch mothers weave traditional cloth Bringing an "elder" into early childhood environments to emphasize cultural activities and native language Beautifying the learning environment with clothing, wall designs, objects, and spaces that reflect local and cultural craftmanship	"The other thing about Montessori is that it fits into any culture. And when fitting to the culture, the child is able to be comfortable learning in their own environment. With that, the child and the teacher, they learn together in the environment that they understand." (Celeste, Kenya) "Whatever culture they're in, that has to be part of it. That has to be included in part of it. Maria Montessori was very attuned to that as she traveled around the world and said, 'Oh, well it looks a little different here and a little different here.'" (Cathy, Midwest United States)

(*Continued*)

Table 3. (Continued).

Adaptation	Examples	Quotes
Adapting to function within cultural norms and community needs	Creating a "mobile classroom" to move with nomadic tribes Designating extended learning time in natural outdoor environments Identifying micro-cultures within communities and preparing an environment to address related and specific needs Including bilingual staff	"I saw in a very real way, in a very basic way with two-, three-, four-, five-, six-, ten-year-olds; that, actually these [refugee children] were having to integrate with each other. First, because they were being treated as if they were all in one group. When actually, they had a lot of mistrust about each other and then you're having to live in very close quarters in a large building. So, we would go with trolleys full of toys, and our work was to sit and pretty much, just play." (Lucille, Austria)
Environment (cont'd)		
Incorporating the natural and cultural environment into a school setting	Bringing local practices, concrete materials, and tangible aspects of the children's natural environment into the classroom that they would typically interact with in outdoor and family life activities Expanding classroom environments into outdoor spaces Creating areas of the classroom that reinforce cultural norms (e.g., "household area")	"[There is comfort and] value that is given to the articles that are in the classroom that say, 'Oh, wow, we have these on the wall. They're so beautiful.' . . . And, 'Look how this one was made with wood. And this one was made with bone. And this one was made. . . . ' I used to tell my students, I said, 'We only have a month or so before it's going to be frozen out there, get as many rocks as you can get. We need rocks in the classroom.' We need things that they can touch that are part of their landscape in the classroom." (Merriam, Canadian Artic)
Adapting to meet the needs of the child	Allowing the child to work on learning activities outdoors Taking the child for an outdoor walk Bringing in materials for learning that entice the specific interests of the child.	"I think it really stems from the adult and the adult's approach and the adult's attitude and the way the adult sees the child, and their role in helping the child. I think that that's the biggest key. And then that adult will do everything they can to create an environment, the best environment that they can come up with for the child." (Cathy, Midwest United States)
Practices		
Altering presentation, practices, and environment to reflect local sociocultural norms	Presenting materials right-to-left instead of left-to-right to reflect reading patterns Providing children with materials and instruction in multiple languages Helping children from non-Montessori backgrounds to integrate (e.g., transitioning from traditional instruction to autonomous learning)	"So, if you think about all the practical life things that are designed to be indirect preparation for left to right . . . that had to be reversed, for example. Or grammar symbols, [for instance], there's no articles in Farsi. So, you don't need the little blue triangles." (Amy, Afghanistan)
Practices (cont'd)		
Incorporating non-Montessori practices to address specific contextual needs	Using dolls to reinstate cultural identities and help children with trauma recovery Borrowing ideas from the general education community to address immediate needs during COVID-19 Applying practices from other sources (e.g., parenting programs) to guide adult-child interactions	"Montessori is not really into making dolls. I have never seen make-believe toys in Montessori school, [except for] these children who lost their parents or who lost their loved ones and they really needed to hug something. And I felt for the first time, 'Oh, [a] *doll*. It's so important for [these] traumatized children.' Sometimes, you know, we think, 'Oh, *work*. Montessori work can solve everything.' But no, it's psychological need to hold something that they really needed these dolls." (Sakura, Cambodian refugee camp)

(*Continued*)

Table 3. (Continued).

