

加强教师专业培训是学校成为好学校的第一步

Strengthening Teachers' Professional Development is the First Step Towards Becoming a Good School

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年10月25日美国《纽约时报》刊登了一篇托马斯·弗里德曼的文章，题目是“上海的秘诀”。

弗里德曼是第三届普利策新闻奖得主，《世界是平的》作者，有着非常敏锐的观察力。他和美国几位知名教育工作者，造访了中国几所表现最好和最差的学校，想找出为什么上海的学生能够在2009年的国际学生测评项目(PISA, Program for International Student Assessment)考试中全部项目名列第一的秘诀。PISA测评每三年举行一次，2009年是对65个国家15岁学生数学、科学和阅读掌握能力的测评。

弗里德曼仔细观察上海学校之后的结论是“其实根本就没有什么秘诀。他们只是无止境地强调那些造就优质学校的根本原则。这些根本原则是：下大决心给教师进行培训，教师之间相互学习，在专业上不停发展，在小朋友的学习过程中提高家长的参与度，学校领导坚持以最高标准要求学校，并且营造出重视教育、尊重老师的学校文化。”

他说：“这些根本原则我们都很清楚，但是想要在整个教育系统里持续地推广则非常有难度。”

上海对教师专业培训的重视作者本人也有体会。上海有不同的学科名师基地，方法是由一个特级教师带一些年轻教师，相互探讨，相互学习，共同提高。各个区也有教师培训学院，定期给教师进行专业培训。笔者也曾受邀给他们上课，介绍新加坡的小学科学及澳大利亚新南威尔士大学的科学测试。

本文将就“教师的专业培训”作进一步的阐述，谈谈一位精通专业的好老师帮助学生取得好成绩的重要性，因为通过快乐轻松地提高成绩，这位好老师可以改变学生的学习态度。在今天这个有太多东西能吸引孩子的时代，教师的水平往往决定了孩子掌握一门课的成败，进而决定他们学习的态度。下面举例谈谈新加坡小学数学教学值得改进的方面。

一个例子是新加坡小学生运算能力普遍薄弱，很多小六学生不会运用竖式进行小数和小数的乘法和除法，原因是教学大纲没有要求，学校也不重视。运算能力的薄弱直接导致做作业时间的延长和错误率的增加。试想一下，如果一个孩子作业要做很久，而且还错很多，他怎么可能有兴趣继续做？久而久之，孩子就不愿意做数学作业，进而失去对学习数学的兴趣，而原因可能很简单，就是运算能力薄弱。

另一个例子是model方法的过度使用以及对代数方程的故意回避。

Model方法是小学数学众多解题方法中的一种，目的是使用直观的方法找出数量之间的关系，让题目变得容易理解。中国也用，他们叫“线段法”，不过，只用于某些特定的题目。但新加坡把model的使用创造性拓展了，从整数拓展到分数，到比例，再到百分数。开发这一方法当时的设想可能是帮助孩子理解分数的概念，但后来就被不恰当地推广了。

用直观方法来帮助理解抽象的数学概念有一定的好处，尤其是对数学能力不强的学生，但用多了却可能反过来扼杀了抽象思维的建立。新加坡从小二（有些怕输的从小一）开始用model到小六，教师花了很多精力教学生，学校也举办讲座教家长model方法，似乎model成了小学数学唯一或第一的方法。可突然有一天，孩子小六会考结束升入中学，却再也不用了，一直要到20年后自己做父母时再拿出来教下一代。这样的选择正确吗？

事实上，小五尤其是小六很多题目的难度已经超越了直观的思维，应该是时候建立代数方程的概念了。小五下半年可能是合适的时机，当然其他章节也须作相应调整。小五引入简单代数方程对数学学习从小学到中学的顺利过渡也会有很大的帮助。上海从小五第一学期开始就教代数方程。其实，新加坡小一小二的有些题目也已经带有代数方程的概念了，例如某校小一的题目（见下图），那为何要故意回避代数方程？

$$\text{Given that } \begin{array}{l} \text{☺} + \text{☀} = 9 \text{ and} \\ \text{☺} - \text{☀} = 1 \end{array}$$

最后我要用两个亲身例子来说明孩子提高成绩后学习态度的转变，以及可能带来的更深远影响。一个例子是笔者的儿子，他是通过小六直接收生计划（DSA）进入本地一所名校的最好班。由于青春期的叛逆加上教师不够专业，课堂效果差，中一和中二的学习简直就像噩梦，中三被编入最差班。幸运的是中三他遇到一位非常优秀的数学老师，极其专业而且认真，班里每个学生都喜欢他，很轻松地儿子成绩就迅速进步至90分以上。中四他又幸运地遇到优秀的班主任和优秀的物理老师。从此改变了他对学习

的态度并对很多事情持有积极而正面的看法。

另一个例子是笔者的学生，小四，数学考34分。他父母来找我帮忙的时候，这个孩子对数学完全没有兴趣。经过一个学期的努力，当他的成绩从34分变成68分时，一天他告诉我，“老师，我今天问了同班同学一个问题，我问他为什么只考到18分？上课不听课，那为什么来学校？”。这个学生的问话，让我吃惊。他认真的学习态度，是因为数学成绩提高后改变的。我想他从此认真听讲的应该不只是数学这一门课了。

所以，加强教师专业培训，提高的不只是学生的成绩，还可能是学生的学习态度和整个价值观的改变。要让所有学校成为好学校，加强教师的专业培训应该是最基本的第一步。🌐

An article by Thomas L. Friedman, “The Shanghai Secret”, was published in *The New York Times* on 25 October this year.

