

Chapter 1

Introduction to Early Childhood Development and Research in Singapore



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1.1 Why Is Early Childhood Development and Research Important?

Education and well-being care are important throughout life, but especially so during early childhood, a time characterized by profound neural change. Importantly, early life experiences and neurodevelopment, in turn, lay the foundation for the subsequent ways in which neurodevelopment unfolds. As neurodevelopment is influenced by both genetic and environmental factors, it is not surprising that the quality of early childhood experiences has been found to have short- and long-term impacts upon individuals and society. For example, early environments characterized by relative responsiveness from caregivers (Fralely et al., 2013; Raby et al., 2015) may lead to academic and/or social competence even into adulthood. On the other hand, early childhood experiences with poverty and/or low socioeconomic status, exposure to parental mental health difficulties, forms of insecure attachment, and abuse or trauma have been linked to outcomes such as lower levels of school readiness, attentional problems, and/or difficulties in socioemotional development (e.g., Psychogiou et al., 2020; Fearon & Belsky, 2004; Dearing et al., 2001; Enlow et al., 2012).

Because early childhood education and care lay the foundation for the future, many countries worldwide are prioritizing early childhood development. Global institutions – including UNICEF, the World Bank Group, UNESCO, and WHO – have also focused on early childhood development in their work. For example,

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UNICEF promotes the importance of healthy brain development in early years through its “Early Moments Matter” campaign. Some of the efforts in this campaign include raising awareness about the topic, promoting investments in early childhood development programs, and supporting parents and caregivers to give their children the best start in life (Lake, 2017). WHO in collaboration with other partners¹ presents a global framework called the “Nurturing Care Framework” as a way for governments to think about supporting children by guaranteeing five inter-related components, namely, “good health, adequate nutrition, safety and security, responsive caregiving, and opportunities for learning” (WHO, 2018). This framework was created as a roadmap for the ways in which multiple groups (e.g., parents, caregivers, service providers, educational institutions, the private sector, governments and societies, academics, the United Nations, and academia) can strive to support children.

1.2 Singapore: Early Childhood Development and Research

The United Nations (UN) committee has praised the combined fourth and fifth periodic report of Singapore on the steps taken to execute the provisions of the Convention on the Rights of the Child (United Nations, CRC, 2017). These rights include those relevant to multiple aspects of well-being including their right to education, physical protection, food, education, health care, and opportunity. It recognizes the significant developments and investments that Singapore has made to improve the rights of the children, especially in early childhood education (Cheow, 2019).

There is a strong commitment to enhance the quality of early childhood development and education in Singapore. In 2012, Prime Minister Lee Hsien Loong first announced that the government would invest more substantially into the early childhood (EC) sector in Singapore and take on a more active role (Lee, 2012). This announcement was followed by several concrete actions. In 2013, the Early Childhood Development Agency (ECDA) was set up to manage and regulate childcare centers and kindergartens. In March 2018, the National Institute of Early Childhood Development (NIEC) was incorporated with Ms. Chan Lai Fung (then Permanent Secretary of Education, now Permanent Secretary of National Research Foundation), Ms. Lai Wei Lin (then Deputy Secretary of Education, now Permanent Secretary of Ministry of Law and Second Permanent Secretary of Education), and Professor Tan Oon Seng (then Director of the National Institute of Education, now Director of the Centre for Research in Child Development) as the first directors. Mrs. Loke-Yeo Teck Yong who previously led the establishment of Ministry of Education (MOE) kindergartens was appointed as Director of NIEC. The establishment of NIEC signals a major milestone in the early childhood sector for Singapore.

¹WHO, UNICEF, and the World Bank Group, in collaboration with the Partnership for Maternal, Newborn & Child Health the Early Childhood Development Action Network and many other partners.

Teacher quality has always been a hallmark of Singapore's education system. As such, NIEC, which is tasked to develop pre-service and in-service early childhood educators, will help raise the quality of teachers for the sector. Concomitant with the various national developments to enhance early childhood regulation, teacher professionalism and preparation is the recognition of the importance of research to inform and support policy and practice. The Centre for Research in Child Development (CRCD) at NIE was established to give more focus to research in early years with a view of longitudinal and large-scale research to better understand early childhood challenges and development for Singapore.

In 2012, the Singapore Ministry of Education published national guidelines for preschool teachers, called the "Nurturing Early Learners" (NEL) curriculum framework. The NEL curriculum framework guides preschool teachers who teach children aged four to six and is intended to improve the quality of teaching at this important developmental age. Furthermore, the NEL provides a common framework for preschool teachers to follow when it comes to pedagogical practices. Six early childhood education principles form the core of the NEL curriculum framework that is based on the idea of holistic learning. These help children become confident in the early years of their life. While preschools in Singapore do not necessarily have to follow the framework to the letter, they are encouraged to use it as a guiding framework.

