

## TEACHER ED | Lessons learned outside the classroom

*Have you ever wondered if the 100 hours you clock in for professional development is really helping to make you a better teacher? Read on to find out what the research shows.*

### Article highlights

- What research shows about teacher learning
- When the workshop ends – and real learning begins
- Getting the most out of your professional development

“Professional development is a continuous process of individual and collective examination and improvement of practice.” ([American Federation of Teachers](#))

As teachers, we attend countless workshops and in-service courses. Added to these, there are many other avenues for teacher learning to take place, such as action research, reflective journals and online communities. They are part and parcel of a teacher’s life.

But how many of those workshops actually improve our pedagogy? How much of the new knowledge we gained is translated into better teaching practice?

### *Maximizing your learning*

In their project, “Teacher Learning and the Acquisition of Professional Knowledge”, American researchers Suzanne Wilson and Jennifer Berne surveyed a number of research projects and found three themes that make for effective teacher learning.

### *Learning must be activated*

Teacher learning needs to be “activated”, as in the case of the Cheche Konnen Project.

When the teachers in this project were provided step-by-step guidance on how to teach the new curriculum, their students learned better.

It also helped when they were able to “see” learning in action – when they learned to learn as their students would. By being able to identify with their students, they were able to understand the curriculum more thoroughly and thus became better teachers.

### *Learning must be shared*

Interaction is integral to teacher learning. When teachers are able to come together and talk about what they do, to share teaching beliefs and practices, and to critique each other as professionals – that is where learning truly begins.

For this to happen, trust needs to be built – teachers need to truly feel comfortable with each other. For the Cheche Konnen teachers, their practice was enhanced by not only because they were using the same teaching method, but also because they were now a “community” of learners.

### *Learning must continue*

For real learning to take place, it must continue long after the seminars and workshops are over.

The researchers noticed that many of the teachers involved in the projects stayed in touch long after the projects were over. This enabled them to continually meet and share their experiences in and out of classrooms.

### *Working hard at learning*

So we know what makes for effective teacher learning. What we often forget is that **real learning is hard work!**

Wilson and Berne explain that very often, when teachers sign up for a seminar or workshop, they expect to learn something new – new theories, new methods, new ways to make teaching easier. The last thing they want is to have their old assumptions challenged or their teaching methods questioned.

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But more often than not, real teacher learning will do just that.

So, before you sign up for your next workshop, remember:

- real learning takes place when are challenged
- real learning takes place when you share
- real learning must continue

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#### *About the Cheche Konnen Project*

This research project was conducted by Ann Rosebery and her colleagues at the [Technical Education Research Centers](#) in Cambridge, Massachusetts. In Cheche Konnen (which is Haitian Creole for the “search of knowledge”), the learning of science was devised around the inquiry method, where learning is based on students’ questions.

In this project, Science teachers were given a new curriculum using inquiry-based learning. However, a year after the curriculum was introduced, researchers found that the teachers were still not competent in teaching with this method.

The research team then tried an alternative method of delivering the new curriculum. This time round, teachers were guided on how their students would use the inquiry method. They had to enact actual scientific investigations and formulate theories from them.

At the end of the project, researchers found that the students gained more knowledge in science and scientific thinking. At the same time, researchers also observed how the teachers learned through professional development workshops and seminars.

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#### Resources

> Visit the [American Federation of Teachers website](#) for more helpful tips on professional development.

> To learn about how you can use inquiry-based science as a tool for professional development, check out our story in [Science Ed](#).

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#### References

American Federation of Teachers. (n.d.). Professional development for teachers. Retrieved February 11, 2009, from <http://www.aft.org/topics/teacher-quality/prodev.htm>

Wilson, S. M., & Berne, J. (1999). Teacher learning and the acquisition of professional knowledge: An examination of research on contemporary professional development. *Review of Research in Education, 24*, 173-209.

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## LANGUAGE ED | Battle of the Tongues

*Mandarin, Malay and Tamil: in Singapore, these are considered the official “mother tongue” languages. However, as the languages spoken at home change over the years, so too have children’s “real” mother tongue. Though these languages are cherished for their ethnic heritage, this may not be enough to save them against a gradual loss of prestige in the face of the growing influence of English.*

*So, the big question is: What can we do about it?*

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#### Article highlights

- What’s happening to Chinese Singaporean preschool children’s oral Mandarin
- How can a corpus help
- What can teachers do

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#### *The Case for Mandarin*

In 2004, the [Chinese Language Curriculum and Pedagogy Review Committee](#) (CLCPRC) found that the use of English as the primary home language among Chinese Singaporeans is now equal to and will soon surpass that of Mandarin.