Adaptation	Examples	Quotes
Modifying practices for use in different environments while honoring core aspects of principles	Creatively altering diverse settings to reflect a "prepared environment" and promote child choice and autonomy Using "going out" experiences to promote autonomy and enhance learning through one-on-one tutoring, monthly children's club, adolescent community Using principles to guide online remote learning during the COVID-19 pandemic	"Some guides I started following [said] that, 'Well, you could adapt some of the activities and do practical life and sensorial [in your home environment], but always respecting/showing the analysis of movement.' So, then I started, and I realized the first thing I have to do is get the furniture at their level. So, I took some tables and I took them to a workshop where the carpenters would cut down the legs and then adapt[ed them]." (Eilena, Paraguay)
Using core principles to modify practices to meet individual learner needs	Altering presentation/use of materials to teach concepts in different ways Allowing children to explore materials outside of their delineated use Forgoing the use of concrete materials for alternative learning styles	"The way I'm talking [about] tailoring the math per individual – a stranger can't just walk in and do that. That's all relationship-building with the child. That's knowing them at such a different level. What is going to be their connection with this material and what is going to be a way to explain this subject?" (Jessie, Midwest United States)

posed challenges for these settings (e.g., wanting children divided by grade level instead of mixed-age groups, parent demands for assigning homework, concerns about encouraging self-directed activity), practitioners sometimes struggled to address these challenges due to the lack of training or resources that would allow them to maintain integrity with Montessori philosophy while creatively addressing needs in their local context. For instance, while recalibration was sometimes linked with compromising for sustainability, such as when inferior materials were used in learning settings due to resource limitations, this phase was distinguished by its role in evolvement or growth of a program – or lack thereof — when resources were insufficient to overcome obstacles. For example, practitioners who encountered sociocultural differences strengthened their program when they were able to access resources to educate others on the developmental or curricular justification for practices (e.g., showing instructional videos posted online to parents), or struggled to appease outside expectations when resources were insufficient (e.g., meeting academic standards without resources to scaffold learning disabilities) and when expectations ran counter to prioritized practices (e.g., responding to trauma-related behaviors prior to addressing academic achievement gaps).

Despite challenges, however, participants demonstrated remarkable resilience and adaptability with this process, bolstered by their paradigmatic perspectives, support networks, and ingenuity in identifying local solutions. This recalibration played a critical role in the ongoing process of growth – a consistent phenomenon described by participants and evident in their experiences, where both individuals and their Montessori initiatives evolved in continuous ways through transformational adjustments frequently driven by the Montessori approach itself. Although this varied depending on the site, driving belief systems (e.g., school vision/mission), and access to resources (e.g., training, seasoned mentors), participant experiences emphasized an overarching trajectory toward more implementation of Montessori principles and practices, not less.

Supporting children in autonomous roles

Although outside the scope of this article for an adequate review, it is critical to contextualize this overview of findings with another core element identified in the implementation model (refer to Figure 4) – that is, supporting children in leading autonomous roles. This was, in fact, the most frequently coded category overall and points to the deep philosophical undercurrent that guides Montessori education practices. Deeply embedded throughout the model, supporting children in

leading autonomous roles involved inviting and facilitating each child's participation in the learning process. Rather than deciding *for* the child, adults made intentional efforts to guide children to engage in meaningful activities through invitation, or enticing them by appealing to their interests. As one participant explained,

> [It] serves them in supporting them for who they really are. First of all, for who they really are in the moment, and then for their potential, for the potential person that they're going to be. And not the potential person that we think that they should be, or that we have in mind for them to be, but the potential person that they really are *going* to be, whatever that is, whoever that is. (Cathy, Midwest United States)

This process was fostered by genuine relationship building and engaging in intentional observation to deeply know and understand each child. It also involved stepping back, or out of the way, to allow children to fully experience the learning process for themselves (including making mistakes) and to handle situations at the height of their abilities – even when that meant conflicting with sociocultural expectations. This emphasis on independence was counterbalanced by a complimentary emphasis on interdependence, or responsibility for others (e.g., peers, plants, animals) promoted by specific Montessori practices and curriculum. As participants and their Montessori initiatives evolved throughout the implementation process, focus on supporting children in these autonomous experiences increased, demonstrated by the vertical arrow running parallel with Montessori being adopted as a worldview perspective.

