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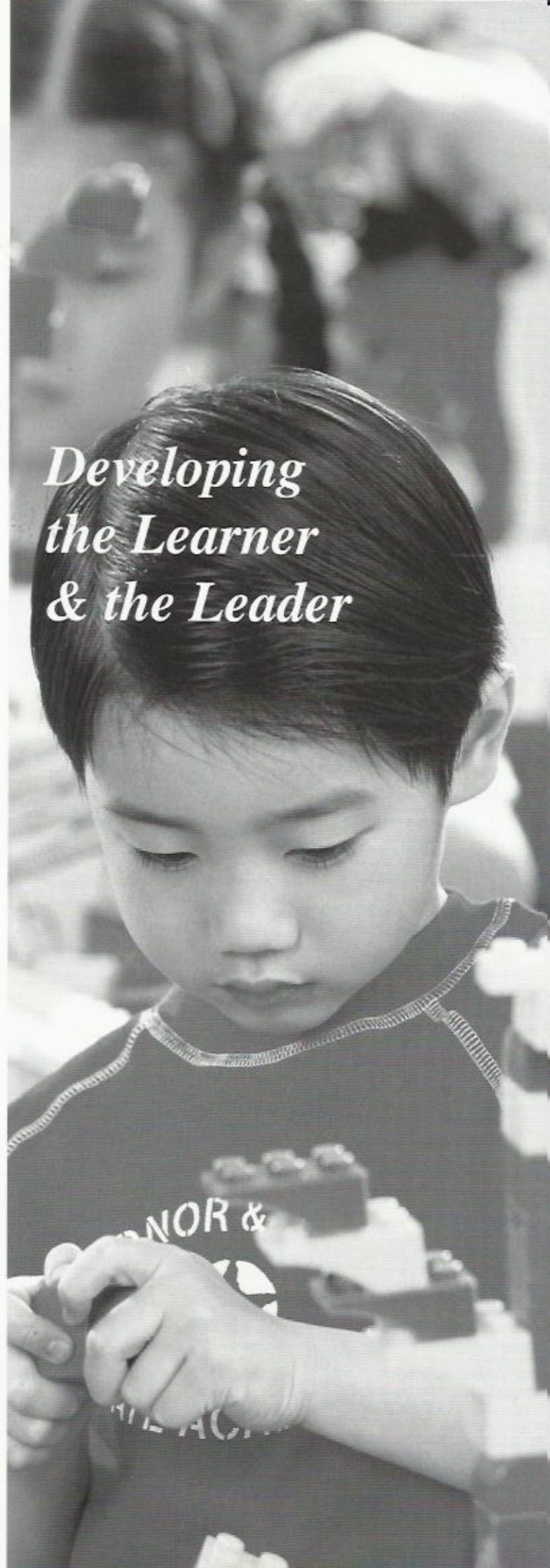
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Developing the Learner & the Leader

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ASSOCIATION FOR SUPERVISION AND
CURRICULUM DEVELOPMENT
(SINGAPORE)



*Developing
the Learner
& the Leader*

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Editorial

In this issue we have tried to present a collection of articles written by a cross-section of teachers, school leaders and educators. We hope that these will provide you with an overview of what is being done by the teachers to develop themselves and by the schools to nurture their pupils as learners, to mould characters and develop future leaders and citizens of tomorrow.

Greendale Secondary shares with us what they have done to encourage service learning. North View Primary principal, Ng Yeow Ling, shares with us the school definition and philosophy on what it means to educate the whole child – to look into the moral, cognitive, physical, social and aesthetic development of the child. Dr Noel Chia shares with us his take on educating the whole child in the child with special needs.

We have also encouraged teacher leaders in various capacities to share their views. Clarence Chow from Christ Church Secondary is a Senior Teacher, Foo Kum Fong is a Master Teacher and Sean Chng is pursuing his PhD at NIE. One of our objectives is to encourage teacher research activists to publish and Ling Yuan of Catholic High (Primary) is one such teacher, sharing her investigation on the use of concept mapping in teaching and learning primary science. Three teachers from Admiralty Primary, Jay, Angeline and Shah, have written on how they are working to teach their pupils to be more independent as learners.

In our next issue we will be looking at 'Learning Inside and Outside the Classroom'. Does learning have to take place indoors? Does it have to be during a specific time and place? Does the physical learning environment play a part in making learning easier for the learner? Do write in to share your work and your views.

Happy writing!

Soo Kim Bee



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Educating the Whole Child: A Perspective from Pasir Ris Primary School

Justin Arul Pierre , Polly Chew and Jayanthi Retnam

Educating the whole child is an important goal in the basic and dynamic concept in elementary education (Frank 1960). McLaughlin (1996) says that we as educators, should 'educate the whole child' and 'teach children, not subjects'. He emphasizes that 'process is more important than content'. This called for education to be 'broad', 'rounded', 'balanced' and 'holistic'. Education of the whole child, according to Moltmann (1967), meant treating a child as intrinsically worthwhile and fostering educational development in genuine creativity. Educators need to instill in children a sense of personal empowerment as well as a sense of belonging and acceptance. We should emphasize the importance of values and teach fundamental skills for a life of unprecedented changes.

The aim of education is to support the children's natural interactions with people

and environment because this process stimulates development through real-life problems (Kohberg & Mayer, 1972). Pupils should be engaged in active learning. Active learning is fundamental to the full development of human potential and it occurs most effectively where there are appropriate learning opportunities in diverse settings (Hohmann & Weikart, 1995). Active learners are undoubtedly questioners and inventors, generating hypothesis and posing solutions to their own problems. Educators need to support them by empowering them to take control of their own learning and encourage creativity and social interactions.

Pasir Ris Primary School recognizes the importance of holistic development in the whole child. Through careful planning and effective delivery of quality programmes, it has focused on staff development for teachers and continual monitoring and



Pupils weaving and illustrating a story.

evaluation of its best practices. It also recognizes that personal and social development promotes staff self-esteem to achieve high standards of attainment. In educating the whole child, we develop his/her self-awareness, boost self-esteem, enhance relationships with others and promote independence and social responsibility.

We believe in providing quality programmes to promote passion for learning, academic excellence, character and social development. Pupils who acquire the essential skills required to enjoy learning and to succeed in school and in the society, attain higher standards. An ethos of achievement is closely

interrelated with effective programmes of holistic development.

Adopting a whole school approach, our school provides several well-balanced, integrated programmes relevant to pupils' needs. In educating the whole child, the teacher's role is that of a facilitator and a guide rather than a director of children's exploration (Feng, 1987). We support open enquiry and discovery, seek community involvement and celebrate wonder (Rose, 1977).

In our endeavour to nurture the whole child, Pasir Ris Primary School leverages on our

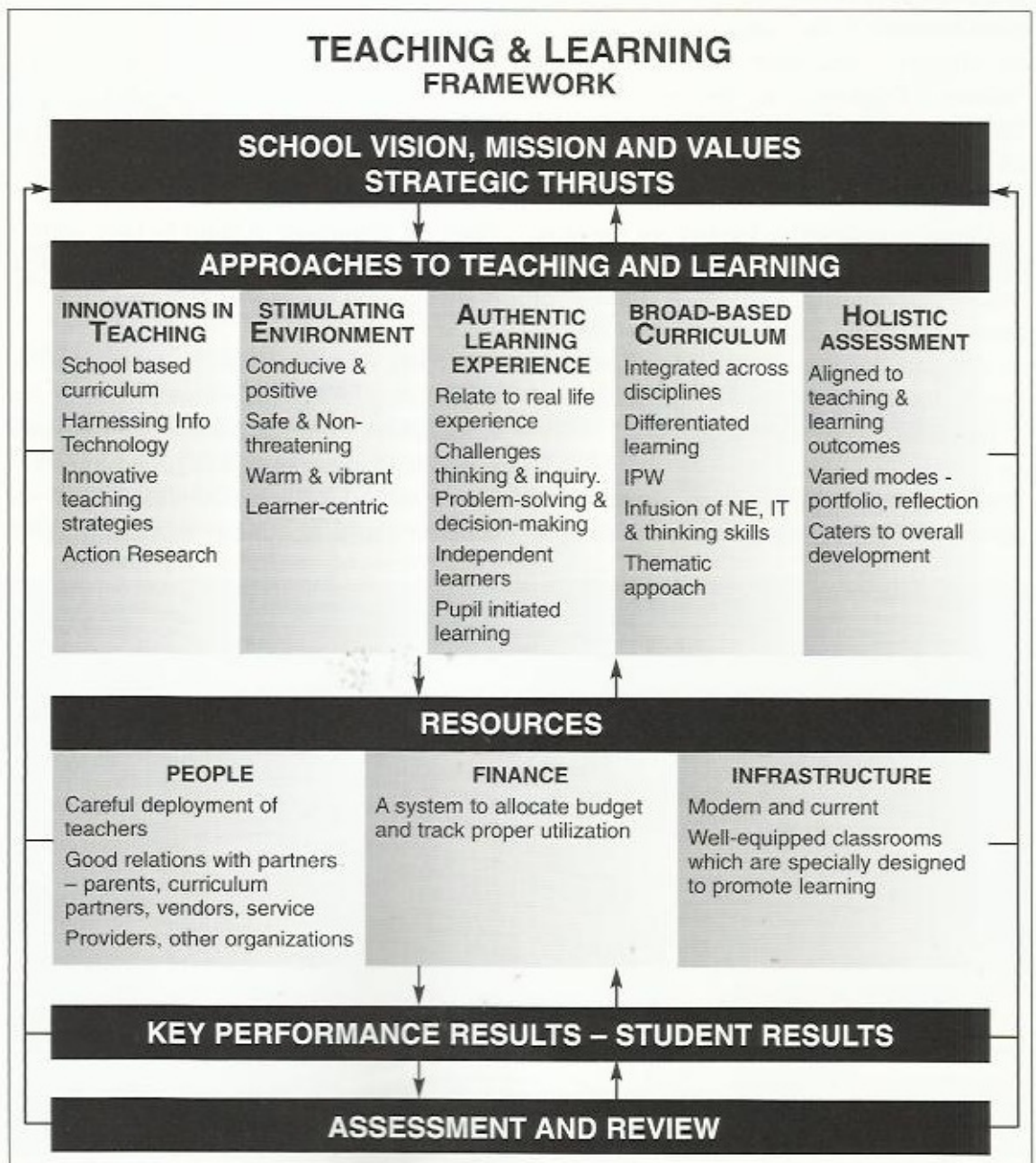


Fig.1 Teaching & Learning Framework

Teaching and Learning Framework (see Fig. 1) which translates the macro aspects of the Principles of Engaged Learning, PETALS, to the application level at the school. This framework is aligned to the school's Vision, Mission, Values and Strategic Thrusts. It focuses on 5 main aspects of the Teaching and Learning process, **TEACH**, which encompasses Innovation in Teaching, a Stimulating Environment, Authentic Learning Experiences, a Broad-based Curriculum and Holistic Assessment.

Innovation in Teaching

The school believes that Innovation in Teaching is vital if we wish to further engage our pupils in learning. This belief is echoed in our annual school theme which provides focus and direction for the year. For example, in 2007, our theme was *Embracing Diversity: Excellence in Teaching, Engagement in Learning, Leading in Innovation*.

As educators, we want our pupils to exhibit the following learning outcomes and Habits of Mind:

1. Be creative, innovative and imaginative
2. Be reflective learners and possessing a questioning disposition
3. Have good social and communication skills
4. Have an understanding and appreciation of core values and National Education issues

We have incorporated innovation in our curriculum in various ways. PRPS Kamishibai is an innovation modelled along the Japanese art of storytelling. This is a good strategy to teach our pupils values. *Kids Weave & Teachers Spin... A Story* is an initiative that involves our pupils creating stories that centre on local themes, values and contexts. Our aim is to give our pupils the opportunity to explore their talents, with the emphasis on ability-driven education. Hence, our pupils create their own stories and illustrate them on

cards. Our cards are a teaching resource created by pupils, for teachers locally and abroad. These cards have been published by Marshall Cavendish International (Singapore) and are used in local schools and overseas learning institutions as a teaching and learning resource.

'4-Op Math Card games' is another successful innovation designed to reinforce mathematical skills and instill creativity and alertness among pupils. It also aims to sharpen pupils' mental calculation as well as increase their speed and agility in problem solving. Each pack of cards comes together with a booklet explaining rules on how to play more than 20 fun and exciting mathematics games. Many pupils have bought the cards and even created their own game rules. The card games have generated interest from beyond school and are widely sold to several organizations and individuals. The amount collected is used to fund needy pupils of the school.

In line with current interests in the area of online gaming as well as harnessing ICT to support learning, the school collaborates with Temasek Polytechnic to create an interactive multi-player mathematics computer game which aims to challenge Upper Primary pupils and engage them in the learning of mathematics. This creative and unique game injects great fun and provides hours of enjoyment as pupils work on various mathematical problems. While getting the thrill of gaming in eliminating 'monsters', so as to increase their 'life' and 'money' in order to 'level up' their status and to 'purchase' armour for higher defence, pupils also enhance their problem-solving skills. A unique feature of this game is the chat-line which allows them to seek assistance from peers if they are not able to solve a mathematical problem and this promotes social interaction. An evaluation carried out on the project revealed that pupils who were exposed to the game enjoyed Mathematics more and that the game had significant impact on their learning.



Students are empowered and have ownership in school decision making issues

'Math Trail Blogs' and 'Vacation Math Blogs' are other ICT-based innovations intended to create awareness that Mathematics is everywhere, even beyond the country. It leverages on the popularity of online journals, 'Blogs', as a tool to engage pupils in their learning. Pupils learn to pose challenging real-life mathematical problems based on their own experiences on blogs which they have created for themselves. In *Vacation Math Blogs*, both teachers and students share their vacation experiences online and challenge viewers to solve their mathematical questions in order to obtain more information on the places visited.

Stimulating Environment

A positive learning environment is intellectually open, stimulating and exciting and it promotes appreciation, exploration and discovery. Hiltz (1994) says that a virtual classroom improves access to education, and attributes this to the flexibility of student location and time. At *PRPS*, teaching is enriched and enhanced by e-learning and info-communication technology in our wireless IT-enabled environment. There is widespread interactive computer-aided learning through the use of SMARTBOARD, the Classroom Performance System and Tablet PCs to

engage pupils. The school subscribes to different Learning Management Systems (LMS) offering a rich repository of digital learning resources for both teachers and students. Students are given a true E-learning experience as they stay home for one week during the school year to do independent study through lessons uploaded in the *LEAD* portal. The e-Portfolio is introduced to students in Primary 4 and 5 with the aim of teaching students to keep records of their works in a variety of digital media such as texts, graphics and sounds.

The school believes that structure drives behaviour. As such, there are well-equipped laboratories, special rooms and study corners in all classrooms to provide an inviting and conducive learning environment. In every Lower Primary classroom, there is a unique L-shaped learning corner which serves as a multimedia center. There are computers, books and educational materials in these intellectually stimulating retreat corners to support mini-discussions and individual tasks. Coupled with customized furniture, these help to facilitate self-regulated as well as interdependent classroom activities.

The school strongly promotes a culture of innovation – all staff are trained in

Innovation Protocol tools to help them ideate and initiate innovative projects. The **SPACE** (Seizing opportunities, Participating without judgement, Aligning with our values, Connecting with other, Engaging hearts and minds), a flexible learning hub, is set up to provide a vibrant and exciting learner-centred environment for innovation. It encourages both staff and pupils to explore innovative ideas so as to enhance experiential and authentic learning. This has brought about a greater sense of belonging and ownership among our students. Some examples of activities that are carried out at The *SPACE* are the sale of ice cream and dedication of songs. Proceeds from these go towards the School Pocket Money Fund for needy pupils. Through such platforms, our pupils are given the opportunity to act out and role model the school value of Share and Care. The *World Map Board* was set up to raise awareness of current affairs around the world, and this is also part of our effort to inculcate National Education in our young charges. Pupils are constantly updated with global news and encouraged to react with sensitivity and empathy to political and environmental issues.

Peters (1973) says that a structured environment, where there is warm attitude of acceptance towards children, produces trust and gives children a basis for understanding people and the world, and this is vital in their moral and rational development. In creating a warm and safe environment for our pupils, we also seek teachers' feedback through our Learning Circles. This is time set aside every week in the Time-table where teachers at all levels sit together to discuss teaching strategies and suggest innovative practices to engage pupils in learning. This has given birth to several innovative projects. The last Learning Circle session of each month is also known as the Share and Care Forum where level Form Teachers meet and surface cases of pupils at risk and discuss how the school can offer support and help to meet their needs. It prompted the idea of the *Godparent Scheme* where

academically weak pupils are 'adopted' by staff who will spend time with them to inquire of their welfare and ensure their total well-being. Twice weekly, Form Teachers hold teacher-pupil conferencing with individual pupils to get to know each one better and to hear their concerns. This builds a close rapport with pupils and fosters a sense of openness and trust. Also, during Learning Circle sessions, the P6 teachers discuss performances of their pupils and identify those who require additional coaching and recommend them for the *Supervised Self Study* scheme. This scheme is aimed to encourage pupils to take ownership of and responsibility for their own learning.

Authentic Learning Experiences

Theorists have long argued the importance of providing our pupils with authentic experiences so that learners can transfer learning from knowledge in formal education to real-life situations, making learning meaningful. Grabinger (1996) says that skills and knowledge are best acquired within realistic contexts. In designing learning environments, one should ensure alignment between context in formal setting and real life setting. Authentic activities reflect nature of real problems as complex, ill-structured, collaborative and offering multiple paths and solutions (Young, 1993). Squires (1999) suggests that an authentic activity that is engaging and relevant is personally meaningful to the learner.

With the emphasis on developing competence in pupils, our school provides an activity-based learning environment, inspired by constructivist and situated learning theories, to improve pupil learning experience. Our activity-based learning environment supports authentic learning and helps students develop relevant competence. It also builds in learning stages and scaffoldings to help pupils acquire important learning strategies, basic information literacy skills, metacognitive skills and thinking skills.

At the Lower Primary level, pupils carry out a sequence of tasks independently and interdependently in groups. Older pupils are assigned extended tasks, such as project work, investigations and inquiry-based problem solving. Pupils are encouraged to initiate activities and to set their own goals. Teachers coach pupils in planning, organising and reflecting upon the tasks completed. One example of an authentic task in a lower primary class is the 'Pizza-making Task'. Here, budgeting skill is needed and this requires careful planning and collaboration among team members who also draw up a shopping list and a create a recipe before actualizing the task. Pupils go to the supermarket to purchase their list of ingredients and return to class to bake a pizza. The learning of 'money' and the use of imperatives is thus made more meaningful to pupils as they transfer knowledge when carrying out this authentic task.

Outdoor education can occur in any outdoor setting, anywhere from a school compound to visits to industries or a walk in a national park. Ford (1986) describes outdoor locations as good sites for firsthand experiences, direct contact with a topic and socialization. It evokes curiosity, excitement, wonder and imagination. Leveraging on this understanding, a Learning Journey Day – a day set aside for the entire school to venture out – is initiated to expose our pupils to firsthand experiences at various places rich in tradition and culture. Adopting a thematic spiral approach, each level is assigned a specific area to visit as part of experiential learning. For example, the Primary 6 pupils visit places of worship to understand differences so as to develop tolerance for other religions and practices. This also raises pupils' awareness, consciousness and understanding of multi-racialism. Pupils gain knowledge about the environment and the community in which they live; in addition, they learn to appreciate and respect different cultures and customs. The Primary 4 level go on

the Fort Canning Trail which covers a visit to the National Museum and Archive. This visit fosters loyalty to one's country through an awareness of struggles and hardship experienced by our forefathers in olden days. It cultivates in pupils a sense of belonging and pride to this country that is governed by wise leadership and blessed with prosperity. Other meaningful outdoor education activities are Olympic Days and the Primary 5 Adventure Camp. The latter is an annual activity designed to provide our Primary 5 pupils with opportunities to come out from their comfort zone, build resilience and to gain skills and experience in leadership and teamwork. Olympics Days allow pupils to compete in various sports and games while upholding Olympic ideals of fair play, friendship and the spirit of sportsmanship.

Broad-based Curriculum

Our Lower Primary classes embrace Strategies for *Effective Engagement and Development of pupils* (SEED) in their teaching. A wide range of activities are conducted to expose them to authentic and experiential learning. Such activities include group and class discussion, stories, drama, role play, games, songs, puppetry, journal writing and art appreciation. One particular feature of this good practice is the successful integration of different subjects using a thematic approach. For example, in the theme on Myself, the following are integrated: vocabulary on body parts, mathematics concepts on Numbers, Health Education concepts on the human body and Music lesson on 'Ten Little Indians'. Teachers interact well with pupils and made good use of verbal and written encouragement to boost self-esteem and foster co-operation. Teachers and pupils work collaboratively to plan and investigate, to seek answers and solve problems at the appropriate level of the development of the children (Rakow & Bell, 1998). Learning support staff and special needs auxiliaries give good support in these instances. In our school, there are

Learning Support Programmes for both English and Mathematics. They are specially conducted for lower primary pupils with low learning abilities. Currently, the school is in collaboration with MOE CPDD (Curriculum Planning and Development Division) in designing a 'Differentiated Instruction in Mathematics' package for our Primary 3 lower ability pupils. At the upper primary level, pupils are banded according to their abilities in English and Mathematics for effective delivery of curriculum pedagogical instruction. Classes at P6 are further grouped into reduced class sizes for greater engagement in learning. Peer Tutoring and Buddy Reading are some other programmes organized to help our weaker pupils. Our high ability pupils are involved in a cluster-based programme conducted by MOE Gifted Education Branch and these pupils are exposed to Olympiad Training and a wide range of enrichment activities to stretch their potential.

At PRPS, we firmly believe that a broad-based curriculum is not just about engaging the mind but also reaching out and touching the hearts and lives of our pupils. Martin Luther King Jr once said '*Intelligence plus character – that is the goal of true education*'. We strongly subscribe to this belief. We engage the Heart, the Head and the Hand of every child – the Head, to know what is good, the Heart, to feel and desire what is good and the Hand, to act and do what is good. As educators, we provide the knowledge, the skills and the opportunities for our students to internalise values and demonstrate them.

The school's **Values Inculcation Programme**, known as VIP, is the programme that encapsulates this philosophy. Our VIP focuses on imbibing desirable behaviours in every child through the school's core values. These values are aligned to Arthur L Costa's and Bena Kallick's *Habits of Mind* (HOM). HOM describe 16 types of intelligent behaviour. Costa and Kallick (2000) maintain that a critical attribute of

intelligence is not only having information but also knowing how to act on it. HOM are cascaded throughout the year by all members of the staff. To make learning meaningful and relevant, the values are brought to life with stories, skits, video clips and even cartoons. To monitor the internalisation of HOM, we have pupil VIP champions to tell their friends what these values mean to them. Thus, values are translated by peers, to peers.

