



From the Editor

Racial Harmony Day, 21 July 2023. A day when preschools and schools in Singapore celebrate the multi racial society that we all belong in. It is especially important to value the diversity of races and to live in harmony with one another. What has your preschool planned for this special day? Many are likely to have students coming in their traditional clothes, talking about their customs and perhaps sharing some food and games from their culture. I would like to nudge you a little, interest you in expanding this, for example, broadly, saying our centre embraces diversity and it is reflected in our daily engaging with our staff and children, through our words and actions. Racial Harmony Day is the icing on the cake, and the rest of the cake happens throughout the school year.

In this issue, I am recommending to you the article “Developing and Teaching an Anti-Bias Curriculum in a Public Elementary School: Leadership, K-1 Teachers’, and Young Children’s Experiences” (Kimura, Antón-Oldenburg and Pinderhughes, CEI Journal of Research in Childhood Education, Vol 36, No. 2, 2022). I found it an interesting read, for many reasons. Firstly, the background of multi-racialism, same-same and yet different. Secondly, it is a good example of strong leadership in practice. The principal brought her staff through a journey of many conversations and reflections, dealing with race and anti-bias sentiments before they even embarked on creating a curriculum on anti-bias education and teaching it to their kindergarteners. Lastly, the topic on anti-bias; in our own context, the term ‘racial bias’ may be more common. For some teachers, it was an opportunity to understand their own experiences with racial bias and how to re-visualise it to be something more positive than negative, and this helped towards their participation in bringing this learning into their K-1 classes in developmentally appropriate ways. One good outcome of this was about the school fostering a collaborative, trusting, supportive community of learners and risk-takers. Interestingly, this study concluded that anti-bias education can be taught in early childhood classrooms.

More food for thought is posed by ‘Have You Filled a Bucket Today?’. It complements this study well. The writer, Nagalinggam Thamarai, points out the simple narrations that convey meaningful little lessons on how to show kindness through words and actions, regardless of races, cultures, abilities and ages.

My list of recommended reads can go on and on because ALL the articles are really good. I commend them to your reading pleasure!

Warm wishes

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Front Cover: *"The Sun Shines on the Water"* by Adriel Chin Wei Yun (Kindergarten 1), Little Seeds Preschool - Ascension.

When Adriel was painting during free play at the Learning centre, he told the teacher that he saw a rainbow next to his house. Adriel said he loved rainbows and wanted to paint the rainbow that he saw. In this drawing, he said "The sun set and the water make a rainbow".

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Developing and Teaching an Anti-Bias Curriculum in a Public Elementary School: Leadership, K-1 Teachers', and Young Children's Experiences

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ABSTRACT

This article describes the process teachers at a public elementary school completed to develop and implement a developmentally appropriate, race-conscious, anti-bias curriculum in all K-5 classrooms. The study focuses on the experiences of the teachers and children in three early childhood classrooms using a case study design. Data were gathered and analyzed following one-on-one interviews with the principal and teachers, and an observation of an anti-bias lesson in one kindergarten classroom. Themes were identified following this analysis that concurred with existing literature on anti-bias education. The findings suggest the developmental appropriateness of teaching anti-bias topics to young children and the importance of iterative cycles of teacher reflection and learning as they engaged in this process. The findings further suggest that anti-bias education could be implemented at 1st-grade and kindergarten levels at a public school.

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REPRINT

In the United States, there is a common ideology that young children do not see differences among people and, thus, these differences do not need to be discussed or taught during early childhood (ages 3–8) (Bronson & Merryman, 2009; Hirschfeld, 2012; Kemple et al., 2016). This colorblind lens couples with the assumption that children cannot comprehend adult concepts because they are developmentally incapable of complex thought (Van Ausdale & Feagin, 2001), and too innocent (Boutte et al., 2011; Epstein, 1993). Yet, the colorblind ideology is a myth; research shows that infants are already beginning to organize what they see and hear (Marks et al., 2015; Sugden & Marquis, 2017).

The U.S. Census Bureau reported in 2018 that children living in the United States reflect a minority-majority population (i.e., less than 50% of children under 18 years are non-Hispanic, White) (Census Bureau, 2018). Despite this diversity and because U.S. society is composed of many institutionally supported power structures and social “isms” (e.g., racism, classism, sexism, ableism, etc.), children who come from marginalized identities are treated unequally and face additional obstacles in comparison to their privileged peers (Marks et al., 2015). Furthermore, discourse that acknowledges these systems of oppression is not common in everyday conversation. Consequently, many adults find it difficult to discuss these social “isms” with other adults (McIntosh, 1988), let alone with young children (Edwards, 2017; York, 2016).

In turn, children may learn they should not point out differences across people. They also may be discouraged from posing questions or engaging in discussion to better understand the experiences of people who are different from them (Doucet & Adair, 2013; Kemple et al., 2016). Young children would benefit from access to tools and language in order to process the differences they see, and to better understand instances of discrimination they may experience or observe (Derman-Sparks & Edwards, 2010; Leekeenan & Allen, 2017).

Anti-bias education theory has emerged as one mechanism to teach children in developmentally appropriate ways about anti-bias topics and to take action against inequities (Husband, 2012; Kemple et al., 2016). Derman-Sparks and Edwards (2010) emphasize that the goal of anti-bias education is to help *all* children reach their fullest potential, and recognize that institutions are built upon historically oppressive systems that privilege certain identities. Guiding anti-bias education theory is the understanding that children are capable of engaging in anti-bias learning and action (Doucet & Adair, 2013; Husband, 2012), and that early childhood educators can play a significant role in helping children process the many confusing and emotionally difficult messages they may be hearing about themselves and others (Derman-Sparks & Edwards, 2010; Edwards, 2017; Howes, 2010).

This article reports on a case study of kindergarten and 1st-grade teachers at a public elementary school where the entire school staff developed and implemented their own race-conscious, anti-bias curriculum in all K-5 classrooms. This case is unique because the literature lacks examples of anti-bias curriculum development and implementation in a public school setting. Instead, the literature often describes implementation examples in a single classroom or at a private early childhood center (Derman-Sparks & Edwards, 2010; Derman-Sparks et al., 2015; Doucet & Adair, 2013; Husband, 2012). Often these early childhood centers are smaller programs, situated in settings (e.g., university lab schools, community centers) that are more open to pedagogical experimentation (Durden et al., 2015; Kuh et al., 2016).

The literature lacks examples of implementation in public schools where resources are less abundant, and teachers and community members may be less inclined to support progressive curricula. Thus, this case study is important in order to understand how anti-bias education can be made more available and accessible to the majority of children in the United States who are enrolled in public schools and are not privileged to anti-bias learning from a young age.

Literature review and theoretical framework

Limited teaching of social “isms” in the classroom

Most U.S. elementary schools do not teach students about social “isms” or give students the time and space to explore their own identities from an intentionally anti-bias lens (Boutte et al., 2011; Doucet & Adair, 2013; Husband, 2012). Instead, schools reify social “isms” by advantaging children and families with dominant identities (e.g., White, cisgender male, heterosexual, middle-class, able-bodied, etc.).

Even in the early childhood classroom, children absorb many different messages that can be harmful to their understanding of self and others. For instance, at age 6, girls have been found to believe girls are not as brilliant as boys (Bian et al., 2017). LGBTQIA+ families continue to be invisible in the classroom and in teacher education programs, depriving teachers of the tools needed to move beyond the heteronormative and cisgender privileging narrative while teaching their students (Bower & Klecka, 2009; Burt et al., 2010). In this way, young children often internalize false narratives rather than learn tools to better understand who they are and how these social “isms” operate in their own lives. In order for children to learn how to process these differences in ways that are respectful of self and others, it is imperative that they be taught the appropriate language to name what they observe and learn how to discuss these social “isms” in healthy and productive ways.

The early childhood classroom is an ideal setting in which to begin having conversations with children about their own identities and to begin learning how to interact cross-culturally (Derman-Sparks & Edwards, 2010). Thus, it is critical that early childhood educators feel ready and able to teach anti-bias topics to their students. Teachers’ confidence in their ability to teach anti-bias topics may be influenced by their own racial identities and their experiences with or awareness of racism. For example, teachers of color are likely to experience racism both in and out of schools (Kohli, 2009), and thus understand the importance of anti-bias teaching (Ríos & Montecinos, 1999), whereas White teachers are more likely to adhere to a colorblind teaching approach and experience discomfort when learning about anti-bias topics (Stoll, 2014; Vaught & Castagno, 2008). Although a deep investigation of how teachers’ identities influenced their engagement with anti-bias teaching is beyond the scope of this study, it remains an important element to investigate in future research.

Important tenets of anti-bias education

The goals of anti-bias education outlined by Derman-Sparks and Edwards (2010) are centered around

(a) nurturing each child’s social identities, (b) encouraging children to learn about differences and similarities across people, (c) building children’s critical thinking skills to recognize unfairness and understand that unfairness hurts, and (d) empowering children to act against instances of prejudice and discrimination. The literature suggests that implementation can be most successful when there is a “high level of

commitment from educators, parents, staff, and stakeholders” (Vera et al., 2016, p. 299). Derman-Sparks et al. (2015) emphasize the importance of collaborative program leadership that scaffolds the teacher learning and curriculum development process, and empowers teachers to step up and feel ownership over the curriculum.

Another important element of anti-bias curriculum implementation is providing an opportunity for teachers to critically self-reflect (Derman-Sparks & Edwards, 2010; Derman-Sparks et al., 2015; Husband, 2012; Leekeenan & Allen, 2017). Self-reflection is especially important because most teacher preparation and training programs do not prepare teachers to confidently work with the diverse array of social identities among their students (Chen et al., 2009; Derman-Sparks et al., 2015; Vera et al., 2016). This reflection process requires a supportive community of learners, a culture that encourages risk taking, and a collaborative environment (Derman-Sparks et al., 2015; Edwards, 2017; Vera et al., 2016).

The current study

The primary research question guiding this study was: What factors informed Eastwood¹ Elementary School’s staff’s work to develop and implement a developmentally appropriate, race-conscious, anti-bias curriculum in its early childhood classrooms? To focus the inquiry, we followed Yin’s (2013) recommendation to use existing literature to determine key theoretical propositions. The four umbrella theoretical propositions included:

- The school administration’s support through collaborative program leadership is critical in the development and implementation of an anti-bias curriculum (Derman-Sparks & Edwards, 2010; Derman-Sparks et al., 2015; Kuh et al., 2016).
- Ongoing teacher self-reflection and learning is crucial before beginning anti-bias teaching (Derman-Sparks & Edwards, 2010; Doucet & Adair, 2013; Durden et al., 2015; Kailin, 2002; Vera et al., 2016).
- Building a community of learners, collaborators, and risk-takers among staff is essential (Derman-Sparks et al., 2015; Doucet & Adair, 2013; Edwards, 2017).
- Teaching anti-bias lessons in developmentally appropriate ways to young children is possible and important (Derman-Sparks & Edwards, 2010; Derman-Sparks et al., 2015; Doucet & Adair, 2013).

Based on these propositions, we determined guiding questions and theoretical sub-propositions to focus the data collection and analysis process (see Appendix A).

Methods

In this study, an exploratory single-case study approach was used in order to answer the “how and why questions” (Yin, 2013, p. 128) related to the process of developing and implementing a race-conscious, anti-bias curriculum. These questions were answered through interviews with three teachers and the principal, and through observations in a kindergarten classroom. The children’s responses to the lessons were examined to understand the developmental appropriateness of the curriculum for kindergarten and 1st-grade children. This study was reviewed and approved by a social, behavioral, and educational research IRB at the research team’s affiliated university.

Setting

The study was conducted at Eastwood Elementary School, a K-5 public school located in a suburb of Boston, Massachusetts. Eastwood had about 550 students enrolled during the year of the study. Among these students, 50.2% were White, 32.0% were Asian, 9.0% were Multi-Racial non-Hispanic, 5.5% were African American, and 2.7% were Hispanic; 31.1% spoke a first language other than English and 15.4% were English language learners; 7.5% had disabilities; and 5.2% had economic disadvantages (profiles.doe.mass.edu, 2017). Eastwood mostly met or exceeded state assessments during 3rd grade and scored higher compared to rest of the state (profiles.doe.mass.edu, 2017). There were about 50 teachers and 20 additional school staff. Of the staff, 87.1% were women, 12.9% were men, 81.0% were White, 7.5% were Asian, 6.0% were African American, 3.5% were Hispanic, 1.3% were Multi-Racial non-Hispanic, and 0.03% were Native Hawaiian (profiles.doe.mass.edu, 2017). Comparing the race and gender demographics across the students and teachers, there was an over-representation of women and White staff, and there was an under-representation of men and Asian staff. This over-representation is similar to the rest of the United States, where the majority of educators are White women (Kailin, 2002).

Although Eastwood is a K-5 school, the scope of this study was limited to kindergarten and 1st grade. Teachers gave written consent to participate in the interview and observations in their classrooms. Parents signed a consent form permitting their child to participate in the classroom observation portion of the study. If no consent form was returned, the child was omitted from the observation notes. All children, regardless of study participation, participated in the observed anti-bias lesson.

Participants

Interviews were conducted with the school principal and three classroom teachers. Observations were conducted in one kindergarten classroom.

Interview participants

Martha was in her eleventh year as Eastwood's principal. Prior to becoming a principal, she had taught in nearly all grades K-12 for 23 years, where she was heavily involved in teacher-researcher work. She had a doctorate and taught part-time at a local university. Martha identified as Latina and a second generation Mexican American.

Yuriko, in her fourth year at Eastwood Elementary, had taught kindergarten for three years and 2nd grade for one year. Yuriko identified as Asian American and as a fourth generation Japanese American. Growing up, she only learned English and was an atheist. She also was a mother of an elementary school-age daughter who was multiracial.

Sarah, another kindergarten teacher with five years' experience at Eastwood, was the lead curriculum developer of the anti-bias lessons for kindergarten. Before teaching kindergarten, she taught preschool and then returned to school to earn her master's degree. Sarah identified as a White, German American. She grew up in a predominantly White community with little class diversity. Sarah attended a large state university where she began to connect with peers from diverse backgrounds, initiating reflections on her upbringing and White privilege.

Monica, a 1st-grade teacher, was the lead anti-bias curriculum developer for 1st grade. Having recently received her M.Ed., she was in her third year of teaching 1st grade at Eastwood. An adopted person, she identified as multiracial. She shared her Black identity with her adoptive parents and also had Mexican and White Jewish roots, which differed from her adoptive parents. She grew up in a multiracial family with other adopted siblings who had different racial and ethnic identities from her, but all shared the common identity of being Black.

Classroom observation participants

The classroom observation was held in Yuriko's kindergarten classroom. Of the 19 children, 10 participated in the study. To limit direct interactions with the participants, the observer did not ask the children about their gender or racial identities. Consequently, we could only assume the children's social identities based on their outward appearance. Six children presented as girls and four presented as boys. The racial make-up resembled the racial demographics of the entire school. Yuriko was the only teacher in the classroom during the classroom observation.

Measures

The data for this study were collected by the first author, who identifies as an Asian American woman and was a fourth year undergraduate student studying applied developmental science at a local university. She first met the Eastwood school principal as a second year student through a course at her university and began working with Eastwood a year later. She did not have any preexisting relationships

with any of the teachers. The first author worked closely with the coauthors of this article to ensure the methods were rigorous. Data collection occurred during the second year of curriculum implementation; interviews were conducted in October and November and the classroom observation was conducted in March of the school year.

Interviews

The hour-long interviews were semi-structured with open-ended questions and were piloted with two early educators. To limit the interviewer influence on the interviewee's responses, the interview protocol required the interviewer to only respond to the interviewee in neutral ways. Interviews were conducted one-on-one in a meeting room at Eastwood. All interviewees consented to be audiotaped. The interviewer acknowledged the potential sensitivity of some questions and participants could decline to answer any questions or end the interview at any point should they wish. The interviewer began with an introduction about her personal background and how her experiences informed the research question. This introduction was intended to help interviewees better understand the basis of the study and learn about the interviewer further. Then, the interviewee was asked five basic questions about her teaching background, why she pursued teaching, and how she identified her own racial, ethnic, and cultural identities.

Next, teachers were asked 15 questions related to their experiences planning, developing, and implementing the anti-bias curriculum for their grade and classroom (e.g., "Can you tell me about a time in which a lesson you taught in the curriculum went really well? Or, a time you struggled with the content of a lesson?"). The interview questions were ordered relatively chronologically, based on a brief timeline provided by the school principal. We formulated interview questions based on the theoretical propositions of anti-bias education. For instance, to understand the importance of teacher anti-bias learning and self-reflection, the interviewer asked about the interviewee's own learning and self-reflection.

The school administrator interview included the same initial questions plus ones about the role of the administration in the process of planning, developing, and implementing the anti-bias curriculum (e.g., "What types of experiences and trainings did you organize for your staff to learn more about topics such as race and privilege?"). Many questions were based on theoretical propositions in the book, *Leading Anti-Bias Early Childhood Programs: A Guide for Change* by Derman-Sparks et al. (2015).

Classroom observation

Prior to the observation, a note-taking sheet was developed listing behaviors children may exhibit if engaged in the lesson (e.g., child follows teacher's directions) or not (e.g., child looks distracted by looking around the room), and included questions about teaching strategies during the lesson. Before the lesson began, Yuriko briefly introduced the observer (first author) to the children. During the 30-minute

observation, the observer took notes on the behavior, body language, and emotional responses of students; comments or questions children posed to each other and to the teacher; and the specific language Yuriko used to introduce the lesson, teach the lesson takeaways, and her responses to children's comments or questions. To manage the observer's bias, the observer took verbatim notes on participant's language and thoroughly described non-verbal behaviors in order to limit assumed attributions to actions.

Data analysis

The interview data analysis began after all interviews were completed, and the observation data were included later. Outlined next are the coding process and the analysis procedures.

Interview coding process

Each interview audio file was transcribed verbatim; next, transcripts were analyzed using an iterative thematic coding process. Recommended by Yin (2013), we used pre-determined theoretical propositions to formulate preliminary themes (see Appendix A). While transcribing, we took note of whether these preliminary themes emerged and noted any additional themes we saw as common across interviews. The initial themes included: (1) principal's role, (2) steps in the process, (3) teacher's feelings during their experiences, (4) examples of lessons taught in the classroom as well as specific language teachers used while talking about anti-bias topics with children, (5) teacher's role in the process, (6) children's reaction, and (7) parents' response.

We organized the initial themes into a priori and emergent categories. A priori themes were expected to surface based on existing literature; all themes identified above fell into this category. Emergent themes included those that we had not expected interviewees would emphasize as crucial components of the process. The final three emergent themes were: (1) external events/context, (2) team culture/attitude, and (3) other staff members' responses. Using these new categories, we re-coded each transcript again and inserted sub-themes, which briefly summarized the quote. Each coded item also included a memo to note initial thoughts on the quote's content regarding why or how aspects of the process were occurring. Throughout the coding process, the research team met weekly to discuss and review the analytic process, particularly as new themes emerged. Another expert research team member reviewed the codes and coding process to check for agreement. Any coding disagreements were resolved via thorough discussions among the research team and by referring back to the extant literature.

Classroom observation coding process

Similar to the interview coding process, we iteratively coded the observation notes with comments, noting any themes and sub-themes, and writing memos with initial thoughts. Since we began coding the observation notes after starting the interview

coding, the interview themes helped to inform the observation codes to affirm or add nuances to the preliminary analysis. Another research team member reviewed these codes for agreement and disagreements were resolved using the same process noted above.

Analyzing the codes

Next, we triangulated the interview and observation data in order to determine common elements of the case study story (Baxter & Jack, 2008; Yin, 2013). Elements were strengthened when a sub-theme was observed in the classroom and mentioned by an interviewee, or if multiple interviewees mentioned similar sub-themes. Sometimes triangulating the data was not possible. For example, the interview with the principal was unique because she was involved in the holistic picture, and thus knew about elements of the process that teachers were not explicitly aware of (reflecting the nuances of the research topic). During the analysis, we reorganized the codes into two categories: content and process. Content themes answered the question, “What happened?” whereas, process themes nuanced the story by humanizing the experience through emotions and interpersonal interactions. Making this distinction helped to build layers within the case study story as a complex process involving many different parts and people.

Results

The results section first outlines the chronology of events to document the process for developing and implementing the anti-bias curriculum. Then, it describes additional factors in greater detail, including children’s responses, challenges in the classroom, and the principal’s role.

Timeline: Teacher learning, curriculum development, and implementation

Initially, Martha (principal) instigated an extensive teacher training initiative in her school. She recognized this was essential, given the demographics of students and teachers. Concurrently, Martha proactively worked to diversify the school’s staff during every hiring cycle to include more men and teachers of color in order to shift the staff demographics to reflect the student demographics in her school. Understanding that teachers’ and students’ identities matter, Martha also hired two full-time school counselors, one counselor who was Black and another who was White, to provide additional one-on-one support for teachers and students. Following a three-year teacher-learning phase, all staff voted and agreed to develop their own anti-bias curriculum together. A core group of 13 racially diverse teachers developed a framework for the anti-bias curriculum during an intensive summer session, which was funded through a school district grant. During the following school year, all teachers piloted the curriculum using a designated weekly time-block to co-teach the anti-bias lessons.

Teaching began with the understanding that staff would be working collaboratively during weekly meetings to further develop lessons so they reflected the teaching styles of all team members. This study was conducted subsequently during the second year of the curriculum's implementation. For a visual of the chronological stages and timeline, see Figure 1.