In sum, the resulting models and findings from this investigation generated a theory of application positioning Montessori education as infinitely adaptable to any context or setting, uniquely equipped to reinforce cultural values and traditions, localize education curriculum, and support children in leading self-determined and community-minded roles. They further theorize Montessori education as a tool accessible to any individual or community to provide learning opportunities for children regardless of access to resources.

Discussion

This study was designed to explore globally diverse Montessori environments as potential solutions for addressing education needs for children in under-resourced and difficult-to-access locations in flexible and adaptable ways. This focus was undergirded by the perspective of education as a tool for human capability (Nussbaum, 2006, 2013; Sen, 1990, 1997), with emphasis on solutions that counter current global challenges of equitable access, adaptability to unique needs, and ongoing humanitarian crises that impact the education of vulnerable children and youth around the world (Callaghan et al., 2021; United Nations Children's Fund, 2019; UNESCO, 2020; UNHCR, 2024). The findings of this study are considered here within the scope of these global challenges, exploring the possibility of ameliorating education scarcities through utilization of Montessori environments.

Addressing education needs and opportunities among children in vulnerable circumstances is very context-specific; thus, exploring *global* solutions requires consideration of unique *local* needs. As such, the connections made here between the findings of this study and global education opportunities are presented within broad possibilities, as opposed to affirmative solutions for any specific locality. Using a rights-based perspective including rights *to*, *in*, and *through* education, Montessori education as a potential global solution is considered across four essential features: availability (e.g., sufficient quantity), accessibility (e.g., non-discriminating), acceptability (e.g., meeting standards of quality), and adaptability (e.g., meeting unique needs of individual students; Tomaševski, 2001). Implementation processes are also discussed, identifying challenges and recommendations for practitioners, organizations, and policymakers.

Montessori education as solutions to global challenges

The findings from this investigation identified several potential solutions via Montessori education to address disparities that inhibit education opportunities for children in the margins, as illustrated in Figure 5. While subsequent outcomes depend on the quality of execution and the specific circumstances of local contexts, the findings here point to particular ways in which Montessori education lends itself to address disparities for learning opportunities. First, the philosophical principles that undergird Montessori education were ubiquitously embraced by the communities that used them to help children advance in education and overall development. Considering the ways that the theoretical underpinnings of these principles align with contemporary theories of learning and development (Lillard, 2017), this apparent universal applicability makes sense. Second, Montessori education practices served as a structural guide or set of tools, so to speak, that enabled changemakers to design and implement a learning environment conducive to their local setting and needs. Aspects such as the prepared environment, mixed-age groups, observation, and practical life engagement provided a structural framework to facilitate not only the organization of such learning settings but also supported behavior management. Finally, Montessori also offered participants a curriculum, or set of methods and materials for content learning, that could easily be integrated, adapted, and constructed within the needs and available resources of their setting. Although the application of Montessori education was as diverse as the settings themselves, these three components were consistently, albeit differently, employed to make learning environments a reality.

Availability of Montessori education

Available education largely depends on provision by national governments, although this can be fraught with tangled webs of policy, national economies and financial security, and political conflict (Tomaševski, 2008). Montessori environments are also subject to these policy-driven agendas and limited financial resources; however, the findings presented here point to innovative possibilities initiated by individuals and communities. Montessori practitioners in this study consistently found ways to address education and developmental needs of children despite a lack of government funding, tackling logistical challenges through creative means. Although the burden of formal schooling ought to be shouldered by governing nations and posed a serious logistical challenge for many settings in this study, Montessori also offered parents in compromised circumstances a way to address current education needs of their children without waiting for policies to be enacted and funding to materialize.

