

## **The impact of children's learning during a curriculum reform in Singapore**

**Dr Josephine Ng**

*Royal Melbourne Institute of Technology University (RMIT)*

### **Abstract**

We often hear that the most important role of education is to teach children to think creatively and effectively. Singapore Ministry of Education (MOE) has recognised the importance of nurturing children from young and aimed to shift from 'academic rote learning' to more experiential learning. Since 2003, mandated nationwide skill development for all preschool teachers has taken place together with a new kindergarten curriculum framework based on American (Developmentally Appropriate Practice-DAP) ideas of play. This change, requiring a shift from years of instructional teaching, is not unproblematic.

A qualitative research methodology was used to study the lived experiences of children after teachers were trained on the play curriculum. Data collection methods included semi-structured interviews, observation and document analysis. In this paper, children's lived experiences in classroom were captured through observation and findings indicated that trained teachers did not move away from instructional teaching to a more child-centred curriculum. Impacts on children's outcomes were observed from the classroom activities. This study will inform on the new curriculum implementation and the implications on children's learning.

**Keywords:** Singapore, children, policy, curriculum, play, puzzles

### **Introduction**

Teachers who understand how learning occurs are more able to both select and develop curriculum that supports rather than undermines the learning process. Brandsford, Darling-Hammond and LePage (2005, p24)

Many countries have continuously undergone educational change and renewals in the drive for a knowledge economy (Nyland, 2001; Ng 2011). There is a general awareness of the importance of early childhood experiences with a broadening endorsement of play as an optimum learning instrument to develop creativity, thinking, language, independence, social interactions and problem solving skills (Berk, 2008; Whitebread, 2008; Brookers, 2010). In the era of globalization, many ideologies were borrowed from countries that have used these ideologies successfully (Nyland & Nyland, 2005). The human capital is the main resources of Singapore and in their drive to meet the demands of globalisation, Singapore has continuously undergone educational reforms. In the the remaking of the new kindergarten curriculum framework in Singapore, ideology of play that was used successfully in the United Kingdom and the United States of America was borrowed for the new curriculum change of the Singapore preschool education system (MOE, 2008a).

According to the Singapore kindergarten guide (MOE 2008a, 36):

Play is children's natural way of learning about themselves and the world around them. Through play, children develop and refine motor and social skills, experience the joy of discovery and mastery and build foundational concepts and skills for life-long learning... play experiences can be considered as purposeful play where children are actively engaged in constructing knowledge and discovering new relationships.

The next section discusses the Singapore preschool context of change.

### **The Singapore Context of Preschool Change**

In the past, there were no minimum qualification requirements stipulated for preschool teachers. Preschool teachers had undergone training on an ad hoc basis till the 1985 when training for teachers became more formalized (Sharpe, 1993). The National Institute of Education (NIE), previously known as the Institute of Teachers was formed to train teachers and conduct research on education. Singapore scholars were also sent by the government to countries like the United States of America and United Kingdom to gain knowledge and insights of educational systems from other nations. In the Singapore government's drive for a knowledge economy, preschool reforms are part of the Thinking School Learning Nation (TSLN) paradigm that was developed to improve the overall quality in Singapore educational system (Ng, 2004). In the late 2001, the Preschool Quality Accreditation Committee (PQAC) was formed to establish quality in teacher training programs. Members of the committee comprise directors, preschool officers, representatives from NIE, MOE, Ministry of Social and Family Development (MCYS) and other overseas early childhood consultants. In 2000, a pilot research for children's learning based on play was conducted and found that play is important in children's learning (Tharman, 2003). In 2003, the MOE launched a new curriculum "Nurturing Early Learners", based on a child centred curriculum and ideas of play (Tharman, 2003). The term "preschool" in Singapore refers to kindergartens, childcare centres and some toddler playgroups (MOE, 2003a). Mandated training for teachers was implemented who were considered as the enablers, agents of change and the key connection between the community's expectations and what children learn (Duke 2004; Fullan, 2001; Fullan, 2007; OECD, 1998;).

An extended version of this curriculum framework was published in 2008 and revised in 2012. Published guidelines included "ITEACH" an acronym of six principles of learning and teaching. A revised version of the 2008 curriculum framework was published in 2012, minor modifications of ITEACH are illustrated below (MOE, 2012a, p24):

- I for Integrated approach to learning
- T for Teachers as facilitators of learning
- E for engaging children in learning through purposeful play
- A for authentic learning through quality interactions  
(previous MOE (2008a, p3) guide stated as "ample opportunities for interaction")
- C for children as constructors of knowledge  
(previous MOE (2008a, p3) stated as "children as active learners")
- H for holistic development

The Singapore ITEACH echoed a child centered curriculum approach similar to the Developmentally Appropriate Practices (DAP) from the United States of America (Copple & Bredekamp, 1997, 2009; Gestwicki, 1999). References in the curriculum guide (MOE, 2008a) also suggest many ideas of play in the guide were borrowed from the same source. In DAP, "play is an important vehicle for developing self-regulation as well for promoting language, cognition, and social competence" and the role of teachers as facilitator for children to construct learning is important (NAEYC, 2009, p.14).

