

# Impression on NCTM in America

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# Impression on NCTM in America

From April 10, 2002 to May 10, at the invitation of Teachers College, Columbia University, I made an academic visit to Columbia University for one month.

During April 21-24, I attended the 80<sup>th</sup> annual meeting of the National Council of Teachers of Mathematics (NCTM) held in Las Vegas, Nevada at the invitation of NCTM chairman Professor Johnny W. Lott. And I delivered a keynote speech titled *Gifted Education: Thoughts and Practice from China*.

During April 4-7, 2001, I also attended the 79<sup>th</sup> annual meeting of NCTM during a visit to Teachers College Columbia University in the United States.

My visits at the invitation of Columbia University are generally arranged in April, because the annual meeting of NCTM is held in April. As a math teacher, when visiting the United States, it is necessary and worthwhile to attend the annual meeting of NCTM in addition to completing the necessary tasks to know directly about the progress of math education in the United States.

NCTM has left a deep impression on me during my attendance twice. Many years have passed, but as long as we speak of math education reform and development, I will think of NCTM, some of whose experience there is well worth our learning and reference.

## A Grand Festival of American Math Teachers

The National Council of Teachers of Mathematics is an organization which math teachers of universities, middle schools, elementary schools and kindergartens in the United States join in together. In every April, NCTM chooses a city in the United States to hold its annual meeting. The duration of the meeting is usually four days. At that time, thousands of math teachers from all over the United States attend their own meeting (16,500 math teachers attended the 79<sup>th</sup> annual meeting; and 19,000 math teachers attended the 80<sup>th</sup> annual meeting).

NCTM always arranges the venue as warmly as in a festival. The meeting is divided into two parts—academic exchanges and exhibition. Academic exchanges consist of reports, presentations, lectures, salons, discussions, consulting and other education forms of mathematics teachers; exhibition includes teaching achievements exhibition, new education technology exhibition, book fair, etc. There are over 1000 sessions in the first part of academic exchanges, covering all kinds of topics, presenting a whole year's papers, reports and classroom teaching prepared by university, high school and elementary school teachers all over America. The exhibition hall of the second part is also colorful, full of a wide variety of products. There are presentations of new teaching technology in terms of development in recent years exhibited by countless education institutions and manufacturers. The opening ceremony of the annual meeting is even more lively—the biggest hall will never hold so many people as the attendees of NCTM annual meeting, and the audience have to listen to the report of the chairman standing or even outside the meeting hall.

There are badges hanging on the chest of attendees, labeled name, job title, the NCTM position and the role of the meeting. Two math teachers as strangers will know everything about each other the moment they shake hands. There is no need of self-introduction. Their distance becomes close at a glance and they quickly discuss the topics of common interest.

Although math teachers come from all over the country, they don't stay long in the famous American cities where the meetings are held. They come and go in a hurry. Some only stay for one or two days, and at most, only four days. Because they have already meeting schedule in hand, they select their interested sessions, and then go back when the sessions are over.

Now there is no country in the world which owns such a big organization of subject teachers in terms of math teacher; and there is no country which holds such a large-scale subject teaching annual meeting.

During the 79<sup>th</sup> annual meeting held in Orlando, Florida in 2001, I went there with Professor Vogeli from New York. Professor Vogeli was very busy during the meeting. He mainly discussed publishing his elementary and secondary school textbooks with publishers. I attended lectures and visited exhibitions according to the conference guide. The theme of the annual meeting was "The World of Mathematics—New Millennium, New Standard". Just during the meeting, I met Dr. Johnny W. Lott, the elected chairman of NCTM. Dr. Lott invited me to attend the 80<sup>th</sup> annual meeting in the next year, and introduce China's mathematics education and teaching.

During the 80<sup>th</sup> annual meeting held in Las Vegas, Nevada in 2002, I was supposed to go with Professor Vogeli, but when we went through airport security checks, Professor Vogeli suddenly felt some heart trouble, and had to be examined in hospital and take a rest at home. The last-minute decision was that I went to Las Vegas alone. It was a long distance from New York to Las Vegas and I could prepare my speech during the flight. It was the first time for me to deliver a speech on such a large conference, and Professor Vogeli suddenly left me alone, so I had to take care of everything on my own, feeling a little bit nervous.