The committee concluded that there are now two major distinct groups of Chinese Singaporean

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children, with very different home language backgrounds, now learning Mandarin in schools:

1. those from English-speaking families (ESF), and
2. those from Chinese-speaking families (CSF).

This comes as no great surprise to many Mandarin teachers in Singapore who have seen the growing use of English among Chinese Singaporeans at home. But this does raise the question of *exactly how different* these two groups of children are with regard to their oral Mandarin competence.

#### *The Corpus: Language in Real Life*

This is where the [Singapore Preschoolers' Mandarin Chinese Corpus](#) comes in.

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A corpus (plural: *corpora*) is a large collection of texts, whether spoken or written, stored electronically. They are used to analyze how language is used in real life.

For more information on this, check out:

[Cambridge International Corpus: What is a Corpus?](#)

[AskOxford: What is a Corpus?](#)

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Using this corpus, lists of Mandarin words spoken by Chinese Singaporean preschoolers have been generated. The corpus has helped us find out:

- **what** preschoolers like to say,
- **when** they say it, and
- **how** they say it.

This data can then be used:

- as a reference for the Curriculum Planning and Development Division when they further develop the Chinese language curriculum, textbooks and pedagogy for primary schools.
- to devise a means for measuring children's linguistic proficiency in order to help determine which module they should join ( [CLCPRC](#)'s recommends that a modular approach to language learning be used to accommodate the students' linguistic backgrounds).
- to highlight the implications for Chinese language classroom pedagogy and teacher education programmes.

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**Declining** levels of **Mandarin** usage at home = **declining** competence in children's oral Mandarin (especially at the preschool level) = **increasing** need for teachers to work hard at improving their pupils' standards of Mandarin

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Furthermore, language is *not* a zero sum game. A decline in the use of Mandarin will not automatically lead to an improvement in Chinese Singaporean children's use of English.

In the study, it was revealed that most parents who claimed to interact in English with their children at home are, by their own admission, *not* very good English speakers.

This discrepancy between the actual proficiency of these parents' spoken English and their desire to introduce English to their children in daily communication would result inevitably in them using Singlish or a mixture of English and Mandarin.

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**Increasing** levels of **Singlish/non-Standard English** usage at home = **declining** competence in children's oral English (especially at the preschool level) = **increasing** need for teachers to work hard at improving their pupils' standards of English

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The end result is that the growing influence of English and its use (in a non-standard form) as a home language among Chinese Singaporeans is posing major problems for both English and Mandarin. It:

1. **hinders** children's acquisition of Standard English, which then effects their learning in all other subjects taught in English in school, and
2. **prevents** them from fully developing their Mandarin competence and appreciating the wealth of cultural knowledge that the language embodies.

#### *The Good News*

But all is not lost. This study has also found that there appears to be a continuum of Mandarin competence among preschoolers, rather than a marked distinction between the groups.

This means that in a bilingual and multicultural society like Singapore, as Xu and Li (2003, p.

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152) so aptly describe, there are still “more bilinguals than monolinguals”.

Therefore, a mother tongue language, like Mandarin, will never truly die out. But if it is to play a bigger role in Singapore’s language landscape, then its prestige and value must be increased and actively promoted – whether in school or at home.

And, to help our students improve their language competence – whether in English or in Mandarin – we teachers must constantly set the standard which we hope they will follow. Standard English is a must if we hope to combat the use of non-standard varieties of English at home.

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#### Resources

[Singapore Preschoolers' Mandarin Chinese Corpus](#)  
[Chinese Language Curriculum and Pedagogy Review Committee](#)  
[Academia Sinica Balanced Corpus of Modern Chinese](#)  
[Peking University Babel Chinese-English Parallel Corpus](#)

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#### Reference

Xu, D. M. and Li, W. (2003). Linguistic dirigisme and language management in Singapore. In P. M. Ryan & R. Terborg (Eds.), *Language: Issues of Inequality* (pp. 122-154). Mexico: Universidad Nacional Autonoma De Mexico.

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## MATH ED | Does practice really make perfect?

*While practice makes perfect – so the saying goes – it is no longer always true in today’s Math class, especially when solving word problems. Word problems today require more than mere computation. You need to consider the context of the problem and give thought to the meaning of the mathematical processes before you can arrive at the solution.*

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#### Article highlights

- When mathematical problems have more than one solution
  - Word problems as a change agent
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#### Thinking time

Try solving this:

Alvin has 2 brothers.  
Brian has 2 brothers.  
Chris has 2 brothers.  
Alvin, Brian, Chris and their brothers went into a van.

How many boys are there in the van?

