

Household Waste Generation: Understanding Family Practices and Challenges in Singapore

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Abstract

Economic development and population growth have led to rapid escalation in household waste generation, giving rise to major challenges for many small nations such as Singapore. The intensity of the problem is clearly recognised and echoed in numerous initiatives directed at different segments of the population, including young children and their families. While it is unanimously agreed upon that families play a critical role in promoting environmentally sustainable practices at home, less is empirically known about the nature of support parents provide to facilitate children's meaning-making on matters related to household waste generation, intergenerational learning, and the everyday challenges they experience. Set against this backdrop and guided by the socio-constructivist framework, this paper presents data gathered from semi-structured interviews with parents of six-year-old children from a local kindergarten that implemented a ten-week programme on saving earth, with a specific focus on Reduce, Reuse, and Recycle (3Rs) in Singapore. Findings indicated a clear recognition of household waste generation as an environmental issue and ways in which they facilitated their children's meaning-making. However, knowledge gap and time poverty were major hindrances to family engagement. Findings of the study highlight the need for a more nuanced understanding of factors that impede parental engagement, with implications for home-school collaborative practices and parent education.

Key Words

Families; children; home-school collaboration; household waste generation

Introduction

Household waste generation now receives unceasing attention due to the intensity at which the problem has grown in recent decades with dire consequences for human wellbeing, stressing the need for active participation from all segments of society (United Nations Environment Program, 2015). As per the World Bank Group (2020) reports, major cities produced 2.01 billion tonnes of solid waste in 2016 amounting to 0.74 kilograms of waste per person per day, and it is estimated that solid waste generation will amount to 3.4 billion tonnes by 2050. This worrying trend, a widely acknowledged by-product of rapid urbanisation and economic development (Hoornweg & Bhada-Tata, 2012), poses a major challenge for many nations, and Singapore is no exception. A land-scarce nation with a population of 5.7 million, Singapore has seen a seven-fold rise in waste generation over the past 4 decades (Ang, 2019). While the domestic recycling rate has risen (National Environment Agency, 2019), reports suggest that Singapore has a long way to go before achieving the national vision of becoming a Zero-Waste Nation (Tan, 2018). The limited availability of land for constructing landfills, the limited life span of the only landfill at Semakau, and the cost of building and operating incineration plants, all illustrate the importance of a swift and consistent action plan to address the issue and achieve the national vision (Lang, 2005). Waste minimisation, which reduces the amount of waste entering the environment, is therefore a viable option for Singapore in the long run (National Environment Agency, 2021). The 3Rs (Reduce, Reuse, Recycle) are at the top of the waste management hierarchy (Hoornweg & Bhada-Tata, 2012), spawning a multitude of national initiatives aligned with the 2030 Agenda for Sustainable Development and targeting all sections of the population, including the very young (Ministry of Foreign Affairs, 2018).

The quest for environmental sustainability begins in the early years of life, and the opportunity should therefore not be missed (Davis, 2014; Edwards & Cutter-Mackenzie, 2011; Elliott, 2010). It is during this phase that the “foundations of thinking, being, knowing, and acting are becoming hardwired, and relationships with others and with the environment are becoming established” (Davis, 2009, p. 20). Young children’s meaning-making about their environment is an individual process. However, it is socially situated in their immediate setting, which includes their family, thus warranting closer examination (Borg, Winberg & Vineterek, 2017; Cline, 2015; Duarte, Escario & Sanagustin, 2015; Rogoff, 2003; Wertch, 1991)

Families play a critical role in shaping children’s habits, values, roles, and actions pertaining to environmental sustainability (Siraj-Batchford, Smith & Pramling, 2010). The interactions and conversations with family members build young children’s foundations for knowledge acquisition and shape their understanding of environmental sustainability in the long run (Davis, 2014; Edwards & Cutter-Mackenzie, 2011; Pramling-Samuelsson & Kaga, 2008). Joint engagement with immediate family members allows for negotiating meanings and forming ideas about children’s ecology (Zimmerman & McClain, 2014). For example, a survey of preschool children in New Zealand showed that family members play an instrumental role in children’s learning about sustainable practices (Prince, 2011). Likewise, a quantitative study of 40 preschool children from Czech kindergartens and their parents suggested a positive correlation between parents’ and children’s environmental attitudes (Kroufek, Janovek, Chytrý, et al., 2016).

