

Teaching Skills Competition: An Important Way of Chinese Science Teachers' Professional Development

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Abstract

From pre-service to beginning, then to the maturation stages, science teachers in China need to attend a large number of Teaching Skills Competitions, which may have been accompanied them the whole teaching career. By analyzing these competitions and teachers' procedure of preparation, we find four common features of these competitions: help and collaboration among colleagues; guiding from experts; experience of personal reflection of teaching ability; long-time preparation and far-reaching influence. These features fully in accordance with the teachers' professional development—"experts' guiding, colleagues' collaboration and personal reflection", which raised by Chinese scholars based on Posner's "experience + reflection= teacher growth". So Teaching Skills Competition is a new way for science teachers' professional development with Chinese characteristics, and it is another kind of science teachers' "lesson study" in China.

Key words: China, Science Teacher, Teaching Skills Competition, Professional Development, Way

1. Introduction

At the beginning of 21st century, the reform of basic educational curriculum started in China. In 2001, the reform of science curriculum for compulsory education was implemented, followed by the reform of science curriculum for senior high school education two years later. The aim of this reform movement was to develop students' basic ability of science, and its major objectives comprise of three aspects: knowledge and skills; process and methods; affective and attitudinal factors. The reform focuses on improving students' problem-solving ability and practical abilities in doing scientific work, particularly emphasizing nurturing their ability to investigate scientific problems. These aspects are also closely related to the contents of PISA, in which students are required to apply their knowledge and skills to solving practical matters. For example, PISA attempts to measure whether or not students can understand and explain a variety of documents in a real life situation by using their literacy (reading skills). Can students solve problems related to numbers and space by applying their mathematical knowledge and skills? Or can they understand, interpret, or actually answer some questions in the field of science by utilizing their scientific knowledge and skills? These abilities are what are evaluated in the above-mentioned survey¹.

This curriculum reform requires a higher level of abilities and qualities on the

part of science teachers. In other words, the ten-year curriculum innovation is a process of examining how to develop teachers' abilities and qualities. In connection with this, "Teaching Skills Competition" has been regarded as one of the means for developing science teachers' abilities, ranging from pre-service education to the stage of becoming teachers and then further up to experienced teachers (veterans).

2. Competitions at the stage of pre-service teacher education

In China, the majority of the current teachers graduated from normal universities (teachers' colleges), majoring in pedagogy, but there are some teachers who didn't. In this study we focus specifically on those who study at normal universities. In the past, little attention was paid to developing students' teaching skills at normal universities, but more emphasis has been placed on it since the implementation of the curriculum reform as the following two new attempts indicate. One was introducing practice-oriented classes such as microteaching or class observation (three hours per week, two credits for third-year students in the first semester). Also the number of practice teaching was increased, resulting in 12 hours per week in the first semester for fourth-year students (six credits). The other change was developing students' teaching skills by introducing a variety of contests of a mock lesson (a simulated lesson). At present, the major teaching skills competition is held either at a department level, at a university level, or at a national level.

2.1 Teaching skills competitions at a department level

Teaching skills competitions for prospective teachers are held at many science departments of normal universities every year. These competitions encourage students to train their own teaching skills by themselves and also provide them with a lot of opportunities to try teaching in public. Let us introduce "Teaching Skills Competition in Physics" by Hua Dong Normal University (science department) as one example of them. This contest lasts for two months, consisting of three parts: a preliminary, a semi-final, and a final. Approximately a quarter of students participate in the contest, excluding fourth-year students who are involved in doing some practice teaching. The majority of participants in the contest are either second-year or third-year students.

Those who do not participate in the contest itself will help participating students, play the students' roles in the contest, or just observe it. The contest provides students with an opportunity to practice teaching before they are actually involved in doing practice teaching at schools, develops their teaching skills, and increases both their confidence in and awareness of becoming a teacher as a profession.