To further reinforce values in our students, we use symbols, our BOB mascots, Missy & Master BOB. BOB is the acronym for our school motto, **Be Our Best**. As we believe that our students will internalize the desired HOM, school values and display exemplary behaviour best through writing about them, we have the BOB Writer's Loft. Pupils write stories and compose poems on values and these are captured in a compilation entitled BOB's Treasures of the Heart.

Giving leadership opportunities and pupils a voice in decision making is also one aspect of building character. **Think@PRPS** is a platform created for pupils to give suggestions for school improvement. Pupils give suggestions via an online suggestion platform. These suggestions are evaluated by the Student Innovation Ambassadors (SIA), a student body made up of student leaders, facilitated by a teacher-coordinator.

Another student body, the STARS comprising the Head Prefect, the Deputy Head and other student leaders are given a voice in school improvement. They conduct surveys and gather feedback from the student population to ascertain their concerns and needs. They then draw up proposals for the consideration of School Leaders.

To foster a spirit of Share and Care, the *Peer Support Programme* ensures each new Primary 1 pupil is cared for by a Primary 5 pupil during the first two weeks of the academic year. Peer Support Leaders, made up of all Primary 5



Learning Journey Day - where learning takes place beyond the confines of the classroom

students, undergo rigorous tailored training at the end of their fourth year at school to equip them with skills to handle their young charges. They induct their young charges into the ethos and culture of the school. The service rendered by these Primary 5 pupils is acknowledged and reaffirmed during the Junior Investiture Ceremony where parents of the Primary One pupils get to know the person who has made their child feel at home.

Speakers' Corner is another platform where students are given a voice. Our Upper Primary students read about social and national issues from the students' newspapers *Little Red Dot* and *What's Up*, which is part of our school's objective to keep students abreast of current affairs. They then reflect on such issues in their journals and daily reflections. These issues are discussed at a session conducted monthly at the school's open-air amphitheatre. Students from all Upper Primary classes give their opinion and air their views at these sessions. This

opportunity allows students to use good English, boosts students' confidence and allows them to think critically.

Our co-curricular programmes offer varied opportunities for holistic development by encouraging pupils to explore and develop individual talents and interests and to learn to co-operate and compete in team activities. These include healthy competitions in sports and the aesthetics, especially in our annual Sing Singapore, a sing and dance competition that binds communities of different races and religion together. Sing Singapore is a highlight of our National Education programme which reinforces in our pupils the need to be resilient, reflective and responsible members of the community. Apart from cultural performing arts, our pupils are actively involved in visual arts such as the Chalk-Art, Oil Pastel, Acrylic and Digital Art programmes.

In sensitizing our young charges to an emerging social concern of an aging

population, our *Community Involvement Programme* includes service learning through the Lions' Befrienders Programme, visits to Homes and several fund-raising events for charities. We believe pupils' sense of social belonging and responsibility is developed through specific opportunities to show care and consideration for others. We teach pupils valuable lessons about interdependence, teamwork and individual initiative, and this aligns with our school mission which is to nurture every pupil to be a contributing member of the community.

Interest Elective Programme (IEP) is an initiative to expose our pupils to various forms of sports and arts in order to cater to their interests, talents and abilities. At the end of each academic year, after the year-end examinations, a 2-day IEP is organized for all Primary 3 to 6 pupils. Pupils can choose to participate in electives such as fencing, scuba-diving, archery, golf, hip-hop dance and digital animation. These are specially designed and customized to meet their needs and interests. IEP generates greater appreciation and expands pupils' knowledge in non-academic areas.

There is extensive partnership with parents, other institutions, professional agencies and the local community in offering our pupils a wide range of experiences. For example, Carolina Biological Consultancy organized and conducted the Amazing Corn Project and Chocolates Creation & Food Biotech for our pupils; Voice Works conduct a course for our Primary 1 and 2 pupils on Speech and Drama. These enrichment programmes value-add to our pupils' learning and expand their knowledge and skills beyond the classroom.

Holistic Assessment

Monitoring and assessment are an integral part of the teaching and learning cycle. Assessment guidelines given by MOE state that assessment "should be holistic, with variety, balance, regular feedback"

and have positive achievement as key considerations.

At PRPS, we use alternative modes of assessment (holistic assessment, formative assessment, assessment for learning) to ensure that all aspects of learning are captured. As part of the reform movement in curriculum, pedagogy and assessment, we have introduced Portfolio Assessment as a school-based curriculum initiative. Representing a shift from the emphasis on traditional pen and paper tests, students are assessed through the use of rubrics. Rubrics are useful to teachers because "they help them clarify what they want from students and convey their expectations for students' work and achievement in ways that students can understand and use" (Martin-Kniep, 2000). Hence, in our school, rubrics are used in Integrated Project Work and Performance Tasks across Primary 1 to 5. In addition, the Holistic Progress Report, designed by the school and given to students, is based on rubrics.

The school also promotes a reflective culture for the students and staff. Webster's unabridged dictionary defines 'reflect' as 'to think seriously, contemplate, ponder'. Reflection is necessary in learner-centred practices. When students assume responsibility for their own learning, they reflect on their accomplishments. Ten minutes of timetabled time at the end of each day is set aside for students to reflect on their learning for the day. Reflections take various forms. Students reflect on specific learning that takes place in the day in their journals, they reflect on social issues and concerns that are highlighted in newspapers and have verbal discussions with their teachers.

Reflections are also done as post-activities to assess the outcome of learning. Students reflect on what they have learnt and reframe their own thinking prior to the activity. For example, a student wrote this as a post-service learning reflection after her visit to Dakota Crescent to serve the old folks.

“Through my visit, I learnt that the **elderly may not be boring** at all. They were all so friendly and sociable... A Malay classmate of ours actually communicated with a Chinese elderly man who spoke a little English. Kudos to Akhyar, **touching the hearts of others in his own quiet way**”.

– Yvonne Ang

This reflection affirms that our Lions Befrienders programme has cultivated in our Primary 6 students the ability to empathize and has sensitized them to the needs of the elderly, a national concern. It also goes to show that this student has internalized the value of Share and Care which transcends racial and linguistic lines.

Reflections are also done on performance tasks. Students reflect on areas they need to improve and this helps them to track their learning. Feedback and Teacher’s Comments given in the students’ reflections also help them to identify the areas they need to work on. Subsequent reflections done show whether they have acted on this feedback given.

Conclusion

Children are constantly faced with a multiple of options. It is critical to teach them well and develop them into ‘whole’ individuals to negotiate and thrive in this world of rapid change. We, at Pasir Ris Primary School, are committed to our purpose and promise of nurturing the whole child – cognitively, physically, morally, socially and aesthetically – as embodied in our School’s Mission: ‘To enable him/her to realise his/her full potential for excellence in studies, sports and arts, while being a caring and contributing member of his community’.

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Character Comes First at Telok Kurau Primary School

Karen Woo & Jeffrey Tan

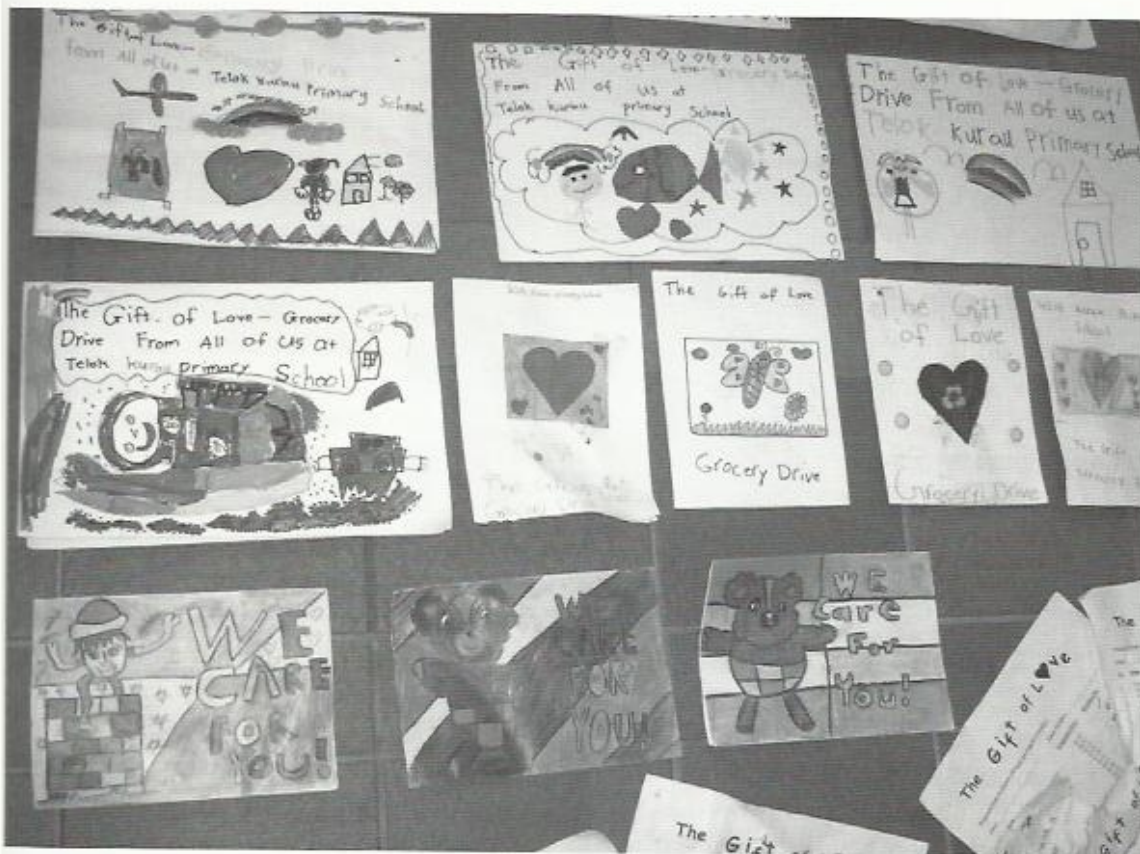
Step into a time machine and be transported to the year 2020. What will the world be like? How will we live? Who will be the ones that will be ahead ... Who will be left behind?

In a handout, "Windows on the Future" by Ian Jukes and Ted McCain from the InfoSavvy Group, developed for the World Education Forum held in Singapore in June 2006, the authors presented seven exponential trends which challenges us to think about the future we face. Of relevance to us as educators is how these trends will affect our pupils, our learning institutions, our curriculum, the nature of teaching and learning, and at the same time challenge the very premise

of how we perceive a person as being intelligent.

At Telok Kurau Primary School (TKPS), we are aware of these vast changes that are taking place and have not remained idle. Welcome to Envisioning 2020 – an exercise aimed at getting our teachers to think more about the landscape of the future, and how we as educators can help prepare our pupils to meet the challenges that lie ahead.

As teachers, we can equip our pupils with the necessary skills. We can teach them to be discerning users of technology, and we can even guide them to be critical and creative thinkers. However, at TKPS, we want to do even more.



The Gift of Love – Grocery Drive

Our Singapore education system strives to achieve two objectives – teach the skills necessary for our children to respond to future challenges; and inculcate in them the desired values to become responsible citizens and productive members of society.

In 1998, during the World Economic Forum, the then Minister for Education and Second Minister for Defence, RADM Teo Chee Hean mentioned that :

“Education must imbue the next generation with the right value system. Through values education, we must develop future citizens with upright character who can contribute to the community. We must also inculcate in our young, a deep sense of bonding to the nation, so that they will be prepared to stay and fight in times of adversity. What use is the education system if it produces smart crooks or selfish individuals who feel no obligation or loyalty to the nation?”

In 1998, the Ministry of Education published a document “The Desired Outcomes of Education” (DOE), which defines the goals of a holistic approach to education. The DOEs describe the attitudes, skills and values that a Singaporean youth should possess at different stages of his education. Featured prominently throughout the DOEs are the values of integrity, respect, responsibility, tolerance, graciousness, courage, perseverance, resourcefulness and loyalty.

Hence, we can see even then, that values are important. The key outcome from the Envisioning 2020 exercise that all staff engaged in was that in the teachers’ ideal curriculum of the future-values inculcation, integration with ICT and the process skills underlying project work, must feature very strongly.

The focus on values education is nothing new. In fact, our school’s philosophy, “An all round education imparted in a caring environment aimed at bringing out the best in each and every child” clearly shows our commitment to providing holistic education to our pupils. Not only do we want our pupils to reach their academic best, we want them to also become citizens of good character. With that in mind, we embarked on a journey to design our very own Character Development Framework.

The TKPS Journey

In his book, *Educating for Character* (Lickona, 1991), Thomas Lickona defines good character as the intersection of the three aspects of Moral Knowing, Moral Feeling and Moral Action. Kevin Ryan, Director of the Center for the Advancement of Ethics and Character at Boston University, states “To have



‘The Gift of Love’ Grocery Drive: Cards of encouragement

good character means to be a person who has the capacity to know the good, love the good, and do the good" (Ryan, 1993).

In TKPS, we believe that values can indeed be taught, and that there are virtues that should be taught to all. There must be significant adults in the pupils' lives to model and reinforce these virtues. There must also be opportunities for pupils to practice and to apply what they have learnt.

Our Character Development Framework

Our character development framework is developed around the three premises as defined by Lickona (1991) and Ryan (1993), i.e. "Know the good" through the formal Values Education (VE) Curriculum, "Love the good", through the reflective component and "Do the good", through the Service Learning Framework. Key to this is the role modeling component by all the staff in the school.

"Know The Good"

At TKPS, the school's values of Respect, Responsibility, Resilience, Harmony, Care and Integrity serve as our core values. In crafting our VE curriculum, we utilised Wiggins and McTighe's Understanding by Design (UbD) curriculum design model (Wiggins and McTighe, 2005). Staff were taken through two key workshops to learn about UbD and Civics and Moral Education (CME) pedagogies to enhance their competencies in lesson design.

Working with the end in mind, teachers were then grouped according to the levels they were teaching to design VE lessons centered around the core values and planned authentic performance tasks to ensure that there is transfer of learning and that pupils are given opportunities to practice and perform what they had learnt. As all teachers were involved in this process, it became a whole school approach to the teaching of values.

To support the formal Values Education curriculum, activities were planned to create awareness about the values that we were focusing on for the month. To kick start the programme, a grocery drive known as 'The Gift of Love' was planned for the month of *Care and Responsibility*. For this project, we worked closely with the Metropolitan YMCA Manna Store to collect and pack grocery packs for needy families living mostly in one-room rented flats in our neighbourhood. This is a whole-school effort aimed at inspiring teachers and pupils alike to dig into their pockets to purchase an item or two to help the

needy. Pupils who were not able to donate items because of financial constraints contributed in a different way. They were given the responsibility of helping to pack the items. Lower primary pupils also created cards of encouragement for these families. Through this project, the pupils learned more about the plight of the poor and experienced the joy of being able to give and to care for the less fortunate in our community.

Competitions and talks were also planned to create more awareness about the other values. 'Harmony in Action', a photography and caption writing competition was held during *Harmony Month* to encourage pupils to capture snapshots of harmony within and outside the school. Real-life personalities will also be invited to share with the pupils during assembly on the value of resilience. All these activities were aimed at reinforcing the values that the teachers talked about in class.



Our "Heroes" mascot for Service Learning



Chiangrai CIP

“Do The Good”

To deliver the “do the good” component, we used a structured Service Learning framework utilizing a cascading environment and spiral approach to expose our pupils to community work. We want the pupils to become proactive, caring and competent helpers of the community. It is our mission to expose our pupils to a wide spectrum of experience in aiding the needs of the community and to enable them to be proactive in their participation. There are three platforms for our pupils to embark on community projects – the whole school platform, the Co-curricular Activity (CCA) platform and the class level.

On a whole school level, Primary 1 and 2 pupils learned to help out in school and at home. They were given task cards to complete over a period of time. Primary 3 and 4 pupils learned to care for the environment whilst Primary 5 pupils learned to care for the elderly. Finally,

Primary 6 pupils, being more matured, were given opportunity to visit homes for the disabled to interact and perform for the residents. Pre-and-post visit activities were conducted to ensure the pupils know the proper code of behaviour. They could also reflect on their service learning experience. “Hero” mascots were also created for each level to create more interest amongst the pupils. The pupils were told that unlike comic book characters who possess superpowers, heroes whom we wanted to cultivate in our school were of a different kind. They would help people in need and expect no returns. Our pupils were told that they too could become heroes if they willingly helped those in need in the community.

Co-curricular Activities (CCA) groups also planned for their own Community Involvement Project (CIP) for the year. Our cultural groups have staged performance for Geylang East Home for the Aged as well as for the public in Sentosa as part of their CIP. On a class

level, form teachers were given initiatives to plan for their own CIP activities.

In addition, our outreach extended beyond the shores of Singapore. Overseas CIP projects were also planned so that our pupils could bring love and warmth to children outside Singapore. They raised funds to help needy children under the Akka Foundation in Chiangrai, Thailand. They also taught these children basic English and even tried helping in the paddy field. They thoroughly enjoyed the experience of interacting with the Thai children and learnt about friendship and care in the process.

“Love The Good”

Key to the programmes is the reflective component embedded into each module and programme. This helped to reinforce the learning and elicit the feelings of the individual child for the teachers to explore further. The 6 core values and the schools operating principles helped to drive the whole school culture, which in turn helped to reinforce the ‘love the good’ component.

The Importance of Educating The Whole Child

All these initiatives that we had embarked on were for a single purpose, to educate the whole child. Our teachers have done so much in the area of academics. It is just as important that character education be brought to the same level. It is only then, can we see pupils who are not only strong academically, but who also have the big heart to match.

Character comes first – and this is one of our school's operating principles. We must say it really does, at Telok Kurau Primary School.

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Developing A W(holistic) Response for Educating the Whole Child

Ng Yeow Ling

Introduction

The call to educate the whole child is not a new one. Almost 10 years ago when we found ourselves in the midst of a transition from an 'efficiency' to an 'ability' driven education system, the Desired Outcomes of Education (DOE) was adopted as a framework for this process (Ministry of Education (1998). DOE defined the holistic development we want our children to have when they go through the Singapore education system. More specifically, these outcomes represent the view that education is much more than just academic achievement – that fundamentally, education is about nurturing the whole child – his moral, cognitive, physical, social and aesthetic development.

A Philosophical Response: From Holistic to Total Education

While educating the whole child involves nurturing the holistic development of our pupils, I would argue that this involves more than the commonly touted holistic education. Stephanie Pace Marshall, President of ASCD, in her Foreword for the *New Learning Compact* (ASCD, 2007), writes "When we commit to educating whole children within the context of whole communities and whole schools, we commit to designing learning environments that weave together the threads that connect not only math, science, the arts and the humanities, but also mind, heart, body, and spirit connections that tend to be fragmented in our current approach" (pg. 21).

At North View Primary School, we espouse

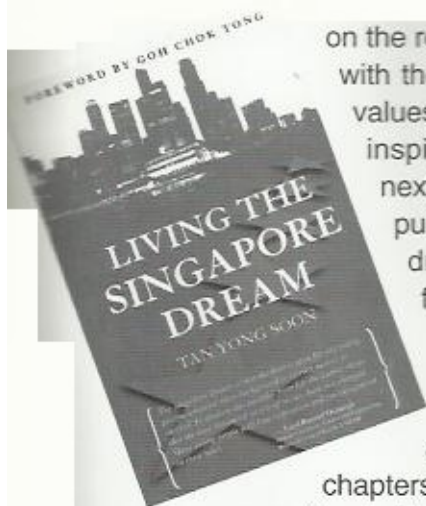
an educational philosophy which seeks to develop a w(holistic) response for educating the whole child. Our mission is to deliver '*total education* for pupils to achieve their *personal best*'. Total education defines the way we deliver learning, in that

- a. We focus on holistic development of our pupils – *our Curriculum Focus*
- b. We build character, engender motivation and develop capacity for learning – *our Pedagogical Approach*
- c. We work with the whole child, taking into account uniqueness in learning profile and background – *our Strategy for Action*

While holistic education has the focus on a broadened definition of developing different aspects of pupils, total education articulates the way to engage the whole child in nurturing his total development. Educating the whole child is *more* than an emphasis beyond academic development.

Engaging the Hearts, Heads and Hands

Here is an account of how we have engaged the whole being of our pupils, not only for maximizing their learning, but to prepare them for life. As part of our ongoing National Education efforts and as a lead up to our National Day celebration this year, arrangements were made for all our Primary 5 and 6 pupils to read 'Living the Singapore Dream' (Tan, 2007) by Mr Tan Yong Soon, Permanent Secretary/ Environment & Water Resources, published in April this year. The book comprised 23 accounts of individual's rich experiences



on the road to success, with their wisdom and values shared, as an inspiration for our next generation to pursue their own dreams starting from young.

To facilitate discussion and reflections, chapters of the book

were allocated to the respective classes. Over two months, teachers used materials to elicit pupils' responses and sharing of learning. There was rich discussion and pupils have been inspired by the contributions made by these Singaporeans to our society in their various fields of work. Pupils followed up their discussions with research on the characters they studied and wrote up their reflections based on their learning.

On 31 July, Mr Tan, together with Paul Tern, Head Prefect, Raffles Institute and Jonathan Lim, Deputy Head Prefect RI, were invited to our school to dialogue with some 60 selected P5 and P6 pupils. This opportunity enabled our pupils to engage the author, as well as two other students who have read the book, in discussing key issues and lessons learnt from the book.

