Recent Changes in the Curriculum of Chinese Dental Schools

Junqi Ling, D.D.S., Ph.D.; Yun Fu, D.D.S., M.S.

Abstract: Chinese dental education is organized and controlled by the government at different levels, and the curriculum is based on the stomatology model. The unique feature of this system has been a heavy emphasis on the medical sciences and the integration of medicine with dentistry. However, the problems with this curriculum have been greater than its advantages since a dental student trained under this educational model was unlikely to be well prepared for patient care in a clinical setting and could struggle to apply modern techniques during his or her professional career. From 1995 to 2000, six well-known Chinese dental schools participated in a curriculum innovation project supported by the central government. This article describes the educational model developed during the project and presents several new educational concepts that have been put into practice in dental schools in China. Nevertheless, the new model is not without problems. If there are no additional innovations related to didactic teaching methods, clinical education, and interpersonal skills, the outcome of recent changes in the curriculum of Chinese dental schools will be unpredictable, and our dental education will not continue to advance.

Dr. Junqi Ling is Professor and Dean, Guanghua School of Stomatology, Sun Yat-sen University; Dr. Yun Fu is Associate Professor and Chief, Department of Periodontology, Guanghua School of Stomatology, Sun Yat-sen University. Direct correspondence and requests for reprints to Dr. Yun Fu, Department of Periodontics, Guanghua School of Stomatology, Sun Yat-sen University, 56 Ling Yuan Xi Road, Guangzhou, Guangdong, PR China, 510055; 86-20-83889253 phone; 86-20-83822807 fax; fygzc@126.com.

Key words: dental education in China, dental curriculum, teaching methods, stomatology

Submitted for publication 1/10/07; accepted 8/20/07

Modern dental education in China began in 1917 when the first dental school, the Faculty of Dentistry, West China Xiehe University, was established with the help of Americans. For the subsequent sixty years, for political and financial reasons, the development of dental education and dentistry in China was slow. Since the 1980s, however, dramatic changes have taken place in dental education throughout the country in parallel with advances in other fields. First, great efforts have been directed toward expanding the number of academic dental institutions in an effort to produce more dentists to serve the oral health needs of the public. From 1978 to 2004, the number of dental schools jumped from six to forty-seven, and dental undergraduate enrollment increased from around 200 to 2500. Second, the dental societies and dental education community in China decided it was important to educate the population about oral health and began to make full use of the media to convey basic dental information to the public such as the causes of dental caries and periodontal disease, how to effectively brush teeth, and the proper use of dental floss. This educational effort produced positive changes in oral health among the population.

The impetus behind these efforts was the discovery that most Chinese people lacked a scientific understanding of dental problems, China was lagging far behind advanced countries in dentistry, and quality dental care was not available for a majority of the Chinese people. Despite improvements in the oral health status of the Chinese population over the past two decades, there are still profound disparities in dental health among individuals depending on income and region. Currently, 80 percent of Chinese medical resources are located in urban areas, where only 20 percent of the 1.3 billion people live. Even in large cities, where inhabitants have much higher income and living standards than in districts that are primarily rural, the majority of individuals have not benefited from the dental professionals and services that are available. In rural areas, there are very few dentists who graduated from recognized dental schools and who can provide high-quality dental services. Instead, so-called dental care providers, who were trained by apprenticeship rather than receiving a formal education in dental school, have dominated oral health care in rural areas of China. These individuals mainly provide relief
from toothache and carry out tooth extractions and less than optimal dental restorations.\textsuperscript{10} It has been reported that only 5.2 percent of the Chinese people have ever visited a dentist in their lifetime.\textsuperscript{10} Contributing to this problem is the disproportionate level of poverty in some areas of China and the government’s inadequate medical budget, which accounts for only 3 percent of all government expenditures and just 0.5 percent of the Gross National Product (GNP). These levels of expenditures are much lower than the international averages, which are 11 percent of the total government budget and 2.5 percent of GNP. China has 20 percent of the population in the entire world, but only 2 percent of global medical resources. Approximately 45 percent of the urban dwellers in China and 79 percent of rural inhabitants do not have medical insurance.\textsuperscript{11} Consequently, the percentage of Chinese people who are able to enjoy dental care is very low in comparison to the percentages in industrialized nations.