2.2 Teaching skills competitions at a college level

A great number of normal universities hold teaching skills competitions in order to develop their students' teaching skills at a college level. For example, Hua Dong Normal University holds "Chen Xing Award Teaching Skills Competition" every year to reinforce students' pedagogic skills. Two or three students recommended by each

department are divided into two groups of humanities and sciences, and join a preliminary and a final contest. The contest is made up of writing a lesson plan and doing a mock lesson (a simulated lesson). In order to make the contest as realistic as possible, junior high school teachers are invited to the contest as judges. In the field of sciences, two experienced junior high school teachers and three college professors serve as judges. Since 1996, 15 contests have been successfully completed, and these contests have made a great contribution to increasing students' general knowledge and abilities and reinforcing their teaching skills. Furthermore, many winners of the contest have grown up to be excellent teachers at junior high schools.

2.3 Teaching skills competitions at a national level

2.3.1 Toshiba Cup

In 2008, “Toshiba Cup, Teaching Skills Competition for Science Students, Normal Universities in China” started under the joint sponsorship of Chinese education department and Toshiba Corporation. Up until now four contests have been held. In the first two contests, just 12 universities participated in the contest, and the number of participating universities has increased up to 40 since 2010. Each university recommends one fourth-year student in the fields of mathematics, physics and chemistry. The contest is conducted in each academic field and is made up of four parts: preparing a lesson plan, making an impromptu speech, conducting a mock lesson, and a Q·A session. In the session of lesson plans, participants are requested to submit their plans beforehand: they have to write a lesson plan for a fifteen-minute lesson based on the textbooks currently used at high schools, and hand in their plans in advance. In writing a lesson plan, they need basic skills for preparing lessons and planning lessons in their original ways. In an impromptu speech, participants choose one topic three minutes prior to their speech and prepare their speeches. They have to make a speech for three minutes and a speech topic mainly centers round curriculum reform, curriculum studies and instruction, or basic knowledge and skills for their own field of study in science. In a mock lesson, they are supposed to teach a fifteen-minute lesson based on their plans they have submitted in advance. 15 first-year students with the same major as the participants attend a mock lesson and participating students are allowed to interact with these freshmen. In a two-minute Q·A session, judges ask students of their lesson plans, impromptu speeches, mock lessons, and students have to express their opinions on the questions they are asked.

In each field (mathematics, physics, and chemistry), the first award goes to one student, the second award to three students, and the third award are given to six students. In addition, “Toshiba Award of Creativity” is given to a student who has developed a novel and unique way of teaching. After the contest, winners can visit Japan for a short period of time, visiting junior high schools and discussing with Japanese people on educational matters.

The contest is regarded as the most important one in terms of pre-service

teacher development and has a great influence. It is highly valued by universities and each university holds a preliminary contest for the final both at a department and at a college level. In the case of Hua Dong Normal University, about 10 fourth-year students who are doing practice teaching join a preliminary contest at a department level, and two or three students go on to take part in the university contest. The university has its own judging committee and it decides their candidate representing the university based on the same procedures of Toshiba Cup, Final. This series of screening a student has a good effect not only on 120 students but on students studying at the university in general. The contest increases science students' practicing skills and creating something new, their attitude toward respecting science, their positive attitude and willingness to examine unknown fields. Both preliminary and final contests are a great success and guarantees that prospective science teachers have nurtured their basic skills for working as a great science teacher in the future.

2.3.2 Teaching skills competitions sponsored by the nation-wide committee of curriculum studies and instruction

In addition to the nation-wide competition mentioned above, we also have a national teaching skills competition sponsored by committees of curriculum studies and instruction in each field of sciences such as “Ren Jiao She Award,” (teaching skills competition for students majoring in physics) under the auspices of the special committee of physics education, Chinese Society of Education. This competition is held every year and so far has been held three times. Both graduate students and undergraduate students participate in the competition from normal universities and other universities. 651 students from 90 universities joined the third competition: 616 of them were undergraduate students, and the rest of 35, graduate students². The contest aims to develop overall teaching skills of physics students and also practical abilities of teaching, and evaluates participants from both theory and practice like planning a lesson and explanation of educational design, a mock lesson, etc. The ratio of the first, the second, and the third awards is respectively 3:4:3, and in 2011 a special award was given to a participant whose grades were outstanding. The competition greatly helps students of physics, physics education, and related fields raise their awareness of teaching profession, to developing teaching skills of physics in particular³.