Despite literature acknowledging the role of immediate contexts in shaping children’s understanding of sustainable practices, there is limited research on how parents shape

children's understanding of household waste generation and the 3Rs and challenges involved in providing 3R-related learning experiences at home. Moreover, the research literature is primarily representative of western countries, thus leaving a significant research gap in the Asian context (Kaveri, 2015). Furthermore, household waste generation as an environmental issue is generally investigated as a smaller component of sustainability related research leaving a research gap that this paper aims to address. In summary, this paper focuses on family practices and challenges experienced by parents when shaping children's understanding of household waste generation and the 3Rs, thus providing insights on the nature of interactions between parents and children, thus enable obtaining a richer picture on how families shape young children's meaning-making.

Theoretical Framework

The theoretical framework for this paper is derived from social-constructivism, a view of knowledge that stresses the role of the context in individual meaning-making (Oldfather, West, White, et al., 1999; Rogoff, 2003; Vygotsky, 1978). This framework puts forward the claim that learning is not a purely cognitive phenomenon, rather, it is embedded within contexts. The importance of social interactions between children and family members is highlighted (Rogoff, 2003; Vygotsky, 1978). While children are endowed with the capacity to construct meanings, they are dependent on the more knowledgeable others who have more access to knowledge and information, and in a position to support them in carrying out a task that the children may not be able to do independently (Zimmerman & McClain, 2014). Such a process allows children to construct meanings, and transform social knowledge to personal knowledge (Brooks, 2011; Prior & Gerard, 2007; Spinthourakis et al., 2012, Van de Pol, Volman, Beishuizen, et al., 2010; Zimmerman & McClain, 2014).

The more knowledgeable others such as the parents have the capacity to provide resources and facilitate children's participation and mature forms of thinking about (among others) their environment and sustainable practices through cognitive and affective strategies (Duarte, Escario & Sanagustin, 2015; Zimmerman & McClain, 2014). While cognitive strategies enhance children's conceptual meanings, affective strategies provide the necessary emotional support (Masters, 2005). In addition, the adults also facilitate children's meaning-making through tangible mediators, i.e., things children can touch, see and use (Kozulin, 1998). With specific reference to early years, the mediators are primarily external and the very first tools that young children use to understand their world. Some examples of mediators that are increasingly recognised as ways to scaffold children's understanding include story books, tools for drawing, technological tools, and the physical environment such as learning corners (Jacobs, 2001). These forms of support demonstrate the importance of the social world in the lives of young children in allowing them to participate actively and mature in their thinking (Rao & Sun, 2012; Rogoff, 2003; Wood, Bruner & Ross, 1976).

While it is established that the home environment and children's interactions with more knowledgeable others (that includes the parents/care givers) are critical for children's meaning-making (Duarte, Escario & Sanagustin, 2015; Zimmerman & McClain, 2014), less is known about the subtleties of parents' use of mediators, cognitive and affective strategies, and the challenges they experience when interacting with their children about household waste generation (Kaveri, 2015). The closer examination of both mediators and, cognitive and affective strategies, allow us to receive a richer picture on how families shape children's meaning-making, and the resulting implications for home-school collaborative practices which form the focus of this paper.

Methodology

The data presented in this paper are part of a larger study that investigated children's meaning making about household waste generation and the role of contexts including both the home and school environment (Kaveri, 2015). Data for this paper were gathered through semi-structured telephone interviews with the parents of six children. These children were enrolled in a registered kindergarten that implemented a ten-week programme on saving the earth with a specific focus on the 3Rs. The demographic information of the participants is presented below in table 1:

Table 1

Demographic Information of Parent Participants

Name of child	Parent	Level of Education
Child J	Mother	Secondary school
Child N	Mother	University
Child T	Father	Pre-University
Child G	Mother	University
Child J	Father	University
Child M	Father	Diploma

The telephone interviews were conducted following the children's completion of learning experiences on the 3Rs. These experiences were planned and implemented by the class teacher using whole-to-part approach. In this approach, the experiences progressed from creating an awareness on the importance of saving planet earth to the gradual introduction of waste management in Singapore and the benefits of 3Rs. The learning experiences included creative play using recyclable materials, setting up a recycling centre, and sharing knowledge and skills with children from other classes. An interview schedules the guided the conversation between the researcher and participants focused on the nature of parent-child interactions on household waste generation and the 3Rs and challenges experienced during this process.