A clear policy focus is to support economically disadvantaged children's access to high-quality preschool education. The government has invested in several programs such as KidSTART, Uplift, and KiFAS to achieve this. KidSTART provides health, learning, and developmental support to low-income families. KidSTART, and other similar programs, may help address some of the barriers that constrain children from such families from accessing good-quality early childhood care and education (ECCE). A new inter-agency task force – Uplift (Uplifting Pupils in Life and Inspiring Families Taskforce) – has also been created to promote inter-agency coordination. Different agencies are working under the Uplift umbrella to support and monitor the progress of low-income and vulnerable young children. Since the KidSTART pilot program started in 2016, the Uplift taskforce has reviewed its results (with more than 900 families receiving support through KidSTART) (Goy, 2017). The Kindergarten Financial Assistance Scheme (KiFAS) targets needy families who cannot afford to finance the education of their children. By subsidizing 90% of the monthly fees (or up to \$82 SGD) per month, the KiFAS makes it more affordable for such families to send their children to eligible non-profit kindergartens. Additional help is available through several community organizations that are providing financial support to low-income families through different schemes to cover pre-school education (Tan, 2007). An important step in this direction has been a conscious effort to create platforms and opportunities for parents to develop a better understanding of the importance of holistic development among children and guidance on nurturing children as lifelong learners. The MOE, ECDA, and several other agencies are collectively involved in such efforts (MOE, 2012; ECDA, 2014).

In 2015, the NIE embarked on a Tier 3 project titled the "Singapore Kindergarten Impact Project" (SKIP). SKIP was the first large-scale local study examining how

the early educational environment affects children as they progress from Kindergarten 1 (K1) to Primary 1 (P1) (Goy, 2015). It marked NIE's deeper foray into early childhood education (ECE) research in Singapore.

With the enhanced emphasis on early childhood, there could not be a better time than now to introduce a book on early childhood in Singapore. The present edited book serves to chart the development of Singapore's early childhood sector. It also serves to consolidate the more recent research work that has been done in early childhood, specifically by researchers from the NIE.

1.3 Layout of the Book

The book opens with Prof. Oon Seng Tan and Jallene Chua's Chap. 2, "The Honeycomb of Early Childhood Development: A Big Picture Approach for Supporting Development and Education for Early Years." In this chapter, the authors stress that building character and competence from a young age is at the core of effective ECCE. This requires adopting a big picture approach involving multiple stakeholders and agencies. Therefore, they propose the "Honeycomb of Early Childhood Development" as a conceptual framework that tackles the essential and macro factors that make up early childhood development. The Honeycomb of Early Childhood Development comprises six important factors (the six "E"s): (1) economics, where they talk about ECD as an investment that is practical for the economy and beneficial for children when done early and strategically; (2) equity, where the importance of enabling access to ECCE for every child is highlighted; (3) essence, where they consider ECCE as a crucial phase of life that every child is entitled to; (4) education, where they discuss the types of curriculum and pedagogies that need to be incorporated together; (5) educators, where the role of preschool teachers, teacher education, and teacher policies are discussed; and (6) ecology, where the relevance of various stakeholders and parties in ECD is brought to attention. The chapter concludes with a message that Singapore would benefit greatly from this framework which can be used to drive research, policies, and practice in the future when it comes to the ECCE sector. Parents, educators, policymakers, and other important stakeholders involved in the early childhood journey may also use it as a guide.

In Chap. 3, "Pre-school Teacher Education in Singapore: Developments and Challenges," Dr. Nirmala Karuppiyah reviews key policies and practices to improve preschool education quality and equity initiated in Singapore in recent decades. Efforts in four areas of improvement that have been identified by the MOE for the pre-school sector in Singapore are discussed – regulations, curriculum, training, and research. The author identifies the challenges Singapore faces in preschool education – lack of a stable and well-qualified workforce in the pre-school sector, stress and fatigue among preschool personnel, and challenges in working with young children and their families. Dr. Karuppiyah believes that the setting up of the Centre for Research in Child Development (CRCDD) in 2017 and the National Institute of Early

Childhood Development (NIEC) in 2018 has been a positive step forward in the Singapore government's commitment to invest and improve the provision of the quality care and education for young children and their families. The author concludes that much work involving changing mindsets and reviewing the goals of pre-school education in Singapore would be top priority in the next wave of change.