There is also a teaching skills competition at a prefectural level. For instance, “Yuan Da/Lang Wei Cup”, teaching physics skills competition for college students in Shan Dong Sheng (province) has been held six times under the sponsorship of Shan Dong Association of Physics and the Special Committee of Junior High Physics Education in Shan Dong Province. In 2001, 133 teachers from 14 schools participated in the competition.

3. Contests for new teachers

It takes about three to five years to be able to teach junior high school students all by oneself after they start to teach as new teachers. Commonly two approaches are adopted at school to develop such new teachers' pedagogic abilities as soon as possible. One approach is that a veteran teacher helps new teachers as a guiding teacher, and the other is that new teachers are required to join teaching skills competitions. Such competitions that new teachers can take part in are as follows:

3.1 A self-report and an open class

Newly employed science teachers are expected to be engaged in reporting their lessons (a self-report) either in a group of teachers who teach the same subjects or in a school as a whole. In this, new teachers are evaluated whether their teaching skills have been improved after they started teaching. Also, at many schools new teachers are requested to show their lessons to the public (an open lesson).

We cannot equate these two types of attempts with teaching skills competitions, but still we need to evaluate teachers' pedagogic abilities in some way or another, so these two can be said to be "a semi teaching skills competition." In these, teachers have to explain how they plan a lesson, and reflect on their lesson after teaching, as well as to conduct a lesson itself. Colleagues, veteran teachers, leaders at schools spot some problems during these activities and propose solutions for them after discussing. Sometimes professors of education are invited from a normal university and an open class is conducted.

3.2 Competitions at a university level

Schools regularly hold teaching skills competitions at their own school so that new teachers can improve their pedagogical abilities efficiently. If a large number of participants are expected, competitions will be divided into humanities and natural sciences, and the first, the second, and the third prizes are given to participants, and these prize winners are commended

Teaching skills competitions are held even at a local Qu level. For example, in Yang Pu Qu, Shanghai, "Xiap Ne Cup" is held every two years for teachers with less than three-year teaching experience. In 2011, the sixteenth competition was held and in the field of science (physics, chemistry, biology, information science), the first, the second, and the third winners were selected in a preliminary and final contests. The competition is comprised of planning a lesson, explaining how to plan a lesson, and conducting a mock lesson⁴.

4. Competitions for becoming veteran teachers

4.1 Competitions at a Qu (ward) level

In a Qu (ward) where education and research are advanced, teaching skills competitions are regularly held for science teachers who have gone through the first stage of teacher development as new teachers so as to further develop their

pedagogical abilities. Generally, in one Qu more than ten high schools and tens of junior high schools participate in competitions. No more than one teacher is recommended from each department from one school. Final competitions are held after the preliminary contest if a great number of participants are expected. “Bai Hua Cup” in Yangpu, Shanghai, for instance, is a traditional teaching skills competition for teachers who have worked as teachers less than seven years. This competition is held every two or three years, and fifteen competitions have been held up until now. It contains planning a lesson, explaining a general idea of an educational plan, and a mock lesson both in a preliminary and a final contest⁵.

In each Qu, preliminary competitions are held both at a city, and a national level in addition to a Qu level. A high-level competition helps teachers promote and become a department head or an excellent teacher, and has a great influence on making schools famous in the area. Because of this, more teachers are interested in participating in competitions at a city, a Qu (ward) and a nation level. To maintain fairness of competitions in a ward, preliminary contests are held for a high-level competition, and based on the results of it, one junior high and one senior high school teacher can go on to a nation-wide competition.