The interviews were transcribed, read and re-read with the overarching questions that guided the thinking about what would constitute a theme, which then led to search for meanings and patters within the data. Initial codes were generated and written mostly, as short phrases. Phrases were then analysed to identify possible patterns and then matched with data extracts. The themes were then captured based on the patterned meanings they revealed, and aligned with the overarching focus, the literature review and theoretical orientation (Braun & Clarke, 2006; Evans & Lewis, 2018; Masters, 2005; Merriam, 1998).

Findings

In this section, I present the data gathered from semi-structured interviews with parents of six-year-old children that implemented a ten-week programme on saving earth, with a

specific focus on Reduce, Reuse, and Recycle (3Rs) in Singapore. Findings indicated a clear recognition of household waste generation as an environmental issue and ways in which they facilitated their children's meaning-making. However, knowledge gap and time poverty were major hindrances to family engagement.

Recognition of household waste as an environmental issue

The parents recognized early years as a formative period during which children should be provided with experiences that enable learning environmental values. They were committed to educating their children about the environment; however, their reasoning displayed distinct concerns for the environment. Child M's father, saw the close relationship between excessive use of natural resources and damage to planet earth, and recognised the pressing need for action, thus displaying a biocentric, i.e., a nonhuman centred orientation (Kahn, 1999).

You can look at the amount in statistics...reports from the media shows that we are disposing a lot of waste. I suppose by doing this we are killing the earth.

Before disposing, you are consuming a lot of waste, you are using a lot of natural resources to create such things. The earth will be affected and the ozone layer and the environment.

However, to Child N's mother, knowledge of waste disposal is critical to save Planet Earth for future generations, which suggests an anthropocentric orientation, where protecting the planet through human actions is viewed primarily from a human perspective (Kahn, 1999). Similar thoughts were shared by Child J's mother.

Good one for the children, for them to know how to dispose of the waste. When they do that, it is helping to save the earth...saving the environment for the future generation. (Child N's mother). Quite a good theme! It is good to have this theme. They are cutting a lot of trees, global warming all this, so it is a good theme. Get children to know, to be conscious about the environment. It is important for the world. (Child J's mother)

Despite differing orientations, a unanimous recognition of household waste as an environmental issue was clearly evident. In addition, findings also suggest the need to understand parents' environmental orientations as they have implications for household practices (Leppanen, Haahla, Lensu, et al., 2012).

External mediators and cognitive and affective support

External mediators are objects or tools children can use in their meaning-making (Bodrova & Leong, 2001). Parents of the six children under this study provide a wide range of external mediators that include newspapers, books, encyclopaedia, and resources from the world wide web to facilitate their children's understanding of environmental issues and the 3Rs. While some parents have their own resources, others use resources in the community to facilitate children's learning about the environment. Furthermore, resources with pictures and words alleviate parents' burden of explaining complex topics in easy-to-understand language.

[...]some from the internet...on recycling programmes, showed her videos on it, showed her some encyclopaedia books on recycling things, what is happening on the earth atmosphere, and why should you go about saving the earth and you have ozone depletion as well. (Child N's mother)

I go to the library, get books, and get more information on what we can do. (Child J's mother)

When she comes home and asks questions – Why you have to do this? What is the ozone layer? And what do you mean by there is a hole in the earth? and so on[...]So to explain to her in words I found it difficult rather showing it to her in picture form is easier for her to grasp. (Child N's mother)

In addition, parents incorporate sustainable practices as part of everyday living and make reusable materials available to their children. Child N's mother, for example, shared that she does not discard cartons or plastic containers. Instead, she regularly collects, cleans and stores them for children's creative work both at home and school.

Parents also engage in conversations about the 3Rs and the importance of everyday sustainable practices. These are mainly in the form of answering children's questions about what they see in the environment, backed by supporting evidence that facilitate children's understanding of the 3Rs. The parents actively listen to their children. They pay attention to their children's thoughts, acknowledging and responding appropriately when needed. Child M's father reported an instance when his daughter came home from school feeling sad about the dying earth that the teacher had introduced during one of the curriculum experiences. The entire family listened to her story, valued her thoughts and said a family prayer for the earth's recovery, thus demonstrating the role of families in providing affective support in enabling children's meaning-making. In this case, Child M's family did not disregard her thoughts. Instead, respected and valued it, thus reinforcing her biocentric meanings that gave importance to Planet Earth.