These were the concepts and ideas that have been offered to the Singapore teachers through their mandated training and skill development. This new change has challenged teachers and caused

tensions in their attempts to promote learning and integrating theory with practice. Teaching methods and the extent of rigidity in the design of timetables for classroom activities and routines have direct implications on children's learning and the way they learn.

### **Why children go to preschool?**

When questioned on "What is the main purpose of children going to preschool?" often there is a continuum in the perceptions of teachers and parents about the educational purpose of the preschool. Singaporean parents interviewed voiced that the major purpose of preschool is to prepare children for formal schooling. Teachers interviewed stated that meeting parents' expectations are required for the kindergarten's sustainability. All parents stated that they needed to sight worksheets of academic learning to be assured that their children are prepared for primary one. Other literature affirmed that parents' expectations from the preschool programme focused on readiness for formal schooling (Hutt, Tyler, Corrine & Christopherson, 1989; Elkind, 1990; Khong, 2004; Ng, 2011). Teachers state that they need to "justify" to parents and colleagues that children's play is not "simply a pleasurable occupation or something to be done when 'work' is completed" (Abbott, 1994, p.49). Parents viewed play as having fun, pleasure and joy and did not relate to play as an instrument for children to learn (Almon, 2003; Wood & Attfield, 2005; Ailwood, 2010). Teachers often state that they are under "increasing pressure from parents to prepare children for subsequent schooling" (Ebbeck, 199, p170).

From a critical perspective, if teachers were constantly under scrutiny from parents and facing pressure to meet parents' expectations for academic learning and worksheet practice, an apparent situation prevails- children's learning will be affected. What will happen to the implementation of the new play curriculum? A range of literature has indicated negative impacts of academic learning in young children (Brooker & Edwards, 2010; Kohn, 2000; Ng, 2009).

Anderson, Greeno, Reder and Simon (2000, p.12) state that it is necessary that we "develop a better understanding of relations between what is taught in classrooms and the capabilities children have and should develop in their present and future nonschool lives". According to Kuhn (2005, p.3), "life preparation" is the reason why parents send their children to school but parents interviewed have perceived "preparation" as a focus on academic learning and achievement. Theorists of early childhood education view accomplishments for life preparation as building confident children who are self motivated learners, responsible and independent thinkers with a love for learning and value knowledge (Berk, 2008; Brooker, 2010; Kuhn, 2005; Wood, 1988). Jackson and Davis (2000, p.11) suggest that schools should help children "learn to use their minds well". The next section discusses the purpose of this study.

### **Purpose of this paper**

This paper explores classroom activities and implications for children's learning as teachers were constantly challenged to meet the requirements of policy change and at the same time meeting parents' expectations. An in-depth study was conducted using informal semi-structured interviews and observations of classroom teaching and children's learning. Observations were conducted on children's learning experiences and the physical environment of Kindergarten 2 (K2) classrooms. This study aimed to examine the pedagogical practices of trained teachers and the impact of teacher's practices. In summary, this paper examines:

- 1) How the environment influences children's learning and cognitive development?
- 2) The lived experiences of children.

3) Implications for children's learning if the practice of the teachers is not responsive to the reform agenda.

The researcher analysed the data collected and findings for the transition of the change process will be discussed. Implications for children's learning during this change process was gained from findings based on observations of the physical learning environment, children's work, teaching methods and a detailed examination of two groups of children's attempts to complete puzzles. This present discussion relates the children's difficulties in completing puzzles, and discusses implications of these insights from long term impact on children's thinking and problem solving skills.

## **Methodology and Methods**

### **A qualitative case study**

#### **The centre and the participants**

The research methodology for this research entailed an in-depth qualitative case study (Mertens, 2005; Yin, 2003). Using case study methodology enables the researcher to investigate the process and realistic consequences of changes in a Singapore context when control over the events may be directed by both external and internal factors (Yin, 2003). A Registered Kindergarten with the Ministry of Education was selected as a sample for this study. Informal interviews were conducted with five teachers with preschool teaching diplomas or certificates. Interviews were also conducted with four parents and MOE pre-school unit personnel. This paper aims to explore and discuss how children, as one of the stakeholders in the curriculum reform, experienced change and the implications from their learning. Observations were conducted of children, 6 years old, in a K2 classroom to study their learning experiences. Ethics clearance was obtained from the university human research ethics committee where the author works.

Cherry Kindergarten (pseudonym), a registered non-profitable kindergarten, approximately forty years old, catering for families with low to average economic status and children are recruited from the local estate. The total enrolment is around one hundred and fifty children between the ages of 3-6 years. The kindergarten runs two 3-hour sessions daily and is open from Monday to Friday. School holidays are designated by the MOE and also public holidays.

Findings for this paper are situated within the research literature on theories of play, cognitive development, analysis and implications were drawn from the data collected. Observations were recorded as anecdotal records and photographic narratives. In this paper the relevant research literature is identified, the kindergarten context described and observations of children's experiences within the classroom presented and discussed.

