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Developing Young Children's Critical Thinking Skills through Conversations

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ABSTRACT

The current project is a single-subject case study which investigates how critical thinking of a preschool child can be facilitated through conversation with an adult. It serves as an exploratory study. The research literature on young children's thinking informed us that questioning and dialogue are central to the process of developing young children's thinking. The child is a six-year-old boy attending K2 in a local kindergarten. The conversation was conducted as an in-depth one-to-one 'interview'. The result indicates that the use of open-ended questioning and reflective discourse were effective in eliciting and extending the child's thinking. The child utilized a wide range of critical thinking skills to elaborate on his ideas. These included formulating concepts, constructing theories, inferring relationships, problem-solving, reasoning, hypothesizing, generalizing and applying knowledge.The findings show that young children can be competent thinkers and that adults can play a vital role in challenging children's thinking in a discursive process. The teacher-child dialogue can be a potential pedagogical tool in itself for the promotion of thinking skills in young children. Embedded within this focus is the emphasis on the effective use of teacher questioning and probes to engage the child. Opportunities for such quality conversations can be created as part of the structured curriculum or during free-interaction periods.

DEVELOPING YOUNG CHILDREN'S CRITICAL THINKING SKILLS THORUGH CONVERSATIONS

INTRODUCTION

Critical Thinking in the Early Years

In assessing what matters in early years, Bertram and Pascal (2002) called attention to the development of dispositions to learn. They emphasized the importance of this in terms of impacting lifelong learning and equipping children for life's challenges. Katz (2002) also asserted that the younger they are, the more important it is to strengthen children's dispositions. Critical thinking has been included as one of the dominant dispositions that should be developed in young children.

In current discussions of 21st century skills, equipping our children with essential dispositions and skills has been seen as an important dimension of education. In many of the 21st century skill models, the matrix of skill competencies highlighted invariably will include various aspects of critical thinking. These are the skills which are said to be valued by employers and are needed to "navigate a dynamic future" (MOE, 2009, p.24).

Developments in the Singapore Context

In the past, the focus of early childhood education in Singapore has been on the acquisition of basic literacy. Didactic-teaching was given emphasis in many of the preschools. In recent years however, the early childhood landscape has seen perceptible changes in terms of embarking on more progressive approaches. The impetus for change has come from socio-political factors. To spur transformation of a system which has seen an unhealthy emphasis on rote learning, the Singapore Ministry of Education adopted the vision of 'Thinking School, Learning Nation' (TSLN) in 1997 and the 'Teach Less Learn More' (TLLM) initiatives in 2004 (MOE, 2011a, 2011b). Seen as a continuing journey to re-gear our education, the initiatives provided the basis for schools to forge ahead with the development of key skills such as critical thinking in our mainstream schools. In his elaboration of the Curriculum 2015, a recent development to re-envisage the role of schools to prepare the generation of the future, the then Minister of Education, Dr Ng Eng Hen re-emphasized the need to move away from a knowledge acquisition system to one that places a greater premium on the critical analysis of information (Ng, 2008).

These nation-wide advocacies have encouraged a re-configuring of what education should entail at the early childhood level. It alerted practitioners to re-examine their practices. This was supported with the launch of the MOE new 'Kindergarten Curriculum Framework' in 2003 in an attempt to re-conceptualize the practitioners' role as facilitator of children's active construction of knowledge, amongst others (MOE, 2003). The companion guide, 'Kindergarten Curriculum Guide' was produced in 2008 which reiterated children as life-long learners and the development of key dispositions, including critical thinking and problem-solving (MOE, 2008).

LITERATURE REVIEW

The literature on young children's critical thinking supports the development of such a disposition at an early age (Taggart, Ridley, Rudd & Benefield, 2005). Lubawy for example (2006) asserted that very young children can " develop strategies for exploration, thinking and reasoning as well as create working theories to make sense of the natural, social, physical and material worlds they live in." (p.15). This reflects a strong image of the child as a competent thinker.(Dahlberg, Moss & Pence, 1999).