For instance, although distance and lack of transportation can be a major deterrent to attending school for children in remote areas (e.g., Hockett, 2021; Muralidharan & Prakash, 2017), many of the

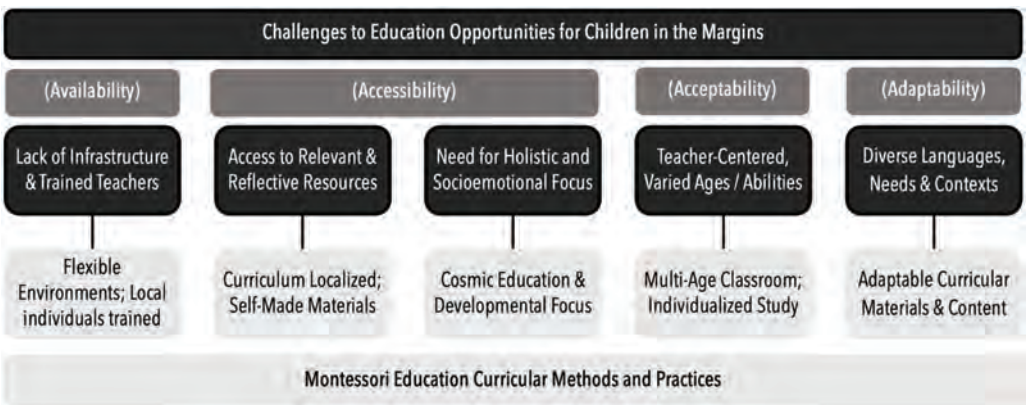

Figure 5. Alignment of Montessori education solutions to disparities in education opportunities.

settings in this study relied on community strengths to establish learning centers in their local area. Similarly, whereas remote and/or isolated locations typically struggle to maintain teachers (Magayang et al., 2020), Montessori settings represented here, and in the literature (e.g., Tschurenev, 2021), provided training for local community members as opposed to bringing university-trained teaching staff from urban areas. Both in terms of resources and infrastructure, the Montessori environments in this study flexibly adapted to available infrastructure and resources – creating learning centers in refugee and displacement camps, rented churches, building foyers, mobile tents, homes, and the outdoors. Thus, although Montessori environments also strive for optimal resources and infrastructure, the methods and practices involved in the learning process are easily adapted to work with available resources in circumstances generally considered "under-resourced."

Accessibility of Montessori education

To be *accessible*, school settings need to provide safe and welcoming environments where children feel a sense of belonging regardless of gender and ethnic, racial, or national backgrounds (Tomaševski, 2001; UNESCO, 2019b, 2019c). Further, learning needs to be accessible in terms of language and adequate learning opportunities, with relevant curriculum matched to the needs and abilities of students. While Montessori education settings will undoubtedly bend to local sociopolitical and sociocultural values and traditions, Montessori practices and principles were both shaped by and reinforcing of a philosophical worldview that is often referred to by its practitioners as "peace education." These philosophical underpinnings were not only evident in its curriculum (e.g., grace and courtesy lessons), they were also embedded in its structural components (e.g., prepared environment, mixed-age classrooms, self-directed learning), which silently, but powerfully, demanded a balance between the deserved dignity of each individual and the interdependent functions of the learning community. Although the Montessori environments in this study were diversely shaped by the particular interests and values of their communities, acceptance and belonging were consistently identified as fundamental strengths, with strong emphasis on both respect for the learners and social responsibility to facilitate interdependent communities.

Access to relevant learning resources, or materials, that honor and reflect the local population in culturally sustaining ways is another critical area of consideration. In many cases, conventional school materials (e.g., textbooks) are not only costly and difficult to come by, they are often outdated, do not reflect the local culture and context, may use discriminating language and depictions, and are often in a language the children do not understand (Babaci-Wilhite et al., 2012; Black, 2017; Leach & Little, 2016). In contrast, Montessori curriculum uses didactic or hands-on materials for learning content in place of textbooks; for practitioners in this study, Montessori materials that could not be purchased (due to cost or access) were handcrafted by the guides (i.e., teachers) or contributed by the local community using local skills, talents, and available materials that reflected the local environment. Several participants in this study referenced the advantage of being able to adapt materials and the learning environment to include, reinforce, and reflect the children's home language, natural environments, and culture (e.g., bilingual/multi-lingual instruction and language materials, nomenclature curriculum tailored to their geographical environment, culturally based practical life activities). Similar to other findings (Debs, 2019a), participants in this study described overwhelming support from parents who not only encouraged attendance but also contributed extensively via time, talents, and resources to ensure the success of the Montessori environment – particularly among locations in remote, restricted, and conflict-affected settings.