The parents provided insights into commitment to environmental sustainability and the 3Rs. However, they also meet some challenges. While they recognise early years as an important phase and are aware of the urgency of protecting the planet from human destruction, they experience barriers that hinder their engagement. These include time poverty, dichotomy between preschool and mainstream education, and knowledge gap.

Time Poverty

Young parents' participation in the labour force has implications for quality parent-child interactions (Ishi & Urakawa, 2015; Ma, 2020; OECD, 2013). Working parents are among the severely time-deprived groups, and in particular, for dual-income families, time poverty can be a major limitation in facilitating children's learning experiences at home (Harvey and Mukhopadhyay (2007). All six families commented that their commitments at work had implications for the time spent with their children. In particular, the mothers shared the challenges they experienced balancing home and work. The long hours at work and returning home to face what amounts to a second shift consumed a large part of their time. This limited their interactions with children on curriculum-related matters and facilitate learning at home.

I work and come back and sometimes I find that I don't have the time to sit down and teach [...] then I have cooking. We are working people and

we have our own working commitments. We do forget to reinforce all these. (Child J's mother)

I would like to do a lot of things [related to the 3Rs] but sometimes I don't have the time to do. (Child J's mother)

While there were opportunities to interact with children on sustainability-related topics, parents shared that they procrastinated and prioritised other aspects of life such as work, and household chores.

There are a lot of things we can do but we don't make the time and effort. As I said we get cooked up with our own daily activities. I mean it can be a part of our daily activities. It's just a matter of putting more effort in it. (Child J's mother)

Data points to time poverty as one of the main deterrents to active parental engagement, thus suggesting implications for home-school relationships. Careful consideration of the unique challenges experienced by parents in this respect is critical to developing effective partnerships designed to optimise children's learning and meaning-making about household waste generation and the 3Rs in particular.

Dichotomy between preschool and mainstream education

Three families that participated in the study have children in the Singapore primary school education system in which languages, mathematics, and sciences are taught and assessed through diverse modes. While a number of engaging methods are in place to facilitate children's learning experiences, assessment remains an integral part of the system, thus requiring some form of adult support and guidance (Clarke, 2001; Ministry of Education, 2019). Data from semi-structured interviews suggests that a large portion of parents' time at home is spent on mainstream school-related matters, with implications for their interactions with their younger children, collaborative home-school relationships and parent education.

Currently, I could say that I put a lot of attention on my first one because she has a lot of homework in primary school. I get less involved in her work because she is only in kindergarten. (Child G's mother)

Knowledge Gap

Meaningful parent-child interactions are critical to children's understanding of environmentally sustainable practices. These are often associated with parental knowledge, that includes facts, information and understanding of environmental issues, and beliefs about sustainability (Borg, Winberg, & Vineterek, 2017; Trahan & Prince, 1999). Findings from the study showed knowledge inadequacy about the 3Rs as one of the challenges;

Basically, limited knowledge is one problem; we have to read up more, get more into it. (Child J's mother)

Parental knowledge of content and processes on topics such as household waste generation and the 3Rs is critical to facilitating children's meaning-making and therefore the need for parent education programs with a focus on 3Rs. Broadly speaking, parent education can provide parents with contextual information on household waste

generation, and prepare young parents for joint-participation in environmental activities to foster young children's understanding of the 3Rs and household waste generation.

Discussion

The parent responses from the current study, reveal a unanimous agreement on the importance of the 3Rs and the need to educate young children. However, it is also evident that parents distance themselves from playing an active role (Hoover-Dempsey & Sandler, 1997), a position that may be viewed from several perspectives.

Firstly, parental perceptions of their roles influence the extent to which they engage with their children's learning at school. Findings of the study suggest that all parents involved saw their role as secondary, viewing the preschool as primarily responsible for providing relevant learning experiences. Moreover, that parents prioritising mainstream education over preschool education may reflect the dichotomy between the two, and the broader culture of Singapore, where there is a greater emphasis on mainstream education that leans towards academic achievements (Ang, 2012), with implications for environmental sustainability-related interactions between family members.