## **Marvelous Scenes in the Meeting**

If you stand at the sign-desk of the conference, you will see crowded people lining dozens of meters, not only at the opening ceremony but also the second or third day. At the sign-desk, it writes clearly that the sign-desk will be open from the previous day of the meeting until the closing ceremony. Why don't they all arrive on the first day? That's because Americans calculate time accurately. Except for those who attend for the first time staying for the whole four days, people generally pick some lectures which interest them. In addition, a lot of school principals come here to negotiate in terms of business with education technology producers, or professors discuss textbook publishing with publishers.

If you stand in the corridors of the venue, you will find that people are walking in the corridor like the tide, running from morning till night. People's pace is so fast that none of them is going for a walk. With Program Books in hand, they hurriedly went into the conference rooms where their sessions are held. When one is over, they are busy on their way to the next.

If you stand at the door of the meeting room, you will see many people, sometimes as many as

dozens, sitting on the floor. What are they doing? They are sitting on the floor, waiting in line to get tickets and for the beginning of the next Session. That's because every Session is booked up. There are orange plates hanging on the doors of the meeting rooms, telling everyone obviously "The Session is closed. " People are worried about not getting tickets if late for a while, so they sit on The aisle carpe early, a bit like the devout Buddhists worshipping the mountains in front of the famous mountain temples.

In order to have a complete knowledge of NCTM, I tried to attend as many conferences and exhibitions throughout the meeting as possible. NCTM annual meeting gave me the deepest impression that American mathematics teachers are so enthusiastic and serious about their career. This is what we can't see in China, and also what we don't understand.

### **Most of Them are at Their Own Expense**

In addition to a small part who are funded by school or state education departments, most math teachers who attend the NCTM annual meeting spend their own money. They don't mind the expensive tickets and hotel accommodation. They felt that it is completely worthwhile to attend the meeting, get information and learn from others' experience.

NCTM don't pay those speakers in the venue, and the speakers spend their own money. Although some of them are invited cordially by NCTM as VIPs, but NCTM neither provides accommodation fee nor lecture fee, which has become a routine. Even speakers have to pay for the multimedia devices in the venue. The NCTM is purely a "Non-Profit" organization and its fund comes entirely from the funding. So the members of NCTM support the work of NCTM with their practical actions. It is said that NCTM published its balance of payments accounts every year which is exactly accurate.

Rather than weaken the enthusiasm of the math teachers to attend the meeting, it achieves the real purpose of the meeting. Independent teacher education is based on their own expense. Teachers must clearly assess the value of the trip, and identify how much they have learned. Las Vegas is the world famous city of gambling, but before the slot machines in the streets, we never see any NCTM member who carries a badge stop and take a curious look.

### **Dazzling Book Exhibition Hall**

In the book exhibition hall of NCTM annual meeting, there are books and periodicals about mathematical education in the United States everywhere, enabling people to understand the pace of progress in math education over the years in America from books.

Since NCTM published in recent years *the standards for curricula and evaluation* which has the world influence, the states in U.S. and even many countries in the world have adopted it as the frame and standard model of mathematics education curriculum reform, because *the standards for curricula and evaluation* has stated authoritative guidance in American math education. National Science Foundation (NSF) has invested considerably to make the content and the implementation plans of *the standards for curricula and evaluation* more specific. Although NCTM is a non-governmental organization, federal agencies, especially NSF and the Federal Department of Education, pay much attention to and highly support its national mathematics education activities.

NSF supports NCTM in the innovation of teachers' in-service training, especially in the efforts of improving the mathematics quality and teaching theory of teaching staff. In this context, NCTM encourages math teachers in America, including university, secondary school, elementary school and kindergarten math teachers, to participate in the discussion of curriculum and evaluation standard, and publish countless articles and books. It is called the world-famous wave of American mathematics curriculum reform.