Acceptability of Montessori education

Acceptable education is operationalized here as education offering high standards of quality equitably accessible to students with diverse needs and backgrounds (Tomaševski, 2001; UNESCO, 2019c). As noted in the review of the literature, standards of quality in education are contextually driven and

subjectively defined by those who ascertain quality standards, driven by varying models of education and value standards (Robeyns, 2006). Thus, as with all systems of education, the Montessori environments represented in this study are subject to varying standards and assessments of quality. This study emphasizes the standards of quality driven by a human capability approach – encompassing both instrumental and intrinsic roles of education to empower individuals toward their full potential and capabilities, to pursue a life that they value (Nussbaum, 2013; Robeyns, 2006; Sen, 1999). From this perspective, education is individually oriented, with emphasis on the socioemotional development of children and community well-being and belonging in addition to critical thinking, world citizenship, problem-solving skills, and imaginative understanding (Darling-Hammond et al., 2020; Nussbaum, 2006). The findings speak strongly to Montessori environments serving children and families along these sectors of quality. Specifically, socioemotional emphasis was prolific across settings with a heightened focus on the individual child – striving toward the development goals of independent (i.e., autonomous) and interdependent (i.e., community-focused) mind-sets. Outcomes shared by participants revealed remarkable gains along both academic and holistic developmental strands; this was particularly true in reference to students leading out in successful pursuit of individually defined goals and interests.

Similarly, quality of instruction is naturally addressed in Montessori settings through practices that are highly child-centered, individually focused, and designed to support self-initiated learning experiences and interactions. This was strongly reiterated by the findings where participants emphasized the benefits of a prepared environment that included mixed ages and allowed children to advance academically through self-initiated and peer-to-peer learning interactions. In these situations, mixed ages and learning abilities served as an advantage, in contrast to teacher-centered or traditional school environments where varying abilities and levels present significant learning barriers (Ganimian & Murnane, 2016; Mbiti, 2016; UNESCO, 2020). In Montessori environments, mixed-age and mixed-ability classrooms aid individualized education because younger children observe and learn from older children and older children take on leadership roles in assisting younger children – building confidence and reinforcing prior learning concepts. Overall, participants reported high satisfaction from parents who felt that their children were thriving and advancing academically in ways that also reflected cultural and familial values – a phenomenon reiterated by other studies among marginalized populations (e.g., see Debs, 2019a, 2019b; Holmes, 2018; Schonleber, 2014).

Adaptability of Montessori education

In terms of *adaptability*, the findings of this study situate Montessori education as perhaps the most adaptable method of education among its contemporaries. Indeed, its infinite range of adaptability may well be the reason that it has historically struggled to maintain consistent perceptions of its core structure, alongside historical and geographical tension within the Montessori community regarding these adaptations (Del Pozo Andrés & Braster, 2018; Howlett, 2017; Kramer, 1988; Lillard, 2019, 2021; Whitescarver & Cossentino, 2008). Across every noteworthy finding presented from this investigation, elements of adaptation were evident – where Montessori was applied, by whom, in what ways, and for what purpose.