#### **Significance of early years in promoting cognitive development**

Brain research has reported the lasting effects of a child's early learning and experiences on their brain architecture (Shonkoff & Phillips, 2000). The quality of the early childhood environment experienced by the child helps to lay the foundation for future development critical for important outcomes of children's learning and thinking (Shonkoff and Phillips, 2000; Fox, Levitt & Nelson, 2010). The preschool years are of significance as they have an impact on children's cognitive and social development and long term effects on their life learning and educational achievements (Ebbeck & Waniganayake, 2010; Fox, Levitt and Nelson, 2010; Shonkoff and Phillips, 2000; Sylva, Melhuish, Sammons, Blatchford, & Taggart, 2010). The writings of Blakemore (2000); Brynes (2001); McGregory (2007) and Fox, Levitt and Nelson (2010) and Sylva et al. (2010) have continually highlighted the experiences in early years that have impacted and influenced children's cognition. Brain research (Fox, Levitt & Nelson, 2010; Shonkoff & Phillips, 2000) has reported similar findings that "The brain, however, achieves most of its mass in the first few years: 60

percent by age three, 80 percent by age five and 95 percent by age seven” (Hutt et al., 1989, p.7). The early years are an important period for nurturing thinking skills as significant connections are formed in the brain and its mass density increases from birth to 6 years of age (Blakemore 2000; Brynes 2001, Dobbing and Sands, 1973). The recent policy change in the Singapore preschool educational system indicated that the government had identified the importance of nurturing children from young. Answers were sought on whether activities in the classroom with trained teachers are supportive in promoting children’s learning with play as a prominent medium.

## **Observations**

### **Observations of the K2 Classroom Environment – contextual discussion**

The researcher’s impression of the timetable sheet on the wall was that it suggested a very rigidly structured schedule for a strong emphasis on academic learning for K2 from Monday to Friday. The timetable focused mainly on academic learning on subjects such as language, math and Chinese. Art and craft were limited to thirty minutes per week and only twenty minutes of outdoor play was scheduled every Friday.

The teachers interviewed reported positively on their diploma training and said it had given them knowledge in designing physical environments for integrated learning that help children develop cognitively. Low wooden shelves were orderly arranged where the children can easily put back the didactic materials and manipulative after using them (Olds, 2001). Learning corners were clearly labeled subjects such as Language, Math, Art and Science was observed around the classroom (Dodge, Colker, Heroman & Bickart, 2002). A big whiteboard was prominently placed in the centre of the classroom at adult height.

Two long rows of tables were arranged with an aisle in the middle. There were twenty children in the class with one teacher. Children were constantly reminded to work quietly at their table on worksheets for all subjects. During a math session of addition and spelling several children struggled with the task, which seemed beyond them. The atmosphere indicated that children were not given a choice in activity and were constrained to accept whatever activities set by their teacher. In this setting the children did not question whether the task given to them made any sense, however, they endeavoured to follow instructions given by their teacher and some had difficulty finishing the assigned task.

A characteristic observed in the K2 classroom indicated that the timetable was adhered to and the children experienced a tight schedule of learning on the different subjects listed. The routine was weighted towards worksheet practices for math, language, science and second language. As described the daily timetable scheduled was carefully formulated and the teacher interviewed stated that the schedule was a negotiated agreement among staff and the principal. The children did not have a voice. The K2 classroom agenda seemed to be sufficiently full and demanding of children’s attention all the time. In the math lesson the teacher stood in front of the whiteboard and wrote all the spelling of the words for numerals from one to twenty and the children read these after the teacher. The teacher displayed a good deal of enthusiasm and energy when writing the spelling out the numbers on the whiteboard and also reading the numerals loudly. The children observed were attentive and copied down word for word from the whiteboard in their exercise books. The atmosphere that pervaded the K2 classroom was that there was work and writing to be done. The noise level in that classroom was not a challenge but the teacher’s voice was constantly heard reminding children to work and play quietly. Each piece of worksheet from an individual child was reviewed, marked and commented on by the teacher. A weekly spelling list of ten words was

distributed to all children to learn and memorise over the weekend to be tested on the following Monday. Parents had a role to play in ensuring their children learnt their spelling homework during the weekend.

Toileting, snacks, story times and rhymes were part of the daily routine scheduled. Children were required to line up inside the classroom, with supervision from their teacher, as routine practice, before classes, routines like toilet and snack times or outdoor play on Fridays. During this prescribed practice of standing quietly in line, for periods of time, the children were told not to make a noise and required to conform before moving to the next task. The teacher interviewed said that with a ratio of one teacher to twenty K2 children she felt classroom management was a challenge, therefore her agenda required more regimented control and orderly classroom management before she could proceed to other activities.

Art materials were limited to a corner with a small display of crayons, colouring pencils, pieces of paper, pencils, erasers and a small tray of child size scissors. A display board with children's art indicated an adult directed activity where neatly cut and correctly positioned eyes, nose and ears of animal masks were placed prominently on the wall at adult height. Other craft, bearing the Chinese New Year theme of neatly cut and pasted paper flowers, were displayed. The neatness, consistency, similarities and correctly positioned animal parts on the paper masks in the children's art and craft demonstrated a high level of teacher direction with little scope for creative self expression (Anning & Ring, 2004; Duffy, 1999). To be creative, it requires time for children's imagination, also to provide them ample time to revisit their work, all "within the realms of childhood" (Moyles, 1989:80). It seemed that achieving the end product of the children's art was the main focus rather than the process of doing it. Atkin (1991, p.30) asserts that adults are frightened of the "unpredictability" and "messiness" of play when they are not in control of the player and the content. The teacher interviewed had stressed that classroom management was important, hence the need for constant reminders to work quietly, conformity in the classroom and frequent deskbound activities. Integrated learning from the clearly labeled learning corners was not sighted in any of the classroom activities though teachers interviewed stated that the training had provided them with knowledge of physical environment design and the use of appropriate resources for integrated learning.