Our pupils' and teachers alike were pleasantly surprised by Mr Tan's open sharing and willingness to give his insights to wide ranging topics of discussion. Enthusiastic and curious pupils' were more than eager to get up and close with Mr Tan. When one of the pupils quizzed him on "Have you ever felt like giving up in life?" He thought for a while and answered light-heartedly "If I am here as a Permanent Secretary, I could not have given up. But, I have faced failures and there are others I know of who had made extreme decisions". Another wanted to know if he still had other dreams and which were his proudest moments. Mr Tan remarked in jest that he did not expect 11 or 12 year

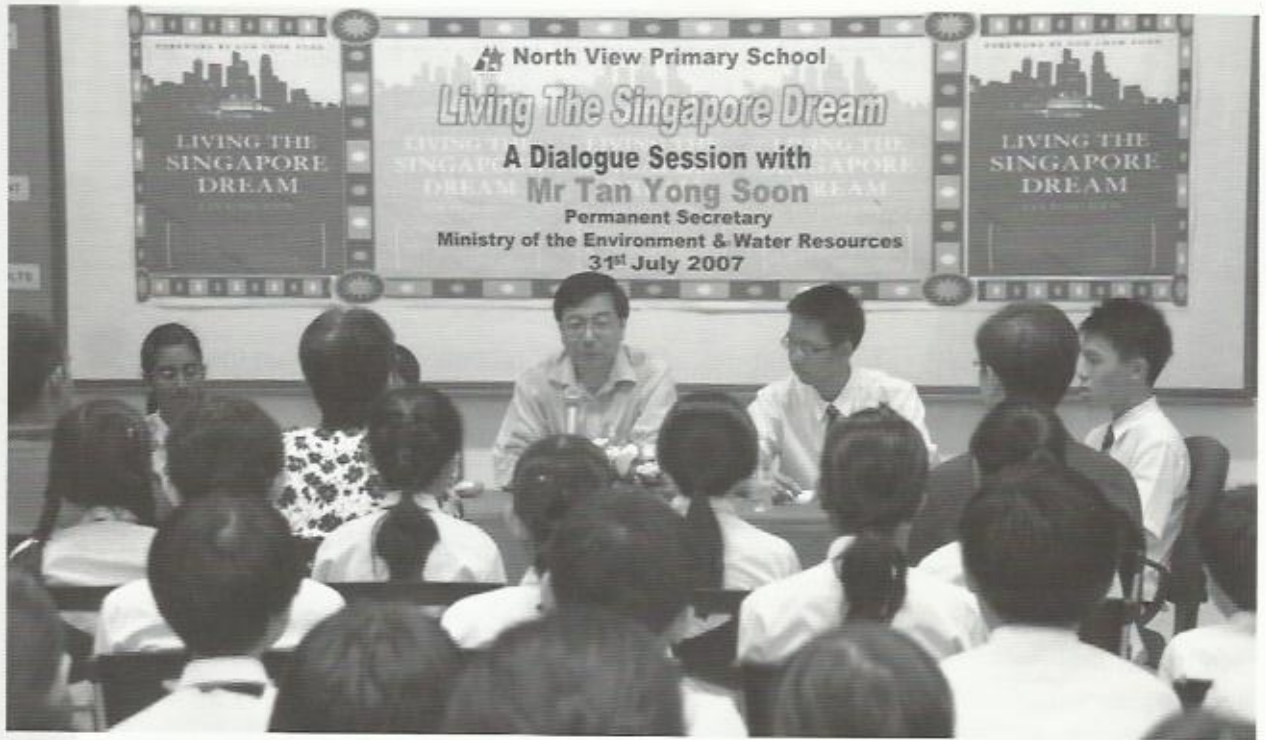
olds to ask such "thought-provoking and in-depth" questions. In addition, the RI prefects also answered questions of the pupils with regards to examination stress, time management and how to prepare for examinations, the smart way. As a token of our appreciation, a compilation of pupils' reflections was presented to Mr Tan.

Our pupils' reflections tell us that their lives have been positively impacted, and here are some examples of their work:

Shiang Chen Ting, Primary 6

'Living The Singapore Dream' book is indeed an inspiring book written by Mr Tan Yong Soon. It clearly depicts how the entrepreneurs of Singapore strived hard to achieve their successes. I was first introduced to this book by my school's Principal, Mr Ng. Reading their stories, I realized that there was one common trait among them: they did not yield to setbacks and their "never-dying" attitude really impacted me. When I heard news that Mr. Tan Yong Soon had agreed to visit our school for a dialogue session, I eagerly volunteered to participate in it. I thought that I could bring home with me some valuable insights of life, and indeed the session proved to be a fruitful one. Many of my friends have asked questions and the replies given by Mr. Tan had a deep influence on me and opened my mind to many things that I had deemed not possible in the past.

I used to think that 'Work hard, play hard' was not possible. I thought that in order to perform well in academics, we must forfeit our play-time. However, a classmate of mine asked an RI pupil if it was possible. He replied yes, for he told us that it was just a matter of time management – which one do you want to spend more time on? Revision and putting in your full concentration on it is certainly very important, but playing at



Mr Tan Yong Soon and RI student leaders in dialogue with North View Primary pupils.

intervals is also vital. I began to believe that once I have worked hard enough, I should take a break so that I can rejuvenate only will I do better in my work. If I force myself to continue even though I could not, then the rate of productivity will decrease. However, I also feel that too much play can be a distraction. I have tried balancing the time between work and play and found that I can function better.

A pupil asked Mr Tan which is the proudest moment of his life. He thought deeply for a while, then answered that he really had no "proudest moment" in his life. In his opinion, he felt that we should celebrate every single proud moment of our lives. Being proud about something does not mean just a great feat. Even little things in daily life, like a praise or a prize, is worth celebrating.

I often wonder if I could really make an impact on society? Then Mr Tan mentioned that, in order to achieve something that we want, we must first have the courage to dream. He told us never to be afraid to dream big, for

successes often start from dreaming. If we don't even have the dream and the target set in mind, how do we aim to get it and improve ourselves? Thus, I feel that, everyone must have an interest from young and develop our dreams from there. This is a dream which belongs to nobody except myself. I feel that this book is a rousing book and everyone who has read it would surely benefit from it. Although I am still a little young and the stories are a little bit difficult to fully grasp, I feel that I have gained a lot.

Isabel Cheung, Primary 6

We received the book before the June holidays and we were told to read a certain chapter and do a reflection on a character. It came as a burden, as extra homework, at first. But it all changed as we got to know more about the character's ups and downs through discussions. We had numerous questions forming in our minds on how these friends and classmates of Mr.

Tan managed to embrace life in the midst of dealing with numerous challenges. Nothing beats meeting the brainchild behind the amazing book and *Wow!* We get to ask the man himself in the dialogue session on 31 July 2007.

During the dialogue session, Mr. Tan talked about adapting to changes and how the way you react to things which had happened before shape and enrich your life experiences. Somebody in the crowd asked how he felt when his friend died. Most of us were expecting the usual answer- sad and nothing more. But the answer he gave made me realize that accepting things is a very important ingredient in order to adapt to changes. And as these things happen again and again, you will learn to be calm amidst the grief, of course. I tried applying it to my life, and it turned out great. I learned to let go of things which were holding me back, and I got to learn new things by doing that.

Ang Ying Mei, Primary 6

Before the dialogue session, I was quite nervous as I didn't know what Mr. Tan is like, and what his reaction would be to the questions posed. After coming up, close and personal with him, it was like a big load lifted off me. His friendly disposition was in itself a great ice-breaker.

After the interesting dialogue session with Mr. Tan and the RI boys, I realized that life is like water: the water evaporates, and then the water vapour condenses into water droplets, gather as clouds, and finally fall back to earth as water again. I realized enjoying what I am doing is critical, even if it means going through a routine repetitively,

the repeated act can build my patience.

In the past, I used to think that good time management only meant planning my time properly, but it has completely changed my perception now; good time management allows me to work and also play hard. Working hard and playing hard seems possible now; compared to before, as it is just a matter of putting your best into your work first, then enjoying the fruits of your labour later. Criticism is a punch to the heart, but we should not take them personally. Instead, we should try to find out what had gone wrong and improve from there. I saw from an example in the book that we must take responsibility for all that we choose to undertake. That will enable people to see what attitude we have towards things that matter.

Failure allows me to pick myself up and prepares me for greater challenges in life, as life is full of ups and downs. At times, I was afraid to face up to the unpleasant things that happened. I even wished that I could just erase the memories from my mind but I realized in doing so, I was getting rid of the most valuable life lessons that I could never get if I didn't allow myself to fall. Through my six years of studying, I am always thinking of the future and often wonder: "What is going to happen?" I realized that I would firstly have to dream big (setting a goal). I truly feel that this book is very motivating, and discovered the meaning of 'life' in it.

Ashley Wee, Primary 6

The journey began when our principal, Mr. Ng Yeow Ling introduced the book to all the Primary 5 and 6 pupils. Each of us was to buy a copy of Mr. Tan's



book, read it and do a reflection on it during the June holidays. Inspiring, motivational and useful; that's how I would describe the book. It provided inspiration for in me to try my best in whatever I do. It provided motivation for me to carry on whenever I am down. Last but not least, it was useful in a way that valuable lessons could be learnt from the stories of Mr. Tan's friends.

Our teachers selected a few pupils from each class to be involved in the dialogue session. Training sessions soon followed and each of us was to prepare a few burning questions to ask Mr. Tan. Time flew by and soon it was time for the dialogue session.

There was one particular part about making friends that Mr Tan Yong Soon said that really spoke to me. Friends are very important and most friendships are built during primary school days. One can make good friends and maybe even some bad friends exist too. "But don't be afraid to make friends," Mr. Tan said, "There might be a particular person in your class that has an idiosyncratic way of behaving that you don't really like, but before you even make the effort to get to know him, you decide not to make

friends with him. Down the years, you might meet that particular person and you try to say hello but it's difficult to, when for six years you have never even said a single word to him."

After the interesting dialogue session with Mr. Tan Yong Soon, I learned that success does not only have one path leading to it. Instead, it has many. To get a chance at it means that you take the path that you think will be good for you. Follow your heart. Take the risk. It might just pay off one day. If you took the risk and for some reason failed, have the 'never say die' spirit and try again, until you succeed. You'll never know until you've tried. When you again for some reason failed, do not be disheartened. If you know that you've tried your best and gave it your best shot, you won't be so disappointed. To round this reflection up, I would like to say that I enjoyed reading the book and enjoyed the dialogue session even more. It was a meaningful dialogue session with an author of such an inspiring book.

It must never be forgotten that the purpose of instruction at school is education. That is, the development of man from within, freeing him from that conditioning which would prevent him from becoming a fully integrated human being."

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Educating the Whole Child in a Child with Special Needs: What we know and understand & what we can do

Dr Noel Chia Kok Hwee

What do we know and understand when we say 'educate the whole child?' According to Noddings (2005), most of the time, we mean "to accomplish academic goals with the task of pursuing the physical, moral, social, emotional, spiritual, and aesthetic aims that we associate with the *whole child*" (p.30). What do we mean the *whole child*? Any child is a *whole* person – not a mere collection of attributes, some to be addressed in one place, and others to be addressed elsewhere. What if a child has some special needs? Is he/she still considered *whole* or *less-than-whole* as an individual? Can we still educate the whole child with special needs? While there are more questions we can ask than answer them, in this article, I shall attempt to address the last question though there is no one straight forward answer to it.

When we as educators "recognize that children are *whole* individuals, the temptation arises to describe the *whole* in terms of collective parts and to make sure

that every aspect, part, or attribute is somehow 'covered' in the curriculum" (Noddings, 2005, p.31). Let me illustrate what I mean by that. When we consider children as moral beings, we must provide them character education program. If they are artistically or musically inclined, we provide them arts classes. When their physical fitness is on the decline and many have become obese, physical education as well as nutrition classes is strictly observed and implemented. What happens next? In no time, we begin to complain that our curriculum is overloaded!

If we say that schools and other social institutions bear the responsibility for nurturing the *whole child*, we must recognize that different institutions will have different emphases. Schools will take greater responsibility for teaching the four R's; medical clinics, polyclinics and hospitals for health checkups and vaccinations; families for food, shelter, clothing and up-bringing; and places of worship for spiritual instruction and enlightenment. No institution on its own is able to completely meet the needs of the *whole child*, but a collaborative effort of various social institutions will stand a better chance in achieving it.

However, the needs of a child cannot be rigidly compartmentalized. The massive human problems of any society demand a holistic treatment. For instance, medical clinics and hospitals in the United States are working with lawyers, social workers and insurance agents to improve better health services for both adults and children (Shipler, 2004). We know that healthy families do much more than just feed and clothe their children; good



parenting is not to be neglected if we want our children to grow up to become respectable members in our community (Flick, 1996). Similarly, schools must be concerned with the total development of children under their charge (Noddings, 2005).

How do we go about educating the whole child?

Let us first of all look at the normal child – the whole normal child – and by this, I mean the child has no medical ailments or learning disabilities of any kind. Such a child is the dream of every parent: intelligent, healthy, diligent, well-behaved, and so on ... a perfect individual! However, we must not forget that not every child is wholly normal. Like everyone else, a child has his/her own strengths and weaknesses. A child with an average academic performance is described as normal or simply, able, while a gifted or talented child is considered to be highly-able. However, a child with mental retardation is seen as disabled, who can be either an educable or a trainable disabled. Then there are also those slow learners whom we look upon as less-able. What do these terms “highly-able”, “able”, “less-able” and “disabled” mean to us as educators when we talk about educating the whole child?

The fundamental role in educating the whole child regardless of his/her ability, as I see it, is to ensure that the child undergoes proper personal and social development by promoting self-awareness, self-esteem (which includes various self-concepts), relationship with others, independence, and social responsibility in him/her (Cramer, 1998; Duck, 1994). The reasons for this personal and social development above all the other areas of development are twofold. Firstly, the child's development as a whole person living in this society is the utmost concern of any educator. Secondly, it sets as the platform for educators to promote other types of learning. While the former concerns about maximizing the potential of any child (highly-able, able, less-able or disabled) as a learner so that the child can grow up to become a good and useful citizen, the latter focuses on learning as a life-long process. It is the latter that I am more interested. Our clear understanding of the learning process is the first step to know how best and what we can do to educate the highly-able, able, less-able or disabled child as much as he/she can learn or be trained as a whole or complete person. In this way, the child's potential/ performance is stretched to the best of his/her ability.

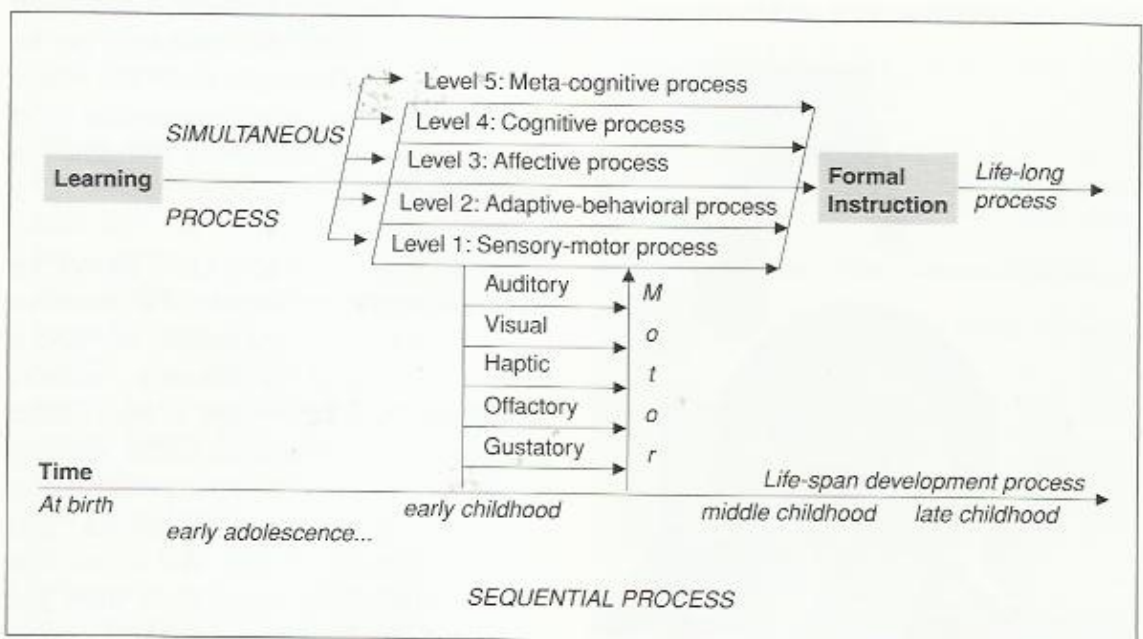


Figure 1: The Learning Process

What do we understand about the process of learning?

To know how a child learns, we need to know and understand what learning is all about. A lot has already been written and published in literature (e.g., Halford, 1993; Skinner, 1965) on the various theories and models of learning and in this article I shall not delve on them. I would define in simple terms learning as a life-long and life-span developmental process that involves several levels of sub-processes simultaneously and sequentially, moving gradually towards formal instruction (see Figure 1).

When a toddler learns, learning is seen as 'caught' where very little effort is needed to teach him/her. As the toddler grows older, learning is no longer a spontaneous process. Teaching has to come in and learning becomes a deliberate process. In this instance, we say learning is 'taught.' Many educators believe that there is this critical or sensitive period when a child learns best between 2 and 5 years of age, and thereafter, the learning performance starts to slow down (Santrock, 1995).

At the first level, learning is a sensory-motor process involving our five senses – auditory (ears), visual (eyes), haptic (skin), olfactory (nose) and gustatory (tongue) – in addition to the motor process (gross and fine motor skills).

- Learning as an auditory process can be divided further into aural sub-process and oral sub-process. The former involves hearing (receiving auditory input but not necessarily registering in the mind) and listening (careful reception and registration of auditory input). The latter involves talking (chatting without thinking through) and speaking (thinking before saying anything).
- Learning as a visual process involves what we observe (paying attention to details) in our surrounding and later how we perceive based on our interpretation of our observation.

- Learning is a haptic process involving touch (tactile) but it also includes proprioceptive sense, which is the correlation of unconscious sensations from the skin and joints that allows conscious appreciation of the position of the body. For young children, an awareness of oneself (e.g., body) is an essential step in knowing one's physical self before venturing out into the external world.
- Learning as an olfactory process involves smell which plays an important role in sensing out food or alerting us to some danger lurking around. Scent is one learning process a young child acquires early in life to identify his/her mother.
- Learning as a gustatory process involves eating (gobbling food) and tasting (savoring food). Young children learn about new objects such as toys by putting them in their mouth to bite or taste.

When motor skills are added to each of these sub-processes of the sensory process of learning, we have learning as a sensory-motor process in the following ways ... as

- an auditory-motor process (e.g., as in dictation and spelling, listening comprehension);
- a visual-motor process (e.g., as in completing tessellations, handwriting);
- a haptic-motor process, also known as kinesthetic-tactile process (e.g., as in physical education);
- an olfactory-motor process (e.g., as in a chemistry experiment to find out if ammonia is present since it gives a pungent smell); and
- a gustatory-motor process (e.g., as in a cookery class to taste if the soup in preparation is plain or too salty).

At the second level, learning is an adaptive behavioral process which represents the conceptual (e.g., receptive and expressive languages, reading and writing), social

(e.g., responsibility, interpersonal interaction) and practical (e.g., dressing, eating, toileting) skills that a child has to learn in order to be able to function in his/her daily life. Significant limitations in adaptive behavior may impact one's daily life and affect the ability to respond to a particular situation or environment.

At the third level, learning is also an affective process as the child grows up not only interacting with his/her parents alone but also with others such as cousins, friends and even strangers (Holden, 1997). Socio-emotional relationships with others are constantly being established, changed and/or broken by the child as his/her social circle evolves over time (Hinde, 1987). It is during this process of learning that a child finds out what, who and how he/she learns best with someone – normally an adult (e.g., a childcare teacher) – whom he/she knows, understands and trusts. Only then is the child more willing to be taught (rather than being compelled) to read, write and count ... and as the child grows older he/she learns even more, such as to love, to get attached and so on (Karen, 1998).

As the child grows older or goes to a primary school, formal education comes in. At the next or fifth level, learning is now more of a cognitive process: learning to sing, read, spell, and write; learning to count and problem-solve; learning to pay attention in class during lesson; learning to ... the list goes on. A good concept formation (e.g., addition and subtraction) is best achieved if teaching is properly carried out in the way that best suits the child's cognitive learning needs and style. However, in a regular classroom where the number of children is large, there will be several of those who are unable to follow instructions or fail to understand what has been taught. There is a need to understand such children and their learning difficulties if a teacher hopes to educate them as whole beings or learners. The Learning Support Program is one example of how the mainstream education system is coping to educate the whole child with

special needs so that he/she can learn and acquire the necessary knowledge and skills needed to succeed in studies. In another instance, the subject-based banding (i.e., foundation, standard and higher levels) system that the Ministry of Education is implementing in primary schools is yet another good attempt to educate the whole child according to his/her level of ability (aptitude) to perform well in different subjects so that the child's potential can be maximized.

At a higher level, learning is more than just a cognitive process. It is also a meta-cognitive process which concerns the child's understanding of what he/she is learning and it also includes self-monitoring of his/her progress in learning (Goswami, 1998).

How to help a child with special needs to learn as a whole child?

Learning, as we can see, is a complex process with several sub-processes consisting of many different skills and it takes place sequentially and simultaneously. Anything can happen at any point during the process of learning resulting in all kinds of learning problems or difficulties.

Every academic activity a child participates in class requires strong, efficient underlying learning skills if it is to be accomplished successfully (Brown, 2000). Many children become frustrated and find schoolwork difficult because they do not have the learning skills and strategies required to process information properly. For these children, any additional school/homework, or special attention not specifically addressing the underlying learning skill weakness, will only intensify their learning problems or difficulties and compound their frustration.

Learning skills are developed through the following stages (see Figure 2).