I really needed someone to explain for me or be my “tour guide” in the dazzling exhibition hall. When my face showed the demand, a beautiful and elegant Asian woman came to me. She asked me whether I needed help in pure and gentle American English. I said, “Will you introduce to me NCTM’s *the standards for curricula and evaluation* and other books?” She said OK. “NCTM’s *the standards for curricula and evaluation* advocates more in student-centered teaching, basing the teaching plan on student activities and opposing mechanical memorizing and practice. *The standards for curricula and evaluation* has obviously done much work in guiding and inspiring people in course construction, teachers cultivation and on-the-job training...” She took me from one shelf to another when speaking in a slow voice, explaining the content or the writer of the books.

A more detailed image of NCTM appeared in front of me. She turned out to be the Infocentral Manager here. No wonder she knew so much about NCTM. Her business card wrote her name as W. V Williams. She was a doctor in Mathematics Education (Ed. D.) and a full-time employee of NCTM. She also told me that she was originally from Asia, from the Philippines. It was a very happy acquaintance. I thanked her for her enthusiasm, patience and politeness, and I also invited her to visit China, visit Shanghai if she had a chance.

I spent a lot of time on the fair. I bought quite many books which were quite helpful in my research, such as *the standards for curricula and evaluation* and a standard set of explanatory material for it as well as mathematics teaching material of various grades and kinds, and mathematics education magazines and journals of universities and institutes. Professor Vogeli jokingly said that I could open open a bookstore when I went back. Although it cost a great amount of money to buy these books, and it would be heavy and arduous to take them back, but I thought it was worth it, and I really enjoyed it.

## **Americans don’t Know Much about China**

My speech theme was "Gifted Education, Thinking and Practice from China". It introduced my research work in recent years and some exploration of excellent students education in China. After my speech, 15-minute Q&A was arranged. Several experts asked me some questions related to excellent students in math and science, then people curiously asked me curiously about other topics, "Is Chinese students’ tuition each year very expensive?" , "How much salary do Chinese teachers earn?" "China's moral education sounds somewhat different from moral education in the United States. What content does it contain?" , "What courses are given in the normal education in China?" , "Does psychology exist in China now?" ....., it seemed that Americans really did not know much in China. When they heard my introduction about China’s ongoing quality education and carrying out the research-based curriculum, research-oriented learning as well as establishing many boarding high schools, all felt very surprised. They exclaimed how fast China's education had developed and would like to have a look in Shanghai.

Dr. Johnny W. Lott, Chairman of NCTM and some other leaders of NCTM came to my speech. They sat in the hall and listened to my speech from the beginning to the end. And at the end of the speech, they asked questions from time to time about the education of China. Though they were quite busy during the four days of NCTM annual meeting and needed to handle numerous issues, attend numerous events and deal with numerous emergencies possible to happen, they didn't appear in a hurry to leave during the whole speech. My speech lasted 20 minutes beyond the specified time and the management of the venue kept reminding us from time to time that they needed to prepare for the next speech, but we couldn't come to an end for a long time. It seemed that China needed to launch more campaigns to America, enabling the American people to know about China, China's construction and the rapid development of education in China in a more comprehensive way.

I was a member of the NCTM. Dr. Johnny W. Lott said humorously, "You are already a member of our big family, so you must come back the next year and we would like to listen to your introduction to China."

A few weeks after I returned to China, I received from NCTM a thank-you letter. They thanked me for my participation which brought help and inspiration to American education and the counterparts of math teachers in the United States. I really admired the considerate work of NCTM. In such a big meeting which tens of thousands of people took part in, where there were so many projects, and where there were so many things to do, the leaders of NCTM would not forget to come to my lecture, and when I went back, they would send me a thank-you note to show their respect and courtesy, which was all beyond my expectation.

## **Rich Thoughts Brought to Us by NCTM**

Since 1980s, great changes have taken place in the Mathematics curriculum in the United States. the National Council of head of Mathematics (NCTM) played a leader role in the process of change during that period. First, *the Action Agenda for School Mathematics in the 1980s* published in 1980 pushed problem-solution to the core of school mathematics education. Then, *the standards for curricula and evaluation for American School Mathematics* which was drafted in 1987 and published in 1989 furthered the reform of American math curricula and drove the basic education in the United States to set off a large-scale curricula "standard movement" in the 1990s.