In the following section, the researcher presents an observation from the K2 classroom of two groups of children struggling to complete the wooden puzzles.

### **Observation of two groups of K2 children playing puzzles:**

The participants observed were K2 level children aged five years and above, the teacher had a preschool teaching diploma with more than five years preschool teaching experience. The puzzles that the children were engaged with were commonly used in kindergartens and childcare centres appropriate for four to five years old. The children observed sat quietly working on a piece of math activity worksheet of addition sum within twenty from a math workbook.

**Teacher:** Those who have completed their worksheets may go to play.

Some children stood up with their workbooks and exclaimed that they had finished their work. The teacher collected their workbooks and gestured them to the puzzles on the shelf. As observed there were several children still working on the math addition at the table, two groups of children working on wooden puzzles on the floor and one child was drawing while several were wandering around indecisive about what they wanted to 'play'.

### **Group One on the puzzle activity**

Four boys sat on the floor and emptied the twenty pieces of a wooden puzzle. Each child tried to match the pieces of the puzzle and place them on the puzzle frame. There were discussions and arguments on where the pieces should be fitted in the frame. Several attempts were made to fit the puzzle pieces- put, removed, fit, placed, removed, replaced, and removed again. After ten minutes, the children emptied the frame again they suggested several ways to continue, such as, working and fitting the pieces outside the frame and then changed the strategies again to work on the frame again. Much brainstorming, trial and error and retrial on the task took place. Twelve minutes had passed and only four pieces were fitted at the corners of the frame. Fifteen minutes passed, six pieces of the puzzle were formed. The teacher came along and looked surprised and said “Not even half completed? Why does it take so long to finish this puzzle?” The teacher stayed, observed and offered suggestions on where a piece should go. The children waited for teacher’s instruction. The teacher finally suggested that she would provide them with an exact model of the puzzle to help the children complete it. The children stopped and waited for their teacher to come back and give them the model sample. The model sample came, the children worked another five minutes, Boy 1 and 4 finally gave up working on the puzzle, leaving the two other boys working on it. Two other friends came and joined in. They tried for another ten minutes.

A total of thirty minutes had passed, not even half of the puzzle was completed. The teacher asked the children to clear up and get ready for the next lesson.

### **Observation of Group Two on a similar wooden puzzle:**

Two children were trying to fix a wooden puzzle of the same nature as Group One with a different picture. Two other friends joined in. They made several attempts similar to the first group and faced similar difficulties in problem solving the puzzle. A girl in this group gave up after ten minutes, followed by another two children who gave up the task after another five minutes. One of the children said: “I also don’t want to play, so hard”. After a total of fifteen minutes working on the puzzle, the puzzle was not completed and abandoned.

To sum up the observations of children playing puzzles:

#### **Group One:**

After thirty five minutes of working on a wooden puzzle, four children aged five years plus were not able to complete the task even with the help of more participants, the teacher and also a model piece given by the teacher. The four children from the same class could not problem solve to complete the puzzle and gave up the task.

#### **Group Two:**

A second group of children in the same class were faced with a similar situation. They lost complete interest on a different puzzle of the same type after they could not do it. They abandoned the puzzle on the floor. They had given up the task much earlier than the first group leaving after fifteen minutes.

## **Findings**

### **Discussion of Impact of environment and teaching practices on children’s learning**

From the observations the teacher had not shifted her practice from traditional worksheets teaching method. Children were expected to finish their work and could then play. In the literature

of play, Lambert (2000) and Gura (1992) have written about the importance of ample and uninterrupted time to be given to children for play. Gura (1992) states that when children lack the time to attempt to play with materials such as blocks, they will develop an attitude of abandoning 'play'. This was demonstrated by both groups when they failed to complete the puzzles and then left the task incomplete. With ample time to play, children will develop an understanding of the complexity of a problem which will enable them to generalize their knowledge of problem solving. However, both groups showed persistence by trying for thirty minutes and fifteen minutes respectively.

Teachers trained on the value of play in children's learning understand that play provides an optimal setting for children to construct knowledge as they interact with the physical environment, other children and adults (Piaget, 1962; Vygotsky, 1978). The learning experiences were not meaningful enough to motivate these K2 children to retrieve past learning of manipulating the puzzles from either associative memory of similar experiences or higher order memory where existing knowledge can be generalized to solve a present problem (Vygotsky, 1967; 1978). Maldonado states that "Observing a child's puzzle solving can shed light on their prior knowledge of concepts and their own unique logical set of strategies" (2010, p. 32). As prior constructive learning had not occurred often enough to develop skills in puzzle solving, the ability to perceive the material through the sensory memory was not present. Therefore, rehearsing or repeating the information so as to be part of the long term memory repertoire had not been possible. Information not stored cannot be applied to new situations (Freire 1970; Novak 1998). In the present case the children had sufficient time, of thirty five minutes, to complete the puzzles, but seemed to lack the cognitive strategies required.