At the foundational level, learning builds on a child's innate abilities which are inherited

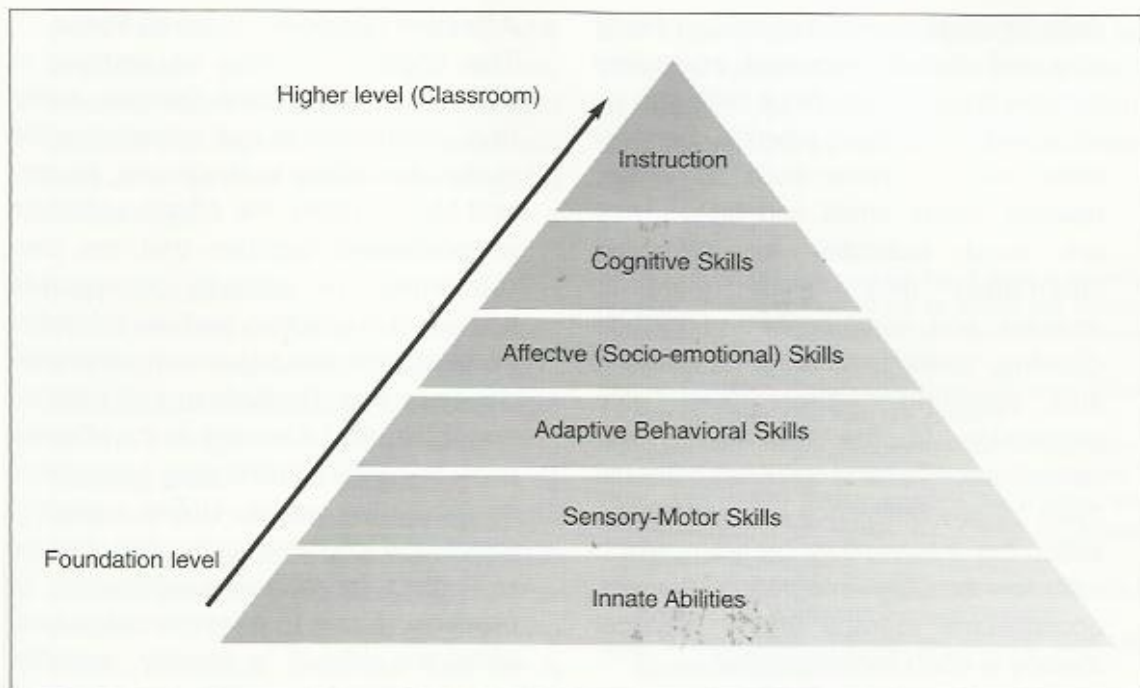


Figure 2: Developmental Stages of Learning Skills

and genetically coded at birth. Very few children can learn anywhere near their maximum capacity as established by their innate skills. This is why both study and practice rewards most children with significant progress made in learning and performance. The flow of their learning development progresses through the stages of sensory-motor skills, affective (socio-emotional) skills, cognitive skills, and finally results in their ability to assimilate formal instruction in a regular classroom situation. A deficiency in any one stage can result in problems in the subsequent dependent stages.

While our schools continue to focus on academic instruction, they seldom recognize that not all children possess the fundamental learning skills required to efficiently process and understand information presented through academic instruction. Without the appropriate level(s) of learning skills in place, increased academic instruction and remedial lessons can do nothing to improve a child's learning ability. In fact, little is accomplished to help these children learn, and hence, the failure to educate them as whole individual learners. Low self-esteem sets in and maladaptive behavior begins to manifest itself in the

child concerned. Soon, off-task behavior and misbehavior become a frequent issue of concern to be reckoned with by both teachers in class and parents at home (Sarason & Sarason, 1998). Let us take a closer look at each stage of learning skills and should there be any deficiency, to recommend appropriate actions to be taken so as to educate the whole child in the child with special needs.

- **Innate Abilities**

At the foundation of the learning process are a child's innate or genetically determined abilities. His/Her upward ceiling in performance is defined by innate abilities, but how near the child comes to performing at those upper limits is determined by other elements (e.g., interest and motivation) necessary to learning (Franken, 2002). It is these innate abilities that a child is assessed (e.g., an IQ test) to determine if he/she is highly-able, able, less-able or disabled in his/her performance as a learner.

- **Sensory-Motor Skills**

The sensory-motor process of learning is developed on the foundation of the child's innate abilities. It covers sensory and motor skills which are partially

determined by genetic code and partly acquired through repeated interaction with the environment. Such skills can be improved with proper practice. Sensory skills refer to those such as vision, hearing, touch, smell and taste. They are most essential for receiving information. Motor skills relate to muscles and movement, and include crawling, walking, running, handwriting and speaking. Motor skills give expression to the information our senses receive and process. Should there be any deficiency in any of these skills, the intervention program which includes sensory integration therapy, occupational therapy and/or physical therapy is often recommended.

- **Adaptive-Behavioral Skills**

The adaptive-behavioral process of learning refers to "the effectiveness or degree with which an individual meets the standards of personal independence and social responsibility expected of his/her age and social group" (Grossman, 1973, p.11). It covers a wide range of skills at different stages of development. During infancy and early childhood, the adaptive-behavioral process of learning covers sensory-motor skills (covered earlier; see above), communication skills (speech and language), self-help skills and socialization skills (interacting and getting along with others). During the late childhood and early adolescence, it covers application of basic academic skills in everyday life activities, application of appropriate reasoning and judgment in mastery of the environment, and social skills (participation in group activities and interpersonal relationships). Finally, during late adolescence and adulthood, it concerns vocational and social responsibility and performance. Children with adaptive-behavioral deficits can be helped through applied behavior analysis that involves systematically arranging environmental events to produce desired changes in their behavior.

- **Affective (Socio-emotional) Skills**

The affective process of learning is concerned with good "people skills" (e.g., interpersonal and communication skills). According to Kratiwohl, Bloom, and Masa (1964), the affective domain encompasses qualities that are prerequisites for socially acceptable behaviors in children, such as desirable interests, attitudes, values, and character development (including self-esteem and self-image). Learning in the affective domain is often challenging because of its subjective nature. Unlike sensory-motor and cognitive skills that can be evaluated by written examination or practical testing, affective/behavioral skills are difficult to identify, quantify, and assess. Intervention approaches to remedy deficits in this area of concern include social skill training, behavior modification, play therapy and counseling.

- **Cognitive Skills**

The cognitive process of learning allows children to process the sensory information they receive. These include their ability to analyze, evaluate, retain information, recall experiences, make comparisons and determine action (Giles, 2005). Although learning as a cognitive process has an innate component, its bulk of cognitive skills are learned or deliberately acquired (e.g., by being taught). When this development fails to take place naturally, cognitive weaknesses are the result and they diminish a child's ability to learn, and are difficult to correct without specific and suitable intervention. Cognitive skills can be practiced and improved with the right teaching. Using the appropriate therapy (e.g., special needs or educational therapy and remedial teaching), the brain of a struggling learner can actually be "rewired" and cognitive function can be restored or enhanced (Goswami, 1998). While weak cognitive skills can be strengthened, normal cognitive skills can be enhanced to increase ease and

performance in learning. That is why enrichment programs (e.g., abacus, phonics, speech and drama) offered outside the regular school system still play an important role in educating the whole child.

• Formal Instruction

When we talk about formal instruction, it includes academic subjects (e.g., algebra and reading) that are dependent on the strength of a child's underlying learning skills if these subjects are to be acquired successfully and easily. While the knowledge base of each academic subject can be expanded, without the proper foundation of earlier learning skills, academic progress can be a difficult and frustrating challenge, especially to a child with special needs. Remedial teaching and intensive private tuition may become necessary to help these children to cope with their learning.

Concluding Remarks

Let us go back to our question posed at the beginning of this article: Can we educate the whole child in a child with special needs? While the answer is not a complete yes, it can still be done, depending on our experience and training, and involving more effort on our part to remedy the deficits at different developmental stages of learning skills. Until we have a clearer understanding of what a whole child means in a child with special needs, any attempt to integrate children with special needs into the mainstream education system might meet with difficulties and even disappointment. However, this does not mean that integration of children with special needs in regular schools is not possible, just that we need to do more homework before implementing such an educational initiative. Perhaps at this moment, what we ought to do is to reach out to parents of children with special needs. They are the people, who need to be educated first, especially to accept their exceptional children as who they are

and to seek early intervention as soon as possible rather than remaining in a state of denial or going round to seek miraculous cures which are not even there.

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Life Skills@NCPS

Yvonne Loh, Lim Pek Wee, Lau Fatt Yong & Molly Soong

Nan Chiau Primary strongly believes that effective mastering of life skills is a major requisite in the building of students' character and to prepare them for lifelong learning.

Leadership's Vision and Commitment

The school adopts an integrated approach towards achieving the school's Character Development vision – "Grooming NCPS pupils into Confident, Active and Responsible individuals – able to empathize with the less fortunate".

The Character Development vision is aligned with the school vision, school mission and Social Emotional Learning (SEL) framework. Character Development forms a vital component of a comprehensive school programme (CARE).

What is CARE?

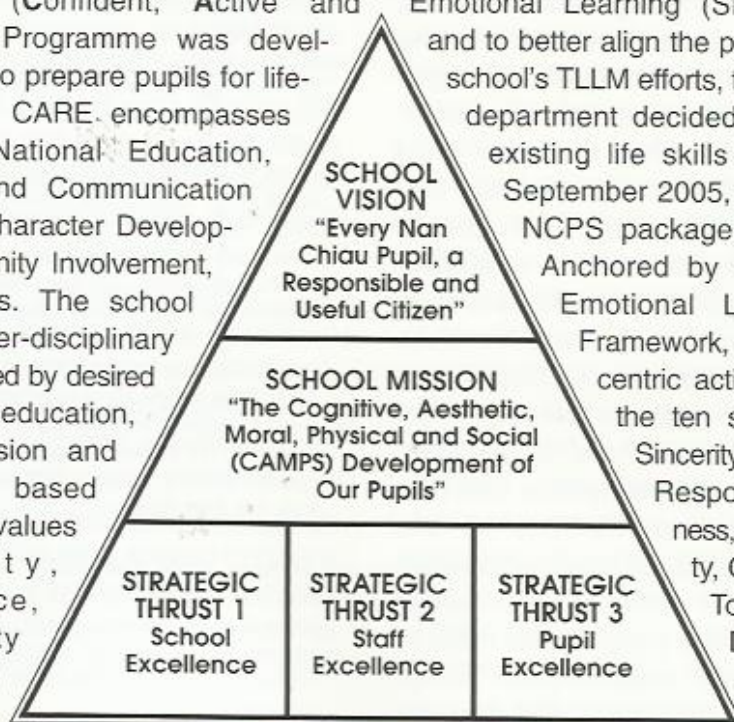
The CARE (Confident, Active and Responsible) Programme was developed in 2003 to prepare pupils for lifelong learning. CARE encompasses Life Skills, National Education, Information and Communication Technology, Character Development, Community Involvement, and Aesthetics. The school adopts an inter-disciplinary approach, guided by desired outcomes of education, the school vision and mission, and based on four core values (Sincerity, Perseverance, Responsibility and Usefulness) and six char-

acter values (Courtesy, Honesty, Compassion and Tolerance, Self-Discipline, Integrity and Loyalty).

Life Skills@NCPS – A teacher-developed curriculum

In 2001, Nan Chiau Primary, like the other schools, selected lessons for the various levels from the life skills package developed by the Psychological Guidance Service Branch (PSGB). Three lessons were selected per term per level. Form teachers were guided to infuse the different non-core subjects in the teaching of these lessons during designated assembly periods in class.

With the introduction of the new Social Emotional Learning (SEL) Framework and to better align the programme to the school's TLLM efforts, the Pupil Welfare department decided to revamp the existing life skills programme. In September 2005, the Life Skills@NCPS package was designed. Anchored by the new Social Emotional Learning (SEL) Framework, it contains pupil-centric activities, based on the ten school values of Sincerity, Perseverance, Responsibility, Usefulness, Courtesy, Honesty, Compassion and Tolerance, Self-Discipline, Integrity and Loyalty.



Life Skills@NCPS was launched in 2006. The school strongly believes that effective mastering of life skills is a major requisite in the building of students' character and to prepare them for lifelong learning. The delivery of life skills lessons is made more interactive in nature, involving the use of Multiple Intelligence, PBL, Inter-disciplinary Approach and Experiential Learning. The introduction of the SEL framework allows for a more holistic approach and calls for a change to the school's existing life skills programme. With TLLM in mind, the teaching package was designed to make learning more authentic and experiential for the pupils and to engage them more in independent learning. Each level has 12 lessons planned thematically. Teaching of these skills is done during curriculum time by the Form Teachers. At the end of each lesson, pupils and teachers will complete their feedback forms respectively.

Underlying Pedagogical Principles/Theoretical Underpinning

Inter-Disciplinary Approach

The Pupil Welfare department adopts an

inter-disciplinary approach in designing the teaching package, as it is important for pupils to see links among the subjects they are learning. Knowledge in the real world is holistic in nature and cannot be easily compartmentalised into specific areas of study. The teaching of life skills is seen as "an integrated study where children broadly explore knowledge in various subjects related to certain aspects of their environment" (Humphreys, Post and Ellis, 1981). As suggested by Shoemaker (1989), it should include a combination of subjects with relationships among concepts, sources that go beyond textbooks and thematic units as organising principles.

Multiple Intelligences

Recognising that the pupils in our classrooms are multifaceted and have many abilities, the teachers are encouraged to use varied creative teaching approaches in their delivery of the package. When the various activities were being designed, Gardner's theory of multiple intelligences (linguistic, logical-mathematical, musical, spatial, bodily-kinesthetic, interpersonal, intrapersonal, naturalist) was put into



Our belief in providing a holistic education (CAMPS – Cognitive, Aesthetic, Moral, Physical and Social).



Our school mission is displayed at the main foyer area.

practice, so that the teachers can better cater to the different needs of the pupils (www.mitest.com/omultint.htm).

Problem-Based Learning

At Primary Six, the teachers engage their pupils in Problem-Based Learning. The teachers become coaches and facilitators with the pupils solving the given problems themselves - a move towards Teach Less Learn More (TLLM). Diversity is also promoted as there is no one formula for pupils' approaches to the problem.

Experiential Learning

It is "education that occurs as a direct participation in the events of life" (Houle, 1980, p. 221, quoted in *Smith, 2003*) and researchers have shown that it can lead to genuine learning that will be meaningful and long-lasting. Using the Life Skills@NCPS package, the teachers organise and facilitate direct experiences of pupils to engage them in learning.

Description of Pedagogical Approach and Processes Involved

The Life Skills@NCPS package is thematic-based. There are 12 lessons for each level, from Primary 1 to 6 (P1 - Self, School and Community; P2 - Character building based on the 10 school values; P3 - National Education; P4 - Social skills; P5 - Coping

strategies; P6 - Growing up). The teaching package for each level consists of a detailed lesson plan, teaching resources, activity sheets. The feedback forms are specially designed for that specific lesson. The teachers' feedback forms are uploaded into the e-class file in the school portal for sharing purposes.

It seeks to develop pupils in the 5 core competencies of self awareness, social awareness, self-management, relationship management and responsible decision-making. The inter-disciplinary approach is adopted when designing pupil-centric activities to engage the pupils in independent learning, allowing the teacher to take on the role of a facilitator, as the 'expert' for consultation and not as the 'expert' taking the centre stage. With teachers adopting varied creative teaching approaches, such as Problem-Based Learning, life skills lessons become more authentic and experiential in nature and engage the pupils in active learning.

Impact on Pupils

There is more interaction between pupils and teachers. Pupils can better create knowledge and share this knowledge, so as to learn from one another. The school has moved away from the conventional way of teaching and learning Life Skills. The Life Skills@NCPS package is integrated

into daily curriculum and is thematic based. It provides holistic development of all students in Nan Chiau, and imparts life skills to students in a fun and creative way. It is an integration of all core and non-core subjects. It is designed to cater to the specific needs of our students and helps to promote a culture of continual learning beyond the school environment. The infusion of aesthetics and other subjects' areas in the teaching of Life Skills ensures that the life skills lessons come alive and learning becomes authentic.

With life skills lessons more activity-based, pupils are more interested to learn. They engage in more self learning and learning becomes more meaningful and long-lasting.

Teachers work better as a team because of the integration of subjects. Students are introduced to different innovative learning strategies. Outdoor experiential learning stimulates pupils' thinking by creating authentic learning experiences beyond classroom. Learning through interaction with peers, under the guidance of a teacher, is a concerted effort of our teachers towards TLLM. Challenging students with project work excited them to explore and discover on their own. This makes them responsible for their learning which is aligned to the school vision: "Every Nan Chiau pupil a responsible and useful citizen."

Impact on the School

Life Skills@NCPS has opened the door for the school to showcase her innovative practices at the national level and to foreign visitors. At Teachers' Conference 2006, the school presented a paper on the teaching of lifeskills. During the MOE Excel Fest 2006, the school presented a Classroom Experience for teachers in the North Zone Schools. At the National Innovations and Quality Circles (NIQC) Convention 2006, Life Skills@NCPS received a Gold Award.

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Yvonne Loh, Lim Pek Wee, Lau Fatt Yong and Molly Soong are teachers in Nan Chiau Primary School.



Our pupils say the national pledge with pride.

Developing a Community of Inquiry in the English Classroom

Christine Lim & Rita Zamzamah Ikeda



It has always been a challenge for us, literacy educators, to create school literacy practices that connect meaningfully to our learners' wider world beyond the classroom. Just like other well-intentioned educators, we would like to equip our learners with the necessary skills and tools to be effective thinkers so as to be relevant both in the years of schooling and the years beyond. The English Language Department of Catholic High School has thus crafted a curriculum that placed thinking firmly at its centre with the introduction of *Philosophy for Children*. It is our goal to nurture good thinkers in the English classroom by encouraging children to inquire together and create a culture of reasoning that taps onto children's innate curiosity and sense of wonder.

The Philosophical Approach To Learning

Modelling after Matthew Lipman's *Philosophy for Children* programme, our programme departs from traditional philosophy courses, in that it does not impart a history of ideas from famous philosophers in various eras. Rather, it builds on the essence of inquiry in philosophy to inculcate creative, critical

and reflective thinking that develops reasoning in an open-ended and rigorous fashion. Beyond intellectual rigour, *Philosophy for Children* allows for affective development in learners. Learners are not only encouraged to be intellectually cooperative, but also mutually respectful. The programme thus imbues in our pupils the habit of active listening by recognising the existence of many possible answers to a given problem or issue.

We believe that the benefits of introducing philosophy to our pupils come through active engagement in rigorous philosophical inquiry in a community. By immersing pupils in an environment that encourages them to inquire and reflect, the programme aims to touch the hearts and engage the minds of our pupils. Most importantly, it aims to prepare them for life.

Theoretical Underpinnings

John Dewey (1933) has been advocating the idea of inquiry in education since the 1930s. He emphasizes that learning to think reflectively should be the primary goal of education. Dewey believes that reflective thinking should be conscious, active and persistent. Yet, Dewey's notion

of reflective thinking does not take into account non-routine thinking that promotes creativity and philosophical thought.

According to Matthew Lipman, excellent thinking should extend beyond reflective thinking to include creative and complex thinking. Critical and creative thinking "aims not as justified belief or literal truth, but at the refashioning and creation of meaning – at imagining possibilities, developing concepts, and enlarging ideas in many directions" (Cam, 2003, p.8). Lipman further argues that it is through philosophy that such thinking could be best promoted in the classroom. He thus developed the *Philosophy for Children* programme in 1986 which has since made their way into schools all over the world such as those in Australia, Canada and New Zealand.

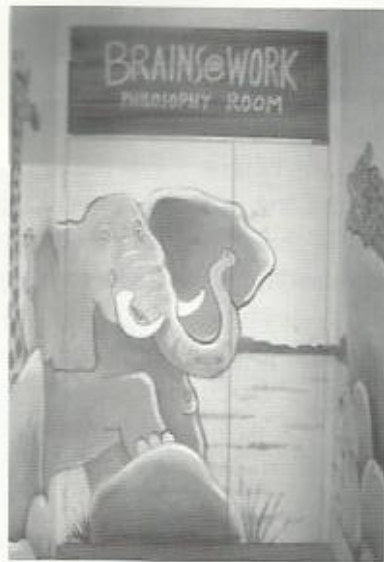
Philosophical Inquiry In The Classroom

The *Philosophy for Children* programme in Catholic High School engages pupils in philosophical inquiry through the teaching of philosophical questioning and exploration of concepts within a community of inquiry.

Teaching Of Philosophical Questioning

Although educators concur with the importance of having pupils ask questions, the teaching of questioning techniques has often been neglected. While there are pupils who do raise their hands and pose questions in the classrooms, the questions are often limited to routine questions that do not probe into deep thinking.

The programme in Catholic High first teaches philosophical questioning explicitly. Using Philip Cam's *Question Quadrant*, pupils are taught various types of questions and how to ask philosophical questions that invite reflection and



discussion. For instance, when pupils explored the topic of multiculturalism in a reading passage, the teacher leads pupils to raise philosophical questions such as "What defines a culture?" and "What is acceptance?". Such contentious questions depart from traditional routine questions in that they call upon pupils giving standard answers or established facts.

Exploration Of Concepts

Conceptual exploration is fundamental in the *Philosophy for Children* programme. In a typical lesson, pupils get into a philosophical discussion by exploring conceptual boundaries, discovering criteria and uncovering conceptual connections. As Philip Cam points out, it is not enough to just teach specific concepts. It is also essential to teach children the "kinds of mental habits that promote conceptual development" (Cam, 2003, p.66). In order to facilitate effective thinking, teachers employ conceptual tools developed by Philip Cam and Clinton Golding. In doing so, we have seen pupils challenging their own definitions of concepts and demonstrating a better ability to think for themselves.

In our school's customized philosophy curriculum, the Primary Three syllabus covers concepts such as cooperation, trust and respect, while the Primary Four syllabus deals with dreams and realities, freedom and homelessness. The concepts covered by the Primary Five pupils include right versus wrong, pride and courage. These concepts are in line with those covered in the pupils' instructional texts.

Building A Community Of Inquiry

Setting up a Community of Inquiry is central to the *Philosophy for Children* programme as it is through thinking together that pupils are made aware of their own thinking processes.

A Community of Inquiry encourages pupils to share their thoughts and views about a given topic. Pupils will need to substantiate their ideas with convincing reasons. At the same time, they are put in positions where they need to listen actively in order to build on the responses of others. It is through this that they learn to be respectful of others' opinions. Pupils thus develop confidence and intellectual courage to put forward their own views in a group. Such classroom discourse seem to entice even the quietest pupil to participate in the community. In this way, desirable cognitive and affective outcomes are acquired naturally and contextually, rather than being taught explicitly.



Going further, the school is embarking on an action research in collaboration with the Curriculum and Planning Development Division to investigate the impact of intergenerational *Community of Inquiry* on the richness of classroom discourse.

Teaching Materials

Children's literature lends itself as an ideal platform to stimulate philosophical imaginations. Tapping on the rich source of philosophical themes in such narratives, lessons are crafted to allow pupils to see consequences, think in sequence, make connections and distinctions, explore alternative, solve problems, uncover assumptions and draw reasonable conclusions.

Besides using Philip Cam's Thinking Stories that are specifically written for the teaching of philosophy, children's story

books with appropriate themes are also being used in the classroom. Beyond texts, contemporary songs that are popular amongst our pupils are also being used. For instance, the song 'Where is the love?' by the pop group *Black Eyed Peas*, allows for discussion on the topic of animosity and truth or happiness. We also use cartoons such as *The Simpsons* and *Dilbert* to whet our pupils' interest for further philosophical inquiry as they are rich sources of social commentary and ethical and existential insights.

Conducive Learning Environment

We believe that a suitable physical arrangement is essential in a philosophy lesson. As it is important for every child to be able to see every other child's face, pupils are seated in a circle throughout the discussion. The Philosophy Room, *Brains@Work*, is equipped with customized furniture to allow for a full class discussion, as well as discussions where pupils are put into small groups.