Teacher learning

When Martha became the principal, community perception viewed Eastwood as a “have-not” school that was underperforming compared to the rest of the school district, and the underperforming children were more likely to be children of color and low-income children. Martha pushed her staff to confront these issues, encouraging them to think: What was in their control? What was *not* in their control? At this point, Martha did not see an anti-bias curriculum as the end goal of her work. Instead, Martha focused on the question: “Do the adults in the building have a good, strong understanding of their own biases or privileges?” As a solution, she created learning opportunities for teachers that progressed over time and allowed teachers to revisit learning to further deepen thinking in an iterative fashion. For example, Martha initiated an ongoing lecture series during faculty meetings with guest speakers from local universities and organizations to provide different perspectives from experts on topics, including: considerations for Chinese immigrant families and parental education supports, experiences of Muslim women in the United States, bilingualism and African American discourse styles, and experiences of Indian Americans and overlapping spheres of culture. Bringing in professors and community leaders gave these anti-bias topics more credibility and provided a breadth of knowledge beyond Martha's teaching. Critically, each lecture also included intentional staff discussions on how the topic related to the experiences of Eastwood students.

Following these lectures, Martha established required staff book clubs where she selected four different books that ranged in content from an introduction to anti-bias awareness to content that dug deeper into the complexities of race. The array of options scaffolded the exercise to enable individual staff members to appropriately engage, while still involving everyone. Martha noted that the book clubs seemed very powerful for the staff and helped to jump staff to the next level of awareness, setting the stage for teachers to begin asking questions related to anti-bias teaching in their classrooms. Additionally, Martha organized workshops and created safe spaces for staff to practice difficult conversations. These discussions first began without explicitly addressing race, and then later added the layer of race because Martha understood that “inherently, it's not easy for many adults to talk about race,” and she understood the importance of “setting up the progression of experiences, so that [teachers] can take on something that feels like it could be . . . hard.” In fact, Martha believes her decision to meet her staff where they were in their learning helped limit any resistance from staff.

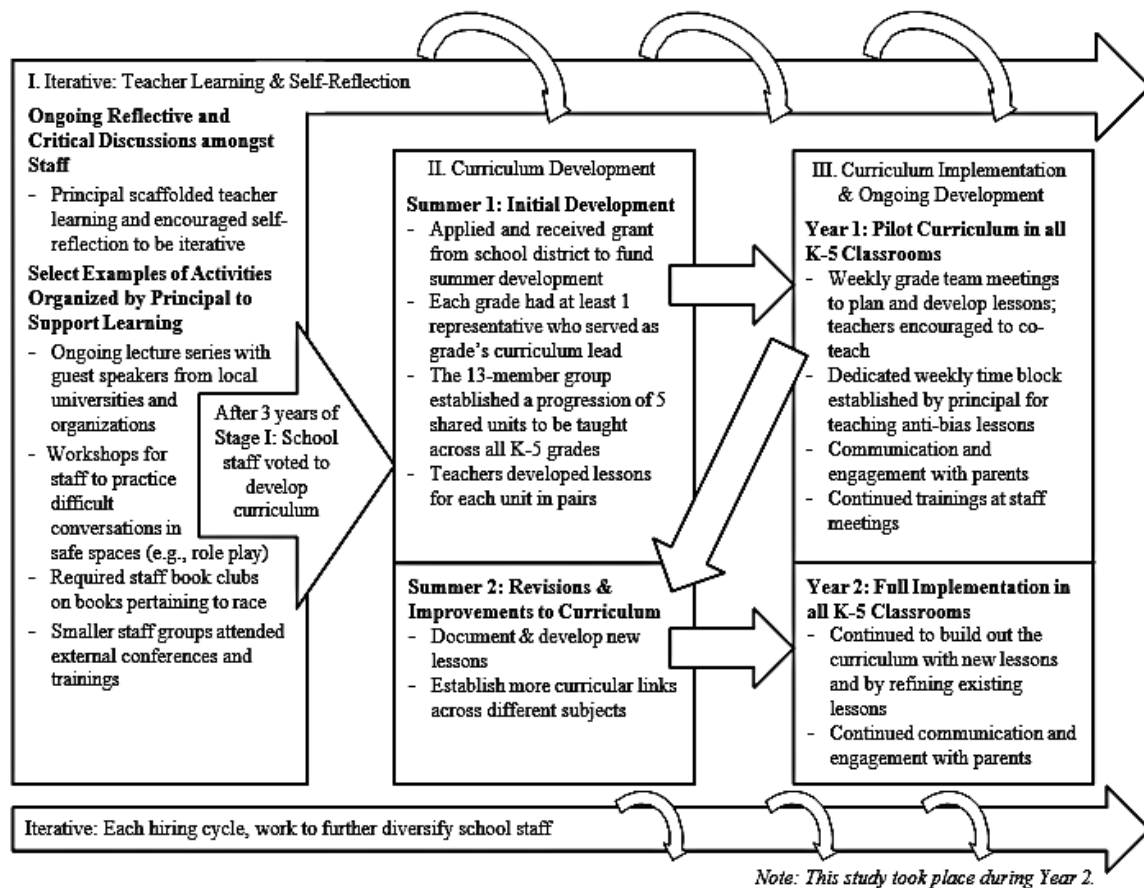


Figure 1. Chronological stages: teacher learning, curriculum development, implementation, and revision.

- **Why anti-bias teaching?** One of Martha's goals through this progression of learning was to build a strong sense of understanding among staff about *why* anti-bias learning and teaching was so important for their students. Martha wanted the anti-bias curriculum to give children the vocabulary to discuss these topics, so that they were prepared in the long term to critically think about anti-bias topics. However, she needed the staff to believe it too. She mentioned, "There's this moral imperative that all of our children feel that they can belong, and my job is to really make it crystal clear to all of the staff, that *why* . . . [and] help them feel ownership of that *why*."

Based on the teachers interviewed, it seems Martha was able to ground them in this understanding because they all shared a conviction that despite the challenges, the anti-bias curriculum was necessary for their students. This shared understanding was reinforced by the deep care they had for their students and their personal experiences. For example, Monica shared a memory from high school when a teacher told her, "Sit down, you minority." She remembered feeling very confused by the incident because although she knew she was Black and that racism existed, she said, "It wasn't explicitly taught to me how my differences would affect me. I don't want that to happen to any of the students I'm teaching." On the other hand, Sarah, who was White, mentioned in her interview how she found it very hard to engage in the anti-bias development and teaching work, noting that she mostly listened during the development of the anti-bias curriculum because she "didn't feel like an expert." Yet, she mentioned, "I continue to

be involved in this work because I think it's so important that kids are given language to talk about [anti-bias topics]." She did not want her students to find it hard to discuss these topics or assume they were unimportant. Thus, teachers felt invested in the anti-bias teaching because of their personal experiences, motivating them to remain a part of this challenging process.

- **Teacher self-reflection.** Another iterative element of the process was Martha's request that staff continue to self-reflect and work to interrogate their own unconscious biases and privileges. Monica mentioned in her interview, "There's a ton of time for reflection . . . for conversation about your own identity and thinking about how these situations affect you as a person." She followed by noting, "I think it's very important . . . that there's that reflectiveness during the [anti-bias] lessons, but also, when we have faculty time [Self-reflection] has been very helpful."

Sarah also described this iterative process, noting "[Through] the guest speakers, different presentations from Martha, and the book club, I was definitely given a lot of time to reflect and have definitely been really reflective. The more and more I'm involved the more and more it helps me to reflect on my own." As a result of this iterative process, Sarah reflected that this learning "has helped me reflect in my teaching and also informing some of these [anti-bias] lessons [The learning] definitely is always at the back of my mind." Both Monica and Sarah's comments demonstrate their belief in the importance of continued reflection and the influence of their reflections on their approach to teaching the anti-bias lessons.

Martha also mentioned an important turning point in this reflective process when teachers began to realize that they needed to explicitly and proactively discuss contemporary racial issues, such as the killings of Black boys by police officers, in order to ensure students – especially Black students – understood where teachers stood on these issues. Avoiding these conversations would further deprive all children of the language and tools to process what was happening. Through reflective and critical discussions, Martha and her staff concluded that they needed to bring these anti-bias conversations to the students themselves. This conviction was further solidified at an external conference, and with an affirming vote from the entire faculty, the development phase of the anti-bias curriculum began.

Curriculum development

The development process began with Martha inviting staff to join her effort to apply for a school district grant to fund an intensive summer development session to design the anti-bias curriculum; 13 staff joined, with at least one representative from each grade. Monica and Sarah were part of the summer work as the lead curriculum developer for their grade. In the beginning, Martha provided significant facilitation and structure for the group, in order to identify unifying themes and goals for the curriculum. The staff eventually decided on five shared units, taught in the order of: (1) Identity and Perspective, (2) Privilege and Bias, (3) Oppression and Power, (4) "Not Solved Yet,"

and (5) Social Activism. In the beginning of the year, each grade also facilitated a foundational conversation with the students to discuss “why this is important,” and create rules and a safe space as a class. Each grade level agreed to teach all five of these units every year to help build continuity across grade levels and create a cohesive progression of learning for students.

Next, staff broke into pairs to create lessons for each unit in their respective grades. Martha and other school administrators were part of this pair work – Martha worked with Sarah on the kindergarten curriculum, and the assistant principal worked with Monica on the 1st-grade curriculum. Lessons were outlined and written as suggestions, rather than rigid requirements for teachers to follow, to encourage other teachers to adapt lessons to their teaching style. Recognizing that these anti-bias topics could be challenging for young children to understand, staff worked to scaffold the teaching to make sure the content and lessons were developmentally appropriate. For example, they decided that the kindergarten curriculum would mostly focus on identity, empathy, and privilege with the intention of discussing topics such as race and racism as they organically emerged in conversation. In contrast, the 1st-grade curriculum included explicit vocabulary words such as race, racism, power, and oppression.

Curriculum implementation

The summer team then brought the curriculum to the rest of the staff and they began discussing how to implement the lessons. For this part, the METCO² social worker was also involved and provided important insights on the curriculum because her students were all children of color. Monica mentioned that although the rest of the 1st-grade team thought the curriculum was fantastic, they were skeptical as to how they were going to fit these additional lessons into already packed school days. Martha solved this issue by creating a designated time block every week when the entire school would be teaching the anti-bias curriculum. Yuriko emphasized during her interview that this administrative decision was really important because it took much of the burden off teachers to fit in lessons on their own.

The staff decided to begin piloting the curriculum in November with the understanding that significant faculty meeting time would be devoted to the development of additional lessons throughout the year. While piloting, all teachers were encouraged to incorporate their own experiences into the lessons and participated in the development and testing of new lessons. Monica touched on the adaptability of the curriculum in her interview, noting, “The curriculum has lots of opportunities for . . . teachers [to put] their own identity and self, or experiences in it. Even if they’re a White teacher, they’re saying, well I have the privilege of having my skin color in every box of crayons.” Many lessons were developed organically. For instance, Yuriko said teachers often created lessons based on new books they found or ideas they brainstormed together. She described a time when she and Sarah collaboratively developed a lesson, co-taught the lesson, and then documented their reflections. By

planning and co-teaching together, Yuriko and Sarah helped each other take risks that may have been difficult to do alone. Inherently, they needed to trust each other to take these risks together. Reflection and documentation were integral in the process. In addition, Yuriko shared the new lesson with 1st- and 2nd-grade teachers, illustrating how collaboration occurred organically across grades and further highlighting the importance of interpersonal relationships between teachers. Separately, Martha mentioned that communication across grades was encouraged because this helped with the continuity of the curriculum and ensured that perspectives of teachers of color were represented even in grades with mostly White teachers.

Monica gave an example of a time when she used her brother's experience to create a lesson on the fly. She told her students about her brother's "situation where someone was being racist toward him, but he wasn't aware of it," and asked them to write letters to him using the words racism and discrimination in their letters. Monica's teaching process appeared to be different than Sarah's and Yuriko's because she sounded more comfortable improvising and confident in her ability to teach children about anti-bias topics without significant planning time. Despite the different styles, it appears that all teachers felt comfortable with their methods of prep for the anti-bias lessons and motivated to try new lesson ideas throughout the year.

After the pilot year, Martha and interested staff applied for another school district summer grant to revise the curriculum by adding new lessons or documenting lessons developed the previous year. During this time, Monica mentioned that she identified curricular links that connected the anti-bias lessons to lessons in other subject areas to help her fellow 1st-grade teachers integrate anti-bias lessons into the school day.

Children's learning in the classroom

The interview and observation data all have examples where 1st-graders and kindergartners showed comprehension of anti-bias concepts. Nevertheless, teaching anti-bias lessons was challenging, and all teachers mentioned moments when lessons needed improvement. Consequently, teachers shared that they were continuously revising lessons to make them as developmentally appropriate as possible.

Evidence of learning in the classroom: Interviews

All teachers emphasized that their students were able to thoughtfully and seriously engage in the anti-bias lessons, and that children were using the anti-bias vocabulary words such as empathy, discrimination, and racism in conversations outside of the lessons. For instance, Monica mentioned a time when her students were taking a benchmark reading assessment in class. The reading featured a creature with green skin who was teased by other creatures for its skin. The assessment then

asked students to describe what this name-calling made them think of, and one child said, “It makes me think that they are racist. . . . That word racism you taught us. Those are those animals.” This anecdote demonstrates that this 1st-grader was able to understand racism and apply the learning outside of anti-bias lessons, suggesting that explicitly teaching 1st-grade children the language to discuss anti-bias topic such as racism can be done in developmentally appropriate ways.

Furthermore, the teachers mentioned moments in teaching when they could tell the children were engaged and the learning resonated with them. For example, in 1st grade, one lesson involved role-playing *Sneetches* by Dr. Seuss, where some children were randomly selected to have a star on their bellies, while others did not. Children with a star were able to play fun games, while the other children had to sit and watch. By the end, there was an array of emotions in the classroom, ranging from crying and confusion to children wanting to experience the other side. Despite the different reactions, Monica constructively brought the children back together by connecting the activity to her own experiences. She told her students, “This is something that I experience every day where people are allowed to do certain things that I am not allowed to do.” Monica emphasized the importance of tying lessons with real-life examples because she noticed that the children understood the greater implications of the lesson content better when it was contextualized within the real world.

During the interviews, teachers mentioned additional teaching strategies that helped to make lessons more developmentally appropriate. For instance, both Yuriko and Monica found that lessons without activities or literature did not resonate well with their students. In addition, Monica mentioned it was helpful to use a similar structure for all anti-bias lessons because the structure helped to scaffold the content for her students and a consistent structure helped them follow along.

Evidence of learning in the classroom: Observation

The classroom observation data suggest that the observed lesson seemed to resonate with the kindergarten students, supporting the interview data. During the observation, the kindergartners participated in a lesson about the concepts of advantage, disadvantage, and privilege. The lesson began with an overview where Yuriko outlined the content of the lesson. She then split the class into two groups and gave each group alphabet cards. She challenged them to work together and put the cards in alphabetical order during the allotted time. What the students did not know was that one group had all the alphabet cards, whereas another had only 10 cards.

Observing the difference in verbal and body language between the two groups was striking. When the activity began, the group with all 26 cards quickly sat down, shouted out letters, and worked together. They were smiling and energetic. In contrast, the group without a full set also began by shouting out their letters but those shouts slowly turned to murmurs as each child walked around with one alphabet card

in their hand, unsure what to do. Eventually, the group realized they were unable to complete the task, and their body language reflected this realization: they were looking down, conversing quietly, sluggish in energy, and not smiling. Yuriko then called time, appearing to have been waiting until the disadvantaged group realized they could not complete the task. Yuriko then directed the students to begin a similar activity – build the highest block tower in the allotted time. This time, she gave the previously disadvantaged group more blocks and gave the previously advantaged group a few blocks. However, the second activity ended rapidly as the now disadvantaged group learned fast and quickly realized they could not build a high tower.

During the class debrief afterward, the children expressed that they understood that one group was disadvantaged while the other was advantaged. One girl, Kathryn, explained she felt the alphabet activity was “bad because [they] didn’t have all the letters so [they] couldn’t finish.” This feeling seemed to stick with Kathryn because during reflection time in their journals afterward, Kathryn, looking downward, told her tablemates that her group didn’t have any letters. But then, perking up, she more excitedly announced that her group had lots of blocks. Similarly, another boy, Suraj, drew in his journal a picture of a tower of blocks, labeled “bad,” and a picture of “a b c d,” labeled, “good.” These examples seem to indicate that Suraj and Kathryn were both able to attribute their different emotions depending on their group’s advantage or disadvantage, demonstrating that they both grasped the concepts of the lesson.

Navigating challenging conversations

Although the children demonstrated learning and understanding of anti-bias topics, there were still instances when teachers had difficulty navigating conversations with their students that often emerged spontaneously. For example, Yuriko mentioned the following:

It came up that Donald Trump was building a wall to keep out bad people. And someone else said, No he’s building a wall to keep out Brown people. So then, we had to talk about race because . . . half the class was like, ‘Brown people? What are Brown people?’ And, the other half of the class [was] pointing at people that they felt were Brown and were saying, ‘Well he’s Brown!’

Here is an example of a complicated race-related situation where 5- and 6-year-old children were trying to make sense of what they are hearing and observing, and the teacher’s role was critical to help them understand. The anecdote highlights how acutely aware young children are of race-related, real-world events and the importance of discussing these topics when they arise. Yet, anti-bias topics can be very complicated; it is not surprising that a teacher might struggle to explain these topics to kindergartners in a way that is developmentally appropriate. Sarah encapsulated this challenge when she said anti-bias lessons “can feel tricky because I don’t feel like I have all the answers for the kindergartners and kindergartners ask a

lot of questions.” This challenge is further illustrated through another anecdote from Yuriko’s interview:

This is a question [from students] every year: ‘What’s Black people? What’s African American?’ And we can’t use [students] as an example so we say . . . ‘Some people would say an African American is someone whose family, at one point, came from Africa. And sometimes their skin is darker.’ And [the students] will—this happens every year—point at usually an Indian student and say, ‘Oh, he’s Black.’ And then the Indian student will say, ‘Yes, I’m Black.’ And I’m like, okay, great, so I don’t really know where to go with that.

Yuriko sounded uncertain on how to respond to the children’s comments because she could not tell this child that they had mis-identified themselves. This predicament appeared to be common, as Monica also mentioned students in her class often misunderstood the difference between Black and South Asian identities, even when her students knew that she was Black. Both teachers were unsure on how to address this conflation.

Another example of a challenging moment happened to Sarah when they were learning about Rosa Parks and her students had trouble comprehending why there were “bad laws” that forced people like Rosa Parks to sit at the back of the bus. Sarah said, “I didn’t feel like I had the words to explain because I don’t know.” In this situation, Sarah also felt at a loss for words to explain the harsh reality of racist laws to kindergartners. These anecdotes all illustrate the difficult process teachers constantly navigated to make the lessons as developmentally appropriate as possible. Sarah and Martha both described this process as a “muddling through” to figure out which lessons worked, and which did not in order to improve the curriculum.

For difficult moments, all teachers mentioned their grade-level teams and inter-grade colleagues as resources to brainstorm ways to address situations in the classroom. For instance, Sarah’s strategy to address spontaneous bias-related scenarios was to wait and talk with Yuriko, Monica, or another kindergarten teacher about what happened, instead of immediately feeling the need to respond in the moment. This way, she could ask for her colleagues’ thoughts and brainstorm the best way of responding together. Implied in this approach was the understanding that teachers did not always have to feel pressured to respond immediately, allowing teachers to instead pause and plan a response. In contrast, Yuriko said that she responded to spontaneous scenarios using the same strategy each time: First, validate the children’s observations and then, ask further about their thought processes. To illustrate this, she talked about a time a child told her she looked just like Mrs. Smith, who was a White teacher. Yuriko followed her strategy asking the child, “Yes, Mrs. Smith and I do look a lot alike. Tell me what you think about that,” and the child responded, “Yea, you’re both wearing pink today.” In this situation, it would be easy to mistake the child’s statement as erroneous since Yuriko was Asian and Mrs. Smith

was White. However, Yuriko’s anecdote touches on the important point that teachers must always be checking their own assumptions and biases as they interact with children, reinforcing the essential role of continued teacher learning and reflection throughout the entire process.

Similarly, Monica noted a critical point: teachers need to practice these difficult conversations with one another. She mentioned a time during a faculty meeting when the teachers practiced a role-play scenario where they overheard another teacher responding in a troubling way about a child’s hair. Monica talked about how scenarios such as this one still made her nervous because she did not want to feel like she was talking down to her colleague. However, she noted that role-playing was important so that teachers were able to practice having these conversations in order to be prepared for impromptu situations. Thus, practicing how to navigate these challenging conversations with everyone – both students and teachers – appeared to be important to the process.

The principal’s role

All three teachers reflected that Martha played a critical role as the leader and visionary at every step. In Martha’s words, she saw her role to be “responsible for both bringing in consensus around a vision and putting forth and championing the vision.” She provided guidance throughout the entire process by organizing all of the teacher trainings, fostering a collaborative and supportive staff culture, encouraging teachers to take risks, structuring the development process, and providing support throughout the pilot and second year of teaching.

Providing administrative support

Martha was always thinking about ways she could use her leadership role to support teachers. For example, she organized the effort to apply for a grant so that teachers could be compensated for their work during the summer development. She created the designated time block for the anti-bias lessons, and she introduced co-teachers into the classroom so that teachers could feel more supported while teaching. In her interview, Monica mentioned the usefulness of the co-teaching model, noting, “[My co-teacher’s] constantly trying to learn from my experiences. I’m trying to learn from hers. So, it’s very, very useful to have that person in the classroom and have that reflective time too.” Monica also mentioned that Martha was always putting other teachers in leadership roles and providing them with more learning opportunities through outside workshops and conferences. Additionally, Martha made sure it was clear to teachers that she would always back them up no matter what, noting, “What the staff here knows is that if they get pushback for anything they’re doing, I’m the one that’s going to take the heat. I’m their ‘holding environment.’³” Yuriko also mentioned that if she ever needed help, she knew Martha would step in. In this way, Martha was a safety net for teachers; having her support was critical for teachers to feel secure enough to take risks.