Founded in 1920, NCTM has a history of over eighty years of history. It has 110,000 members including Canada and the United States and acts as the world's largest professional organization of mathematics education and mathematics teachers. From the beginning of the establishment, NCTM has been devoted to promoting K-12 grade mathematics teaching and learning reform, and to formulating the mathematics curriculum standards and mathematics teachers' professional training in recent years. Its effective work greatly promotes the mathematics curriculum reform in the United States, and it has become one of the most influential professional organization of American education discipline and teacher education.

After publishing *the standards for curricula and evaluation for American School Mathematics* in 1989, NCTM released *The Professional Standards for would Mathematics* in 1991 and *The Assessment Standards for School Mathematics* in 1995 respectively. The former aimed to improving the training level of math teachers and the latter studied the evaluation of mathematics

curricula systematically. In October 1998, NCTM released on *the Internet Principles and Standards for School Mathematics: Discussion draft* up to 334 pages, planning the math curricula in the United States in the 21st century and officially enacted the standards officially in April 2000.

NCTM enables us to see various forms of American teacher education. The education colleges or teachers colleges of universities are responsible for the training of undergraduate and graduate students majoring in teachers, and also responsible for the curricula education and non-curricula education training of in-service teachers while NCTM is in charge of non-curricula teachers education. They carry out the research and training activities of teachers by means of annual meeting. There are no degree awarded, and teachers have to pay on their own, but they are held year after year. The organizing committee of the annual meeting receives numerous papers and applications for sessions in terms of classroom teaching presentations and research courses each year. It seems warm and spectacular during every annual meeting. They are always full of confidence and enthusiasm of their country's mathematics education.

The diverse forms of teacher education make American mathematics teacher's training vivid and lively. The great power derived from the enthusiasm and passion from the nongovernmental sector pushed American mathematics education to the forefront of the world. Teachers play a subject and positive role in the education and teaching and teachers' lifelong learning is promoted. In such areas, NCTM has made role models and set good examples for us.

A national nongovernmental organization NCTM, in which mathematics teachers from American universities, high schools, elementary schools and kindergartens participate, aims at actively cooperating with the national education reform, studying how to develop the mathematics education course reforms, regulations and how to specifically implement it to textbook writing and teaching materials. They investigate and study the problems in the curriculum standard implementation, and discuss the countermeasures and so on all over America. During the four days of the annual meeting, they fully present the forums and exhibitions of mathematics education prepared for one year. Those lectures are carefully prepared by teachers, and almost all lectures are crowded with participants who are willing to listen. Speakers are not driven by "fame" or "wealth", and learners are also not driven by "Degree" or "utilitarian". The whole conference building is overcrowded, which fully embodies the math teachers' enthusiasm and initiative.

There are branches of NCTM in every state across the United States with large institutions and numerous personnel, but the work was carried out in good order. Their program has clear responsibilities, which are totally different from those of government but play a complementary and interactive role with the same goal.

Their goal is obviously national interests first. Though no government officials attend the meeting and the chairman of NCTM is the person with the highest rank, they never discuss politically sensitive topics. All forums, meetings, lectures, salons and shows revolve around one theme, which aims at supporting the country's education reform.

We here are also in the curriculum reform, and are also implementing the education spirit of reducing the study load. How should teachers act? How should mathematics teachers act? The power of a school alone is not enough and the principal is not an expert in all subjects, such as

science, math, Chinese, English and so on. The government's attention alone is also not enough. The practice of government covering everything has exposed many defects and shortcomings. Therefore, our secondary and elementary school mathematics teachers' association or secondary and elementary school mathematics teaching research institution should be duty-bound to stand up, driving the national, provincial, city and county mathematics teachers in action. It should actively put forward suggestions and methods of curriculum reform, respond to the education spirit of reducing the study load, study the main points of the students' innovative ability training, study quality education implementation situation, and survey the difficulties in the implementation of the reducing the study load. The secondary and elementary school mathematics teachers' association or teaching research institution can have their own journals, websites. It will publish quality academic research papers and release the latest dynamic for subject teaching and research. It can link the subject education throughout the entire country from the perspective of the discipline and carry out education, teaching and research activities of the subject in a lively way.