**Curriculum Revision: Background**

Traditionally, the Chinese dental education system followed the former Soviet Union model, which was based on research-based stomatology. The curriculum was regulated by specific educational guidelines imposed by the government. While the government has thus determined the framework for dental education by dictating the courses that comprise the core curriculum, the actual day-to-day details of how courses are conducted are usually determined by the individual university.

In almost all Chinese dental schools, the curriculum traditionally was divided into three parts: a basic medical science phase that introduces students to the foundations of human structure and function; a general medical science phase that addresses function and disorders of human organ systems; and the dentistry phase. The dentistry phase was subdivided into basic dentistry (comprised of the anatomical, physiological, and pathological bases of dental diseases); clinical dentistry (which encompassed epidemiology, etiology, clinical features, diagnosis, treatment, and prophylaxis of dental problems and which were presented in the classroom and practiced in the laboratory); and clinical training (whereby students worked with patients under the guidance of teachers in a dental office).

In 1982, this traditional system was revised, enriched, and formally developed into a “Teaching Plan for Higher Education of Stomatology in China,” which spanned a five-year curriculum. The goal of this new program was to create an integrated and more sophisticated stomatological curriculum that mainly focused on conservative dentistry, oral surgery, and prosthodontics designed to produce politically and technically qualified dentists. The 1982 curriculum included thirty compulsory subjects in the basic biological sciences (e.g., physics, chemistry, and biology), basic medical science (e.g., histology, biochemistry, and gross anatomy), medical clinical science (e.g., internal medicine, general surgery, and pediatrics), basic dental science (e.g., dental anatomy, oral pathology, and oral biology), and dental clinical science (e.g., prosthodontics, orthodontics, oral and maxillofacial surgery). The lecture time consisted of approximately 3,900 hours, and the total duration of clinical training was forty-eight weeks.\textsuperscript{12}

To some degree, the 1982 curriculum has proven to be excellent for training high-level oral and maxillofacial surgeons because the unique feature of this system was a heavy emphasis on the medical sciences and the integration of medicine with dentistry. However, the problems that were identified with this curriculum were greater than its advantages. First, dental care was neglected as the total number of hours devoted specifically to dental science was less than 30 percent. Over the past two decades, dramatic advances in science and technology based on developments in biomaterials and a revolution in bioinformatics and computer-based medicine have changed the content and scope of dental practice and will continue to do so.\textsuperscript{13} It is clear that, in this curriculum, there are not enough hours available to accommodate the ever-increasing body of knowledge associated with the practice of dentistry. Secondly, the curriculum itself did not reflect the changes in disease spectrum, and the time allocation for laboratory and theoretical courses is much less than that in other countries. In this teacher-oriented curriculum, emphasis is placed on classroom lectures to disseminate factual knowledge, and students are entirely passive in learning. Furthermore, there are numerous areas in which the subject matter content overlaps among different disciplines, and there is minimal integration among basic science courses, clinical subjects, the medical course, and dentistry—making it difficult for dental students to broaden their knowledge base to meet the future challenges of dental practice. As a consequence, a student under this education model...
is less likely to be well prepared for patient care in a clinical setting and may struggle to apply modern techniques during his or her career.

Since the 1980s, a number of innovations have been introduced into this traditional curriculum. From 1995 to 2000, six well-known universities led by the Beijing Dental School participated in a project known as Innovation of Curriculum and Teaching Content of Higher Stomatological Education in China (ICTSE), which was supported by the Ministry of Education and Ministry of Public Health. The research group that directed the ICTSE project was comprised of faculty from the participating schools. This group began its work by first encouraging widespread participation among the faculty of these schools by inviting them to share their ideas. Then, the group collected dental school curricula and educational statistics for many dental schools in China and in other nations for comparison. After the group analyzed these curriculum documents, faculty members from many of these Chinese dental schools were invited to take part in the discussion and give their suggestions for improvement of students’ education. All opinions were recorded and analyzed very carefully. Finally, the ICTSE coalition research group synthesized the approaches of each school and proposed a preliminary draft for a new educational model. Representatives of the research group presented the preliminary version of this new curriculum plan three times at National Dental Education Innovation Conferences from 1997 to 1999 in order to obtain as many perspectives as possible. It was stressed that each dental school could use the ICTSE educational model as a framework to determine its specific curriculum, depending on the unique circumstances and resources at the institution. After repeated revision of the ICTSE plan based on feedback, the coalition research group completed the final version in 1999 and presented the plan at a Chinese dental and medical education symposium held in ChangChun. This plan proposed a preliminary approach for future innovation in dental curriculum format and content.