Building a supportive team culture

Understanding the importance of mutual support, Martha played a key role in building a supportive, collaborative team culture that was grounded in a culture of trust. She wanted teachers to know that they were in this together – no one was alone. Acknowledging Martha’s efforts, all teachers mentioned experiences related to a collaborative team culture that seemed to be normalized into the teaching and continued development process. For example, Sarah expressed gratitude toward the kindergarten team for being so open-minded, flexible, and collaborative throughout the entire process, and Monica mentioned that the 1st-grade teachers always worked together the day before to share materials and prepare for the anti-bias lesson. In addition to building a collaborative culture, Martha also mentioned her conscious effort to create a setting where teachers of color and White teachers could feel comfortable sharing and learning together:

When you’re talking about White people and People of Color . . . how do you not get stuck in the White guilt piece that then turns people off and makes them mad and then makes them turn away? And, how do you make it safe enough so that the People of Color can speak their truth without the denials. Orchestrating those pieces together—that’s a complicated process.

Her comment is important because anti-bias work is inherently very personal, shaped by an individual’s experiences. The reflection process for a teacher of color would often be very different from that of a White teacher. For example, Monica mentioned a powerful experience she had at one anti-bias workshop where they were writing down their personal narrative:

That [workshop] was the first time I actually got to write down my own story in multiple situations where I experienced extreme racism. And I, for the first time, cried because I was like, oh my goodness I didn’t realize how much this affected me, and I never really had the chance to think about it and talk to other people about it.

Monica remembered that this reflection during the workshop was emotionally challenging because she had never had a chance to fully interrogate these experiences of extreme racism. Her comment illustrates the importance of teacher self-reflection to lead to these critical realizations. It also demonstrates how reflection opportunities must be iterative because often these deeper reflections do not emerge from just one instance of reflection. Anticipating these strong emotional reactions, Martha created opportunities for staff to meet in affinity spaces to ensure teachers, particularly teachers of color, had safe and trusted spaces to share their experiences.

Monica provided an example of how relationships with other teachers of color were important. She mentioned,

One of my best friends in the school, she's also Black and we always talk about, oh my god, that happened to me as a kid that was very, like traumatic for me as a kid. [We get] to talk about [childhood experiences] now that there's a space for it.

Monica and other Black school staff, including the school counselor, were critical leaders in the process to ensure staff and students of color were heard and supported.

Additionally, these staff supports were important to maintain a cohesive team dynamic. Part of this cohesion was maintained by encouraging staff to see themselves as learners together. Martha said she encouraged constant learning through a metaphor presented by Jay Smooth.⁴ She noted that just like how you brush your teeth every day, you have to “keep being aware that we are likely – if left to not thinking about it – to resort to whatever our unconscious bias is.” Metaphors, such as this one, helped teachers understand the importance of ongoing learning and reflecting. In fact, the understanding of how critical teacher learning was for anti-bias teaching was exactly why Martha and her staff were not actively spreading the anti-bias curriculum to other schools – they did not want other teachers to begin teaching the lessons without first interrogating their own assumptions and biases.

Discussion

This section is organized by the four overarching theoretical propositions to discuss how the development and implementation process at Eastwood aligned with existing anti-bias literature.

Theoretical proposition #1: The school administration's support through collaborative program leadership is critical in the development and implementation of an anti-bias curriculum

Martha, as the school principal, played an indispensable role in the entire process. Examining the sub-propositions under the first theoretical proposition (see Appendix A), Martha managed to complete practically all of the recommendations for program leaders, outlined largely by Derman-Sparks et al. (2015). For example, Martha was determined to ensure staff understood *why* anti-bias teaching was so important for their students, and this shared understanding helped to ground teachers throughout the process. As a result, even though talking about anti-bias topics can be difficult and uncomfortable for many teachers, having a shared vision and goal seemed to help them overcome these challenges. Their ability to persist was also supported by the team culture framing the staff's anti-bias work as a joint process. Additionally, as the principal, Martha was able to make important structural changes for Eastwood (e.g., a designated weekly time block for the anti-bias lessons, diversifying the staff). Notably,

although spearheading the process, Martha did not impose her leadership role at any stage of the curriculum development or implementation process. As recommended by Derman-Sparks et al. (2015), Martha encouraged a horizontal leadership structure by making space for teachers to step up and fill additional leadership roles, exemplifying exercising “power *with*, rather than power *on*, staff and families” (Derman-Sparks et al., 2015, p. 24).

Theoretical proposition #2: Ongoing teacher self-reflection and learning is crucial before beginning anti-bias teaching

This second proposition was heavily emphasized by Martha and informed her decision to dedicate ample time for teacher learning and self-reflection before beginning discussions about an anti-bias curriculum. Martha stressed learning and reflection because she was aware that if teachers did not interrogate their unconscious biases, these assumptions would inevitably reflect in their responses to their children (Burt et al., 2010; Leekeenan & Allen, 2017). Thus, Martha provided teachers with a variety of opportunities to learn about anti-bias topics, incorporating different learning styles and materials (e.g., videos, faculty meetings, lectures, book clubs, and role-playing). As the literature suggests, all of the teachers noted that taking time to self-reflect was important for their learning, growth, preparation, and teaching (Derman-Sparks & Edwards, 2010; Husband, 2012; Kailin, 2002). Furthermore, as the literature suggests, the experiences of the self-reflections were significantly different for teachers of color than for White teachers (Doucet & Adair, 2013; Kailin, 2002; Vera et al., 2016). For example, Monica, as a teacher of color, mentioned a very emotional moment when the self-reflection helped her realize the extent to which past racist grievances against her had deeply impacted her. On the other hand, for Sarah, who identified as White, she found the process to be difficult to engage with, which she attributed to her upbringing that lacked conversations about race. Importantly, Martha understood the complexities of navigating racial dynamics among staff, and thoughtfully and carefully made sure to build a community that supported all racial groups.

Theoretical proposition #3: Building a community of learners, collaborators, and risk-takers among staff is essential

It was unexpected that all interviewees emphasized the collaborative culture as central to the entire process. For example, despite receiving no questions about the effect of the team culture on teacher experiences, every teacher repeatedly emphasized the significance of the supportive, collaborative culture. It is now clear that because of this culture, teachers felt more comfortable co-teaching and taking risks, without the fear of being accused of wrongdoing. The collaborative culture made it easier for teachers to navigate complex questions and comments from children by relying on each other to brainstorm ways to address these moments.

Importantly, Martha also modeled risk-taking for teachers, a strategy Derman-Sparks et al. (2015) emphasized to be important for collaborative program leaders. Although some of the literature mentions the importance of establishing a community of

learners and risk-takers (Derman-Sparks et al., 2015; Kuh et al., 2016), much of the existing literature does not mention team culture as being essential, rather focusing more on individual teachers and their classrooms (Doucet & Adair, 2013; Kailin, 2002; Leekeenan & Allen, 2017; Vera et al., 2016). Therefore, this study further emphasizes the importance of having a collaborative, supportive staff culture when approaching anti-bias education work as a school.

Theoretical proposition #4: Teaching anti-bias lessons in developmentally appropriate ways to young children is possible and important

The findings at Eastwood Elementary School effectively debunk the colorblind myth – young children *do* notice differences among people (Bonilla-Silva, 2014; Derman-Sparks & Edwards, 2010; Leekeenan & Allen, 2017; Marks et al., 2015; Vera et al., 2016). It is clear that kindergarten and 1st-grade children notice differences across people, and that they can comprehend ways to show empathy as well as learn to appropriately use explicit anti-bias vocabulary such as race, discrimination, and power. These demonstrations of learning by the children are important because the literature suggests that the likelihood of young children believing social inequities to be normal will likely be disrupted if they learn that these systems of oppression are in fact abnormal (Husband, 2012; Kailin, 2002).

The children's comprehension of anti-bias topics was likely due to Eastwood staff's thoughtful planning and revisions in order to make the lessons as developmentally appropriate as possible. For instance, teachers learned that by contextualizing lessons with real examples, children were able to better understand broader implications of the content beyond the classroom. Teachers reflected that incorporating literature and activities were both effective ways to teach anti-bias topics to early childhood-age children. In addition, unlike much of existing literature, Eastwood's anti-bias curriculum is unique because it is not just immersive everyday anti-bias conversations, but rather structured lessons with the goal to teach children specific content, with units, sub-units, and vocabulary words. In this way, Eastwood's curriculum adds to the existing anti-bias education literature and demonstrates ways that young children can learn from a structured and developmentally appropriate anti-bias curriculum.

Limitations

The present study had a narrow scope of inquiry due to time constraints. Thus, the interview sample size was small and the number of observations was limited. The interviewee perspectives were limited to a few voices and are not representative of all staff at Eastwood. All interviews were conducted retrospectively, relying on participants' memories. Since the interviews were conducted in the fall of the second year of implementation, interviewees could not yet identify how the prior summer's curriculum revisions improved the teaching process (e.g., usage of curricular links). Furthermore, during the interviews, we did not specifically ask how the interviewees' racial identity affected their experiences. As a result, we had limited data on how teachers' racial identities influenced their experiences and, where possible, we had

to infer how an interviewee's racial identity affected her experiences. Future research could incorporate interview questions on how an interviewee's racial and social identities influenced their experiences when developing and implementing the curriculum.

Additionally, the observation notes were also based on the researcher's biased observations. Although the researcher attempted to objectively take notes, it was impossible to eliminate her personal lens from the observation data. Moreover, because we conducted just one observation, we relied heavily on interview data to construct the case study. Instead of observation data, it may have been more helpful to use video recordings for later viewing and coding as video recordings would more fully capture the observed classroom activity. We also did not directly measure children's understanding and learning of anti-bias concepts; rather, we inferred learning through teacher's observations and through the classroom observation. Further research should include more observations per and across multiple classrooms, and interview more teachers, particularly for grades 2–5.

In sum, the experiences described in this study are based on one school's experiences, which were shaped by the surrounding setting and population. Depending on the school setting and population, a different process may unfold. Finally, all conclusions were made through the researchers' perspectives and elements of the process that they thought to be critical. Another researcher may have identified different elements instead.

Conclusion

Schools that are interested in developing and implementing an anti-bias curriculum may want to consider the following central takeaways from Eastwood staff's experiences. First, strong leadership from the principal and key teachers is critical. The leaders must provide guidance, while also opening space for others to step up. All leaders need to be supportive and ground teachers in a clear vision of the goals. Second, carving out time and space for teachers to learn about anti-bias topics as well as critically self-assess their own identity, background, biases, and privileges is a necessary first step before teaching anti-bias lessons to young children. It is vital that teachers understand their own unconscious biases to ensure all students are well supported. Importantly, the self-reflection process can vary between teachers of color and White teachers, particularly given teachers' lived experiences with racism. Thus, an array of supports that address and respond to different teachers' needs should be made accessible.

Third, fostering a collaborative, trusting, supportive community of learners and risk-takers is essential for teachers to feel prepared and confident to teach anti-bias lessons to their children. This collaborative culture can be further strengthened when teachers have a firm understanding of *why* anti-bias learning is important, especially during the early ages. Importantly, if teachers are continually reminded of the

importance of anti-bias teaching, they are more likely to continue investing their time and energy into the process. Finally, this study supports the literature that anti-bias education can be taught in early childhood classrooms. The findings illustrate that developing and incorporating an anti-bias curriculum at a public elementary school is possible and that larger public elementary schools could potentially work to develop their own anti-bias curricula. If more schools are able to implement effective anti-bias curricula, more children will receive anti-bias education from a young age, better preparing them for their future development and experiences.

Notes

1. All names are pseudonyms to protect participants' identities.
2. The METCO Grant Program is a voluntary school desegregation program in the Boston area. The purpose is to "expand educational opportunities, increase diversity, and reduce racial isolation." In 2017, about 3,300 children participated in this program (<http://www.doe.mass.edu/metco/>, 2017).
3. As referred in Drago-Severson, E., & Blum-DeStefano, J. (2018). *Leading change together: Developing educator capacity within schools and systems*. ASCD.
Original presentation noted in reference list as Tedx Talks (2011).

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References

- Baxter, P., & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The Qualitative Report*, 13(4), 544–559. <https://nsuworks.nova.edu/tqr/vol13/iss4/2>
- Bian, L., Leslie, S.-J., & Cimpian, A. (2017). Gender stereotypes about intellectual ability emerge early and influence children's interests. *Science*, 355(6323), 389–391. <https://doi.org/10.1126/science.aah6524>
- Bonilla-Silva, E. (2014). *Racism without racists: Color-blind racism and the persistence of racial inequality in America*. Rowman & Littlefield Publishers.
- Boutte, G. S., Lopez-Robertson, J., & Powers-Costello, E. (2011). Moving beyond colorblindness in early childhood classrooms. *Early Childhood Education Journal*, 39(5), 335. <https://doi.org/10.1007/s10643-011-0457-x>

- Bower, L. A., & Klecka, C. L. (2009). Lesbian mothers' bids for normalcy in their children's schools. *The Educational Forum*, 73(3), 230–239.
<https://doi.org/10.1080/00131720902991293>
- Bronson, P., & Merryman, A. (2009). *NurtureShock: New thinking about children*. Grand Central Publishing.
- Burt, T., Gelnow, A., & Lesser, L. K. (2010). Creating welcoming and inclusive environments for lesbian, gay, bisexual, and transgender (LGBT) families in early childhood settings. *YC Young Children*, 65(1), 97–102.
<http://www.jstor.org/stable/42730553>
- Census Bureau, U. S. (2018). *A more diverse nation: Distribution of race and Hispanic origin by race groups*. U.S. Department of Commerce, Economics and Statistics Administration. <https://www.census.gov/content/dam/Census/library/visualizations/2019/comm/age-race-distribution.pdf>
- Chen, D. W., Nimmo, J., & Fraser, H. (2009). Becoming a culturally responsive early childhood educator: A tool to support reflection by teachers embarking on the anti-bias journey. *Multicultural Perspectives*, 11(1), 101–106.
<https://doi.org/10.1080/15210960903028784>
- Derman-Sparks, L., & Edwards, J. O. (2010). *Anti-bias education for young children and ourselves*. National Association for the Education of Young Children.
- Derman-Sparks, L., LeeKeenan, D., & Nimmo, J. (2015). *Leading anti-bias early childhood programs: A guide for change*. Teachers College Press.
- Doucet, F., & Adair, J. K. (2013). Addressing race and inequity in the classroom. *YC Young Children*, 68(5), 88–92, 94–97.
<http://www.jstor.org/stable/ycyoungchildren.68.5.88>
- Durden, T. R., Escalante, E., & Blich, K. (2015). Start with us! Culturally relevant pedagogy in the preschool classroom. *Early Childhood Education Journal*, 43(3), 223–232.
<https://doi.org/10.1007/s10643-014-0651-8>
- Edwards, J. O. (2017). How to get started with anti-bias education in your classroom and program. *Child Care Exchange*, (233), 78–82.
<https://www.childcareexchange.com/article/how-to-get-started-with-anti-bias-education-in-your-classroom-and-program/5023378/>

- Epstein, D. (1993). Too small to notice? Constructions of childhood and discourses of “race” in predominantly White contexts. *Curriculum Studies*, 1(3), 317–334. <https://doi.org/10.1080/0965975930010302>
- Hirschfeld, L. A. (2012). Seven myths of race and the young child. *Du Bois Review: Social Science Research on Race*, 9(1), 17–39. <https://doi.org/10.1017/S1742058X12000033>
- Howes, C. (2010). *Culture and child development in early childhood programs: Practices for quality education and care*. Teachers College Press.
- Husband, T. (2012). “I don’t see color”: Challenging assumptions about discussing race with young children. *Early Childhood Education Journal*, 39(6), 365–371. <https://doi.org/10.1007/s10643-011-0458-9>
- Kailin, J. (2002). *Antiracist education: From theory to practice*. Rowman & Littlefield Publishers. Kemple, K. M., Lee, I. R., & Harris, M. (2016). Young children’s curiosity about physical differences associated with race: Shared reading to encourage conversation. *Early Childhood Education Journal*, 44(2), 97–105. <https://doi.org/10.1007/s10643-014-0683-0>
- Kohli, R. (2009). Critical race reflections: Valuing the experiences of teachers of color in teacher education. *Race Ethnicity and Education*, 12(2), 235–251. <https://doi.org/10.1080/13613320902995491>
- Kuh, L. P., LeeKeenan, D., Given, H., & Beneke, M. R. (2016). Moving beyond anti-bias activities: Supporting the development of anti-bias practices. *Young Children*, 71(1), 58–65. <https://www.jstor.org/stable/ycyoungchildren.71.1.58>
- Leekeenan, D., & Allen, B. (2017). It can be done! Strategies for embedding anti-bias education into daily programming. *Child Care Exchange*, (236), 52–56. <https://www.childcareexchange.com/catalog/product/anti-bias-education/4902057/>
- Marks, A. K., Ejesi, K., McCullough, M. B., & Coll, C. G. (2015). Developmental implications of discrimination. In R. M. Lerner & M. E. Lamb (Eds.), *Handbook of child psychology and developmental science* (pp. 324–365). John Wiley & Sons.
- McIntosh, P. (1988). *White privilege: Unpacking the invisible knapsack* (ED355141). ERIC. <https://files.eric.ed.gov/fulltext/ED355141.pdf?utm#page=43>

- Ríos, F., & Montecinos, C. (1999). Advocating social justice and cultural affirmation: Ethnically diverse preservice teachers' perspectives on multicultural education. *Equity & Excellence in Education*, 32(3), 66–76. <https://doi.org/10.1080/1066568990320308>
- Stoll, L. C. (2014). Constructing the color-blind classroom: Teachers' perspectives on race and schooling. *Race Ethnicity and Education*, 17(5), 688–705. <https://doi.org/10.1080/13613324.2014.885425>
- Sugden, N. A., & Marquis, A. R. (2017). Meta-analytic review of the development of face discrimination in infancy: Face race, face gender, infant age, and methodology moderate face discrimination. *Psychological Bulletin*, 143(11), 1201–1244. <http://dx.doi.org/10.1037/bul0000116>
- Tedx Talks. (2011, November 15). *TEDxHampshireCollege - Jay Smooth - How I learned to stop worrying and love discussing race* [Video]. YouTube. <https://www.youtube.com/watch?v=MbdxeFcQtaU>
- Van Ausdale, D., & Feagin, J. R. (2001). *The first R: How children learn race and racism*. Rowman & Littlefield Publishers.
- Vaught, S. E., & Castagno, A. E. (2008). "I don't think I'm a racist": Critical race theory, teacher attitudes, and structural racism. *Race Ethnicity and Education*, 11(2), 95–113. <https://doi.org/10.1080/13613320802110217>
- Vera, E., Camacho, D., Polanin, M., & Salgado, M. (2016). Education interventions for reducing racism. In A. N. Alvarez, C. T. H. Liang, & H. A. Neville (Eds.), *The cost of racism for people of color: Contextualizing experiences of discrimination* (pp. 295–316). American Psychological Association.
- Yin, R. K. (2013). *Case study research and applications: Design and methods*. Sage Publications.
- York, S. (2016). *Roots and wings: Affirming culture and preventing bias in early childhood*. Redleaf Press.

Appendix A. Anti-bias education theory – Guiding theoretical propositions

1. The school administration’s support through collaborative program leadership is critical in the development and implementation of an anti-bias curriculum.

Guiding question: How did the administration facilitate the teacher learning, curriculum development, and implementation process?

Theoretical sub-propositions

- (a) Establish and stay grounded in a shared program vision; Affirm nonnegotiable program values.
- (b) Empower teachers by providing opportunities for teachers to step up and feel ownership of the curriculum.
- (c) Promote collaboration and input from all staff to encourage staff to feel personally invested in mission, values, and goals of the program.
- (d) Lead by example; Have the courage to take the first step forward.
- (e) Respect and build connections with families.
- (f) Understand and balance staff power dynamics.
- (g) Have staff that comes from a diverse array of backgrounds through intentional hiring procedures.
- (h) Be prepared to negotiate potential conflicts between different program stakeholders (e.g., staff, families, and administrators).
- (i) Understand the context in which school is located and the surrounding community.

2. Ongoing teacher self-reflection and learning is crucial before beginning anti-bias teaching.

Guiding question: How did the staff trainings aid in the staff planning, curriculum development, and implementation process?

Theoretical sub-propositions

- (a) Program leadership need to scaffold teacher learning and the curriculum development process because staff are coming from different places and levels of awareness regarding anti-bias work.
- (b) Program leadership should provide multiple different avenues for teachers to engage in anti-bias learning (e.g., staff meetings, assigned literature, workshops, staff retreats, professional conferences).
- (c) Program leadership must carve out time and create space for teachers to engage in critical self-reflection.
- (d) Staff should understand that everybody has biases and these affect their perspectives.

- (e) Staff should understand their own social identities, implicit biases, assumptions, stereotypes, and discomforts.
- (f) Staff should acknowledge their own privileges and potential internalized oppressions or privileges.
- (g) Staff may feel that critical self-assessment is a very uncomfortable process.
- (h) Staff may find that reflecting in groups and sharing reflections with others helps deepen their learning and understanding.

3. Building a community of learners, collaborators, and risk-takers among staff is essential.

Guiding questions: What was the staff mind-set regarding anti-bias work and what was the staff culture related to developing and teaching the curriculum? In what ways did this particular mind-set and culture contribute to the development and implementation process?

Theoretical sub-propositions

- (a) Everybody needs to make a commitment to anti-bias work.
- (b) Program leadership should create an environment where people are comfortable taking risks and there is a culture of trust.
- (c) Staff must support each other.
- (d) Staff must feel supported by program leadership and believe the leadership will back them up, if necessary.

4. Teaching anti-bias lessons in developmentally appropriate ways to young children is possible and important.

Guiding question: How did teachers decide whether a lesson or the lesson content was developmentally appropriate?

Theoretical sub-propositions

- (a) Important to scaffold children's learning by asking questions relevant to their lives and to encourage critical thinking.
- (b) Learning happens often in spontaneous moments and it is important to listen and respond to children's curiosities, questions, and comments as they come up.
- (c) Ongoing conversations and reminders to children are important and necessary for successful anti-bias teaching.