Conclusion

Although the Philosophy for Children programme in Catholic High School has been in place for a short two years, we have received positive feedback from parents, teachers and pupils. Teachers and parents notice significant improvement in the quality of pupils' responses and thoughts. Pupils are also observed to display greater intellectual courage and are more mutually respectful of diverse opinions. As one of our Primary Four pupils aptly summed up, "Philosophy has taught me to think deeper and I could open up and say what I think, instead of being afraid of doing so."

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Service Learning Through Social Entrepreneurship

Tan Kok Wah & Tan Li May



"Anyone can serve, because we all have something to give"

– Sharon Davis

Background to Service-Learning @ Greendale Secondary School

What is Service-Learning (SL)?

SL originated from the United States and was introduced in Singapore by the National Youth Council (NYC) in 1999. By 'service,' it means *meeting real community needs* while 'learning' denotes *self-development*. SL is therefore a key strategy to making community service meaningful both to the 'giver of the service' as well as to the beneficiaries.

Why Service-Learning?

SL places equal emphasis on service outcomes and learning goals. At Greendale Secondary, we believe that SL will result in the reciprocal strengthening of service and learning outcomes. This, in turn, will enrich the Community Involvement Programme (CIP) experiences and enhances learning. It will also increase students' competence and their sense of self-worth. In addition, SL is in alignment with the school's vision of 'A thinking and gracious community, with distinguished service and leadership.'

Whole School Approach

The school believes strongly in adopting a whole-school approach to address the needs of the community and to benefit from it. Under the guidance of their teachers, every pupil in the school is involved in an SL project. Examples of past projects include:

- Fund-raising and organizing of walkathon for the Parkinson's Disease Society (Singapore)
- Fund-raising and public education for the SPCA
- Fund-raising and public education for Mercy Relief
- Social Entrepreneurship: Fund-raising for needy Greendale students
- Teaching of reading skills and Mathematics coaching to Edgefield Primary School pupils
- Collection of canned food and clothes for the Pertapis Children's Home
- Collection of canned food and clothes on behalf of Food from the Heart
- Setting up of organic farm plot in the school compound for Kampung Senang
- Fund-raising for the NCC Yellow Ribbon Fund Project
- Fund-Raising for NPCC HQ



- Setting up of recycling bins to recycle waste paper
- Collection of old clothes and newspapers in support of World Vision

National Day Observance Ceremony cum Bazaar @ Punggol 21 Community Centre (CC)

To instil a sense of social responsibility as well as the spirit of enterprise in pupils, pupils were introduced to the concept of Social Entrepreneurship. This marked a key milestone in the school's journey towards nurturing young social entrepreneurs who pursue a social cause through undertaking entrepreneurial-related activities.

In partnership with TOUCH Seniors Activity Centre and Punggol 21 CC Committee, the school co-organised a charity bazaar for National Day Observance Ceremony 2007 (Punggol North). The aims of the project were:

- To raise awareness of the public towards the TOUCH Seniors Activity Centre, and
- To raise funds for the programmes for the TOUCH Seniors Activity Centre.

The Service-Learning Process

Pupils were taught the spirit of enterprise, volunteerism and resourcefulness while remaining rooted in sound values. This involved developing their capabilities and

capacities, and broadening their experiences. A 3-stage strategy was adopted.

The processes were as follows:

Stage A: Getting Ready - Pre-activity planning

Pupils, as a class, identified a charity organization which they wished to render their service. The decision is important as it has to match the particular organization's needs and pupils' interests. The pupils in this class (2A1) chose the TOUCH Seniors Activity Centre.

Pupils were involved in the planning of the charity bazaar by identifying the type of stalls they can set up. After a consultation session with teachers and the main organizing committee of the bazaar, the class decided to set up six stalls – one group to man one stall. The stalls to be set up range from balloon sculpture, henna painting, handicraft work to food and drinks. The proceeds from the stalls were to be donated to the TOUCH Seniors Activity Centre.

Stage B: Rendering Service - Implementation of activities

This is the stage where the main action begins. Groups of pupils started their preparation for the stalls such as making of the handicraft items (eg. Handphone pouch, bookmarks) and learning how to make balloon sculpture.

On the actual day of the charity bazaar, pupils turned up as early as 7 am at the school to prepare for the event. Pupils were then transported to the venue of the event and set-up of the stalls began. Concurrently while manning the stalls, pupils were given constant feedback by their teachers on their service rendered.

Stage C: Reflection - Structured ongoing process of learning about self and the activities

Throughout the project implementation



process, pupils carried out structured reflection. This included:

- a. a pre-service reflection which required pupils to anticipate what might happen during the actual Service
- b. a mid-service reflection which required pupils to evaluate their contribution and plan for improvement
- c. a post-service reflection which required pupils to assess their effectiveness and how well their personal goals were achieved. This included some thoughts on their next S-L project. Pupil groups recorded all these reflections on the prescribed forms provided.



Evaluation

At the end of their service, pupils submitted a consolidated group report. TOUCH Seniors Activity Centre and Punggol 21 CC were also requested to complete a feedback form to help the school evaluate the effectiveness of the project. This provided an opportunity to assess both the process (how pupils went about the activity; what they did well and what they could have done better) and impact (how pupils and organizations benefited from the service provided).

Impact

Pupils were elated to see that the project was able to 'take off' after many weeks of planning. Beyond the funds that they raised from the event, many useful skills and learning points that they acquired were beyond what normal classroom learning could offer.

It was also observed that pupils worked as a team and with a desire to 'give back' to the community. Through SL, pupils also learnt to be more responsible especially when they planned and carried out their tasks. Below are some excerpts of pupils' reflection after the event:



"The charity bazaar was a very good activity for us because we gained lots of experience. I have learned the importance of teamwork and communication. This event also gave me a chance to show my leadership skills"

– Geraldine Yap (Handicraft Stall)

"My group members were cooperative. We spent a lot of time preparing and it helped build our friendship with one another."

– Muhd Hussein Bin Abdullah
(Food Stall)

"The charity bazaar helped me to become a better and more responsible person."

– Sally Tan (Accessories Stall)

Feedback from the various stakeholders was also encouraging, as shown below:

"The contribution by the school had indeed brought much cheer and variety to the whole atmosphere. Besides these ... the charity bazaar had a good mix and varieties of handicraft display, food and drink stalls which were only possible with the hard work and passion put in by the students. It's indeed commendable of the students ... to do their part for charity."

– Mr Eric Chua, Chairman,
Organising Committee of the Punggol North
National Day Observance Ceremony 2007

"The students were excited and enthusiastic about their roles. Many of them showed leadership qualities and the aptitude to make good decisions when changes or problems arose".

– Mr Kenneth Tan
(Teacher-in-charge, Drinks Stall)

"The event is a great opportunity for the students to learn how to be more independent. Most of the students are honoured to be given the chance to be involved in such an important event. It's definitely an eye-opener for most of our students. The teachers were also able to interact with the students at a more personal level."

– Miss Engracia Lim
(Teacher-in-charge, Balloon Sculpture Stall)



It was also observed that pupils displayed the school's core values throughout whole process of carrying out the project:

Graciousness in dealing with each other and towards members of the public (customers);

Determination in completing the assigned tasks;

Loyalty to the team; and

Sincerity in communicating with each other and to customers.

Other benefits from the project include:

- Pupils gained a sense of personal satisfaction for helping the seniors at the TOUCH Seniors Activity Centre

- Pupils' project management skills was nurtured through developing and evaluating ideas, as required in the setting up of the stalls at the Bazaar
- Pupils learnt collaborative skills through participating in teams and working together towards a common purpose
- More importantly, the fun and enjoyment had translated into practical financial help for the needy elderly at TOUCH Seniors Activity Centre

Conclusion

The National Day Observance Ceremony on 5 August was a very meaningful and successful one with a great turnout of about 1,000 spectators. In particular, the charity bazaar provided pupils and teachers an opportunity to contribute something useful and enriching. The pupils showed great determination and team work in making the event successful. In addition, the enthusiasm they brought on that day was inspiring and encouraging. It was indeed a fruitful experience with many success stories and learning points.

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New Kids on the Blog

Herman Cher Main

This article features how an innovation in a primary one classroom in Temasek Primary School has made a difference to the pupils' learning.

The Innovation

An innovation, to be effective, has to be simple and it has to be focused. It should do only one thing, otherwise, it confuses. If it is not simple, it won't work.

– Drucker (1993)

The school leaders in Temasek Primary School were driven by the 'Teach Less Learn More' philosophy and the FutureSchools@Singapore initiative in further harnessing the use of ICT in teaching and learning. The FutureSchools@Singapore initiative is an initiative by Ministry of Education in Singapore that looks into harnessing ICT effectively for engaged learning and to better prepare our pupils for the future. This initiative challenges current strategies in the use of ICT in schools. Pupils and teachers not only need to use ICT pervasively, but they should also know the cultural and social implications as a result of being connected through cyber space.

One new initiative that the school was exploring was the use of the electronic portfolio (e-portfolio) to enhance the teaching and learning of its pupils. Many teachers in Temasek Primary are familiar with the paper-based portfolio but few of them have attempted to harness IT to enhance the efficiency and scope of the portfolio. The use of the e-portfolio as a valuable learning tool is well established in higher institutes of education and it is becoming increasingly popular in

elementary and secondary schools in UK, US and Canada. Some secondary schools in Singapore have also experimented and implemented e-portfolios within their curriculum (Chua, 2005).

Many of the schools adopted the commercial e-portfolios that require some form of capital investment. While embarking on the potential use of the e-portfolio for teaching and learning, Temasek Primary School was willing to take on the challenge of exploring the use of low or no cost applications that are available on the internet and even to re-examine their existing applications in the school.

Realising the importance of stimulating and engaging the pupils in reflective thinking, the school leaders and teachers also explored the use of integrating blogs in the e-portfolio. They believed that although the use of blogs may be less formal, they do possess some essential features. For example, they are organized in diary forms and, hence can be used as reflective journals. There is also the possibility of integrating files, graphics, photographs and video clips. A person's ideas, beliefs and achievements could also be showcased through the use of blogs being incorporated in the e-portfolio.

After much discussion and planning the school decided to adopt an innovative approach in the use of the **e-Portfolio through blogging** for the pupils of a Primary 1 class.

The principal of the school, Miss Low Yoke Kiew, was of the opinion that pupils as young as Primary 1 should be given the opportunity to be better engaged in their personal learning and development. In most people's minds it would be a challenge for any child that age to be self directed and independent in their learning.

Consequently, this innovation was designed to achieve the following objectives:

- To add value and complement pupils learning
- To bring an awareness to both pupils and teachers to the potential of connectivity for learning
- To provide a tool for pupils to be empowered to take ownership of their learning and personal development
- To provide a means for the pupils to achieve their work at various stages of their learning

The Team

To drive the project, a team was set-up comprising the author, and a few of the teachers from the school. Much credit must go to the team of teachers. One of them, Mrs Danial Seah, took ownership of the project and did an excellent job with the children.

The Technology

An issue that occupied the initial discussions was the choice of software. Eventually, the school reviewed the following 4 strategies, adapted from Stefani et al.(2007), to select the software:

1. The Open Source common tools approach which may not be appropriate if users do not have considerable web skills.
2. A commercial system would be suitable if the institution does not have the resources to develop a proprietary system. However, this option would mean committing considerable resources and may not be economically viable.

3. A commercial system would again be a strong consideration if the institution cannot support the overheads incurred by an Open Source e-portfolio.

4. Begin with blogs and consider trying a commercial system later. This option would be suitable for an institution that has not committed to a full implementation.

The choice was for Option 4 and it was based on the following rationale:

1. It was accessible, yet protected. The platform for blogging was provided in the portal that the school was using. The school's community (teachers, pupils and parents) has access to the portal but not the public. This was viable because it would help protect the children from malicious and uninvited comments from elsewhere.
2. No additional software cost was incurred as the software was already available in the school.
3. Posting comments on blogs required only baseline IT skills like keyboarding and uploading.
4. All blogs have built-in interactivity where readers can respond to the reflections done of others by posting their comments on the blogs. This in turn will promote social learning.
5. Due to its interesting features, the use of blogs would definitely appeal to the children.

During the initial exploration, the school encountered some difficulty in uploading files and documents. For this project, a complement to the blogs was needed and a commercial application was chosen, MS Powerpoint. It is widely used and required IT skills that both pupils and teachers were familiar with. It is also very flexible and allows pasting of digital files of multiple formats.

The Implementation

The project was planned and conducted in 4 phases.

The exploration, conceptualization and design of the e-Portfolio interface were carried out in the first phase. The second phase was the preparatory stage where pupils were trained on the following baseline skills that were related to the e-Portfolio:

- MS Powerpoint
- Blogging
- Use of digital cameras

The pilot project was conducted in the third phase. The final phase of the project was the evaluation and review of the project.

Impact on the pupils

The finding of a survey that was administered on both parents and pupils revealed the following:

1. Parents concurred with their children. The project generated excitement for the children. Here's a comment from a parent:

- *"She was excited about writing her blogs and we gave her suggestions on things that she could write."*

2. All parents claimed that their children shared their learning experiences with them. A comment made by a mother was evidence of this:

- *"I had the chance to help Edmond with the posting of his blog. I am rather surprised and impressed at his ability to do his Powerpoint presentation. Each time he learnt a new IT technique he would excitedly share with me. He is very proud of his IT project and so am I. Thank you."*

3. Parents also agreed that their children were more independent in their learning. Here are more comments from the parents:

- *"My daughter has greater self-esteem now as she is more independent and*

confident especially where IT skills are concerned. She does not rely on me a lot now."

- *"We did a Powerpoint slide together for Mother's Day. He has been more observant. When he sees some interesting web addresses, he will try to login to the web addresses."*

4. Parents and teachers agreed that the children were able to articulate their thoughts better, and their motivation to learn had increased. The use of incorporating blogs in the e-portfolio has also allowed the children to be more confident in the use of IT. Here are some comments from the parents:

- *"My siblings were impressed to see Paul showing interest in photography. He likes to take pictures using our hand-phones. He told us he learned how to take pictures in his lessons. We decided to buy him one."*

- *"Going through her work and blogs, we gave her suggestions on how to improve them. She is definitely more IT savvy now and more confident in navigating the various websites."*

- Pupils also gave positive feedback on the use of the e-portfolios. They were motivated enough to compile a wish list of learning. For example, some of them stated that they would like to have more of such learning and would want to further upgrade their skills in using Powerpoint, uploading pictures directly from the camera to the computer, as well as, enhancing their writing and typing skills.

5. All parents surveyed agreed that the project has made a positive impact in terms of their children's learning and personal growth. A parent gave the following feedback:

- *"It was a good learning experience. While trying to help him, it encouraged parent-child bonding as well. He is*



Tampere Primary's blog

10 Jul, 2007

• search

What I Think About My Learning Tapestry

My Learning Tapestry — Posted by [Tampere Primary](#) @ 17:41

My class had a trip to the zoo on 29th of June 2007 for our Learning Tapestry project. First we took the bus, then when we reached the zoo, we went to see a kind of monkey. After that, we saw the mousedeeers. I felt that the mousedeeers looked like wolves, their legs were thin and hoofed. Next, we came to the place where the polar bear stayed, only one polar bear was seen swimming in the pool. After that, we saw the white tigers, one of them was sleeping. I was told by my mother that white tigers are going to extinct, that is why people are trying to protect them.

As we continued, we saw the pygmy hippo, my teacher tried to take a picture of the animal. We also came to a place where they kept snakes, all the snakes were real! One of them was hanging across the branches... The next animal we saw was the kangaroos, my teacher asked the zoo keepers about what kind of food they were feeding the kangaroos.

As we went along, we saw many other kinds of animals. There were zebras, giraffes, different kinds of cats and leopards. When it was time to go back, we were all very tired but happy 😊, we were the first class to finish the excursion.

4 comments

comments

1.

Dear [Tampere Primary](#),

Your blog is very well written. Do you know most of the white tigers came from India ?

Posted by [David Lim \(1\)](#) — 12 Jul 2007, 23:12

2.

Dear [Tampere Primary](#) you did an excellent job you know lots of animals.

Posted by [Daryl](#) — 12 Jul 2007, 00:27

3.

Dear [Tampere Primary](#), your blog is so nice can you teach me how you write a nice blog like you.

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Annex A: Sample blog entry

comfortable using IT but needed help in reading and understanding the text sometimes.

Impact on the Teacher

Mrs Seah used information from three sources, which included, the use of qualitative observations of the classroom

dynamics, the entries from the pupils' blogs and the writing assignments given to the pupils, to gauge the impact of the use of the e-portfolio on her pupils.

She observed that the pupils were more reflective, vocal, inquisitive, independent and IT savvy. Through blogging, she noticed that they were becoming more

expressive and interestingly, they showed the ability to write constructive feedback to their peers. This was evident in the blog entry as shown in the attachment (Annex A).

She also agreed that the project instilled interest in learning among the pupils and through constant contact with their e-portfolio, they were now better able to archive what they had done during lessons such as posting reflections and uploading images.

"When we studied the pupils' writing before and after the project, we found that their writing abilities showed more maturity than before. The pupils' ideas were better linked, they were able to make good arrangements of the sentences and most of them showed the ability to write more."

According to Mrs Seah, pupils at the Primary 1 level were usually guided in their writing and that it was sufficient for them to produce a composition of about 100 words. However, with the use of the e-portfolio, the pupils showed a higher capacity than before in their composition writing. On average, they were using more words and they were going beyond the description of what they saw in the picture composition. They made the attempt to describe emotions and included interesting characters into the composition.

She reckoned that the interest generated through the use of the e-portfolio has allowed the pupils to take a greater interest in writing and also made them more aware of the sentence structure in the English Language. This has enabled them to create better and meaningful pieces of work.

Impact on David*

A pupil that best captured the impact of the use of the e-portfolio for learning was

David. He was transferred to the present class just as the class was embarking on the project. It was a different learning environment for him...one that he welcomed. His mother, explained that,

"He loves to play computer games and that was the motivation for him to log-in into the program."

From an incoherent piece of writing as shown in Figure 1, he has shown a remarkable improvement to create a storyline with a plot of Fairy Tale narration in Figure 2. If you study his writing in Figure 3, you would not know that he is dyslexic.

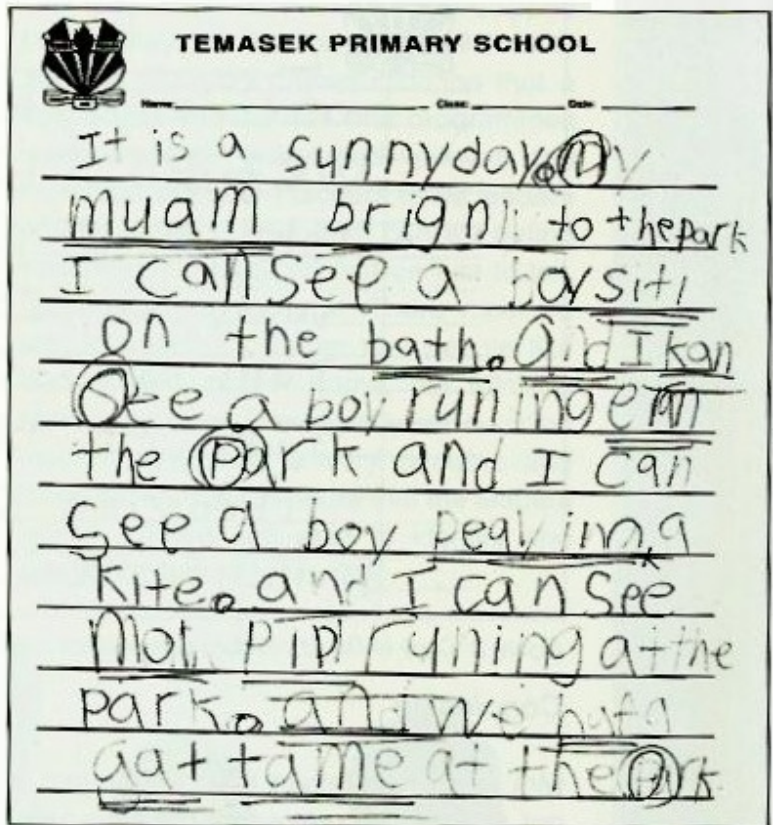


Figure 1: Copy David's Picture Composition for Semestral Assessment 1, Pre LT 2007

Recently, Mrs Seah was pleased when told by David's mother that,

"We can see an improvement in David in terms of his learning. He is more keen to learn. He even took the initiative to learn for the upcoming spelling on his own."

* Note: A pseudonym is used here to protect the pupil.



TEMASEK PRIMARY SCHOOL

Name _____ Class _____ Date 26.7.07

once upon a time in a land far
far away there is a bar. and a
princess and the princess
ran from the bar, and a
knight came to rescue the
princess but the knight sat
as my miti sat and at the
the knight and princess and the
knight lived happily.

Figure 2: Copy David's Fairy Tale



TEMASEK PRIMARY SCHOOL

Name _____ Class _____ Date 26.7.07

one day / Sally / Tom and I
went to the library. Sam
took a book. He gave one
book to Sam tore the book
Tom was shocked. Tom bring
Sam to the librarian. The
librarian scolded Sam.
I am sorry.

Figure 3: Copy of David's Picture Composition – Post LT Classroom Writing

Conclusion

Mrs Seah maintained that one project is not sufficient to prove that the innovation had contributed to the improvements of the pupils writing skills but she felt that it was a good start. She has abandoned the use of the written journal, opting to rely on the blogs instead. Some pupils have continued blogging on their own while others take to it readily when an assignment is given. This project revealed the immense potential of blogs for developing competencies in writing and skills in publishing. As a result, the school has committed two Research Activists to

study and collect concrete evidence that using blogs can actually help to develop the writing abilities of the pupils.

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Composition – Post LT Classroom Writing

Herman Cher Main is Vice Principal, Queensway Secondary School.

Teachers as Leaders

Clarence Chow

The notion of every teacher being a leader and a role model has become rather debatable if we acknowledge the diversity of people currently coming into the profession, for similarly diverse reasons. The expectations of a teacher to lead by action and example have been so daunting that even the most enlightened would find it rather impossible, if not just challenging. Is our generation of young teachers equipped to do what their teachers did some thirty years ago? Is this one of the reasons for the downward spiral of discipline in schools?

A teacher is expected to identify and groom future leaders from among their charges, inculcate the right moral values and cultivate that sense of civic responsibility in them. There is so much that a teacher has to do besides teaching. If he is to practice what he preaches, we would then really have to examine the qualities and capabilities of the teachers in our schools today. If 'it takes a thief to catch a thief',

then it would take a leader to identify and groom a leader. Are all our teachers then, leaders in the true sense of the word?