Since 1999, many dental educators have come to believe that the ICTSE plan should guide the reform of Chinese dental education. As of 2007, most Chinese dental schools have already put the draft plan into practice, and many more schools are preparing to implement it. The purpose of this article is to describe the educational model proposed in the ICTSE plan and review other innovative ideas put into practice in several Chinese dental schools that were stimulated by this educational reform effort.

### Curriculum Goals

The aim of dental education has been defined by Bertolami as the training of dentists who are able to provide the best possible oral health care. The goals for the five-year undergraduate dental school program proposed by the ICTSE are as follows:

1. **Knowledge.** A prospective dentist should possess basic theory, information, and skills in the field of medicine as well as dentistry. His or her integrated structure of knowledge should be comprised of the following domains of comprehension that are needed by the dental practitioner:
   - **First domain**—sciences, biology, basic medical science, clinical medical science, basic dental science, clinical dental science.
   - **Second domain**—humanities, medical psychology, behavioral science, medical ethics, medical esthetics.
   - **Third domain**—health economics, health management, health resources, public relations, dental management.

2. **Ability.** The qualified dental school graduate should 1) be able to use the knowledge from all three domains to diagnose and treat common medical problems and oral diseases and conduct preliminary scientific research; 2) be capable of providing community-based dental care and manage a dental practice/clinic/office using sound business and employee supervision methods; 3) be able to communicate effectively in the English language and have the capacity to use the computer and Internet for communication; 4) have a good adaptability to social development and environmental changes; 5) have the capacity to understand and apply professional ethics in the practice of dentistry; 6) have a positive attitude towards lifelong learning and be able to and willing to incorporate scientific reasoning into the practice of dentistry; and 7) demonstrate creativity in solving problems and exhibit potential for future growth as a health care provider.

### Changes in the Dental Curriculum

The guideline for compulsory subjects proposed by the ICTSE includes the following:

1) The number of compulsory subjects should be limited to fifty-five, and the didactic time
should be within twenty-eight to thirty hours per week.

2) Among the basic sciences, besides changing the intrinsic content of the course, the didactic content and methodology for foreign language and computer (information technology) courses should be modified in order to keep up with the advances in these two areas. Students should receive education in a foreign language and information technology throughout the curriculum rather than just in isolated courses that do not provide adequate learning experiences.

3) The recombination or renovation of traditional courses in the basic medical sciences should be determined by individual schools in accordance with specific conditions. Reform should be based on careful considerations and detailed planning and then evaluated with a small sample of students in a pilot test. Life science content should be superimposed upon the current basic medical subjects, and the relevant departments should be combined. From a broad perspective, life science consists of all of biology of the human, animal, plant, and microorganism species. The unique Chinese course “Outline of Traditional Chinese Medicine” should be retained in the curriculum. However, currently in China, basic medical knowledge is not required for non-medical students.

4) Some of the traditional compulsory clinical courses such as otorhinolaryngology, ophthalmology, and introduction of psychiatry should become elective subjects that can be taken by students who have a special interest in these topics but should not be required for all dental students.

5) Compulsory courses involved in basic dental science should include the introduction of stomatology, dental anatomy, head and neck anatomy, oral physiology, oral pathology, oral biology, oral pharmacology, dental materials, oral diagnosis of radiology, the basis of oral biological dynamics, oral engineering, and verbal technical foreign language. In most Chinese schools, English is the foreign language. However, in some special regions of the country, the foreign language used may be Russian, Japanese, etc.

6) Compulsory courses in clinical dental science should involve operative dentistry and endodontics, periodontology, oral mucosal disease, pediatric dentistry, oral and maxillofacial surgery, prosthodontics, orthodontics, preventive dentistry, and dental equipment.