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How can Questioning Strategies Support Children's Scientific Investigations during Construction Play?

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Introduction

Children engaged in construction play display behaviours of scientific investigation, such as experimenting with different sizes of boxes to form a bridge or attempting to fit loose parts to build a ramp as they explore with materials. According to Vygotsky's idea of Zone of Proximal Development, a more knowledgeable other scaffolds children's learning, helps to construct concrete meaning and engages in active reflection (Beloglovsky & Daly, 2015). Children tap on these valuable opportunities to further develop their critical thinking and problem-solving skills. Hence, this teacher research project will look into the use of different types of questions in order to engage children in learning science concepts in the early childhood classroom (Bulent et al., 2016).

This teacher research project by Hui Li Shee (under the supervision of Siew Chin Ng) took place in a kindergarten setting in Singapore with eight children aged 4 to 5. It investigated how questioning strategies facilitate and extend scientific learning for young children during construction play – specifically using convergent and divergent questions. Data was collected via observations of children's construction play episodes with teacher journal entries. Thematic analysis was conducted on the observation notes as well as the teacher reflective journal. This study demonstrates that the use of convergent and divergent questions support children's scientific skills of observation, prediction, experimentation, classification, comparison and communication.

Literature Review

What is construction play?

Young children explore constructive materials creatively and playfully (Thorshag & Holmqvist, 2018). Children construct, build, expand and test their ideas by stacking, assembling, disassembling or moulding materials. Thorshag & Holmqvist (2018) found that young children explore the use of materials to construct 'houses' or 'vehicles' naturally using everyday materials with their peers. Ramani et al. (2014) reported children experimenting with vertical and horizontal block placements to make 'towers' and 'rows' in their 'houses'. These indicate that construction play consists of opportunities for children to explore and investigate, amongst some of the scientific skills that could be promoted.

Science Learning

Research shows that young children are capable of science learning and scientific reasoning from an early age (Samarapungavan et al., 2008). During science learning, children investigate how things work using tools to observe, predict, experiment, compare, classify and communicate with others (Ministry of Education, 2013). Science learning is important because it allows children to understand what is happening in the world around them (Ministry of Education, 2013).

Scientific investigation in construction play

Construction play involves science and is often considered a science-related type of play for children (Bagiati & Evangelou, 2016). Gold & Elicker (2020) likened children to scientists hypothesising, predicting and testing their construction goals during construction play. An example of these goals were illustrated by Gold & Elicker (2020) who detailed 4-year-olds attempting to maintain the structural stability while building a tower. Children determined the tower's centre of gravity by balancing blocks and involved themselves in understanding the concept of the state of equilibrium. This showcased children's scientific investigation in finding out how the tower can be prevented from collapsing. Similar findings were reported in Weber et al.'s (2020) work on children's reasoning skills during construction play. Children confront their scientific predictions with evidence through investigation or experimentation with hands-on materials while playing (Bagiati & Evangelou, 2016). In the process, young children confirm or adjust their theories through concrete evidence, developing their capabilities as young scientists.

Questioning strategies to support scientific investigation

Educators play an integral role in shaping conversations to promote children's learning (Thwaite & McKay, 2013). Questioning has functioned as a primary tool for teachers to activate children's cognition and support children's exploration. Different types of questions lead children to either think, recall, predict or problem-solve (Bulent et al., 2016). It is fundamental for teachers to be aware of the type of questions to pose as different questions portray different aims (Bulent et al., 2016). In this teacher research, convergent and divergent questions will be utilised.

Convergent questions are close-ended, factual and recall questions that move children towards a singular conclusion. The use of convergent questions is found to be effective in assessing children's understanding of scientific content. In a study by Furman et al. (2019), children aged 5 were asked to distinguish between the volume of the sound with a convergent question, 'Was the sound quiet or loud?' The teachers find that this type of questioning allows them to collect evidence of children's understanding of the intensity of sounds almost immediately.

Divergent questions are open-ended questions used to induce higher level thinking for predicting, hypothesising, evaluating and creative thinking in children (Bulent et al., 2016). These are the 'how could', 'what might' and 'suppose' questions. These enable

children to seek out more information in order for prior knowledge to be transferred from one context to another during their scientific investigation.

Prior observation of the group of children in the current study included their experimenting with different sizes of boxes to form a bridge, exploring with PVC pipes to build a ramp, or attempting to fit loose parts together to form a car. Thus, the teacher-researcher became interested to look into children's scientific investigations during construction play as they demonstrated curiosity, inquiry, exploration and experimentation.

Methods

Data collection was conducted over 5 weeks when children were observed whenever they had participated in construction play. In particular, children's responses relating to scientific investigation were noted, such as predicting, hypothesising, testing theories. In addition, interactions and conversations with peers and the teacher-researcher were also audio recorded. Teacher journals were also recorded on a weekly basis. The observation notes and teacher reflective journal were analysed qualitatively following Berg (2001), Morse & Richards (2002) and Bengtsson's (2016) qualitative data analysis framework. All the data was first decontextualised, then recontextualised, later categorised and lastly compiled, reviewed and labelled with codes according to the use of strategies and children's responses. The themes emerged based on how the use of convergent and divergent questions support children's scientific investigation during construction play.

Findings

From the observation and teacher journal data, analysis revealed six scientific skills displayed by children during construction play: (1) making observations, (2) making predictions, (3) engaging in experimentation, (4) comparison, (5) classification and (6) communication with others. An example will be presented for each theme to illustrate children's scientific investigation in response to divergent and convergent questions utilised by the teacher researcher.

Theme 1: Making observation

Making observation involves children using non-verbal cues and utterances to communicate their observation on occurrences and properties of constructive materials. For example, children commented on what they were building and described the colour and size of the constructive materials as well as explained and provided reasons for how the constructive materials connected or moved.

In this instance, Luca was engaged in the repeated process of building ramps and rolling the marble down the ramp. I utilised both convergent and divergent questions to draw his observation to the motion of the marble on different ramps.



Photo 1 - The two-level ramp built by Luca

Teacher (Convergent question): *Did you see how the marble rolled from one end to another?*

(Luca tracked the motion of marble on the ramp. He tracked the marble on the ramp that is less steep.)

Luca: *It looks like it is rolling slower, why is it rolling slower?*

Teacher (Divergent question): *How can you tell from looking at the marble?*

(Luca rolled the marble down the ramp again and tracked the marbles with his eyes.)

Luca: *The marble takes a longer time to roll down to the end on the second ramp.*

The convergent question encouraged Luca to observe facts about the speed of marble on a less steep ramp and wondered why the marble was rolling slower. The divergent question continued to encourage Luca to observe why the marble was rolling slower and Luca was able to infer from his observation that it was because the marble was taking a longer time to roll down the ramp.

Theme 2: Making prediction

Making prediction involves children predicting either the outcomes or what will follow based on the occurrences they had observed. For instance, children suggested what happens next through speculating the speed and distance of the marbles on different levels of ramp.

In this instance, I extended Luca and Aloysius's interest in building different levels of ramps by using both divergent and convergent questions to help them make informed guesses and to explain what happens when the marble roll down a less inclined ramp.



Photo 2 - Luca and Aloysius built a new ramp that is steeper

Teacher (Convergent question): *I see, and the first ramp is steeper than the second ramp. So, would the marble roll faster or slower on this new steeper ramp?*

Luca: *I think it will roll down faster.*

Aloysius: *Me too, it will roll down fast fast.*

Teacher (Divergent question): *Why do you say that?*

Luca: *Because this ramp is taller than the first ramp.*

Teacher: *Ok let's find out.*

The convergent question helped children to recall prior observation of marbles rolling down the different levels of ramps, while the divergent question helped them to make connections of their prior knowledge to what they are currently doing so that they can predict what happen when the marble roll down on a steeper ramp. This allowed the children to make the prediction and to give the explanation that the marble would roll down faster because the ramp is steeper.

By responding “Let’s find out”, children were encouraged to confirm and test out their predictions, whether they are correct or inaccurate. After which, they found out that the taller ramp makes the marble roll down faster.

Theme 3: Engage in experimentation

Engaging in experimentation involves children’s experimentation with the constructive materials to look at how different phenomenon take place after they experimented with the constructive materials. Some instances include balancing pegs and straws to build a long bridge or experimenting with wire casing and blocks to build ramps for the marbles to roll down.

In this instance, Ally was building a long bridge with pegs and straws. Both divergent and convergent questions were posed to engage her in trial and error of building a long bridge that stands.

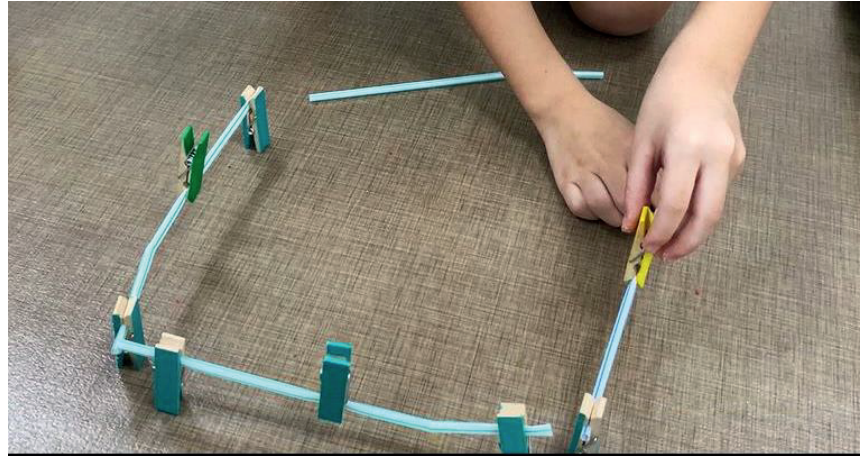


Photo 3 - Ally stabilized the 'bridge' by pegging the sides and middle of the straws

Teacher (Convergent questions): *What method are you trying? Did it work?*

Ally: *I used many pegs on the straws, I am trying to make it stand. It's not standing.*

Teacher (Divergent question): *How can we stabilise the straws?*

(Ally began to peg the middle and sides of the straws and the bridge stood.)

Ally: *This method works!*

The convergent questions prompted Ally to identify the method she used to build her bridge and whether it was effective to make the bridge stand. Ally was able to identify that she used many pegs, but it did not work. This helped her to eliminate that method and try a new method to stabilise the bridge. Subsequently, the divergent question guided her to engage in trial and error with the number of pegs she used and where she pegged them. Finally, Ally was able to successfully stabilise the bridge with the new method. As this project was child-led, the teacher-researcher observed that no matter how many unsuccessful attempts Ally had, she did not give up until her bridge stands. Hence, it can be deduced that if a construction project is based on children's interests, they would continue engaging in trial and error until they achieved their objectives, building persistence and grit through the process.

Theme 4: Engage in comparison

Engaging in comparison involves children comparing the similarities and differences of the occurrences and constructive materials they have observed. Some instances include comparing the height and shape of the constructive materials and the differences in distance and time of the marbles.

In this instance, Ros was building symmetrical structures and I decided to use a convergent and divergent question to guide her to observe how similar her structures are.



Photo 4 - Ros built a symmetrical train tunnel

Teacher (Convergent question): *Is your train tunnel same on both sides?*

(Ros nodded her head.)

Teacher (Divergent question): *How are they the same?*

Ros: *They are the same, you see, two squares here, another two rectangles here.*

Teacher: *Oh yes, it is symmetrical, looking like a mirror reflecting the other side.*

The convergent question encouraged Ros to extend her knowledge of her own structures through observation. Later, the divergent question encouraged Ros to explain why her structures are same on both sides. This allowed Ros to identify how her structure is symmetrical as she observed that there is a square and rectangle on both sides.

Theme 5: Engage in classification

Engaging in classification involves children categorising and sorting constructive materials and phenomena into groups according to similar characteristics after the strategies were utilised. Some instances include sorting constructive materials into colour and describing similar occurrences that happened.

In this instance, similar occurrences were happening while Aloysius and Rinnah experimented with the constructive materials. I used both divergent and convergent questions to guide children to observe how similar the phenomenon was and to give the same meaning to similar occurrences.



Photo 5 - Rinnah rolled the marble down the ramp and observed how the marble hit and bounced off the block

Teacher (Divergent question): *Why is the marble going to a different direction?*

Aloysius: *The marble hit the block and rolled back.*

Teacher (Convergent question): *Oh so the marble rolled down the ramp and change direction when it hit the block. Have you seen something similar before?'*

Rinnah: *Yes when the soccer ball hit the wall it also roll different direction after that.*

The divergent question prompted children to describe the phenomena that just happened. This led to the use of convergent question which encouraged children to think of similar phenomena that happened. This allowed the children to classify the phenomena and give them the same meaning.

Theme 6: Communicating with others

This theme reveals how children shared or showed their discoveries with their peers either verbally, or in drawing and construction models to help others understand them after convergent and divergent questions were used. Some instances included asking questions about their peers' constructive models, conveying their construction plan through drawings.

In this instance, I observed Jayden's sense of wonder and curiosity with his peers' structures and decided to use convergent and divergent questions to guide him to engage in peer learning by asking questions.



Photo 6 - Jayden observing Luca's zig zag ramp

Teacher (Convergent question): *You look curious with Luca's structure, is there something you would like to ask him?*

(Jayden nodded.)

Teacher (Divergent question): *What are some things you would like to find out from him?*

Jayden: *He connected the ramps in zig-zag lines, like up and down.*

Teacher (Divergent question): *What questions can you ask to find out about that?*

Jayden: *Luca, how did you connect the wire casing to make zig-zag lines?*

From the anecdotal record, it was seen that the convergent question nurtured Jayden's curiosity to ask Luca about his ramps. The following divergent questions sustained Jayden's curiosity to formulate questions for Luca to find out what he wanted to know. This resulted in Jayden asking Luca how he connected the wire casing to make zig-zag ramp.

Discussions

In response to teacher-researcher's divergent and convergent questions, children demonstrated scientific skills in their investigation. These skills include making observations, making predictions, engaging in experimentation, comparison, classification and communication with others during construction play. The analysis from the experiences and teacher reflective journal suggested that convergent questions helped children to establish facts from more directly observable scientific phenomena to reach a single response which further their scientific skills. When convergent questions were used, children recall facts to communicate what has happened with others who are trying out the same theory. Divergent questions were found to encourage children to further consider their experimentation by engaging in trial and error, attempting new methods and displaying creative thinking. Additionally, divergent questions help children to operate beyond their current developmental knowledge to explain their theory as they explore and find answers to their experimentation. While differing in objective, both type of questions support a

teacher's eventual goal in helping children further their observational and inferential skills as well as experimentations. When utilised at the same time, convergent and divergent questions promote children's scientific exploration which are supported by existing literature that found these questions beneficial (Bagiati & Evangelou, 2016; Bulent et al., 2016; Furman et al., 2019). This teacher research highlights the importance of the types of questions in guiding children's scientific investigation which in turn strengthen their development of scientific skills.

Recommendation

Since the use of convergent and divergent questions have been found to be beneficial in extending children's scientific investigation in construction play, future research can be extended to other play settings which provide multiple opportunities for scientific exploration, such as during water play or outdoor play. This research can also be extended to children of other age groups, in order to investigate if the findings are consistent and can be generalised for all children. This would allow us to collect even more data and enable us to know whether these findings can be generalised. This teacher research could encourage and inform practitioners on how utilising convergent and divergent questions can promote scientific investigations during construction play.

Reflection

This teacher research certainly gave me a clearer view on the role I should take during children's construction play. It allowed me to learn questioning strategies to enrich and extend children's scientific investigation, which help me to gain confidence to support children's learning in the area of my interests – construction play. Additionally, the strategies had extended children's constructive goals which are consistent to the questioning strategies introduced in prior studies. With the opportunity to conduct this teacher research, it implicates my teaching practices with my own class in the future. In light of that, I was able to share what I have gleaned from my research with my peers. As such, it gives them insights to how they can best support children's scientific learning in their own class.

References

- Bagiati, A., & Evangelou, D. (2016). Practicing engineering while building with blocks: Identifying engineering thinking. *European Early Childhood Education Research Journal*, 24, 67–85. <https://doi.org/10.1080/1350293X.2015.1120521>
- Beloglovsky, M., & Daly, L. (2015). *Early learning theories made visible*. US: Redleaf Press
- Bengtsson, M. (2016). How to plan and perform a qualitative study using content analysis. *NursingPlus Open*, 2, 8-14. doi:10.1016/j.npls.2016.01.001
- Berg, B. L. (2001). *Qualitative research methods for the social sciences*. (4th Ed.). Boston: *Alwyn & Bacon*.
- Bulent, D., Erdal, B., Ceyda, A., Betul, T., Nurgul, C., & Cevahir, D. (2016). An analysis of teachers questioning strategies. *Educational Research and Reviews*, 11(22), 2065–2078. <https://doi.org/10.5897/err2016.3014>
- Furman, M., Luzuriaga, M., Taylor, I., Jarvis, D., Dominguez Prost, E., & Podestá, M. E. (2019). The use of questions in early years science: a case study in Argentine preschools. *International Journal of Early Years Education*, 27(3), 271–286. <https://doi.org/10.1080/09669760.2018.1506319>
- Gold, Z. S., & Elicker, J. (2020). Engineering peer play: A new perspective on science, technology, engineering, and mathematics (STEM) early childhood education. *International Perspectives on Early Childhood Education and Development*, 61–75. https://doi.org/10.1007/978-3-030-42331-5_5
- Ministry of Education. (2013). *Discovery of The World. Nurturing Early Learners A Curriculum for Kindergartens in Singapore*. Singapore: Ministry of Education. <https://www.nel.moe.edu.sg/teaching-and-learning/learning-areas/discovery-of-the-world>.
- Morse, J. M., & Richards, L. (2002). *Readme first for a user's guide to qualitative methods*. Sage publications.
- Ramani, G. B., Zippert, E., Schweitzer, S., & Pan, S. (2014). Preschool children's joint block building during a guided play activity. *Journal of Applied Developmental Psychology*, 35(4), 326–336. <https://doi.org/10.1016/j.appdev.2014.05.005>

- Samarapungavan, A., Mantzicopoulos, P., & Patrick, H. (2008). Learning science through inquiry in kindergarten. *Science Education*, 92(5), 868–908. <https://doi.org/10.1002/sce.20275>
- Thorshag, K., & Holmqvist, M. (2018). Pre-school children's expressed technological volition during construction play. *International Journal of Technology and Design Education*, 29(5), 987–998. <https://doi.org/10.1007/s10798-018-9481-0>
- Thwaite, A., & McKay, G. (2013). Five year olds doing science and technology: How teachers shape the conversation. *Australian Journal of Language and Literacy*, 36(1), 28-37.
- Weber, A. M., Reuter, T., & Leuchter, M. (2020). The impact of a construction play on 5- to 6-year-old children's reasoning about stability. *Frontiers in Psychology*, 11. <https://doi.org/10.3389/fpsyg.2020.01737>

Appendix: Examples of Convergent and Divergent Questions

Scientific Investigation Skills during Construction Play	Convergent Questions	Divergent Questions
Observe	1. Did you see ____? 2. Have you seen anything new? 3. Have you seen anything different?	1. What do you wonder about what you see? 2. How can you tell from looking at ____?
Predict	1. What is happening now? 2. What has happened before? 3. What happened after?	1. What happens if ____? 2. Why do you think that would happen? 3. What would that lead to?
Experiment	1. Can you find a way? 2. What kinds of constructive materials are you using?	1. What if we ____? 2. How can we ensure that ____? 3. How can we find out if ____? 4. Why would it be like that ____?
Compare	1. Are they different? 2. Are they the same?	1. How is ____ different from ____? 2. How is ____ the same as ____?
Classify	1. Which group does this belong to? 2. Does this belong to this group or that group?	1. Why are they placed in the same group? 2. How can we group them together?

Communicate with others	<ol style="list-style-type: none">1. Who did you discuss with?2. Who did you tell your predictions to?3. Who did you compare your findings with?	<ol style="list-style-type: none">1. How can you tell your friends about what you saw?2. How can you work with your friends to ____?
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Experiences of a Preschool Classroom Engineering with Blocks to Foster Creative Thinking: A Teacher Inquiry

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Lead Teacher, Little Village

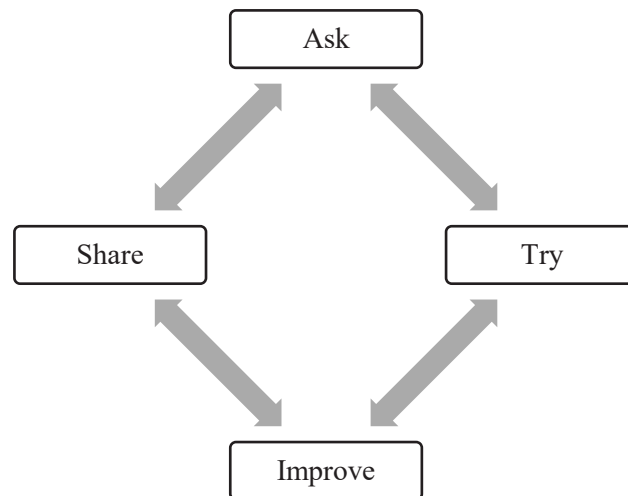
Introduction and Literature Review

As part of the undergraduate program at the Singapore University of Social Sciences (SUSS), I embarked on a final year research project, where I wanted to discover more about the ways children solve problems creatively during block play – a learning centre I spent most of my time in during practicum. I naturally gravitated towards the topic of engineering and creativity in children’s block play creations for this research.