While there is a strong consensus on the need to develop young children's critical thinking skills, there is a parallel concern on how best this can be done in the early childhood context. This concerns strategies which can be employed to promote critical thinking in the children. The practitioner's role in extending children's thinking was for example explored in a qualitative study by Robson and Hargreaves (2005). They investigated the perceptions and practices of 5 practitioners who work with children, aged 3-5. Their findings indicated that while the practitioners perceived the importance of supporting the development of children's thinking, these were often done more implicitly than explicitly. Amongst the strategies that were put forth, there was an emphasis in creating opportunities for talk in developing children's critical thinking.

In the Singapore context, Puspavalli (2008) conducted a study with her class of twenty 4-year old children to facilitate dialogues around picture books in order to develop young children's thinking skills. Open-ended questions, prompts and encouragements were employed to elicit ideas from the children. The results indicated that the children were capable of displaying creative thinking, problem-solving and a range of other critical thinking.

Dangel and Durden (2008) investigated the nature of teacher-child conversations in small group activities with even younger children, aged 2 to 3 years. They concluded that the nature of teacher talk can be an influential tool in provoking critical thinking. In order that the practitioners leverage upon the avenue of talk, they recommended a safe emotional climate which values children's contributions and the use of purposeful questioning and feedback which serve to extend children's thinking.

Taggart et al. (2005) conducted an extensive literature review on young children's, aged 3-7, thinking skills based on post-2000 data. The study reviewed existing pedagogical practices and types of thinking skills young children are capable of, and explored strengths and gaps in the development of young children's thinking skills. Their key findings showed that by the age of seven, children are capable of a wide range of higher-order thinking skills. It also revealed that more infusion than discrete pedagogical approaches were being utilized. The authors recommended that the use of questioning can be more directed at nurturing children's thinking and that more opportunities for structured conversations should be created in the classroom in both the infusion and discrete pedagogical approaches.

PROJECT DESIGN/METHODOLOGY

Known as the 'Children's Thinking Project", the study was undertaken during the author's postgraduate studies to build on her understanding of young children's thinking and her skills in conversing with young children. It involved conducting and analyzing of a conversation with a child. The project was therefore a single-subject case study to explore how critical thinking skills of a preschool child could be facilitated/supported through conversation with an adult.

The child was a six-year old boy attending K2 in a local kindergarten in which the author worked as an early childhood practitioner. Both parental consent as well as the child's assent were obtained before embarking on the project. The latter was incorporated to reflect respect for children's rights as decision-makers in the research process (Danby and Farrell, 2005).

The main data-collection tool was the in-depth individual interview. It incorporated the following:

- framed as an informal conversational interview. There were no predetermined questions in order to for the interviewer to remain responsive to the child's ideas as

they naturally evolved. Fraenkel and Wallen (2006) highlighted that this is a strength of the informal format because it enables the interviewer to follow the natural course of things, thereby increasing the salience and relevance of the questioning.

- topics for the conversation emerged from the child. This places emphasis on valuing of children's ideas and ensures that the conversation stays as child-centric. The main topic selected by the child was on space travel. However many other sub-topics also surfaced as a result of the way the conversation took shape.
- drawings and other semiotic expressions were encouraged.

The project was framed within the social-constructivist perspective because it emphasized the collaborative role of the dialogic engagement between the adult and the child in constructing meanings and shared understandings and the facilitative role of the adult (Bodrova & Leong, 2007). Open-ended questionings were employed to empower this process. Reflective discourse was also encouraged to facilitate the child to express his own thoughts, comments and questions.

The interview which lasted about 30 minutes was audio-taped and transcribed. Content analysis employing the inductive approach was employed to interpret and analyse the data.

FINDINGS AND DISCUSSION OF RESULTS

The Child's Role in the Conversation

The child was very enthused and participative throughout the discussion. He 'dominated' the conversation with suggestion of topics, and explanation and elaboration of his ideas. A conceptual map (figure 1) was drawn up to represent the discussion topics which emerged from the dialogue. This shows that the child was forthcoming in talking and elaborating on his ideas when he was given the autonomy to 'direct' the discussion on areas of his interest. This supports the concept of the 'emergent curriculum' (Nixon & Aldwinkle, 2005). By working on and with the child's interest, the affective component is effectively taken care of. Children's motivation must be considered because this is a critical component of their learning (Slavin, 2009).