The demand for teachers and the rush to recruit them to meet the needs of the schools have left the Ministry of Education in quite a dilemma. Are they attracting the right people into the profession? How well can they best be trained and equipped before they go into the schools? It is to address this very crucial situation that a long string of initiatives and programmes were devised, prototyped, piloted and rolled out to equip teachers to be leaders among leaders. How then can we define leadership? It does not suffice just to tell, pronounce nor reiterate. There must be that intangible 'X' factor that people like Gandhi and, nearer home, our Minister Mentor, possess. The Ministry of Education has embarked on a very genuine and profound course to ensure that the leaders in our schools are able to identify and groom leaders of tomorrow.



The progress of teachers has been clearly identified and teachers can work towards one of the three tracks in Leadership, Specialisation or Teaching. This must be applauded. Not everyone who becomes a teacher would want to be a Principal or Head of Department. Neither would all of them aspire to a specialist in the Gifted Programme, or for Science, Humanities or Arts. Many just want to teach; to answer the call from the classrooms, to interact with their pupils, to inspire, motivate and enlighten them. There had been no recognition for such teachers in the past; they just teach till the day they retire, a teacher.

But many of these teachers were fine leaders in their very quiet and unassuming ways. The quality of our leaders today is the result of these dedicated teachers who had spent their whole life doing something that has been a calling and a true vocation. How much can we see or say of teachers in this present day? Principals and Heads of Departments are leaders in their own rights. They were identified, groomed through a vigorous process and tested. Specialist teachers go through similar 'processing' and they are leader-experts in their respective fields. And then, there are teachers. To ensure that every beginning teacher (BT) who comes into the teaching fraternity becomes a leader, unless they are 'born' ones, he or she needs to be given the opportunity to learn, develop and embrace all the qualities of leadership. Towards this direction, the Teaching Track, which provides advancement for those who wish to be in the classroom, has attracted many a teacher who does not aspire to be a principal, head of department nor a specialist. Their goal is to be a Senior Teacher.

Appointments are confirmed after the five accreditation standards have been met. The Senior Teachers (ST) now have the very important task of ensuring that new beginning teachers are mentored, guided and able to uplift, if not maintain the

passion they have prior to entering the schools, and the reality of classroom teaching. In terms of content, these new teachers should be up to date with the latest. They are definitely IT savvy. They should have the energy and the enthusiasm to carry out the daily routines of the school. However, not all of them are natural leaders. Many may not have the perception that teaching students is not just to convey information. Their very actions, the words they use, the way they carry themselves, dress themselves, are all closely watched and probably followed by their pupils. They may not be aware of the influence they have on the young minds they teach.

Not too tall an order for some STs but it could be extremely challenging for others. The STs experiences through the years, the refinement of their pedagogical skills and their ability to provide and view teaching as a calling, must be transferred positively to these novice teachers. They must be able to help their BTs in every aspect of a good teacher, in and out of the classroom. What if the ST himself or herself has spent eight, twelve or even twenty years in schools doing all the 'right' things but has not the opportunity to experience the complete structure of the education system? How then can this ST be able to know how the Ministry of Education (MOE) works? Can the ST explain the rationale behind many an initiative handed down? Will the ST be able to provide answers to queries from these young, inquisitive BTs to satisfy their quest to understand the work done at Headquarters (MOE)? Assuming the ST is a perfect role model, is able to enthuse the BT, is sound in pedagogy skills and an expert in his/her field of instructional programmes, do these provide him/her the complete overview of what actually goes on within the Ministry itself? Is he/she aware of current trends and directions being embarked upon by the Ministry? Yes, you are now a Senior Teacher. What next? A far-sighted view is provided by Mrs Angela Ow, recently retired Director



of Staff Training at MOE, 'To be a leader among leaders to enable teachers to be leaders in Teacher Leadership.' The STs must continually keep abreast with the system. The idea of the Senior Teachers' Programme (STP) provided an extension to the development of STs. The one-month full-time programme not only rejuvenates the STs, but also consolidates the rudiments of good mentorship, effective coaching as well as enlarging the networking among the thirty-odd STs in that particular STP. It created the opportunity for STs to be exposed to the other organizations and to see how they function and what some of their best practices are. Then, "What's next?" This is where my article would become more personal.

The Work Attachment for Senior Teachers to Headquarters (MOE) is for one term, (ten weeks) and by invitation. It is another avenue to polish and refine leadership among teacher-leaders. All STs who have attended the STP are eligible. The first attachment kicked off on 29 January 2007 with a total of fourteen teachers, ten attached to Staff Training Branch (STB) and four to Teachers' Network (TN). This first pioneer batch came with no references nor knowledge of what is expected of the attachment or what it has to offer.

The objectives were made clear at the very first session. The programme would

be very fluid and flexible. It was to provide STs with a new experience, to savour the work done at Headquarters or Staff Training Branch specifically, as it was in my case. It aims to provide STs with a bigger picture of what is expected of a leader, more importantly a teacher-leader. This understanding would help STs project a positive reception of Headquarters' initiatives, the implementation of new policies and the work done at Headquarters for teachers in schools.

It was also aimed at providing an enhanced prospective of what STB does and how the schools can work together with them.

In the process, STs would gain

- the knowledge and skills in aligning school's learning to strategic trust.
- some working knowledge and skills through guiding/mentoring mentors and BTs in SMP schools.
- an overview in SSD prototyping.
- hands-on experience in crafting descriptors for SPDS standards
- insights and understanding of HQ work at STB.

This is a bold step. One complete term at Headquarters, detached from school and learning, doing, observing and experiencing the daily routine that takes place. It was something completely different from anything a teacher would

have done in school except maybe talking to beginning teachers. On this point of talking with beginning teachers, there were opportunities where the STs on attachment were involved in the Beginning Teachers' Dialogue. The BTs were aware that the STs were not ministry officials and very much senior (older). They were from schools and knew the feel at ground level. These provided a more conducive and less threatening platform for the BTs and most were willing to offer valuable, honest feedback very freely. This was something the Staff Training Officers (STOs) found they had not been as successful when they carried out the Dialogue on their own. It was also an eye opener for the STs. We found out things we had overlooked and what we overdid. We left better equipped to understand the needs of BTs. This was definitely a positive take-away back to school. We became better mentors, more sensitive to the BTs' needs. This also resulted in an awareness which a good teacher-leader should possess. The result: a better, more confident and effective leader.

To ensure that this leadership role takes on a greater scope, the attachment also provided an opportunity for the STs to craft a proposal of an STs' Summit. This brought about lengthy deliberations, proposals and counter proposals. The process brought out many potential talents, creative ideas and especially, a platform for the STs to work collaboratively as a team. The programme was drafted and its contents deliberated upon. Alternative days and dates were also considered. The STs came up with two programmes; a half-day and a full day Summit.

Some of the most enriching moments for all of us came at the pow-wow sessions we organised for ourselves every morning. Here we shared pedagogies, anecdotes, experiences and little instances within those 288 years of education service the group of us had put in collectively. We also added up our ages and arrived at the average of 49.7 years among the ten of us.

We were amazed at the amount of time we had devoted our lives to education and felt comforted to know that we had not lost the stamina nor the zeal. There was so much to share, so much more we could do and should do. The attachment had provided us a platform to come together to exchange good practices, sound advice and how to remain relevant in this fast changing education landscape. We were rejuvenated, enthused and with the number of take-aways from this attachment, we could bravely say we returned to school as better STs. To most of us, the take-away meant a better understanding of the importance of our roles as STs back in school. We were committed to ensuring that our Mentoring Programme is effective, that we be the models for young and beginning teachers, and that we remain positive and rational in our responses to new initiatives and policies. The Attachment has made me a more reflective teacher, not just working towards goals without an understanding of the processes to achieve them. There is the need to be focused, to have structures, and most fundamentally, to be genuine and sincere in our contact with all our colleagues, be they BTs, HODs or other teachers. This should cascade to dealing with our students in the classrooms as well.

If the STs' Attachment is to enhance leadership among teacher-leaders, to provide encouragement and the impetus for other teachers to take on the challenge to become a Senior Teacher and to consolidate the status and confidence of senior teachers, then this pioneer programme has been a great success.

Chow Chee Wing, Clarence, has been a teacher for 42 years and an ST for 5 years. (Has been Discipline Master for almost 15 years, HOD for PE, & Aesthetics and covered duties as HOD English). He was on attachment to Staff Training Branch for one a half months. He is currently inspiring students and beginning teachers at Christ Church Secondary School.

So You Want to be a Master Teacher ?

Foo Kum Fong

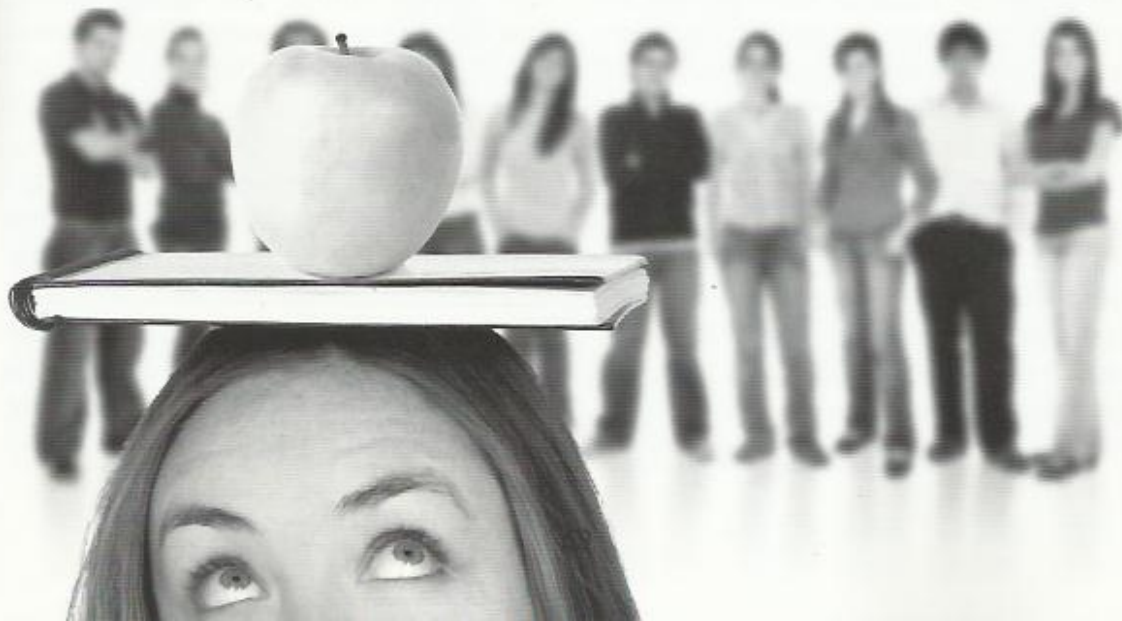
So you want to be a Master Teacher? Have you considered what qualities are required for one to be a Master Teacher? This article is certainly not a research paper. Rather, it is a reflective account based on my eight month stint as a Master Teacher and is intended for all aspiring or potential Master Teachers. Currently, there are only nineteen Master Teachers serving the whole nation and the country can do with more.

As a Teacher Leader

To tread the path of a Master Teacher, the most important characteristic any teacher needs, is patience and resilience – tons of it. All applicants for the post of a Master Teacher need to go through the rigorous accreditation process to ensure that they meet certain threshold criteria in terms of skills, knowledge, performance and competencies. The accreditation framework involves the submission of a professional portfolio – a documentation of evidence for having met the accreditation standards. In addition, there are two rounds of selection panel interviews – at the cluster and ministry levels before the formal appointment. The accreditation process is an insightful learning journey. At each step,

you are forced to review and reflect on your processes and outcomes, as well as on emerging trends in pedagogy on the educational landscape. At each step, you question how you could make it better. One of my colleagues spoke to me about her shaken sense of confidence when she failed in her previous two attempts and her elation when she was finally appointed on her third. Having been appointed on my first attempt, I truly salute my colleague's patience, courage and resilience in her quest to serve as a Master Teacher.

As a beginning teacher, I remembered a conversation with a senior teacher who taught me an invaluable lesson. I told her I just wanted to teach and not be involved in anything else. In return, I would dutifully ensure that all my charges achieved good grades. Instead of the expected nod and praise, I got a sharp rebuke from her. "Then you are just a subject specialist! You are not a teacher. You must see yourself as an educator and not merely as just a subject specialist, unconcerned about the other aspects of the child's development." That was the invaluable lesson I learnt on the meaning of education, one that looks into the holistic development of the child and not merely his academic achievement.



As a Master Teacher, having strong pedagogical skills and being an expert in one's subject knowledge is a pre-requisite of the trade. To look into the holistic development of our students, we need to move beyond expertise in our subject area and be knowledgeable in other aspects, such as alternative modes of assessment and social emotional learning. This is all the more so because our influence as a Master Teacher extends beyond the school level to the cluster, as we provide advice and guidance to the teachers within the cluster. Just like the senior teacher who had made such an impression on me, the influence of a Master Teacher I believe, is far reaching though the fruits of labour are not immediately visible.

Parker Palmer's assertion that 'teaching has thus far been a very privatized profession' is certainly very true. If we examine the past, teaching largely happens behind 'closed doors'. The teacher is truly the king in his class and besides the occasional classroom observations for evaluative purposes; no one knows what takes place in your neighbour's classes. I could still recall how my colleagues resisted my suggestion for peer observations to be carried out as a means of self-improvement. Most were not only unsupportive, but rejected the idea outright.

I went ahead with a colleague in 1994 to practise peer observation on a voluntary basis. Years later, I am very much heartened to know that my colleagues have changed and grown to become more willing and open to professional sharing sessions where they shared on best practices in pedagogy. Some had even moved ahead to engage in lesson study – a collaborative effort by teachers to improve teaching and learning in the classroom. This strategy required teachers not only to peer observe but to examine and critique one another's lesson plans and teaching techniques – a milestone's improvement over the initial resistance to peer observation.

To plant a seed and ensure its healthy development, the soil must be skillfully treated. Similarly, a process of 're-culturing' must precede any form of 'restructuring'. Hence, to influence any changes, we need to be patient but more importantly, never to lose heart. A good idea is like a seed. Therefore, for any healthy growth to take place, the soil needs to be 'cultured'.

To support the initiatives of Teach Less, Learn More (TLLM), which have spurred greater exploration of pedagogical strategies, I conducted more than thirty sessions of school-based sharing for teachers within the first eight months of my appointment. These were usually done during the white space – the time created by schools to promote sharing and interactions among teachers to facilitate better student engagement within and beyond the classroom. As a teacher, I firmly believe that learning becomes more meaningful when pupils are able to relate the subject to real life situations. Hence, in many of the sharing sessions, the historical development of the topic and the connections to daily life were often included. Hopefully, the effort would dispel the notion that problem solving is just about the application of algorithms and prescribed procedures acquired through rote-learning. Over time, the teachers could go beyond the well-defined examination syllabus to ignite the passion in the learning of the Mathematics.

As a beginning Master Teacher, when I first started sharing on pedagogical practice and skills during the white space, attendance and punctuality were a problem. I understand the teachers' predicament because teachers have a very demanding role to fulfill and they have to don many hats. Besides classroom teaching, teachers are often involved in school-based projects and events. Even though the 'white space' was scheduled within the curriculum time, being present for the sharing would rank low in priority if they needed to attend to the immediate needs of the students. However,

after the initial sessions, I noticed that the attendance improved dramatically. It was the attentiveness and appreciation in the later sessions that have in many ways motivated me to improve the efficacy of my sharing.

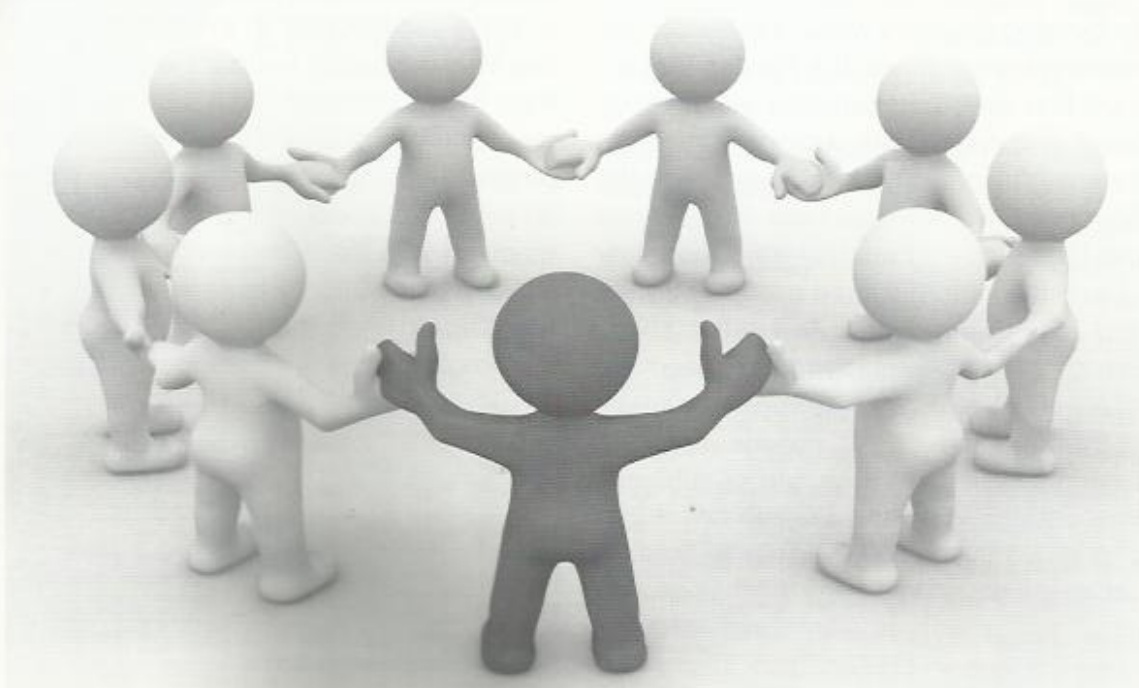
As a Curriculum Leader

Schools have now moved into a new phase in education that focuses on curriculum customization, choice and flexibility – to nurture a new generation of students with diverse abilities and talents. In creating such diverse pathways, we have provided our young charges with more choices in education and encouraged them to grow with their passions. This also meant that schools must experiment with new pedagogical methods, new curricula and new systems of assessment. The implication would be an expansion in the job scope of the Master Teacher. Besides being entrusted with the responsibility of guiding and mentoring teachers, the Master Teacher's role includes providing the depth and knowledge to teachers in the cluster schools and leading them in the customization of school-based curricula. Just eight months into the master teachership, some schools have already approached me about the implementation of alternative modes of assessment and

teaching approaches such as Lesson Study and Understanding by Design to enhance the teaching and learning of Mathematics.

To ensure that teachers understand the curriculum changes, a Master Teacher is expected to work collaboratively with the Curriculum Planning Officers to hold sharing sessions and provide further support to teachers who need assistance. As part of the Ministry of Education's effort to continuously improve the teaching and learning of Mathematics at the primary level, the use of calculators at Primary 5 would be introduced in the Mathematics curriculum in 2008. To equip teachers with the knowledge and skills in integrating calculators into the curriculum, workshops have been conducted by Curriculum Planning Officers for the teachers. In spite of the workshops, some teachers remained apprehensive about the use of this tool in the teaching and learning of Mathematics. To help the teachers acquire the initial confidence and at the same time, show how calculators can facilitate the use of exploratory approaches in the teaching and learning of mathematical concepts, cluster workshops were planned.

As curriculum leaders, it is essential to know the 'whys' besides the 'hows'. The



introduction of calculators into the primary schools curriculum was meant to free students from tedious mechanical mathematical computations. The time saved could then be channeled towards focusing their attention on discovering mathematical patterns and making mathematical generalizations and connections. A lack of awareness and understanding of the policy intentions is one other area in which the Master Teacher could help to bridge.

Building a Community of Professional Practitioners

At the heart of the Master Teachers' job is to build the capacity of teachers within the cluster by mentoring, coaching and demonstrating good teaching practice and model lessons. So far, I have demonstrated some lessons on Algebra and Statistics in some schools, and more have been scheduled for next year in the other schools within the cluster. However, the Master Teacher needs to be mindful that only some teachers need coaching while others need to be mentored, so that the best in everybody can be drawn out to build a community of professional practitioners. In this way, the cluster schools can collaboratively forge ahead to build up their teaching excellence and uplift the quality of the education service.

To develop teachers within the cluster into learning communities, the Master Teacher must first seek to understand with an open heart and listen with an open mind for meaningful synergy to take place. In the Advanced Senior Teachers Programme (ASTP) course, I had the rare opportunity of working with a diverse group of Senior and Master Teachers. As I reflected on my group's presentation, I realized we were such a diverse group – primary, secondary and Junior college teachers having expertise in a myriad of subjects: Mathematics, Physics, English Literature, English Language and even Social Studies. Yet, we managed to synergize for a common goal and collaboratively produced an interdisciplinary presentation using the

model, Understanding by Design. In many ways, the profile of the group mirrored that of the country and even the staff at schools. We can celebrate diversity and tap on one another's strength to good effect only if we listen with an open heart and mind. Besides that, we also need to cultivate the habit of putting aside what we know in order to understand the perspectives of others.

As a Resource at the Cluster Level

To serve as a resource at the cluster level, the Master Teacher needs to be mindful of emerging trends. With the vision of building Singapore into a global schoolhouse and a knowledge and research hub, research is very much promoted at every level in Singapore. In the education arena, especially in schools, action research is presented as a reflective tool, a self-enquiry process to solve problems within and outside the classroom environment. To promote educational research within the cluster, as a Master Teacher, I conducted many handholding sessions to help schools with their research and lend support in the interpretation of data – both qualitative and quantitative.

In Conclusion

Master Teachers play pivotal roles in helping to bring out the best in every teacher, so that they can better nurture the students to their fullest potential. With schools taking greater ownership of their curriculum and programmes, the Master Teachers have an additional task of encouraging committed teachers with the passion and a sense of mission to contribute more in the area of teaching, to step forward to take up this challenge to be at the apex of the Teaching Track.