Freire (1970) criticised rote memorization learning as not meaningful and bearing little relevance and suggested it would lead to what he termed 'domestication'; that is, making the learner dependent on the master for the decision making process. As tasks, such as worksheet learning are not meaningful for young children, then these children were not given sufficient opportunities to develop metacognitive skills (Flavell 1985; Freire, 1970; Novak 1998). Metacognition involves analyzing the problem, reflecting upon what one knows and does not know, in order to create a plan to solve the problem and being able to evaluate progress (Novak 1998, Freire, 1970; Flavell 1985). Thinking and problem solving skills can be developed from learning that is experiential and exploratory with hands on activities such as block building, puzzles and other activities (Fisher 1990; Maldonado, 2010; Moyles, 2005; Robson, 2006;). Exploration of blocks, puzzles or other manipulative materials will help children to develop 'mastery' and control their own learning (Brosterman, 1997; Ebbeck & Waniganayake, 2010; Sylva, 1984; Vygotsky 1978).

A significant body of research stresses the importance of experience to stimulate children's thinking (Fisher, 1990). Lambert (2000) and Sylva, Siraj- Blatchford and Johnson(2002) report that capitalizing on children's self initiated activities will provide opportunities for children to problem solve and extend their thinking. Gura (1992) and Whitebread, Dawkins, Bingham and Hemming (2008) assert that adult- child joint problem solving is a necessity and valuable support for metacognitive development. From the observation of these children abandoning the puzzle indicated a need for adults to provide sufficient opportunity for children to experiment with puzzle activities so they would be able to solve simple puzzles and move on to more complex puzzles. Engaging with puzzle activities is deemed to be beneficial in developing children's ability to construct strategies in problem solving (Maldonado, 2010).



The teacher's current commitment to the rigid time table in this kindergarten, practice, teacher to child ratio and the environment were deterrents and limitations for teachers to provide children with enough time and opportunities to play. The rigid and structured time table with predominantly teacher directed activities emphasizing academic learning may have impacted children's abilities to problem solve, be independent and acquire spatial competencies. The atmosphere observed reflected that children did not have a choice of the activity. Children obediently followed the dictates of their teachers such as queuing, routine worksheet practices and deskbound writing activities. Uninterrupted time is needed for the puzzle activity to help children develop ideas and talk about their thinking (Robson & Hargreaves, 2005). The children observed appeared not to have developed self-regulation as an ability to creatively problem solve that often develops as a result of play.

Play was rewarded only when the worksheet tasks were completed and this presented a situation of unequal opportunity as those children who were slow in their work were not given a chance to play. Therefore due to routine work, children were not provided enough time to develop spatial, perceptual, matching, independence and problem solving skills. The program in Cherry Kindergarten did not promote the idea that children were active learners and capable of making their own decisions, to solve problems and to take on challenges independently.

Children were also constantly reminded to work and play quietly. There was little interaction among peers to create the opportunity to communicate their ideas and thoughts through a variety of means that also help to develop skills in conflict resolution. Gura (1992) reports that in a group, children can problem solve and find new solutions when they have developed the ability to accept and construct knowledge from the feedback given by their peers and in return to provide constructive feedback. As observed, interaction, brainstorming and discussion took place in both groups but the ability to plan collaboratively, combine ideas and experience so as to work constructively was not apparent, therefore, the children abandoned the task much earlier as shown in group two.

### **Implications for practice**

Children are inspired in their learning when they play as they are self-motivated which has its own intrinsic reward. During play, such as fixing puzzles or building blocks, children have subconsciously linked their childhood experiences in their imaginary worlds (Brosterman, 1997). Sometimes, meaningful experiences developed from play in early childhood have linked to the roles and occupations in adulthood. The impact of early year experiences on later career interests can be viewed from the architect Frank Lloyd Wright's experience in his play with Froebel's gifts. He claimed this influence during his childhood had an impact and influence on his later career (Brosterman, 1997).

Reflecting on this study, questioning the importance of an environment and the impact on children's thinking and problem solving skills, it was found that the Singapore teachers' practice did not seem to have shifted to include more experimental and hands on activities with meaningful experiences for children's learning. The daily schedule alone is evidence of the presence of a deterrent to promote play as an instrument of learning. Early childhood education is an important life preparation for young children as independent thinkers. From the findings, teachers justified their roles and emphasis on academic learning in the need to meet parent expectations. This impacted on the amount of time and opportunities for children to engage with discovery learning and build on their spatial, perception and other conceptual understandings. The lack of exposure

to exploratory learning indicated that the two groups of children in the classroom observed had few cognitive strategies to assist the completion of the puzzles.