Overall, adapting to local context was a consistent and prominent theme across all participants' settings from micro to macro levels – including adaptations to environmental, national, and economic circumstances, adaptations to reflect and support local culture, and adaptations to address the needs of individual children. These adaptations were evident in three layers of implementation – first, in the worldview paradigm held by the practitioners; second, in the purpose or perceived need that served as the impetus for the setting; and, finally, in the intentional adjustments made to address logistical challenges and to integrate learning that was valued by the local community. Synthesized together, the findings collectively depict Montessori education as a structural model from which individualized needs and academic rigor may be mutually addressed alongside the values and objectives of its practitioners. The findings further demonstrate that Montessori education can – and does – take place *anywhere*. This asset of adaptability is critical in the context of addressing education needs of

children in the margins across the world, orienting Montessori education as a potential template to address global disparities in education.

For example, when language of instruction is not aligned with the child's mother tongue, learning content can be extremely frustrating and demoralizing for students, impacting both the accessibility and acceptability of their entire education experience (Babaci-Wilhite et al., 2012; Mendenhall et al., 2017; Piper et al., 2020). However, language barriers were not encountered in Montessori settings in the same ways that traditional modes of education might confront. Montessori practitioners in this study explained how multiple languages can be uniquely addressed in Montessori environments due to less dependence on verbal language as the mode of instruction (e.g., relying instead on concrete materials, nonverbal demonstrations, and peer-to-peer learning), adapting curricular materials to provide literacy and content learning in multiple languages, and including bilingual guides (i.e., teachers) in the learning environment. In fact, participants cited its adaptability to multiple languages as one of its most important features – enabling practitioners to facilitate multi-language learning, even language revitalization, to support their students' language development.

From a theoretical perspective, the model of localized adaptation in Montessori education settings aligns with key features of Bronfenbrenner and Morris's (2007) bioecological model of human development. Specifically, there are clear parallels with the bioecological components of process, person, context, and time (Bronfenbrenner & Morris, 2007) evident in the support of interactions between individuals and their self, others, and the environment through tools for adaptation (i.e., process), adapting to match the individual needs and characteristics of children and where they are in their stage of development (i.e., person, time), and especially through adaptations to align with context from micro to macro levels (i.e., child, setting, broader community).

Framework application for practitioners

In addition to the research findings of this study, the processes illustrated in the Implementation Model (Figure 4) offer a useful framework for practitioners, policymakers, and organizations to consider in support of global education initiatives, identifying key areas of strength and support to bolster Montessori programs. For instance, participants shared that building a support network was fundamental to their program's growth and success and served as a segue for community members and parents to contribute meaningfully to children's learning experiences in culturally sustaining ways. As noted in the findings, this served a vital role in the progress, sustainability, and longevity of the learning setting. Although education initiatives often place emphasis on first acquiring materials and building infrastructure, the findings here point to the support network as a less tangible, but far more fundamental, foundation of the learning environment. Urging practitioners and administrators to identify and organize a strong support network with resources in communication and interpersonal skills, functions as a critical area for focused support.

Other areas of potential support were identified in the recalibration phase, where schooling efforts conflicted with sociocultural ideas and expectations (e.g., disagreement between practitioners and parents regarding teaching practices and expected outcomes) or when the practitioner's application of methods required additional training, resources, or mentorship. These findings highlight the importance of two areas of support. First, programs or instructional materials would be well served with emphasis on social validity to help practitioners articulate the ways Montessori education can address learning and development needs in alignment with local sociocultural values, an aspect corroborated by research on learning interventions for children in difficult circumstances (Bosire & Johnson, 2025). Second, access to training, mentorship, coaching, or consultation to support practitioners in the application of principles and practices are needed to guide them through inevitable difficulties encountered throughout implementation.

Importantly, the recalibration phase of implementation highlights the continuity of growth that was strongly evident in the participants' experiences, identified in the model as an "ongoing process" of growth. This aspect of the data emphasizes the strengths-based potential that Montessori education

lends to individuals and communities who want to be change-agents in improving the wellbeing, education, and developmental opportunities of children in self-determined ways. Participants in this study consistently initiated learning environments and opportunities for children while simultaneously engaged in their own education preparation journey, highlighting pathways for adult growth development that are amply afforded in Montessori education application.