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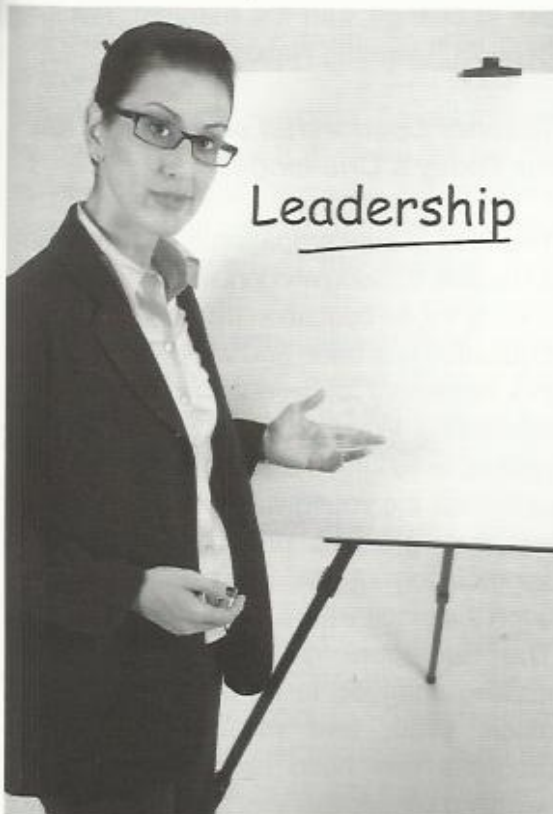
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The Teacher as Leader

Sean Chng

Introduction – Three Kinds of People

We are told that there are three kinds of people; “Some people make things happen”, “Some watch things happen”, while “Others sit around and wonder what happened”. Such candid observations and generalisation about people have been used to humour us in the past but the underpinning intent is more to implore us to make a difference with our lives. Like everyone else, teachers would count themselves as belonging to that category of people who makes things happen. And “Yes”, indeed we do! However, in the busy-ness of our lives, and in all honesty, we are more likely to be all of the above rolled into one in the spiritual and practical or mundane and cardinal aspects of our lives.



Teacher Leadership and The Functionality of Our Lives

Attaining full functionality of our lives, 24/7, is a high and pristine calling. It is an ideal that is hard to realise in practice. Still it is an important reminder that the ‘moral purpose’ (Fullan, 1993) of our being is to strive towards greater efficacy in the dispensation of our duties and the use of our lives. The common belief is that everyone can and will attain some measure of success in their lives if they choose to live intentionally. To secure some measure of success, there is planning to be done, volition to be invoked and a commitment to be made. The process of ‘leadership’ and ‘management’ are simply then the means through which one can make that difference for one’s own benefit, the benefit of one’s family, the community, the nation and even the world. Teachers have been doing that for years, except they did not hype it up or called it, ‘Leadership and Management’! It was a sense of duty, driven by necessity maybe, but certainly not as glamorous or as clichéd as it is made up to be today.

Teacher Leadership and The New World Order

Most of today’s literature concerning leadership and management have their primary objective, the intention to help people attain mastery over their lives and the lives of others they are privileged to lead. The dawning of the ‘New World’ order, commonly known as ‘Globalisation’ has turned Leadership and Management consultancies into a very lucrative business. These experts have one commonality in focus and that is, ‘the people’ and not ‘the

work' is the key to success. The assumption is that good and profitable work is a consequence of good leadership and management and therefore organisations are more likely to be affective and effective if the people doing the work are rightly disposed. Collins and Porras (1994) poignantly said, "Profitability is a necessary condition for existence and as a means to more important ends, but it is not the end in itself for many visionary companies." (Quoted in Dunphy & Griffiths, 1998). However, in this globalised era, this age of unparalleled progress and rapid development characterised by fierce competition and unrelenting change, it is not uncommon that metaphorically, the cart is often put before the horse. Not surprisingly, such people who inhabit these organisations have become disillusioned, unsettled, disenfranchised, marginalised and are left feeling like cogs working for man-made machines of which they have no control. Conversely, others who have reaped the rewards from the global marketplace are convinced that 'creative destruction' is good as it gets rid of the bad eggs, flattens the world and creates a more level playing field for all. (Friedman, 2000, 2006)

Teacher Leadership in the Singapore Context

Singapore, recently crowned as the most globalised city in the world, is proud that she has not just managed to ride on the waves of change but has even thrived in such tumultuous conditions. Yet, her leaders are also very quick to add that, because change is a constant and unpredictable, global competition unforgiving, interconnectivity complex and hazardous and terrorism ever-present and real, her people need to be ever vigilant and not rest on their laurels. Currency and relevancy is on the side of those who are cognizant, creative, innovative and entrepreneurial, whilst obsolescence and irrelevance awaits those who stubbornly hold dear to old and unsuited practices.

Hence, to constantly refine, re-define, re-frame, re-design, re-structure, to be nimble and constantly re-adapt is the leitmotif of the 21st century. Against a global context which is inter-connected, multi-dimensional, multi-layered and chequered with cultural innuendoes and diversities, it is perilous to think linearly and rely on past references. To survive and to thrive in this new world, new tools, new ways of thinking and new practices are non-negotiables.

The Singapore government is thorough and is leaving nothing to chance. The stakes are high with a small country lacking in natural resource and whereby people are her only resource. In ensuring that Singapore stays ahead and keeps abreast with the challenges, Singapore's educators officially received this mantra, "Teach Less, Learn More", during the National Rally speech by the new Prime Minister Lee Hsien Loong in 2004. Mr Lee had announced that, "You need a qualitative change, a quantum leap to get a different sort of education, different sort of results." (Chua & Ng, 2004). Earlier, it was the former Prime Minister, Mr Goh Chok Tong, now Senior Minister, who encapsulated the call to change with the mantra, "Thinking Schools, Learning Nation".

Teacher Leadership and Education for Today's Challenges

This idea to start preparing and developing a creative, thinking and innovative Singapore society via its education system is not new. Education has been and will continue to be the repository of a nation's or people's aspirations. Whether it is to technically train people, or to infuse a sense of nationhood, or to instil the young with a moral compass lest they grow up philistines without an appreciation of the arts; education has been the place where the moulding begins. The Singapore government has been making changes to its education system since 1986, and even as significant progress has been made, there is the worrying perception that the system is not flexible enough for today's challenges.





Essentially, both calls by the men at the helm were designed and crafted to urge educators to move to a more flexible and more diverse education system; recognition that the old efficiency driven approach, as opposed to an ability driven model, is unsuited for the new challenges ahead. Quintessentially, it is also a shift from a quantitative to a qualitative model. This systemic departure from an efficiency driven to an ability driven model is not as simple as merely tweaking the old system to attend to the new. It does require the painful process of devolving and evolving in order to be efficacious. Although the calls were issued to the teachers and schools, but given that today's challenges require a multi-dimensional and multi-pronged approach, it is also obvious that the spotlight is not just on them alone but all the stakeholders in the country as well.

Teacher Leadership and the Traditional View

The teacher facilitates..., The teacher guides..., The teacher encourages..., The teacher prompts..., The teacher leads..., The teacher manages...and the list goes on. That is simply the traditional view of teachers; that besides teaching, a

teacher is called upon to attend to the myriad of challenges and problems relating to pupils, colleagues, schools, parents, homes, the public and the community. So what is so new about 'Teacher Leadership' that the traditional view has not already 'umbrella-ed'?

Teacher leadership as espoused by the proponents of this 'new' concept is about extending the teachers' influence beyond the confines of the classroom to the school and the community. It is about raising the bar of professionalism for teachers and to acknowledge that teachers are capable and have much to add to the leadership and management of schools and the community. The perception is that while teachers have always been doing all the functions of leadership and management, their realm of influence is limited and very much contained within the four walls of the classroom. (IES, 2001) It is timely for teachers now, in the new world of change, to infect the school board and management with their ideas, reflections and practices; and in so doing bring about 'different results'.

Literature concerning teacher leadership is thin, but it is not hard to understand that



there is value in encouraging teachers' active involvement in the running of schools and the community. The realisation that knowledge is unlimited and there is no monopoly of wisdom, necessarily dictates the sharing of ideas and perspectives from all quarters in order to gain a better foothold of reality. In this age of Information, Technology and Knowledge, just leaving matters to the ability of the select and elite few to compute and rationalize the increasing diversities and often-conflicting global perspectives is not only fallible but perilous.

Teacher Leadership and Shared Governance

McNamara (1999) has written along similar lines when he asserts that managers cannot possibly know it all or reference resources for every situation. So managers must count on and listen more to their employees. His conclusions are that new forms of organisations, namely, worker-centered teams, self-organising and self-designing teams would help to redress the deficiency. Surely, this is true also of schools; that a form of shared governance should evolve with the times. Those who stubbornly ignore the shift in the centre of this responsibility, or are not cognizant to this change in the locus of control (Root, 1996), or have not become aware or paid due attention to the diversities and volume of opinions and information, are finding themselves disoriented or ashamedly wanting and unsuited to this new world of challenges.

MOE schools are already ahead in thinking in the aspect of getting teachers' involvement in the school leadership by allowing for teachers to develop their talents along different tracks: teaching, specialist or leadership. Yet, the common complaint among teachers is that there is already too much to do and the daily demands on their time are always never ending. Under such pressing and unsatisfying conditions, there is little incentive for most to take that quantum

leap out of the comfort and familiarity of the classrooms into the wider platform of school and community. Even if they did, their contributions would be minuscule and cursory if their sphere of reference is still anchored firmly in the old efficiency driven organisation paradigm.

Teacher Leadership and Disciplined Research

Research is therefore needful to help teachers make that leap. A firm foundation grounded in principled research is imperative for the practice of teacher leadership in true-to-life situations. Simultaneously, educators must be willing to uproot, re-frame and re-position themselves to face the new challenges. A simple re-organisation and re-alignment of roles and duties may get the job done for the short term but it is erroneous to think the same for the long haul. It is simpler and easier to make small adjustments to an old paradigm than it is to devolve and evolve into a new system to address new challenges. To make matters worse, change is painful and people's threshold and susceptibility to change is directly proportional to the extent of the changes. Yet, there is little hope to achieve quantum leaps with small incremental developments and feeble initiatives that are not informed by disciplined research.

Teacher Leadership and The Singapore Government

The government has shown its political will and resolve to engage organisational change by criticising the civil service. In 2004, at the annual dinner for members of the elite service, Mr Teo Chee Hean, then Singapore's Defence Minister spoke of the need for the Administrative Service to take risks, understand business better and work as a team across ministries (Soh, 2004). What was implicit is that the civil service has been slow in response to the changing circumstances, insular and non-collaborative, has not embraced diversity, is risk averse, out of touch with the market

and not pro-business. These headlines: 'Public Servants must think like insurgents' (Soh, 2004) and 'Civil Servants get wake-up call' (Low, 2004), underline the need to change.

Teacher Leadership and The Teacher

As individuals, it is a noble thing to want to raise the measure of one's significance beyond the parochial state of mere existence or employ. Collectively, it is also commendable for like minded people to raise the standards of their profession or organisational performance. This *ASCD Review*, a literary platform for teachers and researchers to share findings and examine issues in education, has a similar mission beyond keeping the words in print. The topic 'The Teacher as Leader' is not just a glib way of trying to orientate and to nudge teachers to stretch their imagination and the exercise of their leadership beyond the confines of the minds of their charges in their classrooms and into the affairs of school and the community at large. It is a crucial necessity that teachers evolve into new roles because the demands of the new world are different. The teacher can only continue to remain an integral and important component in the process of preparing people for gainful employment and fruitful existence if he/she is similarly adept to reality.

Teacher Leadership – From Stakeholders to Shareholders


Finally, Teacher Leadership is essentially a concept where success and applicability is contingent on many stakeholders. Consequently, whether teacher leadership becomes an important or instrumental facet of educational reform or just pure academic jargon really depends on how all the stakeholders in education resonates with the need to re-plate the system. In other words they will all need to evolve from stakeholders to shareholders. It will take time for each of these stakeholders to realise the potential amidst the

challenges and to seize the opportunities without succumbing to the problems of shareholders. The unchallengeable truth remains – time in the face of intense global competition, is not on the side of those who are unwilling to risk and to try.

In this proactive, government-led, Singaporean context, some encouraging measures have already been taken to solicit ideas from the populace. The various governmental ministries have been inviting and actively encouraging Singaporeans to bring forth their suggestions and ideas through various feedback groups such as the Health, Transport, Tax, Community Development, National Parents, etc. (Chua, 2003). What is needed now is for teachers to take the lead to 'make things happen'. True 'Teacher Leadership' can and will take root when it becomes a habit of involvement and engagement on issues that concerns and binds us all.

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Science Journals: Helping pupils plan science investigations independently

Jay Mahardale, Angeline Teo, Shah Jahan

Introduction

A primary concern teachers have in science education has been on the understanding and improvement of science teaching (Shephardson and Britsch, 1997) and how pupils transfer the learning of content to the lab experiments or sessions they participate in. For science teaching to be effective, teachers cannot focus on the traditional model of teaching and maintaining their roles as chief purveyors of knowledge. The development of key skills through in depth science instruction will not reach its maximal potential and disadvantages pupils as they progress to higher levels of education.

Observations of students' science performances in Admiralty Primary showed that Primary 5 and 6 pupils lacked the key skills needed to apply scientific concepts to the science activities they engage in. The pupils are not sure of how to apply their skills in carrying out science activities on their own. The use of a tool such as science journals would make a difference in their learning of scientific concepts as research has shown that these tools for learning can be used for analyzing

progress, correcting misconceptions and solving problems (Ajello, 2000).

There are several ways we can use science journals to help pupils construct meanings and understandings in their learning. We have decided to adopt the ideas presented by Shephardson and Britsch (1997) in which pupils use their journals as a log where they describe their experimental procedures, record their observations and report their conclusions. The journal functions as a tool for facilitating pupils' thinking by serving as a resource for the creation of a final product (Shephardson and Britsch, 1997). The approach would create learners who are more aware of their own cognitive and verbal processes which in turn would improve the students' investigative skills such as planning their investigations independently, developing



procedural writing skills and quality lesson reflections.

Implementation

Pupils did their hands-on activities which were taken from their activity book (I-Science Textbook 6A, 2004) but modified such that the skills mentioned would be developed as shown in the Table 1, below.

Pupils did not use the guidelines given in the activity book to conduct their experiments but instead created their own procedures. Working in groups, pupils were allowed to design their experiments based on their understanding of the concepts. Pupils were taught through the process of analyzing the activities that had been conducted.

Skills such as writing procedures, stating hypotheses, collecting data and controlling variables as well as drawing conclusions were developed and taught explicitly to give pupils foundation in these skills.

Pupils found the freedom to design their own experiments more refreshing as they were in control of their own learning and they were more aware of their cognitive

and verbal processes as seen in some of their reflections shown below.

"I have learnt that when we attached a greater weight on the spring, the longer the extension of the spring. I've also learnt that we should be very patient when doing an experiment and we need to repeat it several times. I've also learnt that when you attach the same weight again and again on the spring, the extension will also be the same."

"I think the experiment is very fun. I hope we have more of it."

"I have learnt that when doing an experiment, we have to do the aim, hypothesis, results and conclusion. I have learnt that the mass and the speed affect the kinetic energy it has. We find the average to make sure we have accuracy."

As to writing the procedure, we can draw the diagram first."

Monitoring

A set of rubrics was also drawn up to guide teachers in assessing pupils' progress in the various skills as shown in Table 2.

Table 1: Lesson Details

Activity	Topic/Title	Objectives
2.1	Energy: 'Kinetic Energy of rolling balls'	To find out if the kinetic energy of moving objects is affected by mass and speed.
2.2	Energy: 'The gravitational potential energy of balls'	To find out if the gravitational potential energy of an object is affected by its mass and height from the ground.
2.3	Energy: 'Energy Conversion of a falling object'	To observe energy conversion when an object falls to the ground.
3.2	Forces: 'Stretching a Spring'	To observe what happens to a spring when it is stretched. To relate gravitational force to the stretching of the spring.
3.3	Forces: 'What kind of surface results in the greatest friction'	To find out what kind of surface results in the greatest friction.

Skills Development and Evaluation						
Skills	Approaching Expectation		Meeting Expectation		Exceeding Expectation	
	1	2	3	4	5	6
1 Writing Hypothesis	Not able to construct hypothesis clearly.		Able to construct hypothesis with some clarity.		Able to construct hypothesis clearly.	
2. Controlling variables	Does not identify variables and relationships between the variables. Does not specify variable to be controlled and those aspects of an investigation that make comparisons unfair.		Identifies some variables and relationships between the variables. Specifies variable to be controlled and identifies aspects of an investigation that make comparisons unfair.		Identifies variables and relationships between the variables clearly. Specifies variable to be controlled and identifies aspects of an investigation that make comparisons unfair.	
3. Identifying data to collect	Not able to identify correct data to collect.		Able to identify some data to collect relevant to activity.		Able to identify all data relevant to activity.	
4. Writing of procedures	Not able to devise a method to test the hypothesis. Not able to write out the steps undertaken systematically and clearly.		Generally able to devise a method to test the hypothesis. Able to write out the steps undertaken systematically and clearly.		Able to devise a method to test the hypothesis and write out the steps undertaken systematically and clearly.	
5. Drawing conclusions	Does not draw inferences and conclusions from observations made.		Shows some inferences and conclusions from observations made.		Draws inferences and conclusions from observations made.	

Table 2: Scoring Rubrics of Process Skills

The rubrics serve as a guide for the teachers to monitor their pupils' learning. With the monitoring, teachers were able to intervene and plan activities to improve their pupils' investigative skills.

The Way Forward

Pupils were generally more critical of their experiments and tried to use their classmates' critiques and their individual judgment to improve the design of imminent activities. This correlates well to the development of controlling variables and writing procedures skills, where pupils had to be more critical thinkers in planning investigations, inadvertently improving their communication skills.

With a guided discovery approach, these pupils derive meanings from their experiments. The provision for independent planning during the journal sessions required pupils to explain, elaborate, defend his or her position to others and it is the burden of explanation that is often the push to make him or her evaluate, integrate and elaborate knowledge in new ways (Vaidya, 1993), helping them solidify the concepts on the topics learnt.





The scoring rubrics provide a good monitoring tool for teachers to provide feedback to pupils. Feedback provides an opportunity for a two-way communication between the teacher and pupils. Thus, the journals would be best carried out with a high frequency of discussions between teacher and pupils through the journal activities. At the same time, the scoring rubrics should evolve, ensuring that the scoring rubric aligns with pupils' abilities and differentiate performance levels.

Lastly, we feel that we can modify certain elements of science teaching and incorporate them in the science journals: such as the teaching of concept maps which can then be reflected on in the journals, use of journals as a form of formative assessment and the teaching of scientific report writing. Pupils will accomplish more science learning through the use of such journals. The concept-connected set of related learning activities then serves as the basis for the in-depth pursuit of scientific understanding by pupils (Vosniadou, 1996).

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Concept Mapping and Pupils' Learning in Primary Science

Ling Yuan

Abstract

This paper reports on a quasi-experimental study which examined the effectiveness of concept mapping as a revision tool in enhancing pupils' examination performances in primary science. The research objective seeks to determine whether there are significant differences in achievement between the concept mapping and traditional method of revision groups after treatment in both primary 4 gifted and mainstream classes. This research hopes to establish the relationship between pupils' understanding of science concepts along with performance and use of concept mapping as a revision tool in primary science. Findings of this study will be useful towards the implementation of concept mapping as an instructional and revision tool in the primary science classroom.

Objective

The purpose of this study is to examine, in a systematic manner, the effectiveness of concept mapping as a revision tool in enhancing pupils' learning and understanding of primary science concepts.

Interest in knowledge representation and knowledge elicitation has increased greatly over the past decade and new literatures are emerging on this topic. However, a literature search on concept mapping in Singapore classrooms revealed that thus far, no systematic studies have been done, especially in the area of primary science education. Research on concept mapping has only been systematically examined and documented in the teaching of lower secondary history (Loh, 1987) and secondary science (Mohamed Nasir, 1992), in the local context. There were three conference/ seminar papers involving the use of concept mapping in science in Singapore (Chang, 1989; Lloyd, 1992; Wan, Lee, Goh & Chia, 1992).

Significance

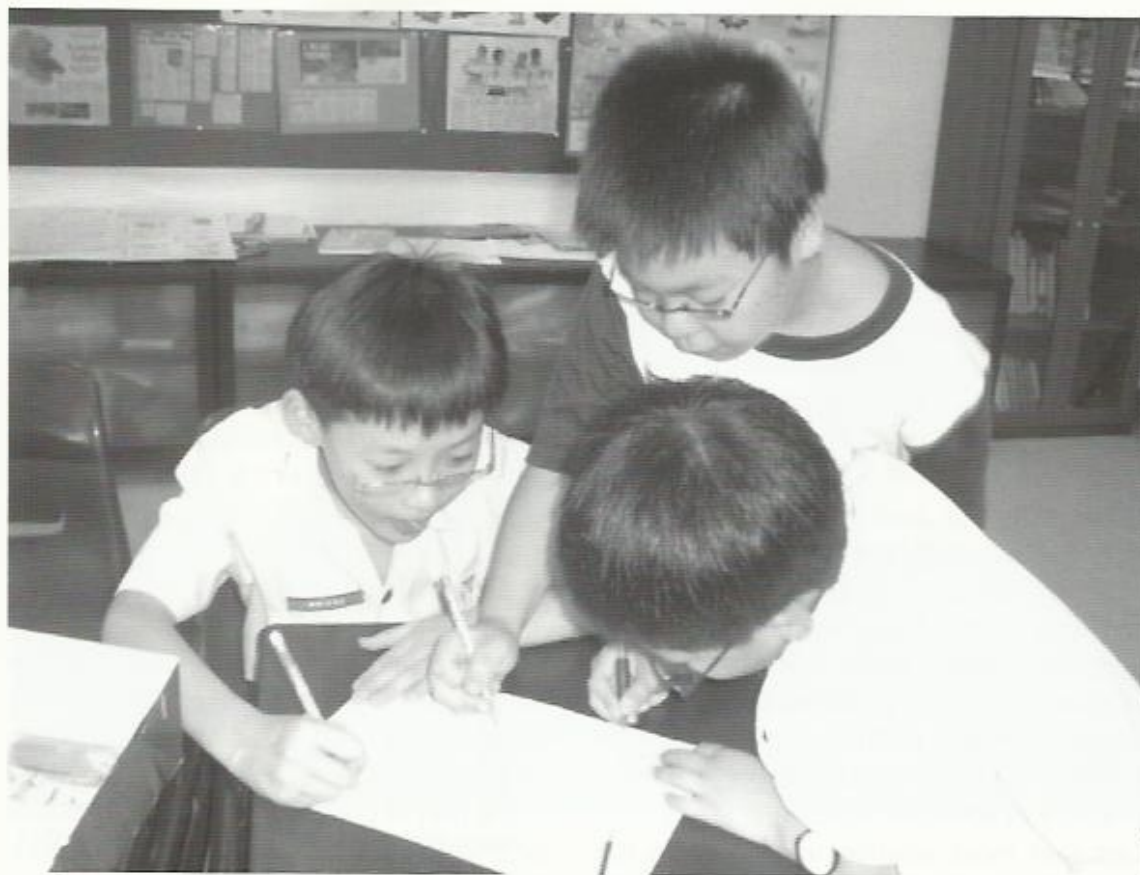
Findings from this study will go some way in addressing the lack of knowledge arising from systematic studies on the use of concept mapping in primary science classrooms in Singapore.