In “thinking about thinking”, the prevailing importance of the inseparable stages and path of learning and thinking are apparent (Robson, 2006, p.3). Though often used interchangeably, the distinction between the two, learning and thinking, needs to be clear. Perkins (1992, p.3) asserts that, “learning is a consequence of thinking”. Schooling has a purpose that provides a unifying experience for life preparation. In designing activities for children, reflective questions such as: “How to help children nurture their thinking? What type of environment helps in developing children’s cognition and to connect children’s understanding to help construct knowledge?”

Decades of research in neuroscience and other research literature presents significant evidence that children need ample opportunities to stimulate neural connections and these connections are made at rates much faster during infancy to 6 years old (Blakemore 2000; Byrnes 2001; Fox, Levitt and Nelson, 2010; Thompson & Nelson, 2001). An environment that provides engaging experiential learning through play within meaningful contexts creates an environment that will nurture development and learning (Blakemore 2000; Byrnes 2001; McGregor, 2007).

Situating this study in the literature, it is reported that the approaches to develop thinking in children and the environments that provide stimulus to extend ‘thinking in thinking’ (Robson, 2006) were not apparent in the environment of the K2 children observed. From the observations of the environment the timetable, the display board of teacher directed art and craft, math lesson conducted, the deskbound worksheet practices and the presence of the white board demonstrated a highly instructional teacher directed space. This current environment does not provide children the opportunities to build their learning dispositions like confidence, interest or motivation (Fisher, 1990). Stimulating early education and care environments that concentrate on the power of play as a medium for learning have been explored in the literature to support thinking and learning (Blakemore 2000; Byrnes 2001; Robson, 2006; Whitebread, 2008). Epstein (2003) reaffirmed that an environment with play will help children to achieve higher level thinking and problem-solving skills, learn to make decisions, regulate behaviours and be responsible, confident to take on complex challenges and to enhance their predictive and analytical abilities.

In summary, learning through play to promote children’s learning was recognized by Singapore MOE and became a driver in proposals for change in preschool education. However, government policy of the training of teachers and a recommended play curriculum was not strongly reflected in the observations carried out in Cherry Kindergarten as the teachers in the kindergarten had not changed their practices and teaching methods.

Atkin (1991, p.11) says:

In play children are not learning to fail, to seek right answers, to accept what adults tell them without questions, to parrot rote responses, to stop doing something because they can’t get it right, to become a spectator to others rather than a participant in whatever field of interest.

Perhaps the strongest commentary on this situation came from one of the children. Given the overwhelming case for the power of play how sad that children’s experience and understanding of play should be expressed in the following way:

In the second observation, a child said; “I also don’t want to play, so hard”.

## References

- Abbott, L. (1994). 'Play is fun, but it's hard work too!' The search for quality play in the early years. In L. Abbott & R. Rodger (Eds.), *Quality education in the early years* (pp. 37-54). Buckingham: Open University Press.
- Ailwood, J. (2010). Playing with some tensions. In L. Brooker & S. Edwards (Eds.), *Engaging Play* (pp. 210-222). Berkshire, England: Open University Press
- Almon, J. (2003). The vital role of play in early childhood education. In S. Olfman (Ed.), *All work and no play...How educational reforms are harming our preschoolers* (pp. 15-42). USA: Praeger Publishers.
- Anderson, J., Greeno, J., Reder, L., & Simon, H. (2000). Perspectives on learning, thinking and activity. *Educational Researcher*, 29, 11-13.
- Anning, A., & Ring, K. (2004). *Making sense of children's drawings*. Maidenhead: Open University Press
- Atkin, J. (1991). 'Thinking about play'. In N. Hall & L. Abbott (Eds.), *Play in the primary curriculum*. London: Hodder & Stoughton.
- Berk, L. (2008). *Child Development* (9th ed.). India: Prentice Hall.
- Blakemore, S., J. (2000). *Early years learning report 140*. London: POST -Parliamentary Office of Science & Technology.
- Bransford, J., Darling-Hammond, L., & LePage, P. (2005). Introduction. In L. Darling-Hammond & J. Bransford (Eds.), *Preparing teachers for a changing world. What teachers should learn and be able to do*. USA: Jossey-Bass.
- Brooker, L. (2010). Learning to play, or playing to learn? Children's participation in the cultures of homes and settings. In L. Brooker & S. Edwards (Eds.), *Engaging Play* (pp. 39-53). Berkshire, England: Open University Press.
- Brooker, L., & Edwards, S. (2010). From challenging to engaging play. In L. Brooker & S. Edwards (Eds.), *Engaging Play* (pp. 1-10). Berkshire, England: Open University Press.
- Brosterman, N. (1997). *Inventing Kindergarten*. New York: The World Publishing Company.
- Byrnes, J., P. (2001). *Minds, brains and learning*. London: Guildford Press.
- Dobbing, J., & Sands, J. (1973). Quantitative growth and development of the human brains. *Archives of the Disabled Child*, 48, 757-767.
- Dodge, D., Colker, L., Heroman, C., & Bickart, T. (2002). *The creative curriculum for preschool* (4th ed.). Washington DC: Teaching Strategies, Inc.
- Duffy, B. (1999). *Supporting creativity and imagination in the early years*  
Buckingham: Open University Press.