The relationship between creativity and engineering thinking is clearly demonstrated during young children’s block play. Creative thinking, as Ness and Farenga (2016) maintained, is important for developing skills such as “problem finding, problem-solving and working with ill-defined problems”. Along the same lines, engineering is the process of finding solutions to problems by creating products or processes that perform desired functions (Stone-MacDonald et al., 2015). At the same time, blocks provide a user with many different uses and possibilities, or, in other words, many affordances, to manipulate and work with. Indeed, Ness and Farenga (2016) propose that an inverse relationship between the level of affordance of a VCPO and the creative development an individual might gain from constructive play. Engineering with blocks thus provides a space when children are free to explore in a way where they can develop their own insights and interpretations about work, developing creativity and problem-solving skills (Beghetto & Kaufman, 2009).

For my research, I utilised the engineering design process (EDP) as a guide to scaffold the children’s inquiries and create solutions for their block play problems. The key elements, as outlined in Figure 1, are often misunderstood as a flow chart, with one step leading to the next, finally ending with a completed product. However, it is important to note that the EDP is an iterative process (Stone-MacDonald et al., 2015). Young children move freely between the phases and even implement several engineering practices at the same time (Stone-MacDonald et al., 2015).

Figure 1
EDP used in my classroom



With a deeper understanding between the creative thinking, engineering and block play through literature, I crafted the following questions to guide my research:

1. How will the introduction of engineering problems as provocations during block play encourage creative thinking in my preschool class?
2. How will the use of the engineering design process (EDP) framework assist me in facilitating children's problem-solving process and discussions?

Methodology

The socio-constructivist approach to child development was used to anchor this research paper. Drawn from Piaget's constructivist theories and re-imagined through the pedagogical approach of Reggio Emilia schools (Rinaldi, 1998) and the Project Approach (Katz & Chard, 2000), the premise of this perspective is that children are active protagonists of their learning. To make sense of the world around them, they test their environments with their own ideas and theories (Chaillé, 2008; DeVries et al., 2002).

Following socio-constructivist perspectives, the research was designed as a qualitative practitioner action research project using qualitative methods, including the following tools used for data collection:

1. complete-participant observation anecdotal records of block play sessions, with photographs, videos, and audio-recordings,
2. group reflections with children, audio-recorded,
3. individual teacher journal reflections, and
4. documentation of the children's work in the form of EDP cycles, interpreted from my understanding of the children's inquiries.

The block play sessions occurred outdoors every Monday for 45 to 60 minutes.

During every session, observations and documentation were conducted for roughly 30 minutes. After each outdoor session, the children gathered for Snack Time where the group reflections took place.

My research study was conducted in a government-subsidized, independently owned preschool in central Singapore, in a classroom of 20 three- and four-year olds (N2). A small group of five children participated in the study. This group of children were chosen based on their parents' consent to participate in the study on a first-come-first-served basis.

Results & Discussion

The children's project

With large hollow blocks (Photo 1) available to them in their outdoor space, the children quickly became interested in stacking and standing on these blocks. Eventually, they wanted to create an obstacle course with these blocks, leading us towards an inquiry project that focused on the navigation of safety, hazards and risk assessment in block building, as well as creative thinking to solve problems that emerged as a result of their navigation process.

Photo 1
An overview of the types of blocks the children had access to.



The children began tackling the idea of safety on the obstacle course from the get-go – in Week 1, the obstacle course was a long line of rectangular blocks laid down side by side vertically. One of the children fell off one of these blocks and on her second attempt on the obstacle course, she laid them down horizontally instead (Photos 2, 3). During our group reflections, she explained that she made this decision because “it was wobbling when they were standing up, and when you lay them down, it’s easier to walk on.”

Photo 2

How the obstacle course first looked.



Photo 3

How the obstacle course looked after the child's adjustments



As the weeks went by, the children became more adept at adapting to the affordances of their play materials (Bagiati & Evangelou, 2016) by adjusting their play ideas and trying to solve problems brought on by the limitations of the blocks. To illustrate, in Week 2, I posed the questions, “What caused our classmates to fall from our obstacle course? How can we make it safer?” as a provocation to spark discussion. The children listed many reasons for why the blocks weren’t safe and strategies they could use to manipulate the blocks so that they could walk on them safely.

By Week 5, the children were contending with newly emerging themes – they had figured out how to make the obstacle course safe, but they now wanted to make it tricky at the same time. As the children shared their differing views on what “safe and tricky” looked like, it became clear that they were trying to adapt the level of risk of the obstacle course to their current capabilities (Obee et al., 2020).

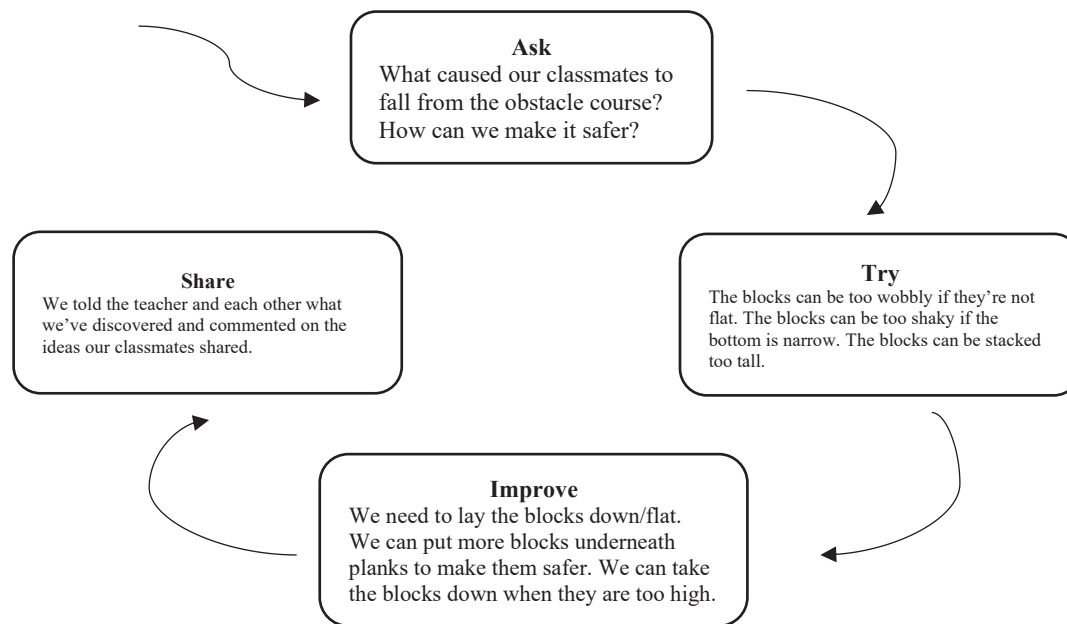
Teacher's Role as Co-Inquirer

Throughout this project, I intentionally took on the role of co-inquirer, making discoveries alongside the children. By Week 3, I realised the way the children were responding to the engineering problems they faced and the creative thinking they used to solve these problems were similar to the engineering design process (EDP).

I went back to the start of the project and began to document the children's experiences following the Reggio-Emilia inspired process of documentation, one that honoured the children's voices and construction of knowledge. I used the EDP to understand the engineering problems the children were facing each week and the steps they were taking to solve their problems. The EDP cycle from Week 2 below illustrates an example (Figure 2).

Figure 2

Our second EDP cycle, extended and connected from Try in the first cycle



By the end of our project, the children had six cycles of the EDP that illustrated their design process in multiple phases over the six weeks (Figure 3). Isabelle et al. (2021) maintained that the children who incorporate the EDP into their play did more reflection and revisiting of their activities, were more involved in collaboration and risk-taking – all of which were observed in my project group. To illustrate, the following photographs below compare our obstacles in Week Two and Week Six: from a random pile of blocks to an organised and clear obstacle course (Photo 4).

Photo 4

A comparison of Week Two's building (left) and Week 6's obstacle course (right)



Figure 3- A compilation of all six Engineering Design Process (EDP) cycles

To view Figure 3, please scan the QR code below.



Implications & Conclusion

My teacher inquiry project focused on two key questions:

1. How will the introduction of engineering problems as provocations during block play encourage creative thinking in my preschool class?
2. How will the use of the engineering design process (EDP) framework assist me in facilitating children's problem-solving process and discussions?

In the following section, I will answer them in relation to the implications for pedagogical practice, using what I have gathered during the data analysis process.

Effectiveness of Posing Engineering Problems as Provocations for Creative Thinking

During the project, I turned what I had perceived as an engineering problem for the children into a question that I posed as a provocation during our post-building group reflections. Sometimes, I would ask these questions during the building session. I learnt that the provocations I posed for the children had a strong influence on the children's ideas and they would invent new methods and tools to change their perceptions and ideas – indicators of creative thinking

While the teacher-initiated provocation supported the children in solving many problems as they engineered with blocks, I struggled with how much I stepped into children's play. Through my documentation of the data, I realised that there were times where I was overpowering the children's voices. Instead of the children taking the lead in their inquiry, I became the center of attention, constantly coming up with new things for children to try.

Implications: Striking a Balance Between Stepping In and Out

Craft et al. (2012), Robertson and Rowe (2012) and Tegano et al. (1991) highlight that too much adult initiation and adult direction can reduce the children's creative behaviors, persistence, involvement, and engagement levels. However, literature is not forcing educators to decide between stepping in and stepping back, but to be careful of when, how and why they do so.

I would conclude that posing the children's engineering problems back to them was effective in supporting their problem-solving skills, and thus, creative thinking. What would make this intervention even more effective is ensuring that when we do bring up and highlight these problems to the children, it is in a context that is relevant and meaningful for them.

Using the EDP as a Documentation Tool to Make Children's Engineering Thinking Visible

Inspired by the Reggio Emilia approach, documentation of the children's experiences became foundational to my teacher inquiry project. To be able to document the children's journey authentically, I needed to truly listen to the children, observe them

sensitively and gave value to their meaning-making process – elements that were important in the pedagogy of listening. Documentation became important not just to inform the next steps in our building project, but by listening to the children, it also conveyed to the children that their efforts and interests were valued (Senet et al., 2021). Through the documentation of the EDP process, I also invited the children to engage in conversational debate – arguing about how they could improve their building and perceptions of risk and safety (Senet et al., 2021; Malaguzzi, 1998).

I conclude that the EDP, when used as a form of documentation, was effective in supporting me in making the children’s thinking visible. Hence, during the discussions with the children, I was better able to bring up the specific behaviours they engaged in that helped them to solve their problems and navigate the balance of safety and risk with them.

At the same time, I realised that the children were already moving fluidly through all the phases, going back and forth, and engaging in numerous stages at once. My job was not to “teach” them to use these skills, but to help myself and themselves better understand the skills they already had. As a constructivist educator, it was empowering and liberating to know that I did not have to transmit such knowledge to the children, but to engage in figuring out the EDP process alongside them.

Implications for Teachers using Engineering and the EDP

When it comes to creative and engineering thinking, I am of the belief that there is no need to “integrate science concepts” or “teach engineering skills” – the child exists as an emergent engineer (Bagiati & Evangelou, 2016; Stone-MacDonald et al., 2015). However, what is necessary for teachers to consider is how open-minded they need to remain and how they shape their own engineering thinking.

The EDP framework exists as a tool for educators to understand what children are thinking about and figuring out. Thus, I conclude that the EDP is most effective when, instead of being used as another set of instruction to transmit to children, it is used as a reflection tool for educators to better discover children, their voices and ideas.

References

- Bagiati, A., & Evangelou, D. (2016). Practicing engineering while building with blocks: Identifying engineering thinking. *European Early Childhood Education Research Journal*, 24, 67–85.
<https://doi.org/10.1080/1350293X.2015.1120521>.
- Beghetto, R. A. & Kaufman, J. C. (2009). Beyond big and little: The four C model of creativity. *Review of General Psychology*, 13(1), 1-12. <https://doi.org/0.1037/a0013688>
- Chaillé, C. (2008). *Constructivism across the curriculum in early childhood classes: Big ideas as inspiration*. Pearson
- Craft, A, McConnon, L., & Matthews, A. (2012). Child-initiated play and professional creativity: Enabling four-year-olds' possibility thinking. *Thinking Skills and Creativity*, 7, 48-61. <https://doi.org/10.1016/j.tsc.2011.11.005>
- DeVries, R., Edmiaston, R., Zan, B., & Hilderbrandt, C. (2002). What is constructivist education? Definition and principles of teaching. In R. DeVries, B. Zan, C. Hilderbrandt, R. Edmiaston & C. Sales. (Eds.), *Developing constructivist early childhood curriculum: Practical principles and activities* (pp. 35-51). Teachers College Press.
- Isabelle A. D., Russo, L. & Velazquez-Rojas, A. (2021). Using the engineering design process (EDP) to guide block play in the kindergarten classroom: Exploring effects on learning outcomes. *International Journal of Play*, 10(1), 43-62, <https://doi.org/10.1080/21594937.2021.1878772>
- Katz, L. G., & Chard, S. C. (2000). *Engaging children's minds: The project approach*. (2nd ed.). Ablex Pub. Corp.
- Malaguzzi, L. (1998). History, ideas and basic philosophy: An interview with Lella Gandini. In C. Edwards, L. Gandini, G. Forman. (Eds.), *The hundred languages of children: The Reggio Emilia approach – advanced reflections* (pp. 49-98). Ablex Publishing Corporation.
- Ness, D. & Farenga, S. (2016). Blocks, bricks, and planks: Relationships between affordance and visuo-spatial constructive play objects. *American Journal of Play*, 8(2), 201-227.
- Obee, P., Sandseter, E. B. H., Harper, N. J. (2020). Children's use of environmental features affording risky play in early childhood education and care. *Early Child Development and Care*, 191(16), 2607-2625.
<https://doi.org/10.1080/03004430.2020.1726904>

- Rinaldi, C. (1998). Projected curriculum constructed through documentation – *Progettazione: An interview with Lella Gandini*. In C. Edwards, L. Gandini, G. Forman. (Eds.), *The hundred languages of children: The Reggio Emilia approach – advanced reflections* (pp. 113-126). Ablex Publishing Corporation.
- Robertson, S. & Rowe, V. (2012). Observing young children’s creative thinking: Engagement, involvement and persistence. *International Journal of Early Years Education*, 20(4), 349-364. <https://doi.org/10.1080/09669760.2012.743098>
- Senet, I. G., Kelley, K., Abo-Zena, M. M. (2021). Sustaining curiosity: Reggio-Emilia inspired learning. *Early Child Development and Care*, 191(7-8), 1247-1258. <https://doi.org/10.1080/03004430.2021.1900835>
- Stone-MacDonald, A.K., Wendell, K.B., Douglass, A., & Love, M.L. (2015). *Engaging young engineers: Teaching problem-solving skills through STEM*. Paul H. Brookes Publishing Co.
- Tegano, D.W., Lookabaugh, S., May, G.E. & Burdette, M.P. (1991). Constructive play and problem solving: The role of structure and time in the classroom. *Early Child Development and Care*, 68(1), 27-35. <http://dx.doi.org/10.1080/0300443910680104>

Oil Spill Project: Saving Mother Earth

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Introduction to Climate Change and Tzu Chi's Education

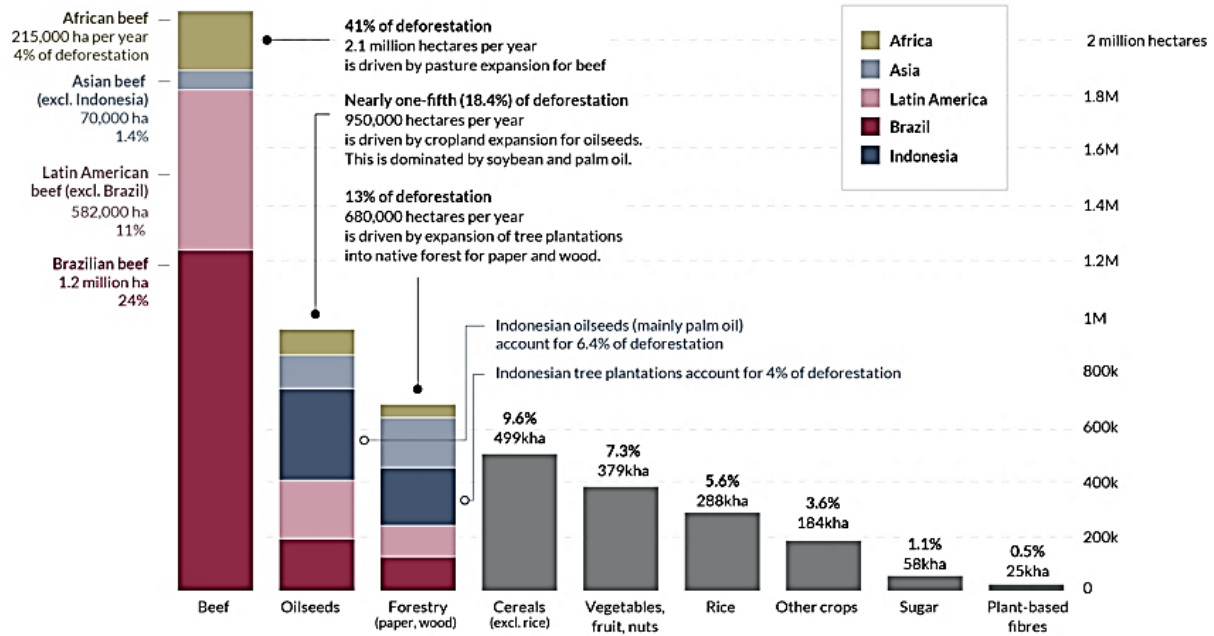
In a tech savvy world today, we have seen an increasing number of disasters around the world through news on our little screens. Many are still not aware of the root cause of these disasters and have no idea how threatening these events are to us and our future generations. As reported by the World Meteorological Organization, statistics have shown 2 million deaths and US\$3.64 trillion losses, from 1970 to 2019, due to disasters caused by climate change (World Meteorological Organization, 2021). A research done from 2015 to 2017 has also shown that extreme events were caused mainly by human influence (World Meteorological Organization, 2021).

“Climate change is no longer a far-off threat — it’s an ongoing disaster that is already endangering humans and natural environments around the world, according to an urgent new report from the United Nations that says the world is running out of time to stave off the most devastating consequences of global warming.” (Chow, 2022)

Global warming happens when greenhouse gases are trapped in Earth, which results in climate change. There are 3 primary gases responsible for global warming – carbon dioxide, methane and nitrous oxide. Nitrous oxide is 300 times more powerful in trapping heat in the Earth’s atmosphere as compared to carbon dioxide; 65% of the world’s nitrous oxide come from the production of meat, egg and dairy industries. Additionally, 5 million hectares of forest are lost yearly (Hannah & Max, 2021). Table 1 shows the main driver of deforestation is firstly, raising of livestock for their meat, then secondly comes the production of soybean and palm oil. The increased production of soy was also caused by the increased demand of feed for livestock, biofuel and vegetable oils (Ritchie & Roser, 2021).

What are the drivers of tropical deforestation?

Nearly all of global deforestation occurs in tropical and subtropical countries. 70% to 80% is driven by conversion of primary forest to agriculture or tree plantations. Shown is the breakdown of these drivers averaged over the years 2005 to 2013. Further observations since 2013 suggest that drivers have not changed substantially over this period.



Data source: Florence Pendrill et al. (2019). Deforestation displaced: trade in forest-risk commodities and the prospects for a global forest transition. OurWorldinData.org - Research and data to make progress against the world's largest problems. Licensed under CC-BY by the author Hannah Ritchie.

Table 1: Drivers of tropical deforestation (Ritchie & Roser, Drivers of Deforestation, 2021).

PRACTICE

I never knew that one's actions and decisions could cause such a great impact on Mother Earth until I chanced upon Tzu Chi in Singapore. Tzu Chi goes by the charity mission of "Educating the Rich and Caring for the Poor" and through the organisation, I learned the importance of educating the next generation and the people around me the urgency of practising vegetarianism and the "5Rs" (Refuse, Reduce, Reuse, Repair and Recycle) - the solutions in combating global warming and climate change.

Phase 1: Introduction to Oil Spill Project

I started a project on Oil Spill with the K2 students in Tzu Chi Great Love Preschool in Term 4. I kickstarted the project by reading them two books as an introduction to the project: "Oil Spill!" by Melvin Berger and "The Snail and The Whale" by Julia Donaldson and Axel Scheffler.

"Oil Spill!" by Melvin Berger talks about how oil spill affects the ocean and the sea creatures, it also explains how oil spill can be prevented if we are mindful of our daily habits. "The Snail and The Whale" by Julia Donaldson and Axel Scheffler depicts a majestic whale and a tiny snail going on an adventure across the ocean, the illustration shows how beautiful nature can be in its healthy and clean state.

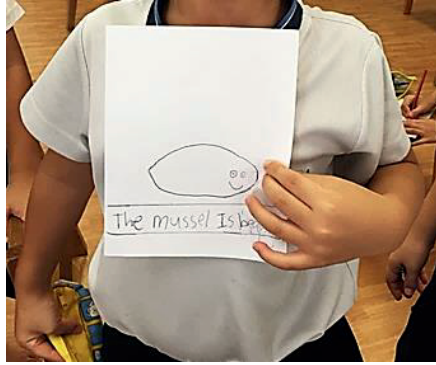


Photo 1: Child A drew a happy mussel in a clean ocean.



Photo 2: Child B painted his drawing with black paint, which signifies the oil spill.

After the stories, the children were tasked to draw how they thought the sea creatures would feel before and after an oil spill (Photos 1 and 2). Through their drawings, it was evident that the children were now aware of the problem existing in the ocean. It was time for them to learn new knowledge through exploring their curiosity (Nurturing Early Learners, n.d.).

Jean Piaget believed that children are active learners when they actively seek answers through various sources (McLeod, 2019). This made the class discussion an easy one, children voluntarily raised their questions related to oil spill. Their questions were then jotted down on a KWL chart (Know-Want Learn)(Photo 3) - What do I know? What do we want to learn? What have we learned? As a facilitator, I processed and selected practical questions that could be answered (Nurturing Early Learners, n.d.). For example, a question like “Where does the ocean come from?” cannot be answered.