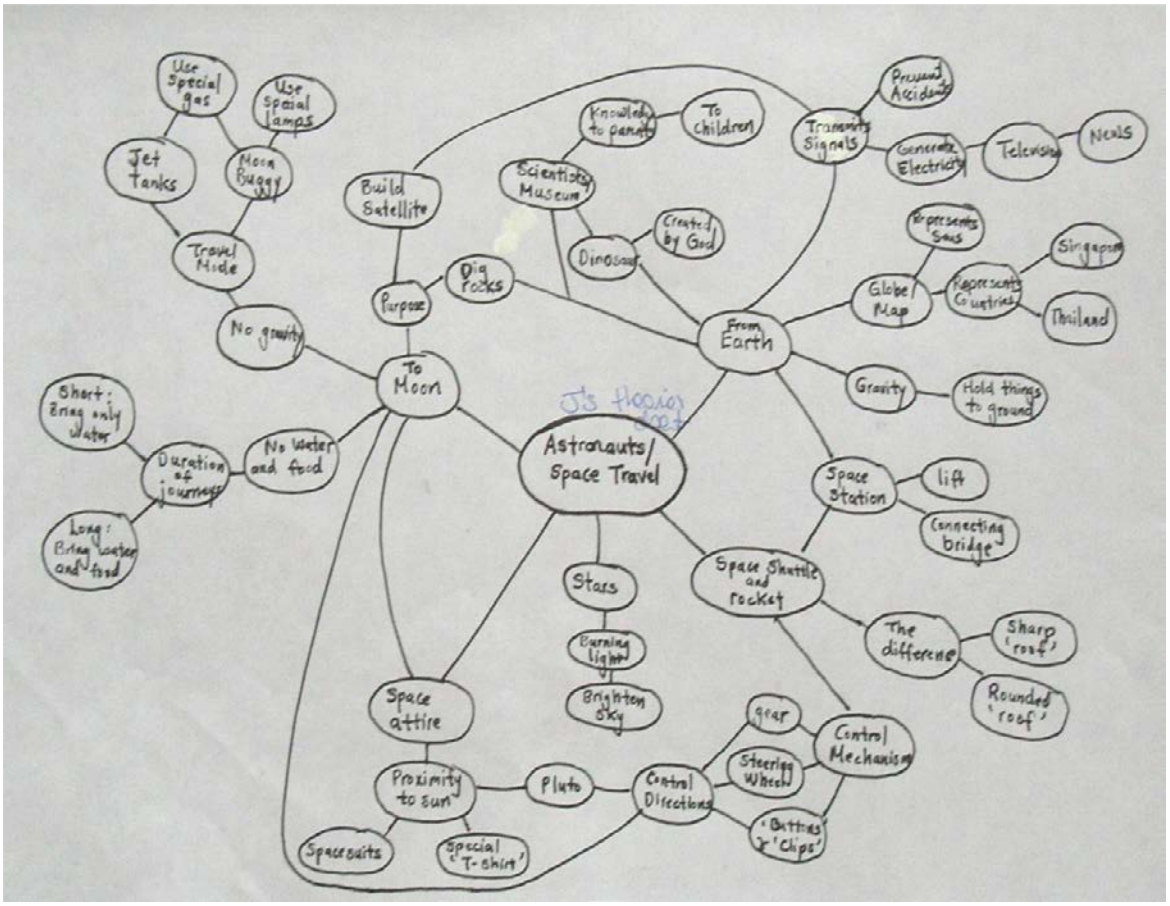

Figure 1

The Adult's Role in the Conversation

The author who assumed the role of the facilitator of the child's thinking processes employed a range of strategies which emerged together with the ebb and flow of the conversation. Some examples were:

- Using open-ended questions such as
  - "Can you tell me more……."
  - "So what happen if……"
  - "What do you mean by……"
  - "Why do you think…"
  - "How do they…"
  - "What do you mean by…."