- Duffy, B. (2005). Art in the early years. In J. Moyles (Ed.), *The excellence of play* (Second ed., pp. 186-199). UK: Open University Press.
- Duke, D. (2004). *The challenges of educational change*. USA: Pearson Education
- Ebbeck, M. A. (1991). *Early childhood education*. Melbourne: Longman Cheshire Pty Ltd.
- Ebbeck, M., & Waniganayake, M. (2010). Perspectives on play in a changing world. In M. Ebbeck & M. Waniganayake (Eds.), *Play in early childhood education. Learning in diverse contexts*. Melbourne, Victoria: Oxford University Press
- Elkind, D. (1990). Too much, too soon: The demise of play. In E. Klugman & S. Smilansky (Eds.), *Children's play and learning. Perspectives and policy implications* (pp. 5-17): Teachers College, Columbia University.
- Epstein, A.S. (2003). How planning & reflection develop young children's thinking skills. *Young Children*, 58 (5), 28-36.
- Flavell, J. (1985). *Cognitive Development (2nd ed.)*. Englewoods Cliffs, NJ: Prentice-Hall.
- Fisher, R. (1990). *Teaching children to think*. Oxford: Basil Blackwell.
- Fox, S., Levitt, P., & Nelson, C. (2010). How the timing and quality of early experiences influence the development of brain architecture. *Child*
- Freire, P. (1970). *Pedagogy of the oppressed*. New York: Searbury Press.
- Froebel, F. (1826). *The education of man*. New York: Appleton.
- Fullan, M. (2001). *Leading In A Culture of Change*. New York, USA: John Wiley & Sons, Inc.
- Fullan, M. (2007). *The New Meaning of Educational Change* (4th ed.). New York: Teachers College Press.
- Gura, P. (1992). *Exploring learning: Young children and blockplay*. London: Paul Chapman.
- Hutt, J., Tyler, S., Corinne, H., & Christopherson, H. (1989). *Play, exploration and learning. A natural history of the pre-school*. London: Routledge.
- Jackson, A., & Davis, G. (2000). *Turning points 2000: Educating adolescents in the 21st century*. New York: Teachers College Press.
- Khong, L., Y.L. (2004). *Family matters: the role of parents in Singapore education. Teaching and learning series*. Singapore: Marshall Cavendish International.
- Kohn, A. (2000). *The schools our children deserve. Moving beyond traditional classrooms and 'tougher standards'*. New York: First Houghton Mifflin.
- Kuhn, D. (2000). 'Does memory development belong on an Endangered Topic List? *Child Development*, 71(1), 21-25.

Kuhn, D. (2005). *Education for thinking*. USA: Harvard University Press.

Lambert, E. B. (2000). 'Problem- solving in the First Years of School'. *Australian Journal of Early Childhood*, 25(3), 32-38.

Maldonado, N. S. (2010). Puzzle solving: a view to children's thinking. *Early Childhood Australia*, 16(3), 32-33.

McGregor, D. (2007). *Developing Thinking. Developing learning: A guide to thinking skills in education*. Berkshire, England: Open University Press.

Mertens, D. M. (2005). *Research Methods in Education and Psychology. Integrating diversity with Quantitative and Qualitative Approaches* (2nd ed.): Thousand Oaks, Sage.

Ministry of Education, Singapore. (2001). Pre-school Teacher Training and Qualifications. Retrieved 27th March 2008, from <http://www.moe.gov.sg/education/preschool/teachers/>

Ministry of Education Singapore. (2003a) Desired outcomes of pre-school education. Retrieved Mar 20th 2008, from <http://www.moe.gov.sg/education/preschool/>

Ministry of Education Singapore. (2008a). *Kindergarten curriculum guide*. Singapore: Ministry of Education

Ministry of Education, S. (2008b). Desired Outcomes of Education. Retrieved from [http://www.moe.gov.sg/corporate/desired\\_outcomes.htm](http://www.moe.gov.sg/corporate/desired_outcomes.htm)

Ministry of Education, Singapore. (2008c). Improving the Quality of Pre-school Education. Retrieved from <http://www.moe.gov.sg/media/press/2008/03/improving-the-quality-of-presc.php>

Ministry of Education, Singapore. (2012a). Nurturing early learners- A curriculum framework for kindergartens in Singapore (Revised 2012), from <http://www.moe.gov.sg/education/preschool/files/kindergarten-curriculum-framework.pdf>

Ministry of Education, Singapore. (2012b). Supporting Kindergartens for a Quality Pre-School Education, from <http://www.moe.gov.sg/media/press/2011/11/supporting-kindergartens-for-a-quality-pre-school-education.php>

Ministry of Education, Singapore. (2012c). Nurturing early learners. A curriculum framework for kindergartens in Singapore: A Guide for parents, from <http://www.moe.gov.sg/education/preschool/files/kindergarten-curriculum-framework-guide-for-parents.pdf>

Moyles, J. (1989). *Just Playing? The role and status of play in early childhood education*. Philadelphia: Open University Press.

Moyles, J. (2005). *The excellence of play* (2nd ed.). England: Open University Press. *Digest* (EDO-PS-00-15).

National Association for the Education of Young Children (NAEYC) (2009). Developmentally appropriate practice in early childhood programs serving children from birth through age 8. Retrieved from <http://www.naeyc.org/files/naeyc/file/positions/PSDAP.pdf>

Ng, P. T (2004). *The Learning School. Innovation and Enterprise*: Pearson Education.