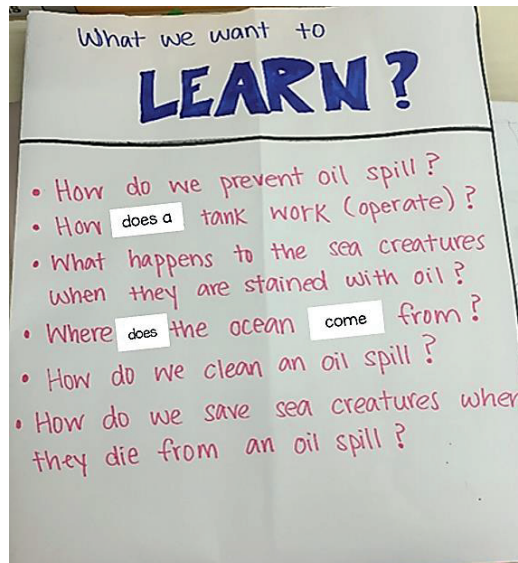


Photo 3: A snapshot of the KWL chart.

Phase 2: Drafting and Constructing Artefacts

It was not possible to bring children to or near waters where oil spills could be found. I thought of a close-to authentic experience for children to conduct an experiment that simulated the oil spill in the ocean. In Jean Piaget's theory of cognitive development, children's intelligence undergo changes as they grow. Cognitive development in children is not only related to acquiring knowledge, children need to build or develop a mental model of their surrounding world (Miller, 2011). This theory implies that children are active learners, thus, doing experiments help them to construct knowledge and eventually seek answers to their own questions (Saul, Constructivism as a theory for teaching and learning, 2019).

In preparation for the experiment, vegetable oil and blue coloured water were mixed in a pail. Thereafter, children suggested ways to clean up the oil spill.

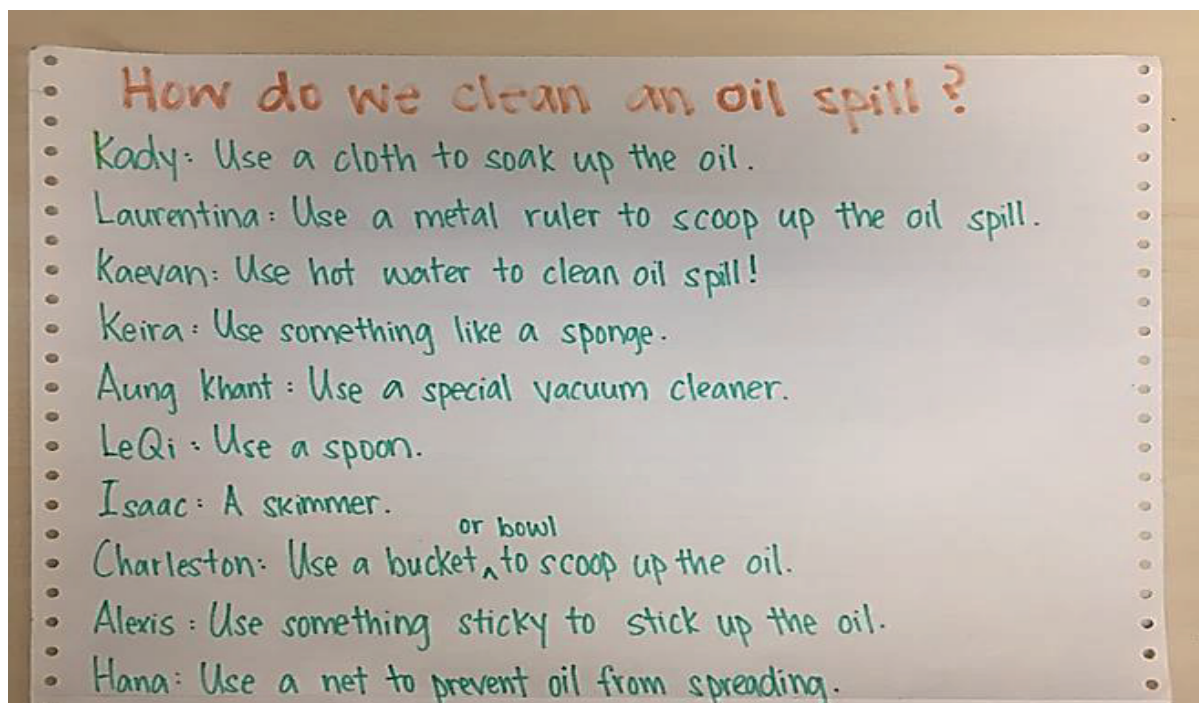


Photo 4: Children suggested methods or tools to clean up an oil spill.

Children did the experiment and tried their best to clean up the oil spill using various tools that were provided for them. During the process, children realised the feasibility of their suggested methods or tools. After the experiment, we sat down for a reflection session, children shared their findings with the class. Eventually, they realised that what they had suggested were not enough nor practical to clean up the oil spill, especially in the vast ocean.



Photo 5: A child tried scooping out the oil, while her groupmate tried to soak it up using a cotton ball.

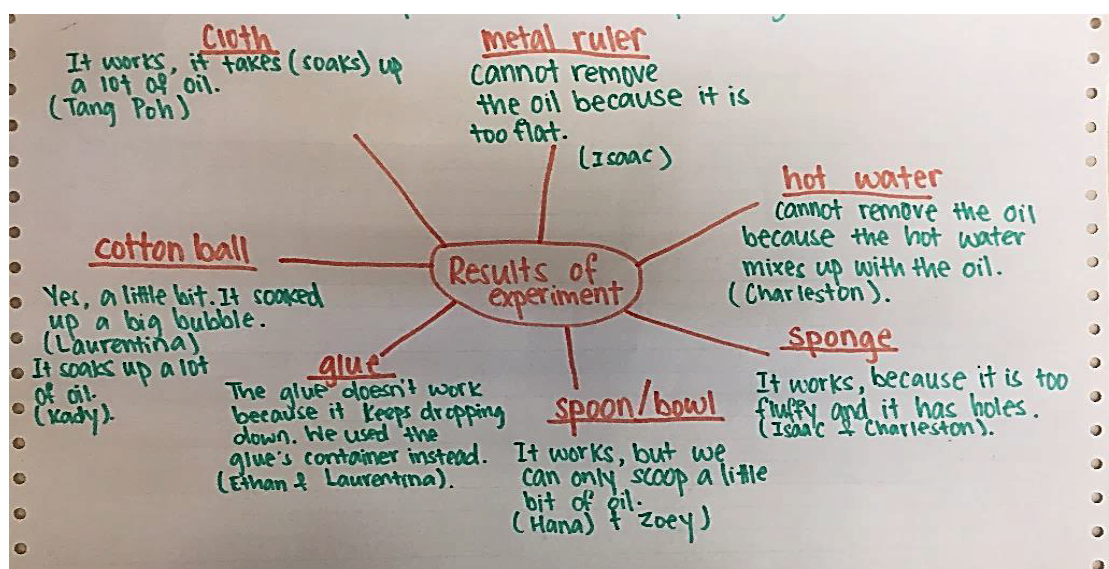


Photo 6: Children's observations and findings jotted down on paper.

What then was the best solution to clean up or prevent an oil spill? First, we had to understand the uses of crude oil. Children watched a short video explaining that crude oil was used for many purposes, such as making plastics, generating electricity, producing petrol and many more. Hence, the best way to prevent an oil spill would be to refuse or reduce the demand for things like plastics, electricity and petrol.

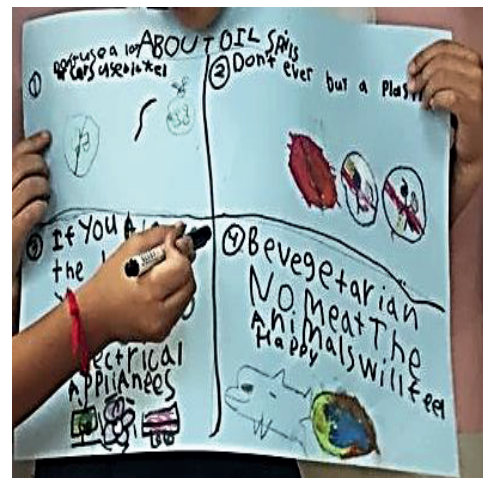
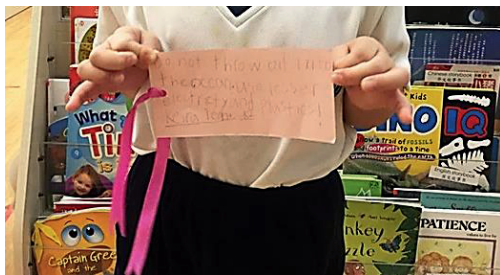
“Refuse” and “Reduce” are part of the 5Rs that Tzu Chi often used to promote environmentalism. “Refuse” is the most important step among the 5Rs and “Recycle” should only come into play when the first 4Rs have been practised. One of the methods in practising the 5Rs is to understand and distinguish our “wants” and “needs”, for instance, in teaching children to distinguish whether the newest toy in the market is a must-have or just a mere desire.



Photo 7: 5Rs by Tzu Chi
(Image by Tzu Chi Singapore)

Phase 3: Public Outreach and Parental Involvement

After understanding the root cause of oil spill and the best solution to prevent it, it was time for children to share what they had learned. We decided to give out handmade posters, postcards and bookmarks during a public outreach (Photos 8 and 9).



Photos 8 and 9:
A child posing with her handmade bookmark. (L)
One of the groups made a poster together. (R)

Approaching the public was not an easy task. Taking the first step was hard. I mustered my courage and took the initiative to approach the public first. Shortly, the children began to follow my footsteps and started approaching the public too. According to Vygotsky, he believed that adults influence how a child thinks (Saul, 2022). This understanding helped my students overcome their fears in approaching the public.

Children learn best when parents, teachers and the community work together as one. I took the opportunity to get parents involved with their children's learning, by asking them to do some research on oil spill together with their children. Back in class, children shared what they learnt at home.



Photo 10: A child read his information book about oil spill to his classmates.

Phase 4: Building Artefacts and Presentation

It was time to present what they had learned this term and to make the artefacts. The children were divided into groups of 4 to 5. With reference to the developmental theory of Jean Piaget, children at the preoperational stage are egocentric (Saul, 2018). Working in a team gives children the opportunity to listen to ideas or suggestions from their peers; through this group activity, they learn to work together as a team. Before the construction of artefacts, children drafted their ideal artefacts through drawings or in their writing.



Photo 11: One of the groups chose to write their ideas using words.

Soon, children started constructing their artefacts based on their drafts. During the process, the teamwork between teammates was evident, some designated tasks for each member while others worked together on the same task. Both commercial and recycled materials were provided for them to work with. At times, children side-tracked by making artwork unrelated to their draft. Some used the materials wastefully too. Hence, it is important for a teacher to intervene and facilitate at times like these.



Photo 12 (L): Children constructing the artefact using both commercial and recycled materials, such as empty toilet rolls and cardboard.

Photo 13 (R): One of the children is in-charge of painting the carton box.

At the end of the project, children presented their artefacts to the school's curriculum lead and myself. This helped hone the children's public speaking skills and also helped them to take pride in showcasing their works to the teachers and public. The children's completed artefacts were displayed on the day of their graduation concert.

PRACTICE

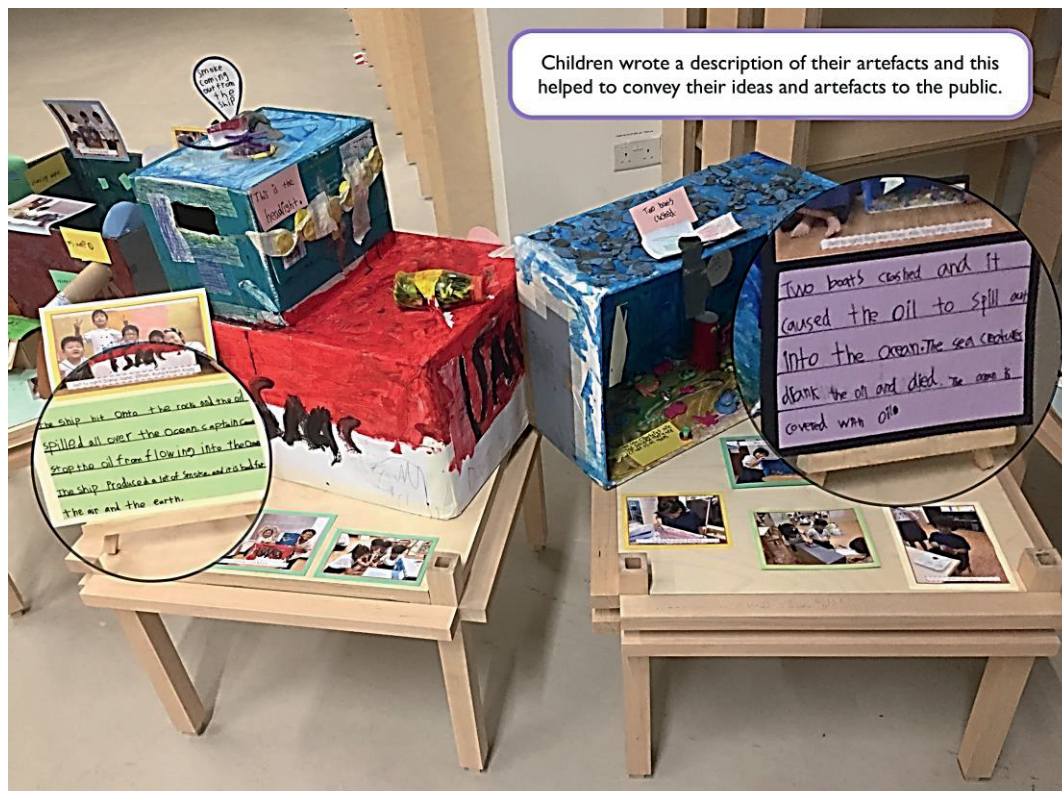


Photo 14: Children's handwritten description of their artefacts.



Photo 15: Display of children's artwork during their graduation concert.

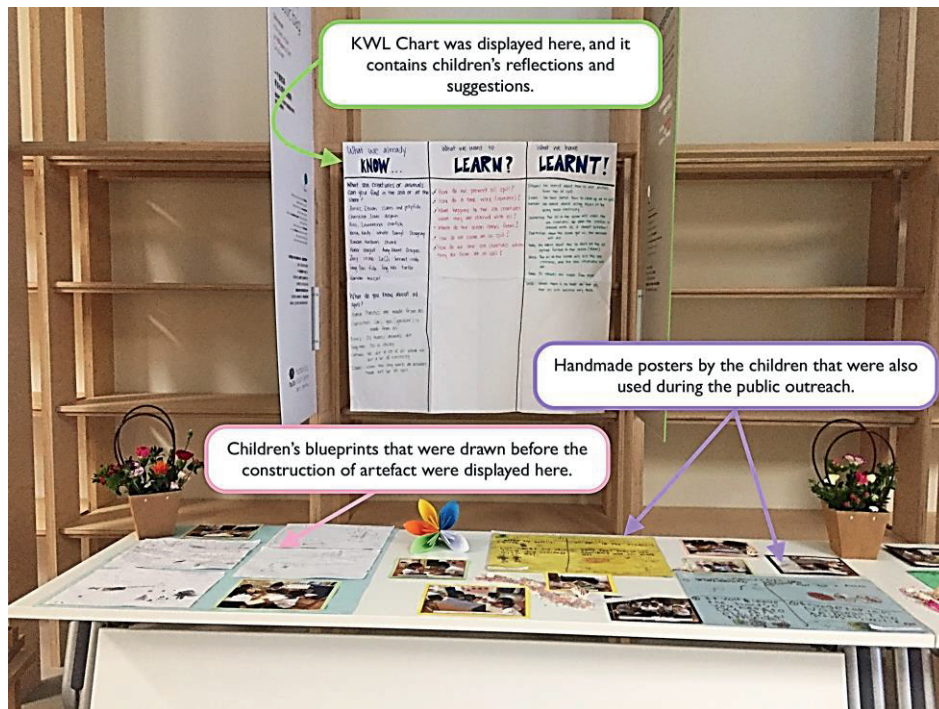


Photo 16: Items used during the project were also showcased to better explain the process of the project.

Conclusion

It had been a hectic, but meaningful term. Our K2 graduands ended their preschool journey with a project that reminded them of the responsibility each of us holds in caring for and saving Mother Earth. Based on the data presented at the beginning, human activities were the main cause of oil spill as well as climate change. The main objective of the Oil Spill project was to make children realise the root solution to climate change was to purify our own hearts by reducing our greed and desires for things and meat. Tzu Chi taught me and the children that a meatless diet was not only beneficial for our health but also for Mother Earth. The large statistics prove that humans have the ability to cause climate change, likewise, we also have the power to stop climate change. It all starts with us.

References

- Chow, D. (2022, February 28). Urgent action on climate change needed 'to secure a liveable future,' U.N. report warns. Retrieved from NBC Universal:
<https://www.nbcnews.com/science/environment/urgent-action-climate-change-needed-secure-liveable-future-un-report-w-rcna17764>
- Hannah, R., & Max, R. (2021). Drivers of Deforestation. Retrieved from Our World in Data: <https://ourworldindata.org/drivers-of-deforestation>
- McLeod, S. (2019, July 17). Constructivism as a theory for teaching and learning. Retrieved from Simply Psychology:
<https://www.simplypsychology.org/constructivism.html>
- Miller, P. H. (2011). Piaget's theory: Past, present, and future.
- Nurturing Early Learners. (n.d.). iTeach Principles . Retrieved from Nurturing Early Learners: <https://www.nel.moe.edu.sg/teaching-and-learning/iteach-principles>
- Ritchie, H., & Roser, M. (2021). Drivers of Deforestation. Retrieved from Our World in Data: <https://ourworldindata.org/drivers-of-deforestation>
- Ritchie, H., & Roser, M. (2021). Soy. Retrieved from Our World in Data:
<https://ourworldindata.org/soy#:~:text=So%20far%20we%27ve%20established,feed%2C%20biofuels%20and%20vegetable%20oils.>
- Saul, M. (2019, July 17). Constructivism as a theory for teaching and learning. Retrieved from Simply Psychology:
<https://www.simplypsychology.org/constructivism.html>

Saul, M. (2022, August 18). Vygotsky's Sociocultural Theory of Cognitive Development. Retrieved from Simply Psychology:
<https://www.simplypsychology.org/vygotsky.html>

Saul, M. (2018). The Preoperational Stage of Cognitive Development. Retrieved from Simply Psychology:
<https://www.simplypsychology.org/preoperational.html>

World Meteorological Organization. (2021, August 31). Weather-related disasters increase over past 50 years, causing more damage but fewer deaths. Retrieved from World Meteorological Organization:
<https://public.wmo.int/en/media/press-release/weather-related-disasters-increase-over-past-50-years-causing-more-damage-fewer>

My Journey with Technology in the Classroom

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National Institute of Early Childhood Development

Introduction

My journey in the early childhood (EC) sector began in 2003 as an assistant K2 teacher. Since then, I've been an EC educator, a preschool principal, an EC lecturer with a special interest in blended learning and educational technology, and a parent.

When I first started teaching in an EC classroom, technology was mainly used by a few educators, including myself, for playing music and watching educational videos. That was the extent to which many of us thought technology could enhance one's classroom and the experiences for young children.

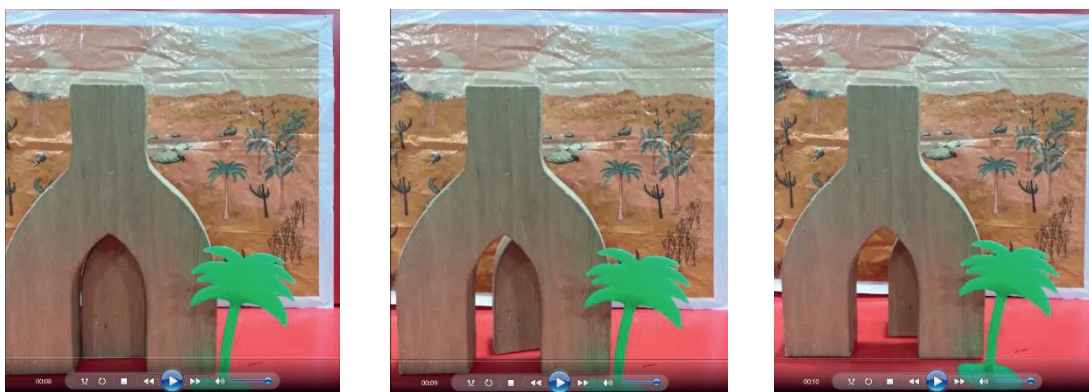
Cut to the present, 20 years later, technology has taken over many processes and operations, with educators using technology daily. But there is still one big question on most educators' minds; "how do I use technology meaningfully in my classroom?" I would like to share how I use technology with my own children and how I advocate for my students (pre-service EC educators) to use technology in their childcare classrooms.

How it all began

From early in my career, my belief in using technology was to enhance children's learning and support the educator, not to substitute them. I wanted to go beyond playing music and videos for my children because I saw how technology could excite and encourage them to learn (Tan, 2022) and even strengthen their relationships as they worked together on mini projects (NAEYC, 2012). I wanted technology to help me make the impossible possible.

Throughout my time in the childcare centres, technology was used in my classrooms for research and creating, and I played an active role as the educator and facilitator through every process.

I empowered my nursery children to learn about patterns and art in nature by watching a close up slow-motion video of a spider spinning her web. I also guided my 6-year-olds in making their very own stop-motion short movies.