7) The teaching of preventive dentistry should be reinforced, and the hours devoted to it should be increased significantly. The guideline for selective courses proposed by the ICTSE includes the following:

1) The number and the availability of selective courses in the curriculum should be increased in an effort to diversify the curriculum and make it more stimulating for students, to broaden students’ knowledge, and to provide ways for students to learn about the latest advancements in each discipline.

2) The content of selective courses should be regulated and enriched. While the options for students during years one and two are mainly humanities, sciences, and other courses, in the third and fourth years the selective courses should focus on dental subjects. In the fifth year, the emphasis should be placed on pregraduation education, and selects should include practical subjects such as guidance for employment, medicine and society, and community dental service so students will be ready for post-dental school employment and understand social and economic issues that influence the provision of health care in society.

The Structure of the Curriculum

The structure of the curriculum should be based on an intercrossing and interpenetrative (integrative) model. Dental students should learn dental subjects beginning the first academic year. (See Figure 1.) In the “old” (1982) curriculum, dental students in China traditionally spent their first two years taking basic science and basic medical science courses including physics, chemistry, biology, anatomy, histology, physiology, pathology, microbiology, pharmacology, immunology, biochemistry, statistics, and cytology as well as English. The instructional methods for these courses were lecture and laboratory exercises. In the third year, clinical medical subjects such as internal medicine, general surgery, pediatrics, otorhinolaryngology, ophthalmology, neurology and psychiatry, public health (hygiene) and statistics, dermatology and sexually transmitted venereal diseases, parasitic diseases, epidemiology, and infectious diseases were covered. These courses were presented through lectures and brief periods (e.g., rotations) of clinical experience. In the fourth
year, students began to study dentistry. The dental science curriculum included oral anatomy and physiology, oral pathology, oral biology, dental materials, oral radiology, operative dentistry and endodontics, pediatric dentistry, preventive dentistry, periodontology, oral mucous disease, oral and maxillofacial surgery, prosthodontics, and orthodontics. Students took these courses by attending lectures and working with simulations. The dental clinical training began in the fifth year, after all the theoretical instruction was completed. The duration of clinical training in which students provided dental care for patients was approximately forty-eight weeks.

For a long time, each course in the curriculum was rigidly defined, and there was little desire among the faculty to make it more flexible. In many universities, there is very little coordination of the different subjects and among different topics in the same subject because each teacher prepares and presents the teaching content of his or her course independently without consulting with other teachers to discuss the objectives, range, and depth of the topics included. As a result, many unimportant topics overlap, and information is not taught in a logical and coordinated sequence. Student and faculty evaluations of this system showed that student learning was disintegrated and knowledge was fragmented.

It has been suggested that the “three big phase” curriculum should be changed into a “basics-clinic medicine-specialty theory-practice” education model, in which the courses are integrated and the curriculum is designed to reflect a gradual development of the material being taught, in the hope that both basic and clinical sciences in medicine and dentistry, along with their theory and practice, would not be fragmented but closely integrated. Such an approach can not only help students to acquire broad basic theory systematically to underpin their specialization education, but also to appreciate the unique features of stomatology and avoid unnecessary overlap of courses.

**Content of the Curriculum**

Modification has also been made to change the content of the curriculum. While the number of theoretical courses, clinical medical subjects, and compulsory disciplines has been gradually condensed, the hours devoted to practical courses,
basic subjects, and selective disciplines have been significantly increased. This section describes these changes in curriculum content in detail.

The course “Introduction to Stomatology” has been established and is taught at the early stage of undergraduate education. For example, in Beijing, two dental schools have scheduled the course in the first and the third semesters, respectively. Senior faculty at these dental schools introduce first-year dental students to the development of stomatology, explain the concepts underlying stomatological education, describe the basic content of stomatology, and explain the relationship between oral disease and systemic disease. The purpose of this course is to help the student learn core concepts about dentistry as early as possible, to strengthen the integration between dentistry and medical disciplines, and to provide incentives for undergraduate students to be interested in stomatology.