Interestingly, we find parallels with this model of implementation and symbolic interaction theory which posits that understanding of human action is illuminated by understanding the meaning behind those actions (White et al., 2018). Symbolic interaction theory emphasizes the interrelatedness of meaning and motive within the social context that drives decisions, interactions, and expectations. The implementation model demonstrates a pattern of implementing education methods that is deeply rooted in and connected to localized principles, values, and their associated meanings. Indeed, the framework points to three realms of social constructs in which Montessori environments are immersed – the setting itself and its supportive network where shared meaning motivates implementation, the local sociocultural environment where tensions are oftentimes generated, and the broader Montessori community of practitioners and advocates through which shared symbols and meaning facilitates resources critical to recalibration (e.g., mentorship, training).

In summary, across each stage of implementation, Montessori was adapted to inform or undergird personally held worldviews, address specific needs, adjust to local requirements and regulations, and elevate or reflect locally held beliefs and practices. These points of adaptation not only point to Montessori education as a way to meet local needs, they also identify critical areas for reflection within training programs, mentoring, and consulting, and in initial program development. This conduciveness to adaptation also behooves trainers and training programs to mindfully consider ways in which personal philosophies and traditional pedagogies make their way into training instruction by trainers and trainees alike. Adaptability plays a fundamental role in the *aid to life* aspect attributed to Montessori education practices (e.g., Montessori, 1949); this advantage, however, may be put at risk when training experiences emphasize practice over principle or when they fail to allow for the integration of varied worldviews, traditional pedagogies, or local values and practices. Thus, bringing intentionality to this process will aid both the trainer and the trainee to balance teacher preparation with local contextual needs, emphasizing ecological relevance and cultural appropriateness (e.g., Leach & Little, 2016; Smith & Williams, 1999).

Considerations and limitations

It is worth noting that the examples presented here are not exclusive of Montessori education; other education programs and methods are routinely constructed or altered to meet the particular needs of children in marginalized circumstances, as evidenced by the plethora of literature published in the field of global education and in this journal in particular. However, the findings of this study highlight two particular areas where Montessori education appears distinct from other pedagogies in its adaptability to context and circumstance. First, while it is not uncommon to alter education methods or construct new methods to fit varied settings, Montessori education appears to be inherently and structurally designed to adapt to or align with the cultural contexts, resources, and communities that use it, as a fundamental characteristic of its makeup. Second, Montessori education appears to offer a full suite of tools to comprehensively meet the particular needs of any given context across all areas (e.g., location, infrastructure, curriculum, learner needs and abilities, teacher preparation, available resources).

While a noteworthy characteristic, the tendency toward adaptability in Montessori education also speaks to its complex orientation within the broader discipline of education. That is, high adaptability

to local context renders outcomes differentiated by the values of the culture and context of the practitioners, students, and community of support. Thus, results and outcomes aligned with standardized criteria may require a reduction of adaptability to the localized and individualized needs of the students. Additionally, the consideration of adaptation, varied application, and range of outcomes is also particularly relevant to the implementation of Montessori programs; that is – in this broad spectrum of application, what determines whether a program still qualifies as a Montessori environment? Arguably, quality of outcomes in any education program is dependent on both execution and specified criteria by its governing body; thus, qualifying a program as a "Montessori environment" is similarly dependent on the evaluation criteria it is measured against – another point of variation in its history (Whitescarver & Cossentino, 2008). This study was an investigation of the potential for Montessori education to provide learning opportunities for children in marginalized settings and circumstances, not to evaluate the academic success or fidelity of implementation evident in any Montessori program. Thus, the findings presented here should not be interpreted as evidence of outcomes. As with any education opportunity, evaluations of quality and measured outcomes are defined by standards set by the community, region, and nation state and should be assessed within that context.