The association or research institution should elect a leader of the subject as chairman, who has a solid teaching theory foundation, a brand new education idea and rich teaching experience; who understands the national interest first and knows how to properly handle the relationship between government and the nongovernmental organizations, thus leading the mathematics teachers in various provinces and municipalities, districts and counties all over China to carry out activities in an orderly and conscious way. Math teachers should be used to independent management from being managed. They should be used to selecting activities independently from participating in activities out of orders in a group. In this way, the math teachers can be absorbed in the career which they choose, which they like and which they are willing to devote themselves to in a lively way.

Education under the new situation is required more and more to make use of the secondary and elementary school mathematics teachers' association or the secondary and elementary school mathematics teaching research institution on behalf of the professional teachers to undertake part of the previous responsibilities of the government. The secondary and elementary school mathematics teachers' association or the secondary and elementary school mathematics teaching research institution should provide more public services for teachers of the subject. Teachers participate in the activities of the association individually at their own expense. The school just helps to coordinate. A teacher can participate in this year and does not participate in next year; he can also participate in next year and does not participate in the year after; he can also attend every year. Teachers can see the national condition of the whole subject's development at the annual meeting of the association, and make self-adjustment and choice accordingly. This kind of activity is purely private without utility and it does not link to your own interest. And teachers attend the activities at their own expense. Therefore, it can put an end to fraud, fake and formalism and achieve the real purpose of the activities.

We should advocate that the teachers should become life-long learners. A good teacher should seize all chances to increase knowledge reserves. Society is in rapid development. Only by constantly learning can teachers constantly improve themselves so that they will not fall behind and that they can own eternal charm in front of the students. This study includes systematic study in teachers college of universities, expanding horizons and pursuing in-depth study. It also includes learning from others in the education teaching practice, comparing notes and drawing on each other's strengths, and even learning from students during the teaching process.