The percentage of basic science in the overall curriculum has been limited to around 18 percent, which is about half of the previous percentage. To accomplish this reduction, the redundant materials in physics, chemistry, and biology, which dental students have already studied in high school, have been deleted. There are more basic courses in the curriculum than there were before. Disciplines such as humanities, law, economics, bioengineering, medical physiology, and medical aesthetics have been added. In addition, many concepts related to information technology, statistics, new dental technology developments, and biophysics have been added to the curriculum, and new information has been added to the pertinent textbooks.

The teaching of basic dental science has been reinforced and the integration of the subjects with basic medical courses has been logically arranged. The basic dental science discipline has been increased to 9 percent (see Table 1), almost double that in the former curriculum. Traditionally, dental students have taken the same basic medical curriculum as medical students in the second year; then, they have to spend many additional hours studying basic dental science in the fourth year. This model wastes the time of both students and teachers, complicates teaching, and creates a lot of unnecessary repetition and overlapping content. In this combined dental-medical year, students also have difficulty focusing on the important features of each discipline. In order to optimize the structure, dental schools in Shanhai, Jilin, and Jiamushi have designed basic medical courses specific for dental students or have integrated basic dental subjects into basic medical courses. This strategy creates more curriculum time and facilitates reorganization and integration of other courses. In Tongji dental school, the integration has already been undertaken in such courses as general anatomy, local anatomy, oral anatomy and oral physiology, medical statistics, preventive medicine, preventive dentistry, medical microbiology and dental microbiology, and medical biochemistry and dental biochemistry. Results of feedback from both students and teachers indicate that the integration is efficient and effective.

The proportion of clinical medical science (about 14 percent) in the previous curriculum has been retained (see Table 1). In China, an undergraduate of stomatology is first a medical student and then a prospective dentist. At the same time, attention has been focused on the association between general medicine and dentistry in the courses early in the curriculum. More emphasis has been placed on the teaching of general surgery, diagnosis in internal medicine, and some important human diseases.

A preclinical training (PCT) program has been established. To a certain extent, dentistry is a type of a technical discipline, and much of the knowledge comes from clinical experience. However, undergraduates in the old Chinese dental curriculum began their clinical training by providing dental treatment for patients only after completing four years of didactic education in the classroom. The problems that accompany this pedagogy are quite clear. First, students usually feel awkward when they encounter patients because they do not know how to communicate with them. Second, lack of understanding of the medical

| Table 1. Modification of proportion in different courses before and after curricula changes in the 1990s |
|-------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Before change                                  | 20%            | 20%            | 15%            | 5%             | 20%            | 20%            |
| After change                                   | 18%            | 18%            | 14%            | 9%             | 18%            | 23%            |

1452
documents and lack of familiarity with treatment procedures and use of instruments can result in poor-quality dental care. In addition, students who are not familiar with the clinic environment and not aware of infection control methods are likely to be nervous, which further compromises their confidence. In view of these facts, some PCT have been planned to supplement and reinforce the classroom didactics. For example, in Shanghai Tongji dental school, a ten-week PCT program has been implemented that specifically focuses on the above problems. It is reported that the program has already been accepted and carried out by some other schools.

Laboratory courses in which students practice operative skills on mounted teeth have been reinforced, and more emphasis has been placed on improving students’ manual training and practical skills. Chinese dental education has long been characterized by the obligatory requirement of a uniform textbook for all students. However, the guideline for laboratory courses is now individualized and varies among different universities. In many schools, the content of laboratory courses is obsolete, which does not help students consolidate their theoretical knowledge and adapt to the clinical environment. Some schools even enroll students and begin their dental education without a laboratory training program, and the teaching of dental courses is accomplished mainly through lectures due to inadequate laboratory facilities and equipment. In trying to overcome this situation, Beijing dental school and four other universities have completed a “Chinese Dental Experimental Guideline,” which is in accordance with the ICTSE guidance and has integrated the advantages of other guidelines. Currently, most of the dental schools have accepted this format.