Secondly, parents face contextual challenges that include work-related commitments and time poverty. The demands of work have implications for the time spent with children and quality parent-child interactions on environmental sustainability matters. In addition, they exemplify the plurality of roles expected of contemporary parents who juggle work and home (Ishi & Urakawa, 2015; Ma, 2019; Organisation for Economic Co-operation and Development (OECD), 2013). While the two central spheres of life in contemporary societies are work and family, their blurred boundaries add immense challenges to dual-income families seeking to accommodate work and family demands (McDaniel, 2015; Ruppeneer, 2015).

Thirdly, "knowledge gap" can be a factor contributing to the nature of parental interactions with children. This challenge can be viewed in the context of home-school communication practices that occurred mainly through the preschool's newsletter, a one-way form of communication. Such written communication, notified parents at the start of the ten-week term about the curriculum and its deliverables, does not facilitate an ongoing understanding of children's curriculum related experiences across the ten-week period.

While the values held by both the school and home were towards the best interest of the child, the nature of joint involvement appear to be a cause for concern. The findings therefore highlight the complexities associated with life contexts and the nature of home-school partnerships. Facilitating children's meaning-making with useful scaffolds entails parents being in the loop of information that assists them to reinforce what is learnt at school and model certain behaviours at home. Communicating frequently and interacting regularly with parents on matters related to the curriculum in ways that accommodate parental preferences and expectations facilitate establishing a home environment that can assist children's learning about household waste generation and the 3Rs (Kaveri, 2015).

Limitations and Implications

Data from parents was gathered through telephone interviews. While semi-structured interviews using the telephone as a medium offer the advantage of a faceless voice, they do not allow for non-verbal elements of communication to be captured (Block & Erskine,

2012), and thus a limitation of this study. While the findings are from a small number of participants, and by no means representative of a larger population, they nevertheless suggest implications for home-school collaborative practices and parent education programmes.

Successful home-school collaborative practices involve recognising families' experiences, expectations, and preferences, and developing a working partnership. This requires preschools to communicate frequently and consistently through flexible modes of communication in order to achieve a common understanding (Couchenour & Chrisman, 2014; Khong, 2004), thus enabling children's meaningful learning experiences about the 3Rs at home. The early years are especially critical as it is during this phase that children's attitudes towards the environment are hardwired, and therefore ought not to be missed (Davis, 2014; Kaveri, 2020). Quality parent-child interactions in the form of conversations and joint participation in day-to-day activities to develop understandings about household waste generation are critical in shaping children's commitment to environmental sustainability. However, parents' lack of time, particularly in dual income households poses the danger of missing an important period in children's lives (Ishi & Urakawa, 2015; Ma, 2019; OECD, 2013), thus suggesting the need for parent education programmes, an implication for environmental organisations that can play an active role in public education with a specific focus on young parents. Equipping parents with appropriate knowledge and skills to promote 3Rs in practical ways can enable parents to rethink their roles and environmental practices at home, and shape children's meaning-making (Kaveri, 2015).