4.2 Competitions at a Sheng (province)/city level

Both at provinces and at cities throughout the nation, teaching skills competitions are held for science teachers, and they are managed by education offices and special committees of curriculum studies at a province and a city. These competitions are highly valued in every field, because it takes very long, its organization is highly-leveled, it is held once in several years, and it is very influential. One example of such a competition is “Educational Evaluation of Young Teachers, Shanghai,” cosponsored by Shanghai Board of Education and Shanghai Elementary, Junior High, and Kindergarten Teacher Encouragement Fund, and managed by Research Office, Shanghai Board of Education. The competition focuses on each subject by turns, and the contest with a specific focus on one subject is held every four years. In 2011 competition, the following subjects were treated: an elementary school natural science, a junior high physics, a junior high chemistry, a junior high life science, a junior high science, and an elementary and a junior high laboring skills. The credentials for participants are that they must have at least three-year teaching experience and they should be less than 45 years old. The competition consists of four parts: planning a lesson, explaining an outline of an educational design, a mock lesson, and an exam on teaching professional abilities (reflection on a lesson and Q & A either before or after a mock lesson). Judging each subject area focuses on a specific topic: in physics, “reproducing the origin of intelligence, and focusing on scientific pursuit, in chemistry, “embodying the ethos of chemistry, and developing students’ thinking ability,” and in life science “emphasizing the consistency of rules, goals, and education and reinforcing the basis for life science.” Preliminary competitions are held in 19 Qu

in Shanghai, and then the final contest is held with both selected junior and senior high school teachers from preliminary competitions⁶.

As more and more attention has been placed on such competitions in the field of science education, winning in a nation-wide contest is getting highly competitive. In each Sheng, Shi, a preliminary competition is held to select the best teachers in each field. In Shanghai, for example, out of those teachers who are recommended from each Sheng, or Shi, one or two teachers are judged and selected by experts and they will move on to a nation-wide contest.

4.3 National teaching skills competitions

At present, there are many nation-wide teaching skills competitions in science education. Let's look at competitions in physics: there are three national teaching skills competitions in physics.

4.3.1 National high school young physics teacher competition

National high school young physics teacher competition is held every two years under the sponsorship of Chinese Physics Academic Association and cosponsored by physics academic societies and departments of educational research in each Sheng. It has been held nine times up until now. A teacher recommended by each Sheng will take part in this national competition and 90 % of their performance in the competition is evaluated by their mock lesson and the rest 10 % by their educational planning. The ratio of the prize-winners is: 30-40 % of the first prize, 60-70 % of the second prize. Those who have made a scientific error or a significant mistake will receive the award of encouragement⁷.

4.3.2 National secondary school physics education reform competition

This competition is held under the sponsorship of the special committee of physics education, Chinese Educational Association. It consists of three programs: educational planning and power point (10 points), a videotaped lesson (60 points), and a mock lesson (30 points). Two senior high and two junior high school teachers can join the competition from each Sheng (including autonomous Qu). A preliminary competition is held by an educational research center and a special committee of physics education, Chinese Educational Association in each Sheng and select those who can move on to the final contest. Based on the ratio of the number of participants, the first, the second, and the third prize will be given. This competition is held every two years, and so far it has been held six times⁸.

4.3.3 National secondary school physics guru contest (Yuan Da/Lang Wei Cup)

National secondary school physics guru contest has been held since 2010 under the sponsorship of the special committee of physics education, Chinese Educational Association with a view to growing research-oriented teams of secondary education physics teachers and creating a better environment where outstanding physics teachers will be born. The credentials for participating in this competition are: physics teachers with the certificate of the first grade or over and those who are over

35 years old. Based on 90 % of a mock lesson score and 10 % of educational planning score, the final score will be calculated⁹. One junior high and one senior high physics teachers will be recommended by each Sheng and can participate in the final competition. In the case of Shanghai, a teacher representing is chosen among those who have attended the courses at training center for excellent physics teacher.

This contest is very competitive, and participants have to have some higher qualifications and also its goal is to create the brightest teacher, more and more excellent teachers are getting engaged both in education and in research and it has been making a great contribution to improving teachers' pedagogic abilities.

5. Discussion

Science teachers in China take part in a variety of teaching skills competitions from the stages of pre-service education to newly-employed, and further up to experienced teachers. In this sense, such competitions co-exist with the life-long development of science teachers. We can summarize the four main meanings these competitions have for science teachers as follows.

5.1 Mutual help and collaboration among teachers

At the stage of pre-service education, those who participate in competitions cannot do without help from their peers, upper-class students and lower-class students, too. At the stage of in-service education, peer collaboration is much more essential for those participating teachers: one's colleagues both from the same school and from other schools will give them some advice on planning a lesson, or help them prepare equipments for scientific experiments, or make a presentation document, and they may sometimes even get psychological support from the colleagues. Thus not only participants but non-participants will learn something very important from teaching skills competitions and improve their teaching skills and their lessons at school.

