

Facilitating Discovery and Learning in the Garden

'SKIP Research Bites' is a series of short summaries based on findings from the Singapore Kindergarten Impact Project.

What does research tell us?

Programmes, activities and projects that utilise a garden as a teaching tool have been found to play an integral part of children's learning and development (Desmond, Grieshop & Subramaniam, 2002). Studies have demonstrated the benefits of learning experiences in the garden on children, such as developing gross and fine motor skills, promoting emotional development, as well as encouraging prosocial behaviours towards nature and people (Blair, 2009). Singapore's NEL Framework describes three goals for children during their discovery and learning of the world:

- **Nurturing a sense of wonder and curiosity:** to encourage children to be inquisitive about their surroundings and to want to find out more about the world around them, *e.g. touch the leaves' texture*
- **Developing process skills:** to develop process skills such as observing, comparing, predicting and recording to help them gather information about the world, *e.g. observe colours and shapes of flowers and leaves and notice the differences in these categories*
- **Developing positive attitudes towards the world around them:** awareness for the importance of showing care and respect for the world, *e.g. taking care of plants in the garden*

Adapted from Sigel (1986; 2002), learning experiences in the garden/gardening activities can be scaffolded by utilising strategies for the following levels of support (Ng, Quek, O'Brien, 2018):

- **Low Support – Making Observation:** Teacher uses language related to observations, or providing prompts for children to explore objects using their senses.
- **Medium Support – Reproducing:** Teacher prompts children to recall sequence of events.
- **High Support – Evaluation:** Teacher demonstrates making judgment or reasoning, or prompts child to make a judgement or to reason.
- **Additional Support – Providing Perfunctory Feedback:** Teacher acknowledges children's response with a "yes" or "no" response.

To Learn More:

- © Ministry of Education. (2013). *Nurturing early learners: Discovery of the World*. Singapore: Ministry of Education.
- © Blair, D. (2009). The child in the garden: An evaluative review of the benefits of school gardening. *The Journal of Environmental Education*, 40(2), 15-38.
- © Ng, S. C., Quek, K. Y., & O'Brien, B. A. (July, 2018). *Outdoor learning in Singapore preschools: Teachers' scaffolding strategies during garden-based learning*. Presented at the International Conference on Teaching and Education Sciences, Okinawa, Japan.
- © Desmond, D., Grieshop, J., & Subramaniam, A. (2002). *Revisiting garden based learning in basic education: Philosophical roots, historical foundations, best practices and products, impacts, outcomes and future directions*. Paris, France: Food and Agriculture Organization/ United Nations International Institute for Educational Planning.
- © Sigel, I.E. (1986). Early social experience and the development of representational competence. In W. Fowler (Ed.), *Early experience and the development of competence* (pp. 49-65). *New Directions for Child Development*, No. 32. San Francisco, CA: Jossey-Bass.
- © Sigel, I. E. (2002). The Psychological distancing model: A study of the socialization of cognition. *Culture & Psychology*, 8(2), 189-214.

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What is this study about?

In this study, we wanted to know...