References

- Ang, H. M. (2019). *Singapore to reduce Semakau waste by 30% under first Zero Waste Master Plan*. <https://www.channelnewsasia.com/singapore/semakau-reduce-landfill-zero-waste-master-plan-recycling-bins-1338431>
- Ang, L. (2012). *Vital voices for vital years: A study of leaders' perspectives on improving the early childhood sector in Singapore*. Lien Foundation.
- Bodrova, E., & Leong, D. J. (2007). *Tools of the mind: The Vygotskian approach to early childhood education* (2nd ed.). Merrill/Prentice Hall.
- Block, E. S., & Erskein, L. (2012). Interviewing by telephone: Specific considerations, opportunities and challenges. *International Journal of Qualitative Methods*, 11(4), 428-445. <https://doi.org/10.1177%2F160940691201100409>
- Borg, F., Winberg, M. & Vineterek, M. (2017). Children's learning for a sustainable society: Influences from home and preschool. *Education Inquiry*, 8(2), 151-172.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in Psychology*, 3(2), 77-101. <https://doi.org/10.1191/1478088706qp063oa>
- Clarke, C. (2001). The role of parents in Singapore primary schools. *Teaching and Learning*, 22(2), 83-92. <http://repository.nie.edu.sg/jspui/bitstream/10497/285/1/TL-22-2-83.pdf>
- Cline, E. M. (2015). *Families of virtue: Confucian and Western views on childhood development*. Columbia University Press.
- Couchenour, D., & Chrisman, K. (2014). *Families, schools and communities: Together for young children* (5th ed.). Wadsworth, Cengage Learning.
- Davis, J. (2014). Examining early childhood education through the lens of education for sustainability: Revisioning rights. In J. Davis & S. Elliott (Eds) *Research in early childhood education for sustainability: international perspectives and provocations* (pp. 21-37). Routledge.
- Davis, J. M. (2009). Revealing the research 'hole' of early childhood education for sustainability: A preliminary survey of the literature. *Environmental Education Research*, 15(2), 227-241. <https://doi.org/10.1080/13504620802710607>
- Duarte, R., Escario, J. J., & Sanagustin, M. V. (2015). The influence of the family, the school, and the group on the environmental attitudes of European students. *Environmental Education Research*, 23(1), 23-42. <https://doi.org/10.1080/13504622.2015.1074660><https://doi.org/10.1080/13504622.2015.1074660>
- Edwards, S., & Cutter-Mackenzie, A. (2011). Environmentalising early childhood education curriculum through pedagogies of play. *Australasian Journal of Early Childhood*, 36(1). <https://doi.org/10.1177%2F183693911103600109>
- Elliott, S. (2010). Essential, not optional: education for sustainability in early childhood centres. *Childcare Information Exchange*, March/April 32(2), 34-37.
- Evans, C., & Lewis, J. (2018). *Analysing semi-structured interviews using thematic Analysis: exploring voluntary civic participation among adults*. <https://www.semanticscholar.org/paper/Analysing-Semi-Structured-Interviews-Using-Thematic-Evans-Lewis/e925d9c92780a1d56af25fc01c8f2cdbf14d6c6e>
- Harvey, A. S. & Mukhopadhyay, A. K. (2007). When twenty-four hours is not enough: Time poverty of working parents. *Social Indicators Research*, 82(1), 55-77. <https://doi.org/10.1007/s11205-006-9002-5>
- Hoornweg, D., & Bhada-Tata, P. (2012). *What a waste: A global review of solid waste management*. Urban Development Series, World Bank.

- Hoover-Dempsey, K.V., & Sandler, H.M. (1997). Why do parents become involved in their children's education? *Review of Educational Research*, 67, 3-42. <https://doi.org/10.3102%2F00346543067001003>
- Ishi, K., & Urakawa, K. (2015). *Time-adjusted poverty among working households in Japan: Two dimensional poverty line approach*. <https://www.pdrc.keio.ac.jp/uploads/DP2014-005.pdf>
- Jacobs, G. (2001). Providing the scaffold: A model for early childhood/primary teacher preparation. *Early Childhood Education Journal*, 29(20), 125-130. <https://doi.org/10.1023/A:1012581113983>
- Kahn, P. (1999). *The human relationship with nature: Development and culture*. MIT Press.
- Kaveri, G. (2020). *Children's attitude towards the environment are hardwired in the early years*. SUS S Researchers @ Work, 2. <https://www.suss.edu.sg/about-suss/centres/centre-for-applied-research/researchers-at-work/issue-2/children-attitudes-towards-the-environment-are-hardwired-in-the-early-years>
- Kaveri, G. (2015). "Papa, the earth is going to die! Can we pray for it?" *A case study of six young Singaporean children's meanings of domestic waste generation and the role of home and kindergarten*. [Unpublished doctoral dissertation]. Nanyang Technological University.
- Khong, L. Y. L. (2004). *Family matters: The role of families in Singapore*. Marshall Cavendish Academic.
- Kozulin, A. (1998). *Psychological tools: A sociocultural approach to education*. Harvard University Press.
- Kroufek, R., Janovec, J., & Chytrý, V., & Simonova, V. (2016). *Environmental Attitudes of Pre-school Children and their Parents*. https://www.researchgate.net/publication/298760903_Environmental_Attitudes_of_Preschool_Children_and_their_Parents
- Lang, J. (2005). *Education for sustainability*. Curriculum Corporation.
- Leppanen, J. M., Haahla, A. E., Lensu, A., & Kuitunen, M. (2012). Parent-child similarity in environmental attitudes: A pairwise comparison. *The Journal of Environmental Education*, 43(3), 162-176. <https://doi.org/10.1080/00958964.2011.634449>
- Ma, X. (2020). Time poverty and maternal wellbeing in Japan. In M. Tsai & Iwai, N. (Eds), *Quality of life in Japan: Contemporary perspectives on happiness* (pp. 107-132). Springer.
- Merriam, S. B. (1998). *Qualitative research and case study applications in education*. San Jossey-Bass.
- Masters, J. E. (2005). *Teachers scaffolding children working with computers: An analysis of strategies*. (Doctoral dissertation). http://eprints.qut.edu.au/16118/1/Jennifer_Masters_Thesis.pdf
- Ministry of Education, Singapore. (2019). *Primary school education: Preparing your child for tomorrow*. Ministry of Education. <https://www.moe.gov.sg/docs/defaultsource/document/education/primary/files/primary-school-education-booklet.pdf>
- Ministry of Foreign Affairs. (2018). *Towards a sustainable and resilient Singapore*. https://sustainabledevelopment.un.org/content/documents/19439Singapores_Voluntary_National_Review_Report_v2.pdf
- National Environment Agency. (2021). Waste minimisation and recycling. <https://www.nea.gov.sg/our-services/waste-management/3r-programmes-and-resources/waste-minimisation-and-recycling>
- National Environment Agency. NEA. (2019). *Waste statistics and overall recycling*. <https://www.nea.gov.sg/our-services/waste-management/waste-statistics-and-overall-recycling>
- Organisation for Economic Co-operation and Development. (2013). *How's life? 2013: Measuring well-being*. <https://www.oecd.org/sdd/3013071e.pdf>