Mr Friedman, three-time Pulitzer Prize winner and author of *The World Is Flat*, possesses a keen sense of observation. Together with a number of established educators from the United States, Mr Friedman visited some of the highest- and lowest-performing schools in China to discover its secret — how is it that Shanghai’s public secondary schools topped the world charts in the 2009 Programme for International Student Assessment (PISA) examinations that measure the ability of 15-year-olds in 65 countries to apply what they’ve learned in Maths, Science and Reading?

After a survey of the schools Mr Friedman came to the conclusion that, “There is no secret. When you sit in on a class here and meet with the principal and teachers, what you find is a relentless focus on all the basics. These are: a deep commitment to teacher training, peer-to-peer learning and constant professional development, a deep involvement of parents in their children’s learning, an insistence by the school’s leadership on the highest standards and a culture that prizes education and respects teachers.”

Mr Friedman writes that, “We need to focus on the basics that we know make for high-performing schools but are difficult to pull off consistently across an entire school system.”

I have a personal experience of the great emphasis placed on the professional development of teachers in Shanghai. On their own initiative, teachers will come together to learn from one another. There is a master

teacher for each subject, and he or she will lead a group of young teachers during discussions to learn and improve together. Separately, each district also has its own teacher’s institute to provide teachers with regular professional training. I was invited to present at one of these institutes, and I took the opportunity to introduce the teachers to Singapore’s primary school Science syllabus and the International Competitions and Assessments for Schools (ICAS) Science assessment developed by the University of New South Wales in Australia.

This article will elaborate on the professional development of teachers, and talk about the importance of teachers in helping students achieve good results. It is through an ever improving grade in a stress-free and fun environment that a good and professional teacher can influence students’ attitudes. The quality of teachers, especially in a day and age where there are many things to distract students, therefore directly influences both the ability of students to master new concepts as well as their learning attitudes. Below are a few examples where the teaching of primary-level Mathematics in Singapore can be improved.

One example is the generally weak ability of primary school students to calculate — many Primary 6 students cannot work out the multiplication and division of decimal by decimal in vertical form. This is primarily because it is not a requirement in the curriculum, and therefore it is not emphasised by schools. Poor calculation skills lead to longer periods of time spent on homework and more mistakes made. If a child has to spend an unusually long time completing an assignment, and making plenty of mistakes, will he enjoy the experience? Eventually the child will be reluctant to do Maths assignments, and gradually lose interest in the subject. And the root of this problem can be very simple: the lack of a strong foundation in calculation.

Another illustration is the over-emphasis on the model method and the deliberate avoidance of algebra.

The model method is one of many methods which can be used to solve Maths problems. It is a visual way to find out the relationships between different quantities, thereby simplifying the questions. This method is also used in China, but is called the line method, and used only sparingly for certain types of questions. In Singapore, however, the model method is expanded to cover topics from integers and fractions to ratios and percentages. The initial implementation might have originated from wanting to help children understand the concept of fractions, but its use was later incorrectly promulgated.

Using a visual way to express abstract Maths concepts has its advantages, and is especially useful for students who aren't strong in Maths. However, too much of it results in the inability of students to build up abstract thinking skills. Singapore schools start students on the model method from Primary 2 (those who are *kiasu* start from Primary 1) and use it up until Primary 6. Teachers spend copious amounts of time teaching it to their students, and schools even hold workshops to teach it to parents. The model method thus becomes the only — or the first — method to solve problems. However, when the students graduate and go on to secondary schools, they stop using it altogether, and it will be another two decades before they need to use it again — i.e. when they become parents themselves and teach it to their own children. Is this choice the right one?

In fact, the difficulty of Primary 5 and 6 Maths problems already surpasses the visual model method, and this therefore ought to be the stage at which elements of algebra are incorporated into the syllabus. The second semester of Primary 5 could be an ideal time to teach the topic, and other topics can then be adjusted accordingly. The introduction of algebra in Primary 5 will also help students in the transition from primary- to secondary-level Maths. Also, the Primary 1 and 2 syllabi already contain elements of simple algebra (illustrated below), so why are we deliberately shunning this method?

Given that $\text{☺} + \text{☀} = 9$ and

$$\text{☺} - \text{☀} = 1$$

Lastly, I will use two personal examples to illustrate the impact of higher grades on a child's learning attitude, and its longer-term effects. My son was enrolled at one of the brand-name local schools via the Direct School Admissions (DSA) exercise. He was placed in the top class, but because of teenage rebelliousness, and an unprofessional teacher, his classroom experience was poor. His lower secondary school days were a nightmare, and he was subsequently streamed into the lowest class for Secondary 3. Fortunately, he then had an excellent Maths teacher who was both professional and serious, and who was well-liked by the entire class. My son's performance swiftly improved until he was scoring well over 90 per cent. In Secondary 4, too, he had an exceptional Form and Physics teacher. From then on his attitude towards learning changed, and he developed a proactive and positive attitude towards many issues.

Another example is one of my students in Primary 4, who scored 34 marks for a Maths examination. When his parents approached me for help, this child had absolutely no interest in the subject. After a term's worth of hard work, he scored 68 in his next Maths examination. One day, he told me, "Teacher, I asked a classmate why he scored only 18 marks for his exam. If he wasn't paying attention during class, why did he go to school?" His words surprised me. His serious attitude towards learning came about only after his grades improved. I'm sure he now has that positive attitude in all his subjects.

Therefore, strengthening the professional development of teachers will have a positive impact not only on students' grades but also their attitudes towards learning, and even their values. To make every school a good school, enhancing the professional development of all teachers is the first, most basic step. 📖👩🏫

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Dr Li is also an international trainer for teaching methods, and has trained Maths and Science teachers in the Philippines and Shanghai.