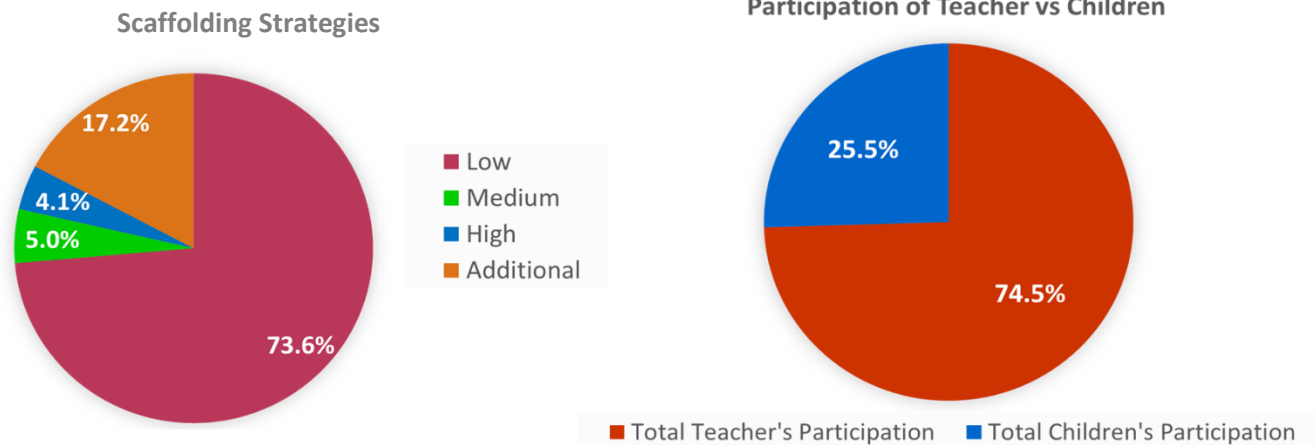
1. What are the types and frequency of teachers' scaffolding strategies during learning in the garden?
2. What is the proportion of teacher and children's participation during learning in the garden?

Learning experiences in three K1 classrooms from three pre-school centres were video-recorded for up to 4 hours and transcribed. Using a coding scheme adapted from Sigel (1986; 2002), teacher's scaffolding strategies were analysed.



What did we find?

Teachers' support for learning experiences in the garden/gardening activities were coded according to four categories of strategies (low, medium, high, additional), as adapted from Sigel (1986; 2002). We looked into the frequency of each category of scaffolding strategies, as well as the participation rate of teacher as compared with children:



Arranged from the most to least frequent, the scaffolding strategies which teachers used gardening activities include:

Category	Strategies	Examples
Low Support	Labelling or Making Choices, Making Observation, Completing a Task (Execution), Describing (Producing Information)	Teacher: Look at the leaves. They are so... Child: Small.
		Teacher: We can put them in one hand and the other hand to pick up and put into... Child: the hole.
Additional Support	Providing perfunctory feedback, Encouraging Close-Ended Response	Teacher: There is a pink flower? Child: Ya.
		Child: I got this slime (by the leaf). Teacher: Oh yes!
Medium Support	Sequencing / Enumerating, Making Prediction, Describing Similarities or Differences, Reproducing (Recalling Events and Actions)	How did (the leaves on) the trees move?
		How many petals does it have?
High Support	Evaluating (Making Judgment or Reasoning), Explaining Cause and Effect, Problem Solving	Why is this leaf brown?
		Why do you think the plants got holes?

We tabulated the frequency of teachers' and children's participation in conversations during learning activities in the garden. Across the three classrooms, it was found that teachers talked almost three times as much as children.

What does it mean for teaching and learning?

Teachers might often regard higher-level strategies as better than the lower ones. However, it is important to use all types of strategies to elicit a variety of responses to facilitate children's understanding. As each child develops at their own pace, the different levels of scaffolding strategies ensure an appropriate level of challenge at different stages of learning. Additionally, teachers are talking three times more than children, which calls for a balance in both teachers' and children's participation. The NEL Framework highlights the importance of promoting children's exploration, inquiry and discovery. To increase children's responses during gardening activities, teachers may:

- Model a sense of wonder and curiosity by using language such as "I wonder where/how/why..." when thinking aloud. When a teacher demonstrates curiosity, children too will become curious observers who will ask questions about the world around them.
- Ask more open-ended questions, e.g. "What do you think might happen next?", "How are these two flowers the same/different?". These will encourage curiosity and critical thinking.
- Provide opportunities for children to respond or initiate responses, e.g. provide longer wait time for children to respond and build on children's comments and questions.
- Plan activities that make use of children's observations, e.g. comparing different plants, recording and communicating their findings on the growth cycles of a plant, making predictions based on their observations.