- Using probing remarks/seeking clarifications
  - "It doesn't?"
  - "You think so?"
  - "I wonder why?"
  - "The roof?"
  - Using interjectory phrases such as
  - "Oh…"; "I see…"; "Okay…"; "Well this sounds interesting…"

- Using gestures such as nodding, leaning forward to take a closer look at his drawings
- Showing keen/genuine interest in the child and respecting the child's ideas.

Table 1 showed some examples of specific questions which had elicited higher-order thinking skills from the child:

Questions asked	Targeted thinking skills
"Why do you think we see stars only at night?" *"Why do you think the astronauts need to dig out the rocks?"*	Constructing of theories
"So what happened if there is no water?"	Forming hypothesis
"Why can't they take a car to the moon?"	Reasoning/logical thinking
"Which do you think is the better way?...Are they the same?"	Analyzing/evaluating/comparing
"Can you tell me more about this gravity?" *"A moon buggy?...What is a moon buggy?"*	Elaborating/illustrating
"What else do you think they can do…besides gluing…to join all the bones together?	Problem-solving

Table 1

The Range of Thinking Skills Displayed

The final outcome of the discussion was a mixture of fairly accurate facts and some personal construction of concepts, ideas and relationships. However the key to developing critical thinking was in the process. In many instances, the child actively employed critical thinking to make sense of the issues that arose and in the process, he often constructed his very own understanding about the many issues concerning space and the other phenomena he observed on earth and space.

The results indicated that the child displayed a wide array of critical thinking skills which included logical thinking/reasoning, formulating hypothesis, constructing theories, analyzing, evaluating, inferring relationships/associating, elaborating/illustrating, applying knowledge/ideas, sequencing, problem-solving, reflecting and employing metacognition. Table 2 highlights some examples of the child's utilizations of his thinking skills.

Constructing theories…	His logical theory about satellite: o *"You know a space shuttle and a rocket they all go to the moon….they land on the moon. They put the satellite there so that other astronauts will not bang into the moon."* His logical theory about gravity: o *"…(the things) fly around. All things will be messed up. If …if we try to grab on something…keeping sweeping around, cannot grab it …cannot grab it…it will mess up the whole room….So gravity help to…help to keep them down so that we may not mess up so many things….so won't be so hard to keep."*
Hypothesising, reasoning…	On why it is important to know the moon: o *"Because if people don't know much about the moon, if they have children…they ask huh, 'Mummy can you tell me what…what is on the moon? Then mummy just said , 'I don't know'."* On why we see stars only at night: o *"I think because the stars give us light in the space. So only…only the moon comes out only at night…then also don't have the sun. The moon maybe cannot shine…so that it's either the stars ti help to light so people can see. Maybe there's special lamps to brighten up the space."*
Comparing & contrasting; analyzing and evaluating…	Comparing the gas of the car to the special gas used for jet tanks, moon buggy and space shuttle: o *"A car don't have fire. That's the difference." "..when you fly to the moon, is…is go by the gas, special gas, they move them. Even though cars have gas, but those gas are not strong. Now there are gravity on earth. But the fire…strong…move…you can bring the rocket up to the…to the moon."* Comparing the moon buggy to the car o *"It's like a car." "But this car is a special car. Not the same car we use on earth. Usually we bring the moon buggy to space."*
Explaining, illustrating, elaborating…	About gravity: o *"Gravity…this is like a strong power to hold you down on the floor. So when you…when you…like (looks around and picks up an eraser) if you throw this eraser, it will fall down (demonstrates it with eraser)…"* About stars: o *"The stars like…is like…er…light…to give light because when you see close-up is like….er…a burning fire. So it's…is very bright." "…like some fireworks bloated up. Then the whole sky become coloured up."* About the rocket and the space shuttle: o *"Um…but…they don't look the same but they…they…they are like partners, like that they help each other."*

Table 2

Using Multi-modalities for Expression

The child used non-verbal communication several times to expand the meanings of his verbal communication. A good example was when he elaborated on the concept of gravity. He picked up an eraser and threw it in the air to illustrate his point. Further on in his elaboration, he threw both hands in the air and moved them around vigorously to accentuate the 'messiness' concept he was developing if there was no gravity on earth. Another example was when he exploited his drawings (Figure 2) to explain why it might take a longer time to reach Pluto using different routes even though the distance drawn appeared the same. This is also an excellent example to show how the child's employed creative problem-solving on the spur of the moment when confronted by an unexpected question:

- *Interviewer : "Why…why is this way the slowest (points to Route 3)?"*
- *Child : "…..but here's the sun (Is quickly adds picture of the sun). You are going to need a lot…reach this level then push down (Is indicates with arrow). So then you have to wait. Then you have to change (spacesuits) over here near the sun (Is draw a round ball near the sun). Then you go ahead; so it's very cold already, then change again. Then you have to push again (Is adds another arrow which reached Pluto), then you have go ahead.*

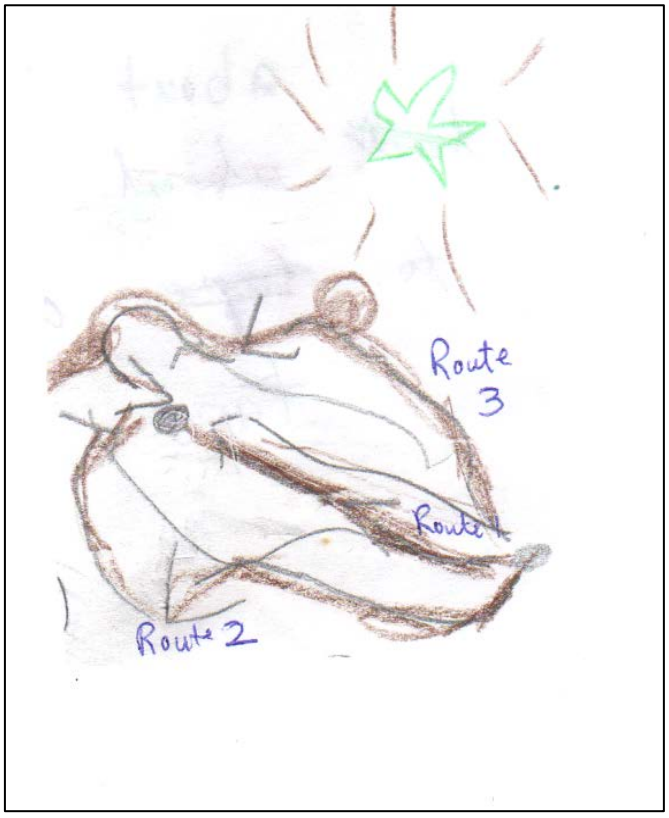

Figure 2

The use of multi-modalities to support and facilitate discussion with young children is encouraged in the field of early childhood research. Tay-Lim (2010) explored preschool children's inter- and intra-dialogic engagement with their drawings and showed that this was successful in probing deeper into what lies with the child when they elaborated on peer rejection their experiences. Wright (2003) noted the use of multiple domains of have enabled children to be "liberated to mentally manipulate and organize images, ideas and feelings, and to use a rich amalgam of both fantasy and reality to portray experiences" (Wright, 2003, p.24).

CONCLUSIONS

Preschool children's are capable of employing a range of critical thinking skills to make meanings and construct their own understanding of their world. The process in which the child constructs understanding and tap on his thinking ability is often more important than the final outcome. This underscores the role of the practitioner as a facilitator of children's thinking. In-depth conversations with children can be a powerful pedagogical tool in eliciting critical thinking skills in young children. This can be further reinforced when we work from the children's interest and encourage multiple domains of expressions.

To incorporate such quality conversations into their pedagogical practice, early childhood practitioners should consider the following:

- Using open-ended questioning, and other supporting strategies (prompts, affirmations, etc) to engage the children in their thinking.
- Allocating time for 'talk' implicitly and explicitly by
  - capitalizing on opportunities for talk during children's free-play and other informal moments (including routine times) to have such quality interactions with the children.
  - making the development of thinking skills a more explicit part of the curriculum
- Build a class culture where children are listened to, where their interests are supported and where they are valued as competent thinkers and communicators.
- Work with families, in particular share with them how their 'talk' with their young children can empower their child in the development of his critical thinking skills.

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