- Oldfather, P., West, J., White, J., & Wilmarth, J. (1999). *Learning through children's eyes: Social constructivism and the desire to learn*. National Academy Press.
- Pramling-Samuelsson, I., & Kaga, Y. (2008). *The contribution of early childhood education to a sustainable society*. Paris: UNESCO. <http://unesdoc.unesco.org/images/0015/001593/159355e.pdf>
- Prince, C. (2011). Sowing the Seeds: Education for sustainability within the early years curriculum. *European Early Childhood Education Research Journal*, 18(3), 273-284. <https://doi.org/10.1080/1350293X.2010.500082>
- Prior, J., & Gerard, M. R. (2007). *Family involvement in early childhood education: Research into practice*. Thomson.
- Rao, N., & Sun, J. (2012). Scaffolding interactions with preschool children: Comparisons between Chinese mothers and teachers across different tasks. *Merrill-Palmer Quarterly*, 58(1), 110-140. <http://www.jstor.org/stable/23098064>
- Rogoff, B. (2003). *The cultural nature of human development*. Oxford University Press.
- Ruppaneer, L. (2015). Working couples: The dual income family. In S. R. Quah (Eds), *Routledge Handbook of Families in Asia* (pp.275-283). Routledge.
- Siraj-Blatchford, J., Smith, K.C., & Pramling, S. I. (2010). *Education for sustainable development in the early years*. <http://www.327matters.org/Docs/ESD%20Book%20Master.pdf>
- Tan, A. (2018, March 20). Singapore generated less waste, but also recycled less last year, says NEA. <https://www.straitstimes.com/singapore/environment/singapore-generated-less-waste-but-also-recycled-less-last-year-nea>
- Trahan, C. H., & Prince, D. L. (1999). Parent partnership: Transforming homework into home-school activities. *Early Childhood Education Journal*, 27(1), 65-70. <https://eric.ed.gov/?id=EJ595756>
- United Nations Environment Program. (2015). *Global waste management outlook*. <https://www.unep.org/resources/report/global-waste-management-outlook>
- Van de Pol, J., Volman, M., & Beishuizen, J. (2010). Scaffolding in teacher-student interaction: A decade of research. *Educational Psychology Review*, 22(3), 271-296. <https://doi.org/10.1007/s10648-010-9127-6>
- Vygotsky, L. (1978). *Mind in society*. Harvard University Press.
- Wertsch, J. V. (1991). *Voices of the mind: A sociocultural approach to mediated action*. Harvester Wheatsheaf.
- Wood, D., Bruner, J., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry*, 17, 89-100. <https://doi.org/10.1111/j.1469-7610.1976.tb00381.x>
- World Bank Group. (2020). *Solid waste management*. <https://www.worldbank.org/en/topic/urbandevelopment/brief/solid-waste-management>
- Zimmerman, H. T., McClain, L. R., (2014). Intergenerational learning at a nature center: Families using prior experiences and participation frameworks to understand raptors. *Environmental Education Research*, 20(2), 177-201. <https://doi.org/10.1080/13504622.2013.775219>

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