Chapter 4, "Early Learners Curriculum: Case of Singapore Early Childhood Education Working Toward Quality," investigates curriculum reform in Singapore that has been implemented to improve the preparation for and the quality of early childhood education (ECE). Dr. Heidi Layne describes the origin of the NEL curriculum framework for ECE as a child-centered ideology. First, the chapter contributes to an improved understanding of the meaning of learner/child-oriented curriculum in the field of ECE in Singapore. While the NEL curriculum framework recognizes the child's curiosity and ownership on learning, teachers must manage the process. The author believes that the creative component, which free play emphasizes, and which is also an important part of twenty-first century skills, is missing from the curriculum framework and from the teacher's talk. This calls for further analysis of the role of play in the NEL curriculum and further observations on the quality of play in Singapore. Second, using preschool teachers' reflections on the curriculum and professional practice, the author provides a better understanding of how the teachers interpret and use the curriculum. The chapter makes a case for teacher education programs that prepare teachers to follow such child-centered and inquiry-oriented curriculum.

In Chap. 5, "Researching Well-Being for Children with Low-Income Family Background in Singapore – for Whom and from Whose Perspective?," Dr. Layne, with Mardiana Abu Bakar, Mercy K. Jesuvadian, and Dhannea Rohaizad, discusses the need for a more holistic approach of well-being in early childhood pedagogy in the Singapore context, where interventions are set to meet the needs of individual children and their families and point to the diversity of families within the low-income categorizations. According to the authors, new diversities of Singapore society crisscross the socioeconomic demographics brought about by mixed marriages and immigration. Attention is also drawn to the current body of work on early intervention studies that tend to focus on the outcomes of child development and learning, rather than what is going on in the classrooms, or understanding the circumstances impacting children's and families' well-being. The authors make a case for a shift toward the new type of early childhood education where the child is the focus and where there is a greater emphasis on the quality of learning instead of only concentrating on outcomes. They feel that this is important for early interventions to be effective. The chapter also describes a research initiative on the Child Support Model (CSM) developed by NTUC First Campus. This CSM is a local (Singaporean) model aiming for holistic support (financial, learning, and social) for children from low-income backgrounds and their families. The authors explain why the CSM may provide a more holistic perspective in supporting the child's development, learning, and well-being. They also argue that analyzing the CSM can inform policy makers on how a process orientation can be meaningfully included in their intervention approaches when working with the range of diversities that families and children bring.

Chapter 6, “Early Childhood Intervention for Young Children with Special Needs in Singapore: Where We Have Been and Future Directions,” provides an overview of early childhood intervention programs and research studies in Singapore. It traces the historical roots of early childhood intervention in Singapore followed by a description of the current ECI landscape that has seen a rise of ECI services. Drs. Xie Hui Chao, Yang Xueyan, and Kenneth Poon Kin Loong note that in contrast to earlier approaches that focused heavily on specialized intervention for these children with developmental needs, the newer approaches focus more on support within the preschool environment for the child with developmental needs. Such newer programs that are part of a larger continuum of services are described such as KidSTART, Developmental Support-Learning Support (DS-LS), Integrated Child Care Programme (ICCP), Early Intervention Programme for Infants and Children (EIPIC), and Circle of Care (COC). Through such programs, more and more young children with special educational needs have received intervention and are expecting to actively participate in the community, such as by attending a mainstream preschool. Based on a small but increasing number of studies conducted in Singapore, the authors present a summary of key findings from local research in the domains of identification and assessment, child profile and needs, inclusive education models/programs, support practices and support needs, as well as family-centered service provision. Drawing from a review of local studies, the final section of the chapter suggests three future directions for ECI in Singapore, namely: (1) enhancing systematic universal developmental screening and monitoring through the use of culturally appropriate instruments, (2) advancing toward inclusive early childhood education, and (3) providing professional development and training for ECI professionals. The authors conclude that to provide meaningful preschool experiences for every single child to reach the maximum potential of their development, collaboration and communications between early childhood education and early childhood interventions is needed.

Chapter 7, “Cross-Cultural Considerations for Adapting Valid Psycho-Educational Assessments,” by Dr. Nicolette Waschl and Dr. Mo Chen, highlights the need for locally validated and culturally appropriate measures in Singapore and the factors that may influence the development and adaptation of such measures. The authors point out that because Singapore is at a crossroad of Asian and Western cultures and with advanced technological infrastructure, it stands out as an exciting place to examine and highlight issues of cross-cultural measurement and assessment and to develop smarter assessment tools. Concrete examples are used to show how the use of two broad types of measurement instruments – self- and other-report inventories and norm-referenced standardized tests – may be adapted in the Singaporean context. The chapter also discusses a new use of technology in psychological measurement (i.e., computerized adaptive testing) to allow for more individualized and efficient testing experiences, making assessment faster, smarter, and less expensive. Drs. Waschl and Chen propose that these are important steps in ensuring that constructs are measured accurately while developing a more accurate understanding of child development; without this, it becomes challenging to develop

and improve theories of child development both internationally and, specifically, in Singapore.