5.2 Guidance from experts

Any type of science competition is usually carried out under the supervision of one group of experts except for small contests where experts are not available. Experts here refer to such persons as veteran teachers, educational researchers, professors of curriculum studies and instruction, etc and these people give guidance to those who participate in competitions, which means that participants are lucky enough to receive a high-level instruction from experts for a long period of time.

5.3 Reflection on education

Each teaching skills competition consists of several parts such as conducting a mock lesson, writing a lesson plan, explaining one's own educational planning, reflecting on one's lesson, questions and answers, etc. These aspects require participants to demonstrate their higher level of thinking towards education and to reflect on their own educational practices. Therefore those who take part in competitions usually watch the videotaped lessons conducted by the winners in the

past contests and attempt to plan their lessons by reading literature and documents on curriculum reform. Furthermore, they will try to revise their lesson plans several times and practice teaching one lesson again and again. They also practice explaining their educational design or writing a journal on their training before and after actually conducting their mock lessons, which will lead to developing their ways of thinking and reflecting on their educational affairs.

If teachers conduct their lessons just on the basis of some guidelines, then they might risk ignoring or taking no notice of important problems appearing in their classrooms. When they join teaching skills competitions, teachers can have a chance to look at their own educational practices from different and new perspectives, which will result in developing their ability to reflect on their practices.

5.4 Long-term preparation and greater influence

No matter which competition they may participate in, science teachers have to spend much time preparing for it. This is also true of an open class, a type of “semi-teaching skills competition.” In an open class of physics, for instance, participating teachers spend more than twenty days while they practice doing a mock lesson three times, having a reflection meeting seven times¹⁰. In the case of a high-level competition, schools and people concerned dedicate themselves to it, and try to lessen participating teachers’ working load so that they can spend much more time on preparing for the contest. In preparing for a competition like this for a long period of time, teachers can have an invaluable experience, and this will in turn affect their educational practices later to a greater extent.

6. Concluding remarks

Let us summarize the major results of this study.

6.1 Teaching skills competitions effectively promote professional development of Chinese science teachers

Posner proposed “experience + reflection = teacher growth,” a model for teachers’ professional development in 1989. Based on this, Chinese scholars designed a trinity model of teachers’ professional development of “experts’ guiding, colleagues’ collaboration and personal reflection¹¹”. Every teaching skills competition for science teachers contains these three factors. Thus we can conclude that teaching skills competitions will promote Chinese science teachers’ expertise and will be an important means of developing science teachers’ professional abilities and qualities.

6.2 Teaching skills competitions are another kind of “lesson study” for Chinese science teachers

In the typical “lesson study,” all members of a certain lesson study group focus on some example lessons and share their ideas or experiences with each other on the lessons. In studying a lesson, all the participants go through a series of planning a lesson, observing it, evaluating it, reflecting on it, presenting their reflection and

opinion, and planning a new lesson¹². To cite a concrete example, one of the members in a study group conducts a lesson, and the other teachers observe it and take notes on it. After the lesson, all the members discuss on the lesson observed, and propose some improvement of the lesson by analyzing the flow of the lesson overall¹³. Similarly, teaching skills competitions are conducted under the guidance of a special guiding group consisting of experts, veteran teachers, educational researchers, and professors. During the competition, participants practice teaching their lessons repeatedly in collaboration of this guiding team: they set up goals, design educational plans, while experts observe their mock lessons and take notes on them, point out some problems on the lessons and suggest some possible solutions.

We can say that teaching skills competitions are not only just another kind of “lesson study” for Chinese science teachers, but are also much better for them. During competitions, participating teachers can interact with, and cooperate with their colleagues, and receive guidance from experts. In addition, they can develop their teaching abilities by experiencing a series of activities we just mentioned above. A special guiding group, on the other hand, can grasp the *status quo* of elementary and junior high school education and obtain the latest data on it. Teaching skills competitions encourage practitioners seek into both practice and theory of education.

Neither “lesson study” nor teaching skills competition is an aim in itself. Examining a lesson whether doing lesson study or joining teaching skills competitions should be a means of widening teachers’ views of education and developing their professional expertise.

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