It will also complement existing knowledge concerning the use of concept mapping in science classrooms overseas, as well as locally in the use of concept mapping in secondary and non-science classrooms.

Research Questions

The following research questions are proposed to further investigate this learning heuristic.

- RQ1. Does concept mapping as a revision tool help primary school pupils (both gifted and main stream) achieve better performance in terms of marks in science tests and assessments?



Pupils working on their concept maps in groups.

RQ2. Does concept mapping as a revision tool enhance concept retention in pupils?

Background and Introduction

The current method of teaching science in primary schools is often didactic and does not engage pupils' prior knowledge actively (Toh, 1994; Toh, Ho, Chew & Riley, 2003). It is not surprising that many pupils still learn science concepts by rote (Songer & Linn, 1991). As a result, new concepts are not assimilated into the long-term memory of the pupils (Novak, 1993) and there is often a lack of understanding of concepts and principles.

As most of these new concepts learnt soon become irretrievable from long-term memory and even if recalled, seldom can the learner utilize the knowledge in new contexts, as in novel problem-solving.

The trend of science questions in recent Primary School Leaving Examination

(PSLE) requires more application than recollection of knowledge (Sample PSLE past year questions). Questions no longer test direct regurgitation of facts. Questions now require pupils to apply and synthesise concepts to offer solutions to problems. Some pupils cannot cope with these demands to answer such PSLE science questions confidently. These observations suggest that local primary pupils may not fully understand the science concepts they are supposed to have learnt, much less to be able to link and apply the learnt concepts.

The Singapore primary science syllabus, though thematically and spirally taught to the pupils over four years, is often characterized by lack of coherence. For example, according to the syllabus, the pupils are taught the topic of materials in primary three followed by that on matter in primary four, without the association that materials learnt in primary three can be subsumed under matter. There is anecdotal evidence that many primary

four pupils learn aspects of matter as isolated elements of knowledge instead of as well-structured and integrated domain-specific knowledge structures, as in relating matter to materials. Such pupils do not appear to possess a well-founded basic framework in which newly acquired concepts can be integrated. This lack of integration is suspected to be at the root of pupils' difficulties concerning concept formation and application of acquired knowledge.

Even with the encouraged inclusion of concept mapping as a teaching method in primary science, as documented in the guide to teaching and learning of primary science (CPDD, MOE, 2004) due to its widespread usage in overseas and foreign studies, most instructions in primary science currently still tend to focus on mastery of scientific words and terms. The fact that most science textbooks do not reveal to teachers how to deeply explore content concepts has resulted in weak inclusion of concept mapping in science classroom teaching. Even if concept mapping has been used in some primary science classroom, there has yet to be any systematic research done to gauge its effectiveness in enhancing learning and performance.

In the context of organized systems of education, the impact of time on children's learning is extremely important because the progressive structuring of knowledge and understanding is gradual. For teaching and learning to be successful, we expect learners to acquire not only new knowledge in sufficient depth, but also to retain this knowledge for a long period of time after instruction. There are two reasons for this. First, this concept durability is needed to equip future citizens with the skills and knowledge accumulated over their school lives for use in real-life settings. Second, further learning is to be based on existing prior conceptions of the learner (Bjork, 1996).

The Learner and Learning: Philosophical and Theoretical Principles

Meaning of Meaningful Learning

Studies (e.g. Gabel, 1983) have shown that pupils may produce correct answers to various kinds of problems, but their understanding of the underlying science concepts is lacking. On the surface, pupils are able to perform the required operations but their shallow understanding results in under performance in the subject.

The key factors contributing to the low level of conceptual understanding and large number of misconceptions among pupils is that current science teaching methods employed do not seek to diagnose or engage pupils' prior knowledge. Didactic instruction encourages passive learning on the part of pupils. This resulted in pupils coming to science classes with misconceptions, preconceptions or alternative conceptions already formed as a result of their interactions with the world. These alternative conceptions influence how they interpret and construct new conceptions in science lessons. Pupils not exposed to the tools to synthesize information from multiple sources are handicapped at integrative reconciliation of concepts.

Constructivist Learning

Meaningful learning occurs when individuals "choose to relate new knowledge to relevant concepts and propositions they already know" (Novak & Gowin, 1984). This is based on the constructivist perspective on learning, where learning is an active process in which the learner is constantly creating and revising his or her internal representation of knowledge when new concepts are linked to familiar concepts existing in the learner's cognitive structure and can be applied to all subject matter (Duffy & Jonassen, 1992).

Meaningful learning of super ordinate concepts also gives new meaning to relevant subordinate concepts and



Pupils working on their concept maps in groups.

propositions, which facilitates integrative reconciliation of concepts.

Concept Mapping

Novak and Gowin pioneered concept mapping based on the meaningful learning theory by David Ausubel (1963,1968). Concept maps are two-dimensional hierarchical diagrams which illustrate the relationships between and among individual concepts. The basic Novakian concept map illustrates a hierarchy of concepts where more specific and less inclusive concepts are linked together by valid and meaningful propositions and therefore are subsumed under the broader, more inclusive concepts. They rely on three fundamental qualities; hierarchical structure, progressive differentiation and integrative reconciliation (Novak & Gowin,1984).

Links between concepts are shown by the hierarchical structure in which the lower concepts are subsumed beneath those of the higher levels, and the super ordinate concepts are more general than subsumed concepts. Two or more concepts linked together by words create a proposition. The prepositions, along with arrows

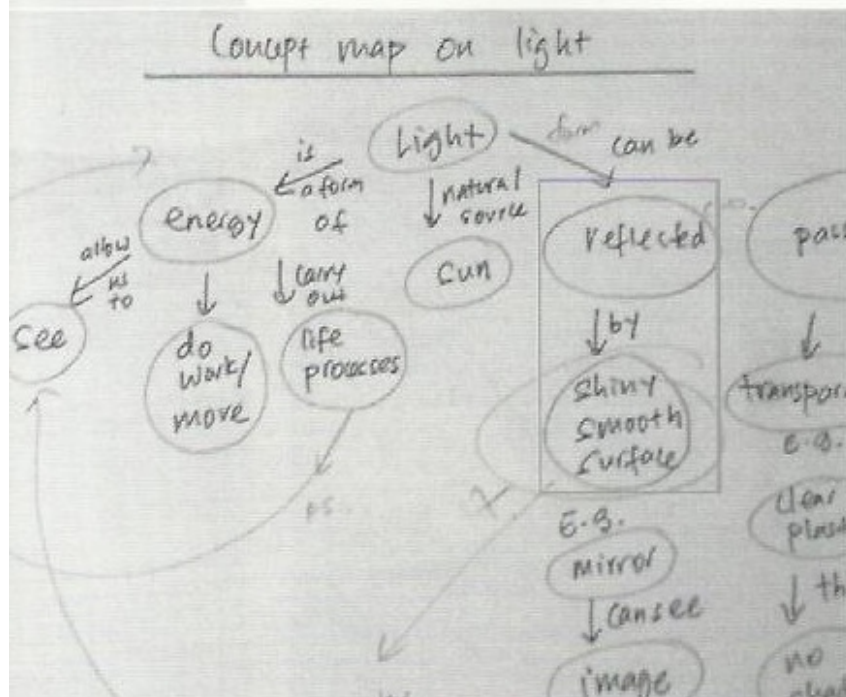
indicating the direction of the relationship help to develop the connections between linked concepts more precisely.

Concept maps are intended to tap into a learner's cognitive structure and to externalize for both the learner and teacher to see what the learner already knows (Novak & Gowin, 1984). Based on constructivist theory, concept mapping mirrors the constructivist definition of curriculum as the set of learning experiences which enable the learners to develop their understanding (Driver, 1986). Researchers (e.g., Heizne-Fry & Novak, 1990) have touted concept mapping as a strategy for promoting meaningful learning.

Concept Maps as Learning Tools in Science Education

Concept mapping has been applied at all levels of learning and instruction in many contents. The use of concept maps is becoming more widespread in the areas of science education abroad.

In science education, concept mapping has been widely recommended and used in a variety of ways. It has been used to help



Sample concept map which reveals the groups' misconception that only smooth and shiny surfaces reflect light.

pupils build an organized knowledge base in a given discipline or on a given topic. Concept mapping has also been used as a study tool for synthesizing information from multiple sources.

Concept mapping engages the learner in the construction of knowledge by linking sub-concepts to more general, inclusive, and abstract concepts, thus bringing about meaningful learning. The tools, when employed by pupils, help them "learn how to learn" (Novak & Gowin 1984) which in turn facilitates pupils to be more aware about the structure of knowledge and the process of knowledge production or meta-knowledge (Novak & Gowin, 1984).

Concept mapping has not only been found useful in promoting pupils' understanding of science concepts. It also facilitate pupils' abilities to solve problems and to answer questions that require application and synthesis of concepts (Novak, Gowin & Johansen, 1983). Concept maps have been used to observe change in pupils' understanding of concepts over time (Novak & Musunda, 1991). It can be used to assess what the learner knows as concept maps can be tapped to measure

pupils' understanding and to reveal unique thought processes.

Numerous studies have shown that pupils bring relevant knowledge frameworks or varying degree of quantity and quality to learning tasks (Novak, 1987). Concept mapping has not only helped pupils elaborate the conceptual understanding theory they already possess but especially helped them to recognize and modify those knowledge structures that contain misconceptions, alternative conceptions or framework (Feldsine, 1983; Novak & Gowin, 1984). Thus, the acquisition of powerful super ordinate concepts should be a primary goal of effective science teaching (Novak, 1998). The ability of the mapper to identify and relate the salient concepts to these super ordinate concepts requires an understanding of the constitution of the science concepts involved. Thus, concept mapping when adopted as an instructional and revision tool promotes higher order thinking and positively impacts science teaching and learning.

Roth and Roychoudhury concluded that concept mapping has some effect on achievement and a large positive effect on pupils' attitudes. It has been used to promote positive self-concepts, positive attitudes toward science (Novak & Gowin, 1984) and increased responsibility for learning (Gurley, 1982). As a learning strategy, concept mapping is most effective if it is conducted on an ongoing basis over the course of instruction. This allows pupils to modify their maps as learning occurs and conceptual understanding grows.

From the perspectives of both the theory of learning and the theory of knowledge, the challenge is for science educators to design an instruction strategy that encourages high levels of meaningful learning, including the development of well-organized conceptual frameworks and well-integrated super ordinate concepts. Concept mapping is a locally under-tapped means of eliciting pupils' concept structure

in a content domain in the area of primary science.

In the area of science curriculum, concept mapping has been used in its development (Starr & Krajcik, 1990) and the evaluation of instructional activities for promoting conceptual understanding. Concept mapping is potentially useful to pupils in the local primary science as the local primary science curriculum thematically and spirally grouped topics taught across the four years of primary science education. The connections that concept maps facilitate, not only allow local primary pupils to draw associations among the main concepts being presented, but also generate greater retention, application, and understanding of concepts. Concept mapping can therefore be an invaluable instructions and revision tool for primary science pupils as the PSLE tests science concepts learnt in all four years of Primary science education.

Research Method

The research design of this study is evaluative and which facilitates gathering of empirical data, thereby making possible some valid statements about the effects of concept mapping on pupils' understanding and learning of science.

Two classes from both gifted and mainstream pupils were selected and assigned to two groups. All pupils first attempted the pre-test to the topic. Pupils in the experimental group were continuously exposed to concept mapping as a learning and revision tool in concurrence to the topics taught.

Secondly, pupils constructed a concept map in groups of 3 for the concurrence topic based on the concept lists provided by the teacher. Pupils from the control group outlined the summary in point form for the same topic taught.

Thirdly, pupils from both groups took the post-test of the topic and their results were analyzed in a quantitative analysis. The above procedures were repeated for each of the topics covered in the first semester

for both the gifted and mainstream pupils. Pupils' results in the continual assessment 1 (CA1) and semester assessment 1 (SA1) were also compared in an attempt to check on the validity on concept mapping in enhancing the retention of concepts over 6 months.

Instrumentation

Test formats

To ensure the test validity and comparability of the pre- and the post-tests for each topic, a table of specifications was drawn up to facilitate the crafting of test questions to involve the same concept and process skills for the topic tested for both the pre- and post-tests. Based on the past years' tests, multiple choice questions amounting to 5 marks and open-ended questions amounting to 10 marks were selected and modified to remain non-biased and in line with the learning objectives of each topic for the pre-tests.

Selected questions were crafted to test pupils' application and linking of concepts. A parallel set of questions was selected for the post-tests.

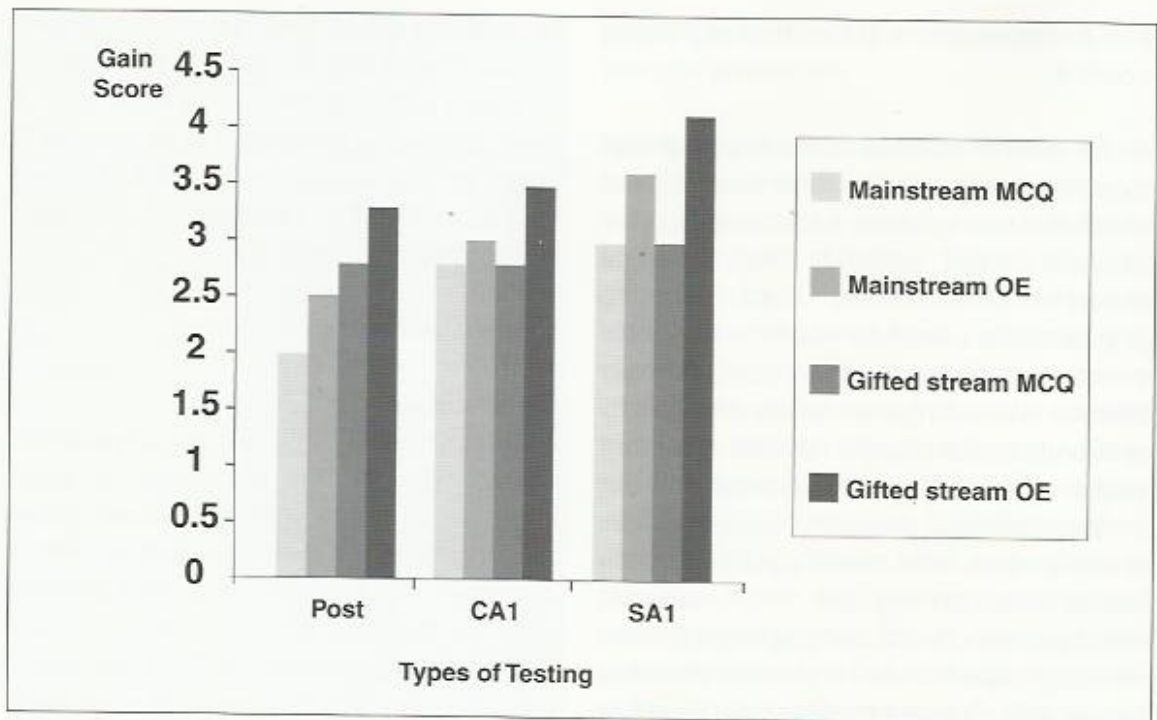
Scoring of pre- and post-tests

Marks were awarded for each correct option for multiple choice questions and concept applied for the open-ended questions. Wrong options made for multiple choices were not penalized but correction for guess work was factored in. Partial marks according to the marking scheme were awarded for partial concept applied in the open ended section of the tests.

Concept Mapping Technique

Procedures During Concept Mapping Training Phase

Concept mapping skills began in the 3rd week of Term 1 and stretched over a term. The teacher explicitly spent 1 hour to guide the pupils in the experimental group through a concept mapping workshop. In the course of the workshop,



Graph 1 - Statistical analysis of gain score of pre and post test, CA1, SA1 in Multiple choice questions (MCQ) and Open ended questions (OE) in both gifted and mainstream pupils in Semester 1.

the teacher introduced concept maps to the pupils by explicitly informing the pupils the components and construction of concept maps and the purpose they serve. During the workshop, pupils had hands-on practices to develop concept maps on common topics in groups of 3 with reference to the concept list for the topics.

Pupils' grasp of concept mapping skills was also facilitated by the use of concept maps as part of the instruction and topic revision. When teaching the topic, the teacher explicitly highlighted to the pupils the linkages of the various concepts.

Pupils in both the gifted and main stream experimental classes then worked in groups of 3 to develop the concept maps during the last 15 minutes lesson for each of the topics covered. Pupils made references to the concept lists provided for each of the topics. The concept maps created by pupils should extend the list of concepts beyond the list formed by illuminating the hierarchical structure, differentiation and integration among concepts.

Data Analysis of Exploratory Study

Quantitative Analysis of Results

The data collected and analyzed included scores for multiple choices and open-ended questions in the pre- and post-tests on the topic of matter, light and heat for gifted and matter and water for the main stream. Pupils' pre-test scores were checked to ensure the pupils in the experimental and control groups for both gifted and mainstream were statistically equivalent. This means that the groups shared similar cognitive structure before treatment and hence, the effect of the pupil's prior knowledge on subsequent learning could be taken as equivalent.

Pair sample t-tests were carried out to present statistical significance for the pre- and post-tests results scored by all pupils. The null hypothesis states there is no significant difference between the means of the results achieved in pre- and post-tests between the experimental and control group. The alternate hypothesis states that there is a significant difference between the means of the results achieved in pre- and post-tests between

the experimental and control groups. A confidence level of 95% was selected. The comparison of the t-value elicited answers to whether concept mapping enhanced primary school pupils' (both gifted and mainstream) performance in terms of marks in science.

Discussion

Quantitative analysis

Since the pupils in the control and experimental classes of the gifted and main stream groups were streamed into their current classes based on their primary 3 results, the control and experimental classes in each group were taken as statistically equivalent and the effect of pupils' prior knowledge on subsequent learning was assumed to be the same. With reference to Graph 1 below, all post-tests carried out showed significant differences between the experimental and control group's scores. The pupils' gain scores were tracked for CA1 and SA1. The pupils' mean gain scores showed a positive trend towards better results in the experimental group for both streams. The increments in means between pre- and post-tests of the experimental group although small were nevertheless significant. The increment in mean results of the continual assessment over post tests and semester assessment over continual assessment provided an indication and a measure of how well retention of concepts has taken place.

Conclusion

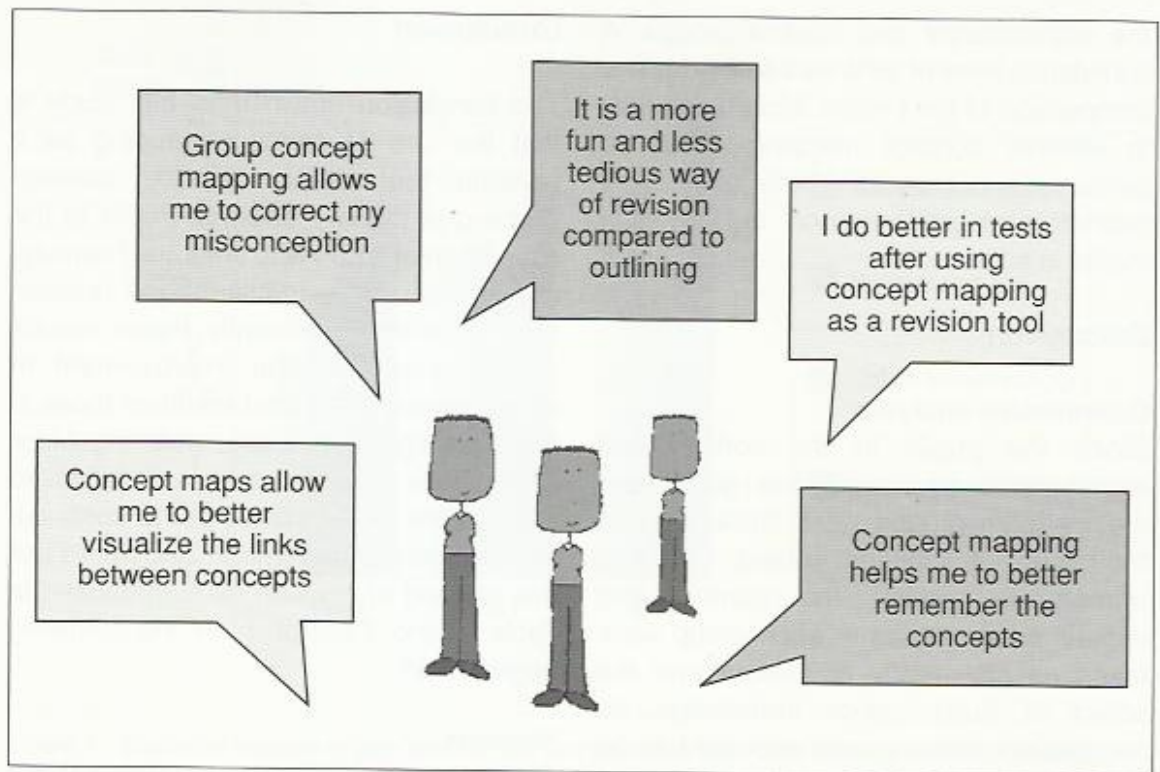
The conclusion drawn from this study is that the use of concept mapping as a revision tool does enhance concept learning in primary science. Pupils in the experimental group who embraced concept mapping as an instructional and revision tool achieved significantly better results as evidenced by the improvement in mean scores of the post-test than those in the control group that used outlining. More significantly, concept mappers achieved significantly better scores in the continual and semester assessments and pupils like this method of revision as summarized in Table 1 and Excerpt 1 on the following page.

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1	I like concept mapping	89% Yes	11% No
2	I am motivated to study using concept mapping	75% Yes	25% No
3	Concept mapping is easy	89% Yes	16% No
4	Concept mapping helps me in recalling the concepts to questions	87% Yes	13% No

Table 1 - Survey on pupils' attitude (in experimental groups) towards concept mapping.



Excerpt 1: Pupils' remarks (in experimental groups) about concept mapping.

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