In Chap. 8, “The Importance of Positive Environments on Infant and Early Childhood Neurodevelopment: A Review and Preview of Upcoming, ‘BE POSITIVE’, Research,” Dr. Anne Rifkin-Graboi considers animal and human research describing how brain development unfolds, especially in early life. The author highlights why early experiences are important in development, especially from a biological standpoint. The author’s review of research demonstrating effects of the caregiving environment upon neurodevelopment shows gaps in the knowledge base, including how such relations unfold outside of low-risk North American and European homes and school systems. The author describes a new collaborative study in Singapore between CRCD and SingHealth, “BE POSITIVE,” that aims to address these gaps starting in children four months to four years. The “BE POSITIVE” (Beginning Early: Singapore’s Ongoing Study Starting in Infancy of Twenty-First-Century Skills, Individual Differences, and Variance in the Environment) study will focus upon environmental quality and aspects of child development including memory, emotion, pre-academics, and regulatory abilities and will collect data from approximately 1000 families at multiple points in time when underlying brain regions are likely to be exhibiting rapid growth. The author emphasizes the need for such research studies as essential to understanding the ways in which our early and subsequent experiences interact to influence outcomes and may foster greater acceptance of learning differences. Finally, the chapter considers the ways in which such research can be helpful in shaping interventions and policy to increase educational success and positively impact well-being.

Chapter 9, “Mindfulness in Early Childhood – Developing Twenty-First Century Competencies,” discusses mindfulness-based practices in early childhood and how it can foster self-regulation and socioemotional competencies underlying twenty-first-century skills important for children to survive and thrive in a fast-changing world. Dr. Kiat Hui Khng presents that the skills required to be learned to practice mindfulness is minimal – breathing, walking, eating, listening – there is little new that needs to be learned except for the attitude and attention to which we bring to these everyday activities. Dr. Khng stresses that the influence of mindfulness on child outcomes is not restricted to the direct effects of mindfulness-based practices on the children who practice them; mindfulness in parents and teachers can impact the children they interact with in similar ways. Attention is drawn to mindfulness in the local school settings – how Singapore is performing when it comes to providing opportunities for direct child mindfulness training in schools, the state of mindfulness in teachers and parents, and how Singapore can improve further. The author highlights the need for future studies that will examine systems-level approaches involving teachers and parents.

Chapter 10, “Using Guided Play to Facilitate Young Children’s Exploratory Learning,” starts with a review of research highlighting the importance of exploratory play – i.e., children acquire cognitive, social, and motor skills as well as gain content knowledge through exploratory play, and their engagement in exploratory play is related to later developmental outcomes. Dr. Yu Yue presents empirical

studies that show that the guided play framework can facilitate young children's exploratory learning as it has the right balance between child-directed play and adult-directed instruction for optimal learning. The case of guided play is strengthened through studies from different nations that compare the effects of direct instruction, guided play, and free play on children's learning in the domains of numeracy and spatial skills, language and literacy, and self-directed learning. To apply guided play to the Singapore context, more research is needed to verify its cultural validity and parents' perceptions about it. If such research leads to positive findings, guided play has the potential to help educators, caregivers, and policy makers create a child-friendly and purposefully designed environment that promotes exploratory learning, in line with the principles of purposeful play and iTeach recommended by the NEL.

Drs. Stella Tsotsi and Yang Yang examine in Chap. 11, "Master Your Feelings: Emotional Competence in Early Childhood – Parent-Related Antecedents and Child Outcomes," the development and importance of emotional competence in early childhood. Through a review of international studies, they show that children's emotion understanding, emotion regulation, and empathy play an important role in a wide array of their behavioral, social, and cognitive development. Moreover, recognizing emotional cues and understanding their possible causes in the social environment has been shown to promote academic achievement. The discussion moves to the factors that affect children's emotional competence – research shows that parents play an important role in socializing children to understand and regulate emotions, and empathize with others, especially in early childhood. The chapter shows that most existing studies on emotional competence have been conducted among Western, especially European American, children, ignoring the important role of culture in children's emotional development. Therefore, the extensive findings in research in Western cultures may not necessarily apply in Singapore context and much remains unknown regarding emotional competence and its correlates among children in Singapore. The authors anticipate and describe that several ongoing projects and future projects in the Centre for Research in Child Development (CRCD) at Singapore's National Institute of Education may fill this gap by investigating Singaporean children's emotional development. Dr. Tsotsi and Dr. Yang also provide tips on how parents and educators can promote emotional competence based on international and local evidence.