Clinical training has been gradually transformed into an integrated dental care model. Previously, the approach to clinical training has been subject-specific, which carried many disadvantages. Not only does it result in a student possessing knowledge that is not integrated and practicing a fragmented treatment modality, but very seldom does it happen that the same student performs a complete treatment for any given patient. For the past decade, it has become gradually recognized that it is essential to develop a student’s comprehensive ability to diagnose and treat oral disease, especially those with high incidence and prevalence. With this objective in mind, there should be integrated teaching of all techniques and knowledge pertaining to different specialties. The integrated clinic training program seems to be the only way to accomplish this goal. In Beijing, two dental schools have adopted a “first subject-specific, and then integrated dental care” training model, in which a comprehensive clinic is introduced at the end of the academic program, when students are able to handle all techniques and are thought to be able to perform a wide variety of treatments. Many faculties believe that this approach is better than the previous one. Instead of solving a patient’s problems in isolation, the patient now is regarded as a whole individual and the student uses a holistic approach to the diagnosis and the development of the treatment plan. No matter in which discipline a student is clinically trained, he or she should first perform a general evaluation of the patient and then develop a treatment plan based on a careful analysis of the case history and a consideration of the state of the oral cavity. Students should try their best to accomplish the plan, with the help, if needed, of students in other disciplines. Another benefit of this approach is that the students will be better trained when they become practitioners because most of them will be general dentists and work in integrated comprehensive care clinics after graduation. However, the comprehensive care model of teaching is not without problems. At some faculties, it has been difficult to allocate clinical teachers who have teaching experience and expertise in all the components of dentistry and who are also comfortable teaching in a comprehensive care model. In addition, the duration or proportion of the integrated care during the entire clinical training period is an issue that has to be carefully addressed. As a result, many schools are struggling to find the right balance between subject-specific and integrated clinical teaching.

The students’ education in technical English has also been strengthened. In China, students usually begin to study English during primary school and continue until the second year of their higher education. However, in most of the Chinese universities, learning of technical English does not begin until the postgraduate level based on the concept that a foreign language is mainly used for communication of scientific research. As a consequence, although students have studied English for many years, only a small number of them can apply it technically (e.g., read and understand a scientific paper in a journal published in English or write a scientific manuscript in English). Moreover, the undergraduates’ methods for studying a foreign language are based on passing tests that focus on grammar and vocabulary with little emphasis on conversation. The objective of learning
technical English for the majority of postgraduates, on the other hand, is to acquire the ability to read and write. When it is necessary to communicate with English-speaking foreigners during international academic conferences, few Chinese dental students or dentists can use English effectively, which indicates limitations in the traditional approach to English education. In order to improve the English language skills of undergraduates, many universities have established a technical foreign language discipline and have compiled their own stomatological English textbooks. Many other innovations have been undertaken in some universities. In Xian dental school, English is used in recording a patient’s disease history and in the case discussion. At this school, students’ ability to read, speak, and write technical English is an important element in the assessment of their clinical ability. In addition, many departments conduct diversified activities to provide technical English training regularly, such as English reading competitions, or organize group activities where individuals must communicate in English.

Changes in Teaching/Learning Methodology

Computer-assisted instruction (CAI) in dentistry first emerged in 1971 with its introduction at the University of Kentucky.18 Now, CAI and other modern information media for teaching are used extensively in educational settings, and great effort has been directed toward the application of electronic text, multimedia projects, and the construction of a dental curriculum network. Many studies concerning the effectiveness of CAI have found that CAI is more effective or at least equally effective as other methods of education while promoting positive attitudes in students towards learning.19,20 This is true for several reasons. First, multimedia learning material has the technical capacity to make pedagogical processes more vivid and clear because it provides an accessible, interactive, and flexible way of giving presentations that utilizes textual materials, visuals, sound, and motion. Second, computer programs provide a means for students to learn at their own pace, and the materials can be reviewed many times when a student is free of distractions and alert, or absent from the classroom. In addition, these materials elicit a positive response from students and consequently motivate students to learn.

CAI in the health professions is becoming a popular vehicle to provide information to students, patients, and practitioners alike.19 Many studies have found that CAI programs have the potential to increase student examination scores over traditional lecture-based methods, produce positive changes in student attitudes toward teaching and computers, and decrease the amount of time needed for instruction.20-22 In the past two decades, the progress in communication technology and the wide use of the Internet have made CAI programs in Chinese dental schools readily available, and their availability without time constraints makes them an attractive alternative to conventional learning.