If you answered 6, you are correct. If you answered 8, you are also correct.

Confused? Could there be more than one correct answer to this problem? Yes - depending on the context:

If Brian and Alvin are brothers and Chris is a boy not related to them, then the answer is 6.

If Chris is a girl and Alvin, Brian and Chris are not siblings, then the answer is 8.

Of course, we are assuming it is an empty van the children are getting into. If the van already has some boys, then the answers are again different.

#### Problem solving

That was an example of a non-standard word problem, as opposed to a standard word problem like this:

Mary has 10 boxes of apples.  
There are 5 apples in each box.  
How many apples does Mary have?

You can get the answer by a simple computation:  
 $10 \times 5 = 50$

In this case, there is no need to consider the context of the problem to obtain this answer. The

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result of the computation is also the solution to the problem.

In standard word problems, the solution is often obtained by identifying the correct operations and carrying out the corresponding computations. There is no need to consider how to use the answer from the computation to obtain the problem solution.

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### *Background of T<sup>3</sup> project*

The Think-Things-Through (T<sup>3</sup>) project aimed to transform the teaching and learning of mathematics through:

- developing teachers' pedagogical skills
- engaging students in sense-making when solving word problems

Teachers were trained to use a set of teaching materials, including student worksheets with standard and non-standard problems and manipulatives. They were given different levels of support, with the majority being given teaching notes and encouraged to discuss the lesson plans with their colleagues.

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### *Changing the way we learn*

Word problems were the focus of a project to study its use as a change agent in Mathematics classrooms.

Although the intervention didn't increase students' success in solving non-standard problems, it did enable more students to think more deeply about the problems. The proportion of students who gave illogical answers using mere computation decreased over time.

Three factors were found to have an impact on how well students were able to handle non-standard word problems:

(1) Teachers who are given more **guidance** in using non-standard problems in their teaching.

(2) Teachers who have the **knowledge** and understanding of the mathematics behind the non-standard problems.

(3) Teachers who **believe** in and are comfortable with a more student-centred approach.

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### *Solutions for Math teachers*

- Give your students more opportunities to discuss non-standard problems.
- Use more student-centred teaching approaches that focus on engaging students rather than on completing a task.
- Internalize the principles of the Math curriculum and adapt them in your teaching.
- Seek guidance on how to incorporate non-standard problems in your lessons.

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Non-standard word problems are not only a good way to build up your students' critical and creative thinking abilities, it also sharpens your skills as a teacher.

In this case, practice does make perfect.

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### *About the project team*

Yeap Ban Har, Berinderjeet Kaur, Lee Ngan Hoe and Ho Siew Yin are faculty of the [Mathematics and Mathematics Education Academic Group](#), National Institute of Education.

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### **Resource**

> Read more about the T<sup>3</sup> project and access the worksheets and lesson plans [here](#).

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## SCIENCE ED | Inquiry in primary science classrooms

*By basing learning around questions, one research project shows how inquiry-based science can be a tool for both student and teacher.*

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### Article highlights

- The 3 essential features of inquiry-based science
  - Using inquiry as a tool for professional development
  - A Teaching tip
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A researcher and PhD candidate who has spent many years with the Science Curriculum and Planning Division, Ms Poon Chew Leng, has been studying four teachers at a primary school for the last year. She is looking for patterns in their teaching which she then builds a framework to represent what she sees to be processes that is happening.

Chew Leng explains, “One of the strong characteristics observed in my study is that teachers use a lot of meaningful investigative activities for the kids. The teacher doesn’t teach explicitly too early in the lesson. Not that there isn’t explicit teaching, but **students participate in finding things out for themselves.**”

### *The inquiry approach*

There are three core components:

1. **Engage:** Teachers interest students in a topic through a problem, question or narrative.
2. **Use of evidence:** Students are involved in hands-on investigations to collect data.
3. **Explain:** Students construct explanations from evidence and communicate and defend their reasonings and explanations.

“Students also come to appreciate the importance of the human element in the construction of scientific knowledge.” She explains, “Theories are models to explain observed phenomenon or patterns and trends in the data.”

### *A move towards inquiry*

A study by the Centre for Research and Pedagogy and Practice, showed that teaching and learning of science in Singapore classrooms is characterized by the Initiate-Respond-Evaluate (IRE) format. The teacher initiates the questions, students respond and the teacher evaluates.

But Chew Leng finds that increasingly in primary schools, teachers have been encouraged to adopt a more inquiry approach to teaching science. In other words, students can also ask the questions. They are taking a more active role to explore, and engage in the activities to find out answers for themselves. They also learn to use evidence from the data collected to support their findings.