Ng, J. (2009). Exploring the perceptions of stakeholders in a Singapore kindergarten during a period of curriculum reform. *Australian Association for Research in Education, Canberra* (December).

Ng, J. (2010). Exploring learning experiences during an early childhood curriculum change in Singapore. *Australian Association for Research in Education, Melbourne* (December).

Ng, J. (2011). Preschool curriculum and policy change in Singapore. *Asia Pacific Journal of Research in Early Childhood Education*, 5(1), 91-123

Novak, J. (1998). *Learning, creating and using knowledge: Concept Maps as facilitative tools in schools and corporations*. New Jersey, USA: Lawrence Erlbaum Associates, Inc., Publishers

Nyland, B. (2001). Looking backward, looking forward: Australian early childhood trends since 1960. *Australian Journal of Early Childhood*, 26(1), 7-14.

Nyland, B., & Nyland, C. (2005). Reggio Emilia in China: The distance travelled: The movement of an innovative early childhood approach from Northern Italy to China via the USA. *Journal of Global Social Policy*, 5(3), 281-301.

Fox, S., Levitt, P., & Nelson, C. (2010). How the timing and quality of early experiences influence the development of brain architecture. *Child Development*, 81(1), 28-40.

OECD. (1998). *Staying ahead. In-service training and teacher professional development*. Paris: OECD Publications.

Olds, A., R. (2001). *Childcare Design Guide*. New York: The McGraw-Hills Companies, Inc.

Perkins, D. N. (1992). *Smart schools*. New York: Free Press.

Piaget, J. (1962). *Play, dreams and imitation in childhood*. New York: Norton.

Robson, S. (2006). *Developing thinking & understanding young children. Introduction for students*. Great Britain: Routledge.

Robson, S., & Hargreaves, D. J. (2005). 'What do early childhood practitioners think about young children's thinking?' *European Early Childhood Education Research Journal*, 13(1), 81-96.

Shonkoff, J., & Phillips, D. (2000). *From neurons to neighbourhoods: The science of early childhood development*. Washington D.C: National Academy Press.

Siraj-Blatchford, I., Sylva, K., Muttock, S., Gilden, R., & Bell, D. (2002). *'Researching Effective Pedagogy in Early Years'* (Research Report 356). London: DfES.

Spodek, B. (1986). Development, values and knowledge in the kindergarten curriculum. In B. Spodek (Ed.), *Today's kindergarten. Exploring the knowledge base, expanding the curriculum* (pp. 32-47). New York: Teachers College Press.

Sylva, K. (1984). A hard-headed look at the fruits of play. *Early Childhood Development and Care*, 15, 171-184.

Sylva, K., Siraj-Blatchford, & Johnson, S. (1992). 'The impact of the National Curriculum on pre-school practice'. *The International Journal of Early Childhood (OMEP)*, 24(1), 45-51.

Sylva, K., Melhuish, E., Sammons, P., Blatchford, I. S., & Taggart, B. (2010). *Early childhood matters. Evidence from the effective pre-school and primary education project*. London: Routledge.

Tharman, S. (20 January 2003). Speech by Me Tharman Shanmugaratnam Senior Minister of State for Trade And Industry & Education Official Luncheon cum Seminar of MOE'S Pre-School Curriculum Framework Retrieved 28th Feb 2008, from <http://www.moe.gov.sg/media/speeches/2003/sp20030120.htm>

Thompson, R. A., & Nelson, C. A. (2001). Developmental Science and the media. *American Psychologist*, 56, 5-15.

Vygotsky, L. S. (1967). Play and its role in the mental development of the child. *Soviet Psychology*, 65, pp 297-333.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Whitebread, D., Dawkins, R., Bingham, S., Aguda, A., & Hemming, K. (2008). "Our classroom is like a cosy house!" Organising the early years classroom to encourage independent learning. In D. Whitebread & P. Coltman (Eds.), *Teaching and learning in the early years*. UK: Routledge.

Whitebread, D. (2008). Young children learning and early years teaching. In D. Whitebread & P. Coltman (Eds.), *Teaching and learning in the early years* (pp. 1-22). UK: Routledge.

Wood, D. (1988). *How children think and learn*. Oxford: Basil Blackwell.

Wood, E., & Attfield, J. (2005). *Play, learning and the early childhood curriculum*. London: Paul Chapman Publishing.

Yin, R. K. (2003). *Case Study Research. Design and Methods* (3rd ed.): Sage Publications.

### **Author**

Dr Josephine Ng Dr. Josephine Ng is a lecturer for the Master of Education program in RMIT University. Her PhD research explored the change processes of preschool curriculum reform in

Singapore. Change management and theories of play dictated the design of her PhD. She presented and published her findings nationally and internationally. [josephine.ng@rmit.edu.au](mailto:josephine.ng@rmit.edu.au)

**Contact details for author:**

Royal Melbourne Institute of Technology University (RMIT)  
102 Victoria Street, Carlton  
Vic 3000, Australia  
Tel: +613-9925 4633  
Fax: +613-9925 3045