Photos 1 to 3 (L to R) - Images taken by my students for their stop motion video

As open and eager as I was to explore the use of technology, some concepts continued to intrigue yet mystify me, Augmented Reality (AR) being one of them. If anyone told me 20 years ago that I would be using AR as a parent or an EC educator, I probably would not have believed them. Yet, here I am. In 2022, I was fortunate to attend a short course on using AR in the early childhood classroom and was eager to test it out with my own children, then aged 6 and 4. I worked with a colleague, a fellow Language and Literacy lecturer with NIEC, to develop an AR environment that we hoped would allow children to be immersed in an experience that would make learning feel more like play.

Engaging an active hands-on learner with technology

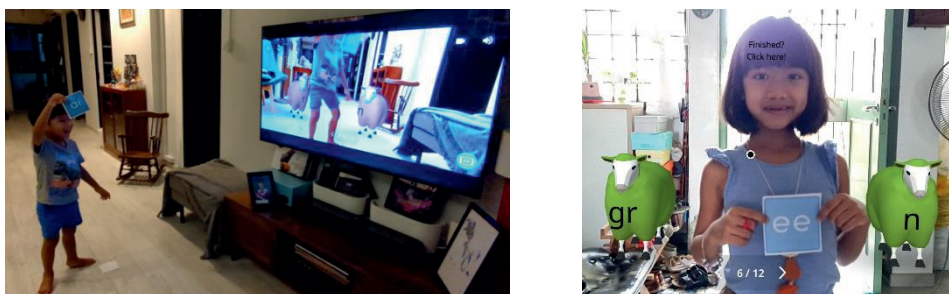
My son, then 4 years old, is an energetic and playful boy with a thirst for knowledge who learns quickly, but has little patience with sitting around in general. The AR experience was created with children like him in mind. I wanted to allow him to move around while learning, almost like he was part of a computer game, which as we know, all children love, and he is no exception.

The AR experience included language and literacy elements like storytelling, dramatisation, a quiz about the story, blending and segmenting words, creating words through onsets and rimes and finally rhyming words.

My son thoroughly enjoyed being immersed in the environment, and was fully engaged in learning concepts I had tried to introduce to him before that he took no interest in. Clearly, the integration of technology worked well to engage and motivate him.

My 6-year-old daughter, who is skilled at a level higher than the activities in the AR experience, took on a different role. She played the role of a facilitator and a more-knowledgeable other who was able to guide her brother and scaffold his learning as we went through the AR environment, scene after scene, tackling all the activities and tasks therein. A fellow NIEC lecturer shares my strong belief that the integration of technology with adult-child or child-child interactions can create an environment that is conducive for learning and relationship building (Toh, 2022).

My role while my children explored the AR tool and experience was to facilitate, provide additional tangible materials for them to manipulate and to narrate parts of the experience. While building this experience, my colleague and I paid special attention to ensuring the educator played a vital role in the experience, and was not somehow replaced by the technology - a guiding principle I mentioned earlier.



Photos 4 to 5 (L to R) - Images of my children in the AR environment

'Being real' with technology

With everything, there are challenges and limitations. The ones I struggled with as a childcare educator was the lack of resources as well as parents' buy-in. I remember working extra shifts to save up to buy a laptop to use in class with my children. Today, many preschools are equipped with technological tools and programmes that were once only a dream, and hopefully more centres will begin adopting these practices. I sought permission from my principal to conduct some simple tech-projects with my children which included the stop-motion movie and some other 'documentary videos' incorporated in an interactive map, which we showcased to parents at an open house to help parents understand the benefits of integrating technology into the classroom. One important benefit was to empower children so that they would be confident using technology outside of the classroom and when they progress to primary school; I did not want any of the children falling behind in the tech-age because I was not confident to use it in my classroom (Torchia, 2022).

My efforts paid off, not without a lot of care taken to assure parents that their children were still being actively 'taught' by a human being, again in line with my advocacy for technology being used to support the educator and not replace them. Parents were relieved to see how technology could be used meaningfully in the classroom with the educator's support and presence. Parents were encouraged further when we broke down the skills children developed and displayed throughout the process of their projects, from conceptualisation, planning, developing and finally presenting. Being able to 'see the learning and development' and acknowledge how technology helped their children push boundaries and hone different skills persuaded parents to further support our use of technology in our classrooms.

Another challenge educators may face is knowing what tools are out there and which tools can be used and how. For this, I turn to social media. There are numerous accounts on all social media platforms where generous educators share their tips of

using technology and their favourite tools. Not only have I discovered new tools to use, I have also learnt how to use the tools and what some educators' best practices with the tools are. As a lecturer and parent, the internet is my campus and I attribute a lot of my tech-tools education to it, free of charge!

Through my use of technology in childcare centres, in my lectures and my own home, I have observed disengaged children and students light up and become not only involved, but motivated, curious and excited about what they are learning and how they are learning. The spark in a child's eyes when they see the creations they have made using technology is invaluable. Using technology has brought me a great joy to be able to blend my interest in technology with my children's and students' meaningful learning. At the end of the day, who would say "no" to some beneficial screen time!

My guidelines when using technology with young children

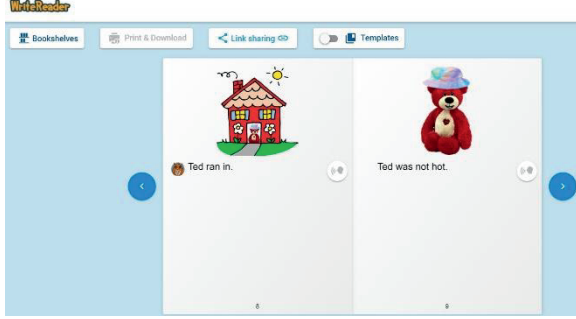
1. I only use technology if there is a problem in my class that technology can solve or if it brings about some form of improvement in the learning experience (Saubern, 2022). Hence, I use technology if
 - children can create something they would not otherwise be able to without technology.
 - children can do or learn something they would not otherwise be able to without the technology.
 - educators can effectively engage children who are typically withdrawn or detached.
2. The educator must be present and actively involved in the facilitation of the activity.

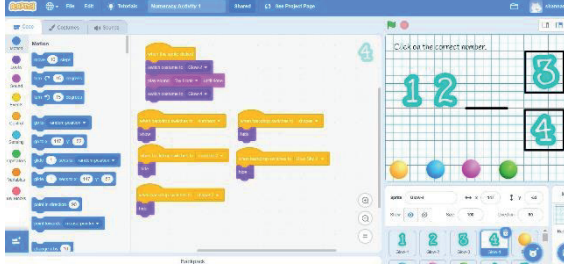
Mini projects and the tools I recommend

I have done some mini projects with 4- to 6-year-olds that I found relatively manageable. The following are in order, from simplest to most complex, in terms of understanding tech tools and believing in one's savviness.

Tech Tools/Devices	Concept	Outcome
Digital cameras/mobile phones and video editing software that has been inbuilt in the computer or phone	Stop motion video	Children took numerous pictures, then put them together in a slideshow and recorded their voices telling their own story, taking storytelling a step further. The outcome was a brilliant stop motion video with a story, created and narrated by the children.
Digital camera, online QR code generator, printer	Interactive map of the zoo	During a learning journey to the zoo, children took pictures of animals and recorded videos of themselves giving a

REFLECTIONS

<p>(Other materials: large paper, markers, crayons)</p>		<p>15-second introduction about the animals they had selected. The children created a map of the zoo by drawing on a large piece of paper, and drew the animals in as well. We put the videos and pictures they had taken on an online drive, and created QR codes for each image and video. We printed and stuck the QR codes and the correct places on their map, and voila, the children had made their own interactive map of the zoo.</p>
<p>WriteReader https://www.writereader.com/</p>	<p>'Name' books and Simple Readers</p>	<p>I used the basic (free) version of this online tool to make name books with the children, where each page had a letter of their name and an image of an object that begins with the letter. Children identified objects and searched for their images on the internet. We included an audio recording of the child saying the letter and the object, for example, "S is for sun" for each page. This helped children recognise their name, spell it and learn a little phonics too. I also used WriteReader to make readers and audio books for children that included their favourite toys and simple word family words to encourage and motivate them to read. This really worked!</p> 
<p>Scratch https://scratch.mit.edu/</p>	<p>Interactive storytelling</p>	<p>My students (pre-service EC educators) created interactive stories where, while listening to a story, children were invited to click on different images or icons to make decisions during the story, to create their own unique experiences.</p>

		<p>This project required a little more enthusiasm to problem solve and a little more confidence to step out of one's comfort zone and be prepared to have some fun and explore the tool. It works on a basic coding programme, which is simple enough, as long as one is willing and eager to try, make mistakes and try again! Children who interacted with these 'stories' thoroughly enjoyed them and asked to repeat the experience numerous times. I also used this programme to create simple interactive numeracy activities for young children, as pictured below.</p> 
<p>CoSpaces https://cospaces.io/edu/</p>	<p>Escape Room AR Experience for Language and Literacy</p>	<p>(For the slightly more tech adventurous educators.) My colleague and I created a farm environment to support the literacy-based approach to facilitate the exploration of blending, segmenting with onsets and rimes, rhyming words among other literacy concepts. It uses a basic coding programme called CoBlocks, similar to the one used in Scratch! To see our final project was extremely rewarding, an encouraging feeling all educators should allow themselves to feel often! The AR environment offered a hands-on and immersive option to developing language and literacy concepts.</p>

Where I would like to go next

I have recently been completely drawn into the wonders of Artificial Intelligence (AI) and I am keen to take my tech-journey to exploring AI with children, starting with my

own, and then empowering my students to discover AI with the children they work with in the childcare centres.

I invite all of us educators to tap on our child-like instincts to allow fears to be converted into curiosity, and start asking simple questions that our children ask daily... What if I tried this new tech tool? Why did this mistake happen and what can I learn from it? How can I make different things happen? Where can this idea bring me? Let's all be explorers and navigate the possibilities technology can offer us - for and with our children.

Note: If anyone is interested in continuing this conversation, please reach out to me at Shanna-Mae_DE_CRUZ@niec.edu.sg.

References

- National Association for the Education of Young Children (NAEYC). (January, 2012). *Technology and interactive media as tools in early childhood programs serving children from birth through age 8*. NAEYC. Retrieved 29 March, 2023 from https://www.naeyc.org/sites/default/files/globally-shared/downloads/PDFs/resources/position-statements/ps_technology.pdf
- Saubern, R. (October 4, 2022). *EdTech in the service of learning: The importance of evaluating education technology*. ACER. Retrieved 29 March, 2023 from <https://www.acer.org/au/discover/article/edtech-in-the-service-of-learning-the-importance-of-evaluating-education-technology>
- Toh, E. (2022). On the right tech. *Beanstalk*, 36, 3.
- Tan, C. W. (2022). Transforming the early years. *Beanstalk*, 36, 1.
- Torchia, R. (September 16, 2022). *Benefits of technology in the classroom for K-12 schools: The meaningful adoption and introduction of educational technology benefits students and educators*. EdTech Magazine. Retrieved 29 March, 2023 from <https://edtechmagazine.com/k12/article/2022/09/benefits-integrating-technology-todays-k-12-classrooms-perfcon>

A Review of the 33rd Annual RIE® Infant & Toddler Conference (11-12 March 2023)

By Christine Soo
Lead Senior Lecturer (NIEC), ECDA Fellow, SkillsFuture Fellow

33rd Annual RIE® Infant/Toddler Conference

Thriving in Challenging Times: Fostering Healthy Infant Brains through Relationships, was the theme of the Conference. It provided 14 hours of professional development on Resources for Infants and Educators (RIE®), which focused on respectful care and implementing the Educaring®

Approach. The Conference was held virtually and it was opened to both early childhood practitioners and parents who wish to acquire practical knowledge and skills and be aligned with the Educaring® Approach. It featured a keynote speaker and nine multi-disciplinary speakers who leveraged on Magda Gerber's approach to inspire and provide insights to build relationships while interacting with and caring for young children.

The virtual platform had several features which simulated an experience likened to attending the Conference on-site. There were opportunities for RIE® Associates and participants from around the world to network and set up meetings to discuss topics of interest. It was amazing that some 450 participants participated in the 45 topics in the 'Community' alone. What was interesting for me was the 'Photos' gallery which had some 40 photographs that gave me ideas of familiar and simple play resources and ways to set up indoor and outdoor play environments to support the children's curiosity and exploration.

The icing of the Conference was a pre-recorded session of an *Introduction to Educaring* which encourages caregivers to see young children as competent and capable humans from birth. This complementary session, which is usually offered as a standalone course, enabled me to contextualise and relate to the Educaring® Approach that is crucial to honour the rights of children and enjoy working with them. This introduction specifically explained Magda Gerber's belief that babies are complete and competent beings from birth and should be treated as such. She believed that parents and caregivers should demonstrate their respect for the children in all interactions and treat them as human beings and not objects. Her basic RIE® principles included basic trust in the child to be an initiator, an explorer, and a self-learner. To foster quality care, she advocated an environment that is physically safe, cognitively challenging and emotionally secure for the child.

During infant interactions, infants should have the freedom to explore and interact with other infants, and they should be allowed to be involved in all care activities to allow them to become active participants rather than passive recipients. Caregivers should allocate time for uninterrupted play, make observations of the children to understand their individual needs. Importantly, caregivers should ensure consistency, clearly defined limits and expectations to develop discipline.

Each of the 90-minute presentations began with video snippets of RIE® practices and provided insights of how culture and context focus on meeting the needs of the child. Below are key takeaways from the presentations and strategies that educators can adopt to nurture infants and toddlers.

Keynote speaker, Dr Terry Marks-Tarlow, discussed the critical importance of supporting intuition in young children. She used a neurobiological model to explain how intuition provides a lifelong framework for moving from the inside out. She advised against 'futurising' children. This is because only intuition allows children to guide themselves from the inside out and prepares them to find their way in an uncertain, ever-changing and completely non-linear world. Educators need to be aware that providing predictable and consistent environments in group settings is not aligned to the real world. To promote intuition in children, she advocated free play for children to develop from the inside out and promote intuitively guided navigation in life. Educators should provide them early and unstructured play such as peek-a-boo or rough and tumble play, and different stages of play that contribute to later affective, cognitive and motor abilities.

Two childcare centre administrators and a RIE® coach shared how they jointly developed systems of communication, support and training for the incorporation of RIE® principles in their communities through a clear communication model and communication pathways that included all stakeholders including parents, children, caregivers and administrators. They categorized their focus on trust, environment and time. They also gave authentic examples such as how educators regularly communicate and build relationships with anxious parents whose children were transiting to the preschool and how newly hired staff were oriented, inducted and mentored to take care of the children. The speakers encouraged preschool educators to be cognizant to work with staff, parents and the community, and be observant of culture changes year to year.

Patricia Ryan presented strategies and practices to apply the Educaring® approach to support relational health and regulate a dysregulated child. She highlighted that it is common for adults to reason away a tantrum or distract a child from misbehaviours. Educators should find out what's really happening in the deep recesses of the child's brain during moments of high emotion. The quality and pattern of the caregiver's responses will build resiliency or contribute to a sensitized, vulnerable child. Hence, educators should be aware of how they interact and intervene with young children.

They should act as the secure base for children's exploration and as the safe haven when they are distressed. They should slow down, observe and wait. For preverbal children, educators should keep trying to be attuned, compassionate and provide calm support. When educators help a child to feel secure, feel appreciated and that someone is truly interested in him, they influence that child's whole personality and the way that child sees life.

I also journeyed with the speakers who advocated Continuity of Care (CofC) in the Australian and New Zealand contexts. CofC recognizes that secure attachments between infants and caregivers and trusting relationships between all those learning to do the 'dance' takes time to develop and should last as long as possible. The speakers highlighted their personal foray into CofC in the Australian and New Zealand context within mixed age settings where birth to two-year-old children were grouped into cohorts of similar aged peers. Some factors that contributed significantly to the success were the staggered approach for children to transit from home to preschool instead of cohort transitions which must be planned for in consultation with parents, having familiar peers and educators welcome incoming children and parents and adjusting rosters around opening shifts of educators.

In *What a Difference Agency Makes: Quality Experiences and Elevated Learning*, the presenter drew from psychology, neuroscience and early development to highlight the value of agency and how to enable such pleasurable and meaningful experiences for young children to enjoy the security and confidence to be able to handle the situations they are in. Educators should be aware of their tone of voice and quality of care to develop children's agency – the degree to which young children have control over their own actions, choices and outcomes – and how agency elevates the quality of experience in learning. Through these experiences, children build trust in others, in the world and in themselves.

The owner and director of Children's Corner Play Center, Linda Hinrichs, encouraged educators to value children's struggle in our work with them, and embrace it as a tool to help children build inner confidence and support their growth as they learn to navigate life's challenges. She reiterated that educators should value the great effort that children made over a period of time to overcome difficulties or achieve something. Instead of protecting children and removing obstacles or rescuing them from impending danger all the time, educators should reflect on our trust in the competency of the child and our belief in children's ability to learn and grow – to master the struggles in their own independence and interactions in the world. They should wait and not interrupt when children are trying to create an experience or make a discovery.

Last but not least, the presenter of *Opening Minds And Hearts: How Parents – And Their Babies – Benefit From RIE Parent and Parent-Infant Classes* shared authentic examples and the impact of RIE® Parent-Infant Guidance™ Classes, over the eight-year study on parents and their babies. She highlighted that the parents had learnt to

more deeply connect and communicate their caring intentions and the babies learnt to express and grow their inner wisdom from the facilitated group experiences. Incidentally, a five-year-old child asked the speaker what she could do if she felt really upset and wanted to hit her mother. The speaker immediately crouched in front of her laptop and jumped up and down to show the child how to release her pent-up anger. The Conference ended on a high note as it showed that both parents and children can embrace the RIE® principles.

I really enjoyed this learning experience and I'll be looking out for the next Conference to enhance my knowledge and understanding of RIE® principles to be a better advocate of young children.

**RIE is a non-profit educational organization founded in 1978 to create the secure beginnings all babies need to develop to their full, authentic potential. We do this by teaching Magda Gerber's Educaring® Approach to parents and professionals worldwide.*

AECES KOBE STUDY TRIP 2023

Kobe, Osaka Japan

18-25 March 2023

Dr Ong Ee Ling Catherine, Kids and Kins Child Care Centre
Jacquelynn Wong, Singapore University of Social Sciences

In their first study trip post pandemic, the Association for Early Childhood Educators, Singapore (AECES) led a team of early childhood practitioners to Kobe, a city situated on Osaka Bay in central Japan. It was an expedition in leadership for early childhood professionals with the opportunity to take a closer look at Japanese early childhood education (AECES, 2023). There were visits to preschools, institutions of higher learning, and opportunities to dialogue with early childhood practitioners and school leaders. Basically, it is an exclusive opportunity to experience what early childhood education (ECE) is like in Japan, and to establish networks for furthering knowledge and enriching practices in early childhood education.

There was much excitement and trepidation amongst the group as none of us were clearly aware of who we would be travelling with until a week prior to the flight. Group dynamics are important to make or break the travelling experience, and fortunately, we had a passionate group representing diverse early childhood education interests. The group of 17 included the warm and friendly President of AECES, Dr Christine Chen herself and her team of AECES colleagues, Ms Cecilia Ng, Ms Eve Tham, Ms Joan Yeo, and a highly resourceful main organiser Ms Ivy Kok. The group also consisted of young-at-heart individuals from the National Institute of Early Childhood Development (NIEC), the Singapore Institute of Social Sciences (SUSS), government-funded and private preschools, and private preschool operators from Singapore and Malaysia.



Photo 1 - With Dr Mari Mori (Centre, maroon sweater) at Irodori no Mori Nursery.

The programme for the trip was well-paced with opportunities to explore the city of Kobe and Osaka interspersed in the main agenda of preschool visits and formal discussions. There were also opportunities to visit the Children's Museum and an exhibition (Mosaic of Graphics Words Material) jointly held by the Japan Institute for Reggio Emilia Alliance and Reggio Children®. The combined experience allowed us to immerse ourselves formally and informally in the cultural context of the early education system we travelled to learn about. Travelling closely together as a diverse group allowed for efficient exchanges of knowledge and information.

There were peer learning opportunities within the group both during formal interactions and informal team bonding sessions over meals and leisure moments. The intellectual and experiential learning experiences made it an invaluable educational study trip!



Photos 2 to 4 (L to R) - Irodori no Mori Nursery

One of the focal early years pedagogical approach we explored in depth during this trip was the Reggio Emilia approach. We visited four Reggio-inspired preschools: Irodori no Mori Nursery, Yume no Mori Nursery, Midori Ayaha Kindergarten and Kaede Nursery School. We are thankful to Dr Mari Mori, one of the leading proponents of the Reggio Emilia approach in Japan, for making these visits possible for us.



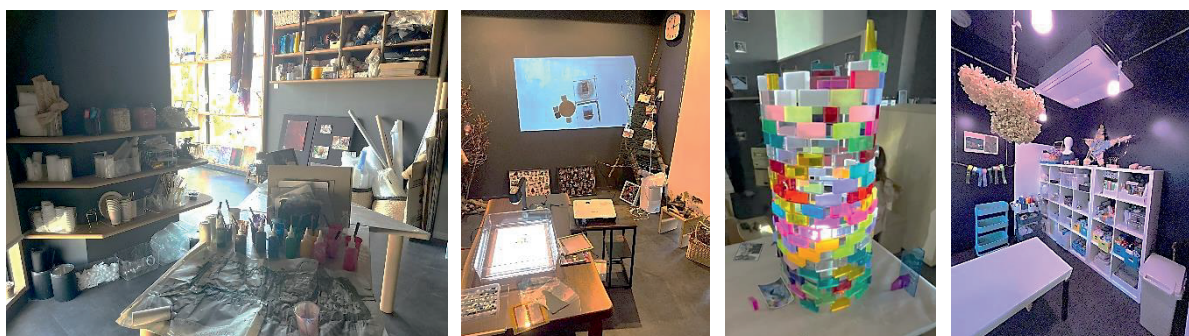
Photos 5 to 7 (L to R) - Yume no Mori Nursery

Due to the limitations on the number of visitors the preschools could accommodate each time, we split up into 2 teams and took turns to visit them. This turned out to be a good arrangement as with smaller teams, we were able to have more personal interactions with our Japanese educators. Communication with them was possible with the help of translations by Dr Mari Mori and Mr Naoki Yajima.