The teachers participating in the study have attributed the change in the science PSLE questions in 2004 as one of the catalysts for change. That was when exams gave greater emphasis to critical thinking skills and the ability to apply concepts. Teachers recognized that inquiry as a pedagogical approach supported the need to teach students science in a manner that would enable them to learn and apply principles and concepts.

### *Anxiety over inquiry*

Chew Leng’s research showed that teachers were anxious when they started adopting inquiry practice.

### *Teachers*

While it was not too difficult to pull off one inquiry lesson, teachers were concerned with the adequacy of curriculum time and resources to adopt inquiry practice on a daily basis. At the end of the one-year field work, the teacher collaborators were surprised that they were able to sustain the use of the inquiry approach and

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complete their syllabus. Chew Leng wants to encourage teachers to pick up the courage to try and not be bogged down by their anxiety.

#### *Parents*

Parents might also be anxious about their children learning through the inquiry-based method as it was new to most of them. One of the collaborating teachers in the study actually conducted a workshop to provide parents with the opportunity to experience this approach to learning science, and received much support from the parents.

#### *Not just for teaching and learning*

The pedagogical framework is a tool for planning and enacting inquiry. At the same time, it also serves as a tool for professional development.

Chew Leng explains, "Inquiry practice is not static. Teachers modify their practice as they talk about their practice with other teachers and reflect on their practice. The pedagogical framework served as a tool for reflection and for generating professional dialogue around inquiry practice."

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#### *A teaching tip*

**How should teachers get attention from a class of over 40 students so that learning can take place?**

The teachers in the study used various classroom management skills. For example, they established a clapping rhythm as a signal for the students to focus their attention on the teacher. When this is established as a routine, the teacher can transition smoothly from teacher to student-based work and from teacher to student-based work. The teacher doesn't have to shout to get the students' attention, for it must be acknowledged that the noise level in an inquiry classroom can be a little high as students can be animated in their discussion around their activity!

As Chew Leng reminds us, "Simple things like these do count a lot in practice and it's these things that could contribute to the success of a lesson."

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#### Resources

> [Primary level science syllabus 2008](#)

> [Sciberdiver: Dive deep into science](#)

Sciberdiver is a web portal containing a repository of the best science websites, specially selected to closely match the learning objectives in the Primary and Lower Secondary science syllabuses.

> [Science Buddies](#)

Project ideas and tools for students

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## HOT TOPIC | Why do academics use such big words in their writing?

*If the purpose of language is to communicate, you might think, from reading an academic article, that academics do not seem very adept at doing just that.*

But before you throw up your hands, cursing the "poisonous language of academia" (Frisk, 2005), let's find out why academics use terms that seem to frustrate the lay readers at every turn.

#### *It's not a secret code*

Academia is not, as most imagine, a lonely profession. In their chosen fields of study, academics work within a community where there already exist a group of researchers and practitioners.

To learn and be kept up-to-date on what's happening in their area of study, members within the community read, discuss and analyze each other's writing.

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And as they respond to each other's works, they began to develop and use certain conventions and terms (discourse) to communicate and exchange information. [Philosopher Thomas Kuhn](#) called these enclaves of researchers, who share language, values and beliefs, "discourse communities" (cited in Flowerdew, 2000).

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**Tip for accessing those oh-so-dense articles**

*Make Google your best friend*

The internet has become, to many, a reliable substitute for a dictionary. Use Google to help you understand the terms you are not familiar with.

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When young scholars start out, they cannot ignore these established practices. To be accepted and recognized as full-fledged members within the community, they have to demonstrate, usually through their writings, that they have learnt and understood these conventions.

And once they embark on this journey, this learning process never ends. Even after they have gained acceptance into the community, they cannot ignore these conventions if they want to

get published. The definition of their success is measured by the acceptance of their writing for publication.

**Not all gloom and doom**

If at this point of the article, you were still hoping for a call to revolt against the language, you are to be disappointed (see Frisk, 2005). The way academics use language is deeply entrenched because it is their way to communicate with each other.

But this does not mean you should be left out of this process. Dennis Kwek, a research associate with the Centre of Research for Pedagogy and Practice, believes that persistence is the key. "If you persist, the articles will become easier because your brain gets rewired to read them."

**References**

Flowerdew, J. (2000). Discourse community, legitimate peripheral participation, and the nonnative-English-speaking scholar. *TESOL Quarterly*, 34(1), pp. 127–150.

Frisk, R. (2005, May 14). "Let us rebel against poisonous academics and their preposterous claptrap of exclusion". *The Observer*. Retrieved Feb 6, 2008, from <http://www.selvesandothers.org/article9561.html>

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