Conclusion and Recommendations

A substantial amount of change has happened in dental education over the last two decades in mainland China. The majority of these modifications have produced positive results. It is hoped that the revised approaches to dental school curriculum described in this article will facilitate the training of dentists who can better serve the needs of the public and society. Here, we introduced the core concepts that provide the foundations for this new approach to dental education in China and described some innovative ideas that have been put into practice in several dental schools. However, more emphasis needs to be placed on the didactic methods, clinical training, and interpersonal skill education. We conclude with several recommendations.

First, problem-based learning (PBL) didactic methods should be greatly encouraged. Changing the curriculum to PBL represents a major challenge for faculty in any school. This is most immediately obvious in pedagogy. The educational objectives of PBL include the structuring of knowledge for use in clinical contexts and the development of an effective reasoning process and self-directed learning skills, as well as increased motivation for learning. It has been recommended that dental education should be problem-based, socially and culturally relevant, and community-oriented. Results of many studies indicate that PBL-trained students are better able to learn and retain information and to integrate and apply basic scientific knowledge to find a solution to clinical problems. However, the conventional lecture pedagogical model still predominates in Chinese dental educa-
As a result, although students have sacrificed enormous time in memorizing the textbook, most of them lack the capacity to think critically, defend or justify decisions, and use logical reasoning to analyze problems. The sad truth is that, in many schools so far, there is little desire among faculty to change this situation because of a lack of motivation and difficulties with financing and faculty training.

Second, clinical training should be strengthened. In China, all clinical training for dental undergraduates occurs in university hospitals or clinics. It seems that there should be sufficient numbers of patients that need dental treatment to allow students to develop their clinical skills in a country with such a large population. Unfortunately, a majority of patients cannot afford dental treatment, and many will not go to a hospital if they can tolerate the symptoms. Furthermore, because government financing is usually minimal and the function of state-owned hospitals is primarily supported by fees that the patients pay, patients needed for undergraduate education will have to pay for the therapy at the same level as they do when they are treated elsewhere. In this case, it makes sense for patients to choose experienced dentists rather than students. Consequently, in some schools, the source of patients for dental education is always a problem, and students’ clinical training is inevitably inadequate. Dental education in China would be greatly improved by three changes: 1) the government increased substantially its investment of financial resources in dental education; 2) the number of students enrolled in dental schools was controlled by the government according to available dental resources; and 3) patients were not required to pay for their treatment if they are treated by students.

In addition, interpersonal skill courses should be established. Interpersonal communication is the process of sending, receiving, and interpreting information through verbal and nonverbal channels between people. Good communication is the basis of effective patient care and management. Training in interpersonal skills provides an excellent forum for practicing behavioral skills. It can help develop students’ ability in ethical reasoning and enhance their understanding of the dentist’s role as a member of a team, as well as familiarize the student with the use of scientific knowledge in clinical practice. In Chinese culture, many educators believe that training in interpersonal skills is not a subject that should be included in a curriculum; it is thought that people can develop this skill automatically through observation and imitation. As a result, most dental school curricula lack a systematic framework that allows students to learn communication skills in settings, and interpersonal skills are attained mostly using passive learning techniques and do not include adequate student evaluation. However, a number of studies have evaluated the effectiveness of communication training. Some assessed changes in knowledge or attitudes, while others assessed the use of skills, patient satisfaction, patient compliance, or patient distress and anxiety with positive results. Chinese dental schools should do their best to integrate interpersonal skill training into the entire curriculum. At the same time, a performance-based assessment mechanism should be built.

Although the traditional Chinese dental curriculum has been modified significantly, without additional reform related to didactic teaching methods, clinical education, and interpersonal skills, it will be difficult to obtain further improvement in stomatological teaching programs in China, and our dental education will not continue to advance. The challenge now before us is how to align ourselves with an international model of dental education, which will make Chinese dental schools more competitive on the road ahead.

Acknowledgments

This project was supported by Guanghua School of Stomatology, Sun Yat-sen University. The authors express gratitude to Dr. Jiang Bai Hua, Wuhan University. Dr. Yin Hong Bin, and Zhang Quan Mei, Xinjiang University, for their assistance in collecting literature.

REFERENCES