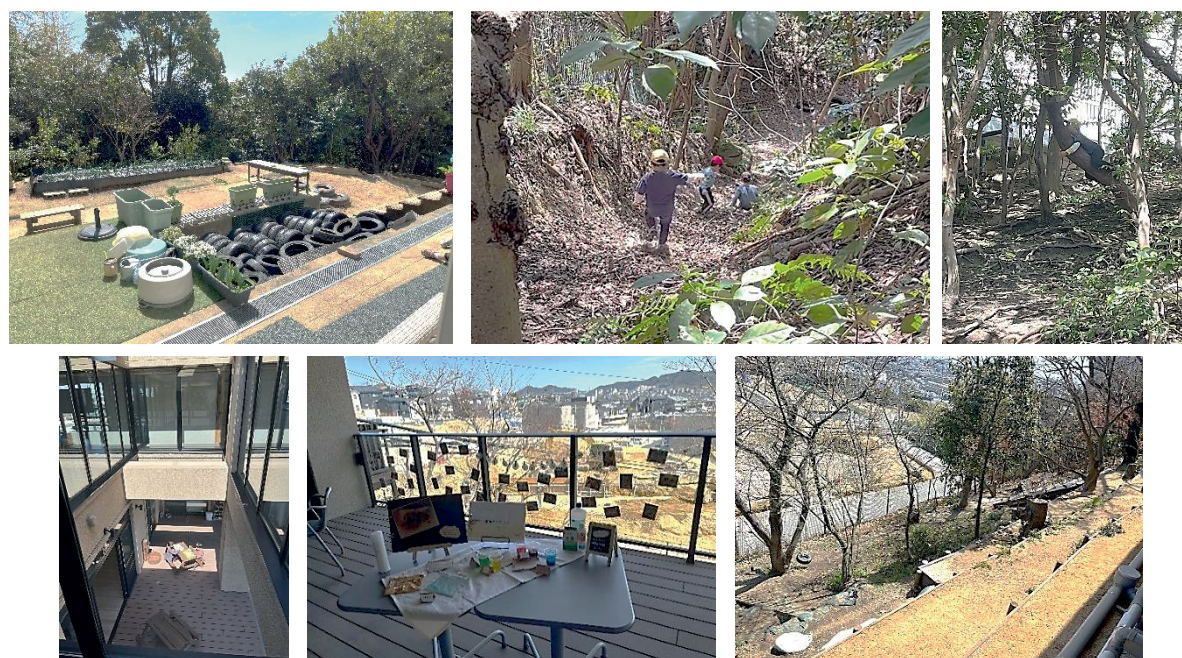
Photos 8 to 10 (L to R) - Midori Ayaha Kindergarten

The Reggio inspirations were evident in the aesthetically refined, nature-based environments of the preschools. There were also well-stocked resource-rich ateliers to encourage creative expressions. Various natural (e.g., pinecones, seeds, twigs, etc.) and recycled materials (e.g., bubble wraps, pull-tabs, bottle caps, etc.), art supplies (e.g., paints, dyes, brushes, etc.), and various equipment for exploration with light (e.g., projectors, lightboxes, torches, illuminating blocks, etc.) were readily available.



Photos 11 to 14 (L to R) - Ateliers at the preschools we visited.

The *atelier* in the schools of Reggio Emilia is ‘a place where children’s different languages could be explored’ (Gandini, 2012). Experiments and discoveries are encouraged within the space which is typically filled with varied materials, tools and people of various competencies for exploring with the varied modes of expressing oneself.



Photos 15 to 20 (L to R) - Varied outdoor environments.

It was impressive that the ateliers we saw at the Japanese preschools were both strikingly neat and yet messy. In this organised mess of children's creativity, materials were placed within reach of young children, who are deemed to have the right to access them and use them freely in their expressions. The ateliers were environments purposefully created for and with the children.

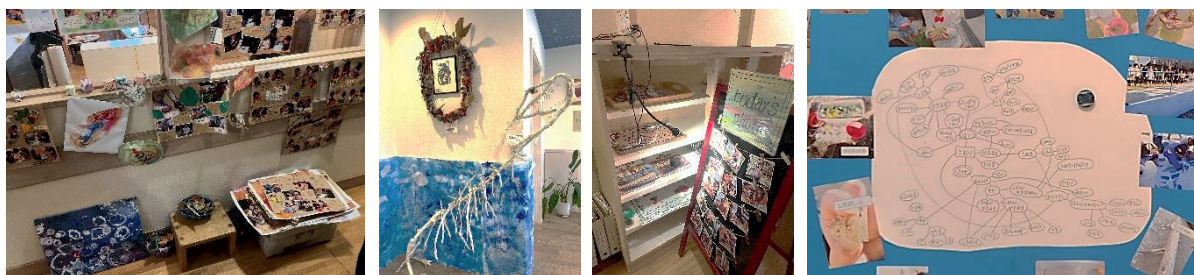
The outdoor environment ranged from 'mild', limited outdoor area accessible via the balcony of the classrooms, to 'wild', almost forest-like backyards with steep terrains and dense stands of trees. In these free-ranging outdoor environments, children are encouraged to take risks during play. They climb trees and slopes, and explore with every tool and material they can find. We were impressed that educators and children have such adventurous outdoor play almost on a daily basis. Bad weather does not impede their time outdoors as raincoats and rubber boots are readily available. We witnessed how the children learnt to work collaboratively with others and through various risky situations, learnt to regulate and control themselves within the group context. We had a go at some of these experiences and they really work every inch of your core muscles!



Photos 21 to 22
(L to R) - Putting our
gross motor skills to
the test.

The preschools do not carry out formal teaching lessons but allow children the autonomy to choose the activities and to learn through self-initiated play. Extensive mind-maps were explicitly displayed documenting children's projects and ideas, with teachers acting as facilitators to script and help children make connections. The teacher to child ratio ranges from 1:4 for the younger children (0-2 years) to 1:15 for the older children (3-5 years).

The precise recordings and extensive documentations were evident in the forms of photographs, descriptions, captions of conversations, culminating in a personal portfolio for every child every year. Many of the walls and hallways were decorated with children's work, photographs and scripts of conversations captured during daily activities. These were both aesthetically pleasing and informative for parents and visitors alike.



Photos 23 to 26 (L to R) - Documentation of children's thoughts, ideas and expressions.

It is also largely through such displays that the children learn to read and write despite not attending formal language lessons. They serve to ignite children's curiosities, prompting them to ask their teachers about the Japanese characters, how to read, write and what they mean! Children are indeed supported to be self-directed learners in these environments that are carefully constructed for child agency and autonomy. The varied and abundance of opportunities to practise decision-making and risk-taking through self-initiated engagements help children develop confidence in their independence and to construct meaningful understanding of the world around them.

In addition, many of these preschools practise mixed age group learning where the older children become models for the younger children. They help to scaffold language and behavioural learning and understanding of their younger peers during close interactions in small groups. The groups help to develop leadership abilities in the older children and at the same time, provide many of the children (who are the only child in their families) with opportunities for sibling bonding relationships and peers they can look up to. The mixed-age grouping attempts to inculcate the Japanese cultural importance of social relationships and considerations for others from a young age.

It was pointed out by one of our group members that the Reggio Emilia approach is not a method to be imported from Italy, but an approach that can only be emulated and implemented in consideration of one's community and culture. Indeed, we observed the incorporation of the Japanese culture in the activities (e.g., origami, Japanese dolls), routines (e.g., cleanliness, eating habits), character building (e.g., consideration for self and others), and celebrations (e.g., Japanese festivals and traditions).



Photos 27 to 28 (L to R) - Learning about food through daily presentations of meal menu. Older children learn good eating habits and gracious character as they dish out portions enough for themselves and not to waste food.

These aesthetically set up and well-run preschools are no doubt impressive and very attractive. They appear seemingly not out-of-place in a country and cultural context like Japan. However, during the discussion about the adaptation of the Reggio Emilia approach in Japan, Dr Mari Mori shared that some educators in Japan spend a considerable time convincing Japanese parents of their pedagogical approach. It appeared that one of the preschools typically spends an average of 3 hours to engage prospective families looking to enroll their child!

The lack of formal lessons does not sit well with parents who are used to traditional schooling approaches, and even more so when the formal schooling after preschool education is known to be intense and rigid in Japan. When questioned about this gap, Dr Mari Mori very candidly remarked that they believe in the present – that children be able to develop the curiosity to learn and the innate desire to want to learn. These early years opportunities will nurture children to naturally develop positive learning dispositions beyond their preschool years.



Photo 29 - Educational session on “Encounter with Philosophy and Practice of Reggio Emilia” by Dr Mari Mori (Kobe Shinwa Women’s University).

To learn more about the Japanese ECE system, we headed to the Department of Human Development located at the Rokkodai campus of Kobe University. Professor Sachiko Kitano and her graduate students briefed us on the bureaucracy of the Japanese ECE system in their presentation “Early Childhood Care and Education in Japan”. We learnt about the Japanese government’s investment in ensuring quality education for their children through revisions of the Japanese National Kindergarten Curriculum Guidelines every decade. The Children and Families Agency was launched in April 2023 with the aim of increasing the welfare and improving the health of children and families, as well as to protect children’s rights through prioritising their best interest (Prime Minister’s Office of Japan, 2023).

We also had an intense discussion on children with special rights*. Not unlike Singapore, the Japanese ECE sector also faces manpower constraints with increasing needs for nursery and childcare services, and particularly so for children requiring

* Children with disabilities or special needs are referred to as ‘children with special rights’ in Reggio Emilia since the Italian parliament’s establishment of the right to a desegregated education in public schools for children with disabilities in 1971 (Soncini, 2012).

special attention. This is a real operational challenge for many of us in the group and we were very much enlightened when more experienced group members shared possible solutions and best practices, including open and empathetic communication with parents to achieve common goals for their children, requesting for shadow helper (family member or caregiver), and providing access to resources from the children's therapists. It is also reassuring that in Singapore, the Early Childhood Development Agency (ECDA) has already started to address this gap with the guidelines for an Inclusion Coordinator (ICO) in every preschool (ECDA, 2021).



Photo 30 - Faculty of Human Development, Rokkodai Campus, Kobe University, Japan (Catherine Ong).



Photo 31 - With Professor Sachiko Kitano (green scarf) at Kobe University.

In addition to training ECE professionals, Kobe University also plays an important role in the ECE research for the revision of the Japanese National Kindergarten Curriculum Guidelines. This is done through research and data collection at the Kobe University Laboratory Kindergarten, which was founded in 1904. The pedagogical approach of this Kindergarten is based on child-centered education effected by the American philosopher, John Dewey and based on playful learning from children's perspectives.



Photos 32 to 33 (L to R) - Introduction to Kobe University Laboratory Kindergarten by Vice-Principal, Mr Takanao Tanaka.

Whilst the Kobe University Laboratory Kindergarten may not be Reggio-inspired, many of their practices are similar to the preschools we visited. The environment (classroom set-up and outdoor) is intentionally designed to cultivate a foundation for learning through play. Developmentally appropriate resources (e.g., light blocks for toddlers to heavier blocks for older children) are aplenty and easily accessible by children. Photographs, drawings, maps, etc., adorned the classroom walls and along corridors documenting children's thoughts, ideas and experiences. They also conduct a wider variety of outdoor activities, ranging from adventurous play with playground equipment, risky play with unicycles and difficult terrains, season-specific gardening to just free running around the open field. Though it was a school holiday for the children and the kindergarten was empty when we visited, we could almost imagine the squeals and laughter echoing through the neighbourhood as the children played in such a conducive environment.

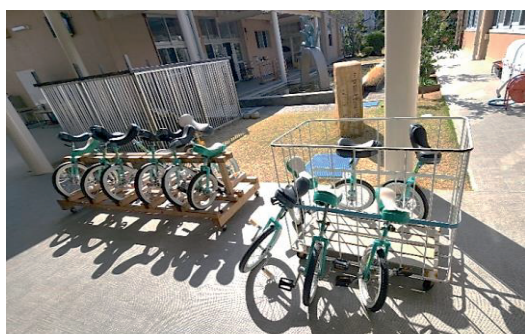


Photo 34 - Unicycles at the Kobe University Laboratory Kindergarten are used to promote gross motor skills, balance, body coordination and also risk-taking!



Photo 35 - Wide spaces and a variety of choices for outdoor play makes a conducive environment for learning!

Mr Takanao Tanaka, the Vice-Principal of the Laboratory Kindergarten, also shared with us the kindergarten's guiding principles of supporting children to develop abilities to recognise and acknowledge what they personally feel is the right thing to do, and for children to be able to work collectively toward a social consensus. This was insightful as we had observed and wondered about the gap between the Japanese culture that emphasises individualisation and their conflicting social ideology of conformity. It seemed that what we perceived as a gap is culturally capitalised as an opportunity for educators to facilitate children's social awareness and where they stand as an individual in this social context. It was a valuable lesson learnt about the differing perspectives one can have toward teaching and learning.

Reflections

For some of us, it was our first study trip with AECES. The intellectual and professional learning and exchange was the most memorable and meaningful for us. We went with little but returned with much – best practices learnt from our Japanese counterparts, knowledge and insightful sharing with fellow ECE professionals, and invaluable networks and sincere friendships forged in the process.

In terms of ECE practices, we have learnt that it is important to tweak what are seemingly best practices for others (in their cultural context) to what works and are operationally possible in our own culture. Quoting one of our groupmates, “A single study trip with AECES beats the dry knowledge we learned from so many books!” And truly so! We are deeply grateful to AECES (especially Dr Christine Chen, Ms Ivy Kok and Ms Janet Yong) for organising this trip, and sincerely appreciative of our wonderful tourmates for their warmth and generosity. Till our next learning journey together!

References

- AECES. (2023). *An expedition in leadership for early childhood professionals. Japan, Kobe study trip-18-25 March 2023*. <https://www.aeces.org/kobe-study-trip-18-to-25-march-2023/>
- ECDA. (2021). *New initiatives to enhance inclusion and support for children with developmental needs*. <https://www.ecda.gov.sg/news/new-initiatives-to-enhance-inclusion-and-support-for-children-with-developmental-needs>
- Gandini, L. (2012). History, ideas, and basic principles: An interview with Loris Malaguzzi. In C. Edwards, L. Gandini, & G. Forman (Eds.), *The hundred languages of children: The Reggio Emilia experience in transformation* (3rd ed.) (pp. 27-71). Reggio Children & Innovations in Early Education: The International Reggio Exchange.
- Prime Minister’s Office of Japan. (2023, April). *Launch ceremony of the Children and Families Agency*. Prime Minister’s Office of Japan. https://japan.kantei.go.jp/101_kishida/actions/202304/_00002.html
- Soncini, I. (2012). The inclusive community. In C. Edwards, L. Gandini, & G. Forman (Eds.), *The hundred languages of children: The Reggio Emilia experience in transformation* (3rd ed.) (pp. 187-211). Reggio Children & Innovations in Early Education: The International Reggio Exchange.

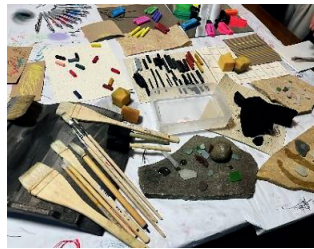
Learning through play!



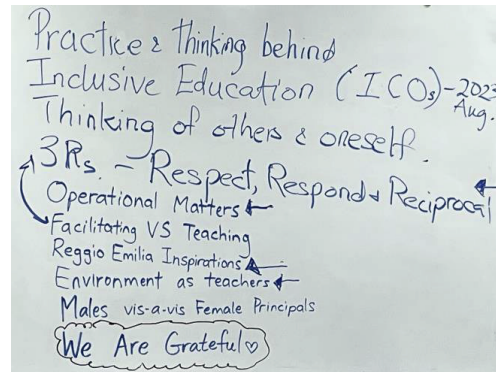
Photos 36 to 37 (L to R) - Visiting Anpanman Children's Museum for insights to colourful and engaging setups to stimulate and entice play in children!

REFLECTIONS

Mosaic of Graphics Words Material organised by the Japan Institute for Reggio Emilia Alliance (JIREA), hosted by Dr Mari Mori



Photos 38 to 42 (L to R) - Learning about respecting the rights of materials the Reggio Emilia way.



Photos 43 to 44 (L to R) - Intense but meaningful debrief to wrap up the learning points from this trip!

Playing harder after learning!



Photos 45 to 48 (L to R) - Forging friendships through meals, nature walks and footbaths! Some of us built fast and fun camaraderie as we re-enact our favourite childhood classic song!



For photo gallery of the trip, please scan the QR code or visit AECES Facebook page <https://www.facebook.com/100063690334791/posts/666591938807145/?sfnsn=mo&mibextid=6aamW6>

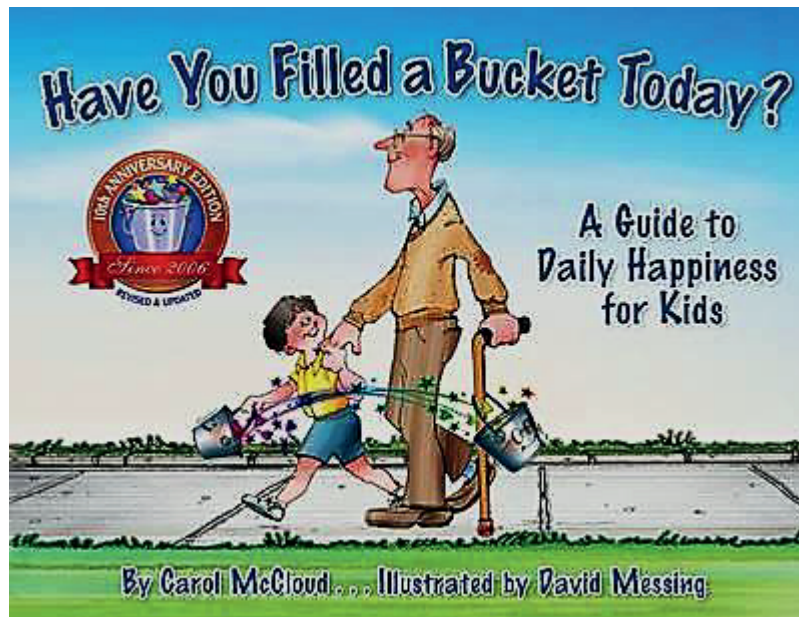
About the authors

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Have You Filled a Bucket Today?
A Guide to Daily Happiness For Kids
By Carol McCloud and Illustrated by David Messing

Nagalinggam Thamarai
Senior Cluster Quality Manager
My First Skool



Have You Filled a Bucket Today? is a heart-warming 32-page book which was first published in 2006 in English. Suitable for preschoolers, it encourages positive behaviours by using the concrete concept of an 'invisible bucket'. The author used simple narrations to convey how our actions and words have an impact on our happiness and others. It is important to instill positive behaviours in our little ones and happiness is key to their overall emotional wellbeing. The relationships that they establish within themselves and with others set the foundation for their future learning and success.

The author has adopted the bucket analogy to depict and foster positive behaviours in our children. The illustrations in the book show that each one of us has an invisible bucket. The colourful visuals enable children to contextualise and learn how they can display kindness, show appreciation and love to others. '**Bucket filler**' and '**Bucket dipping**' are two key words which are introduced for children to understand how their buckets can be filled to hold good thoughts and feelings about themselves.

When children use kind words and actions towards others, they fill others' buckets so they become 'bucket fillers'. Concurrently, these kind acts also fill their own buckets as these acts make them feel good too. Through simple but powerful illustrations, children can comprehend and correlate to good examples on how everyone can

become a 'bucket filler'. Children can relate that it does not take much effort to show love, be pleasant, say kind words or do something nice.

The author also introduced the children to the concept of 'bucket dipping' which happens when they do not behave appropriately towards others. For example, making fun, saying mean things, bullying or ignoring someone is dipping into someone's bucket. The author explained that children who demonstrate these undesirable behaviours that hurt others will not fill up their own buckets either.

I personally love how the illustrator had included people of different races, cultures, abilities and ages to reinforce positive behaviour and that all of them should be treated with respect. The book encourages children to reflect by asking themselves, "Have I filled a bucket today?" This is awesome as it teaches children to pause, reflect and evaluate their behaviours daily. It also creates opportunities for them to correct and work on areas they wish to improve on. This habitual practice paves the way for children to express thoughts, feelings and views.

The book is a useful resource for educators to reinforce the kindness culture, create a positive learning community, shape the children's behaviours and help them self-regulate and make informed decisions about their actions or behaviours. Educators can use the examples in the book to create awareness and encourage positive behaviours in the classroom. They can adopt and facilitate strategies for children to use appropriate language to share and talk about their emotions and encourage them to discuss various behaviours. Then, they can identify if the actions will 'fill up' or 'dip into' their friends' buckets. Educators can be 'bucket filler' models for the children too.

Each child can have his or her own 'bucket' in the classroom. The 'bucket' can be paper cups or containers made from recyclable materials. Star or heart cut-outs can be added to the buckets of both the 'bucket filler' and receiver. Older children may journal or record their 'bucket filling' actions. During circle time, children can show appreciation to their peers who have 'filled' their buckets. They can also design their own 'bucket filler' posters together.

In addition, educators can involve and partner families to cultivate strong values in our children. The strong home-school partnership can ensure continuity that the children's positive behaviours will be acknowledged and they will receive guidance to develop their emotional regulation and social skills.

I would like to advocate for educators to adopt this book to influence and encourage positive behaviours and develop the preschoolers' socio-emotional skills. They can learn to be caring, compassionate and show appreciation for one another amidst all diversity. Last but not least, I am certain it will encourage our children to feel secure, understood, and become happy and confident individuals.