While these collectively pose challenges in terms of standardized assessments and comparable outcomes, these findings behoove practitioners and policymakers to consider the value of its adaptable nature. Variation in outcomes does not immediately translate to substandard outcomes, particularly when education is framed by a human capability approach that supports individual growth in the context of self-determined valuation (Nussbaum, 2013; Sen, 1997). Through its core strength of adaptability, Montessori education appears well positioned to support the availability, acceptability, and accessibility of education opportunities that facilitate holistic and academic growth through developmentally focused and contextually informed processes.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Appendix. Phase 1

Methods

Participants

Purposive sampling was used to recruit interview participants in Phase I, where specific Montessori learning centers were chosen to reflect contrasting application of Montessori practices; recommendations for interview participants were made by the leading director of each school. Participants included eight teachers, guides, and directors (Females = 7, Males = 1), six of whom were also parents of children who were students of Montessori education. Participants in Phase I were not compensated for their participation.

Data collection

Interviews conducted in Phase I were guided by the ethnographic observations collected during this phase of investigation with a semi-structured protocol designed to reflect the research questions of this phase and ethnographic methods (Spradley, 1979/2016). Thus, interview questions focused on cultural aspects of the environment and the overarching aim of the study and were modified during the interview to follow the participant's lead (e.g., "What does a typical day look like for you?," "In your view, what purpose does Montessori serve for these children?," "Based on your experiences, do you think Montessori education could work for environments, such as refugee camps, where resources are extremely limited?").

Data analysis

Several iterations of analysis from Phase I data laid the groundwork for the grounded theory investigation and analysis in Phase II. For instance, the pilot study that preceded Phase I (see Table 1) presented findings that illuminated Montessori education as a complex system with overarching philosophical underpinnings that appeared to transcend far beyond the classroom. Phase I analyses revealed that Montessori education offered strong emphasis in components deemed necessary for education among marginalized children (Johnson & Dalla, 2021) but its approach to diversity was unclear. Further, case study comparison revealed that it was remarkably varied across contexts while retaining core consistencies. These preliminary analyses were conducted utilizing deductive frameworks (ABCDE framework; United Nations General Assembly, 2018) and in-process analysis techniques (Emerson et al., 2011). Although not part of the formal analysis of this investigation, these preliminary analyses set the stage for subsequent investigation in Phase II. See Figure 1 for research study process and structure.

Findings

Diverse application of Montessori education

Early findings during Phase I of this study alluded to immense variation across Montessori sites in cultural expression; despite sharing similar populations (serving primarily White students paying private tuition), geographical location (residing within a 100-mile range), and education methodology (utilizing Montessori principles and curriculum), all three sites in the initial investigation demonstrated meaningful differences in school culture. Thus, differences in cultural expression were not racially, ethnically, socioeconomically, or geographically driven. Instead, it appeared that the cultural undertone for each setting was dictated by the community of children, parents, and staff, and strongly influenced by the overarching mission of the school.

For instance, one site, a nature-based school serving children ages 18 months-15 years, structured learning experiences that were strongly integrated in coexisting with nature and animals in sustainable ways, with intentional community building across age groups. This contrasted starkly from another site where pristine infrastructure – including heated floors and meticulously cultivated gardens – nurtured emphasis on academic achievement through the promotion of independence and self-discipline, with toddlers to teens engaging with educational materials, teachers, and peers in intense and autonomously driven activity. In the third, a small makeshift learning environment of two classrooms in a rented church building, children age 6–12 navigated personally challenging experiences (e.g., learning differences and disabilities, prior negative learning experiences) as a tight-knit community, prioritizing social grace and personal development while pursuing academic growth and meaningful learning experiences.

Notably, these cultural differences were not driven by the method itself; in each setting, specific Montessori practices, learning materials, and principle-driven decisions were both commonly applied and unanimously

praised as essential pillars of their learning community. These commonalities included multi-age classrooms, concrete hands-on learning materials (specifically designed for Montessori education) in a prepared environment, opportunities for socializing and peer-to-peer learning with emphasis on grace and courtesy practices, self-directed learning activities, practical life education, and guided learning from adult staff informed by observations of child activity. Although some variation on emphasis and presentation of these practices existed, the theoretical and practical foundations were the same.