Chapter 12, "Early Arithmetic Skills in Singaporean Kindergartners: What, When, and How?," addresses the development of arithmetic in early childhood. Drs. Pierina Cheung, David Munez, Ee Lynn Ng, Kiat Hui Khng, and Rebecca Bull review key factors across domain-specific and domain-general areas that may support the learning and development of arithmetic skills. The authors also present analyses on data from the Singapore Kindergarten Impact Project (SKIP), a large-scale project on preschool education, and find that children in Singapore have relatively strong counting skills and strong digit literacy. However, children's informal arithmetic skills can be further developed. The chapter concludes with some guidelines for promoting the development of early mathematical knowledge in the classroom and at home. Authors believe that by sharing basic research on child

development with teachers, they can be better equipped with the necessary information so that they know what to look for and can then use the information to analyze children's behavior.

In Chap. 13, "Harmonious Bilingual Development: The Concept, the Significance, and the Implications," Dr. Sun He demonstrates how Singapore society might benefit from implementing the notion harmonious bilingual development in early childhood development. It presents findings that have shown general links between bilingual input and use with children's language proficiencies and with their socio-emotional well-being. The author believes that in Singapore, as in other bilingual societies, the key to achieving such harmonious bilingual development probably lies in the environment of children's mother tongue language learning. Decent mother tongue language and literacy input and use may promote child bilinguals' socio-emotional and behavioral skills. Dr. Sun presents two cost-effective teaching approaches, namely, codeswitching and shared book reading, for their potential contribution to Singaporean children's mother tongue learning and harmonious bilingual development in a long run.

In Chap. 14, "Does Early Language Contribute to Socioemotional Functioning in Preschool and Beyond?," Dr. Shaun Goh provides a bird's eye view of what is known regarding the contribution of language to socioemotional functioning, especially in Singapore's multilingual environments. The chapter starts by providing a framework for understanding the early development of language and explains that language proficiency is a result of a complex interplay between multiple internal and environmental factors. However, it remains unclear if these same factors exert an equal importance across monolinguals and bilinguals, or among different languages of English, Mandarin, Tamil, and Malay. It then presents accumulating evidence from studies about the link between language and socioemotional functioning in early childhood. Although low language ability associates with three major clusters of low socioemotional functioning in childhood – behavioral, emotional, and ADHD type – the author concludes that very little is known about how these relationships come to develop, while even less is known among children who grow up learning two or more languages.

Dr. Ng Ee Lynn and Emily Meow examine in Chap. 15, "Preschool Teachers' Experiences of Work-Related Stress: A Pilot Study of Singapore Teachers," various international and local findings showing that teacher stress has serious consequences for both teachers and children, as well as for the quality of teacher-child interactions in the classroom. The review reveals that teachers may be exposed to many different job demands, which in turn lead to an increase in job strain, burnout, and exhaustion. Moreover, the review also reveals that teachers with access to job resources are more likely to report an increase in motivation and engagement at work, as well as increased job satisfaction. The authors present real-world examples of the ways in which job demands and resources interact to affect job satisfaction and well-being of preschool teachers in Singapore. Considering recent concerns about the high turnover rates of preschool teachers in Singapore and the scarcity of local studies on teacher stress, the authors argue that more systematic research is needed to understand the factors that contribute to teacher well-being.

This book is the first of its kind to cover the development of Singapore's early childhood sector and the latest research conducted by the NIE on early childhood. Most importantly, it is highly relevant for both practitioners and researchers. The topics covered in this book are focused largely on child development and education but also touch on teacher training, well-being, and the development of culturally appropriate assessment. Adopting a comprehensive approach, it is centered on the child, with a consideration of influences in the environment that can impact his/her development. It seeks to help readers understand that a child does not grow in a vacuum. Be it a practitioner in direct interaction with a child, or a researcher doing early childhood research, it will be helpful for him/her to take a holistic view and be mindful of the child as well as his/her environment. Readers will not only walk away with a fuller appreciation of early childhood in Singapore but will also be informed about possible actionable steps to take, both in practice as well as research. With the setup of NIEC and the rapid expansion of the early childhood sector in Singapore, there will be more than 1000 new early childhood teachers every year, for several years to come. This book will be a useful reference.

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