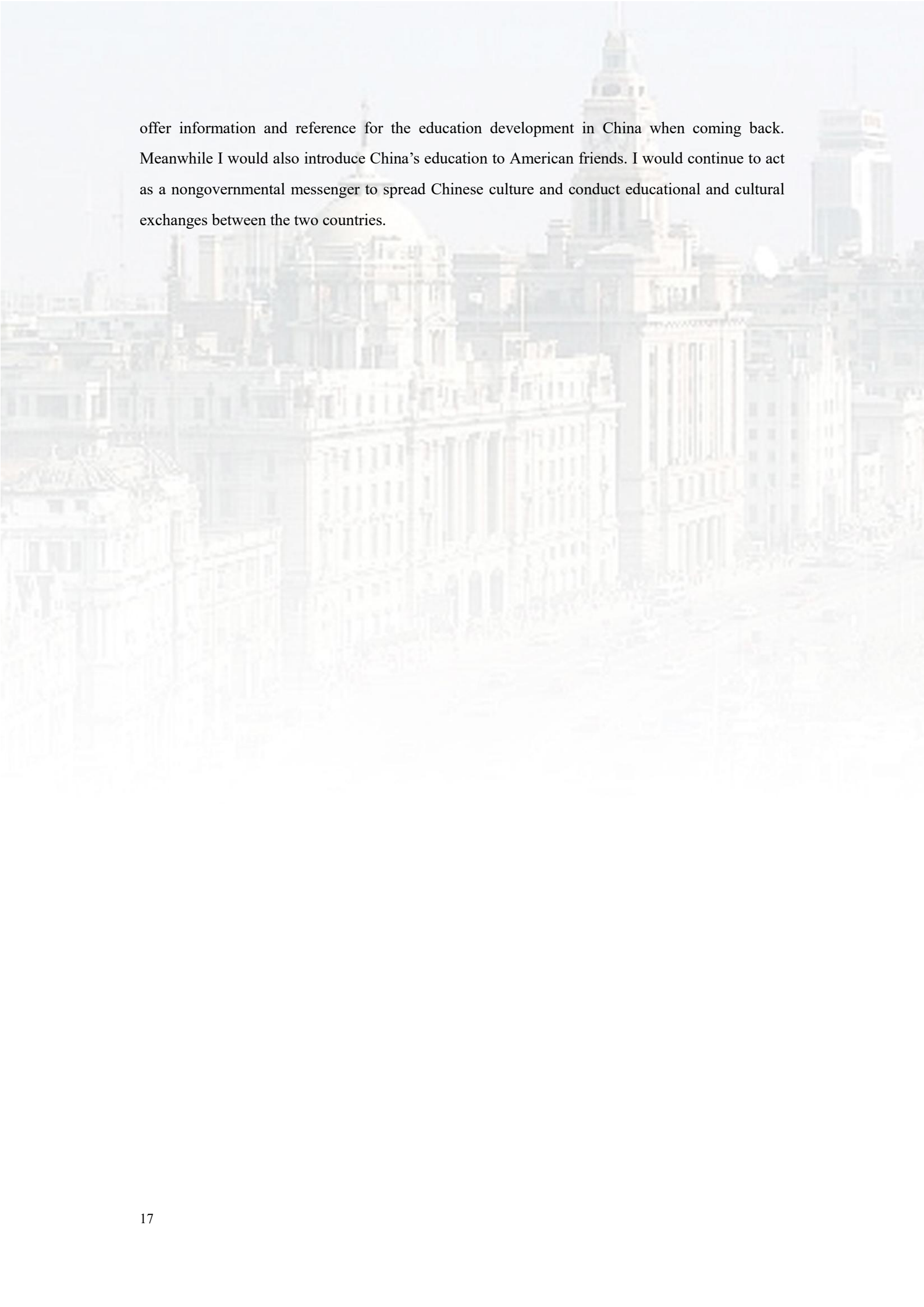
The secondary and elementary school mathematics teachers' association or the secondary and elementary school mathematics teaching research institution carry out activities, and teachers are engaged in independent activity and autonomous learning, which is bound to bring a series of concepts change and progress. All this will powerfully promote the education teaching reform of our country to move forward quickly.

The leaders of NCTM gives one an approachable impression. They are just university professors or education researchers. They never think of themselves as "officers". They treat you as colleagues or friends. They will reply every letter of yours. If the reply comes a few days later, he will apologize to you and explain the reasons. They are always responsive for your request. Even though they can't meet some requirements, they will always apologize to you and make detailed illustrations. When getting along, they respect your ideas and your choice. They never impose their own opinions on you. During the annual meeting, they are among the math teachers, listening to lectures, evaluating, discussing problems, and probing future mathematics education in the United States together. However, they do not forget they are the pilots of NCTM. And they never forget their responsibilities on the shoulders. They think more than others about the course of American math education to follow.

The most profound feeling NCTM gives me is the equality between people. Actually this kind of equal relations between people is a great force, a valuable affinity and cohesion of career and friendship. Just because of this power, all mathematics teachers in the United States have been gathered together annually. Math teachers in the United States are willing to spend a year's time to prepare the four days' meeting, year after year. In this way, mathematics education in the United States develops and math teachers in the United States improve themselves.

The impression of NCTM in terms of education and politics is clear and profound. This is a point I would like to put special emphasis on and reiterate. NCTM's leaders are all genuine scholars. They are leaders of NCTM just two or three years. For the rest of the time, they teach in universities. They don't think or act as the American politicians. In the four days' annual meeting, there are all academic activities, just about mathematics education. There are no political banners and slogans, no forums or lectures related to sensitive political issues during the four days. And the organizers inform the attendees clearly about it. But NCTM is also strongly "political" and it is a kind of non-political politics, because they firmly grasp that everything is for the sake of American national interest. All of their activities are supporting and promoting American education reform. As a matter of fact, it is the most important politics.

Over the past few years I have been busy with the work of establishing Future Road Teachers College in the City of Shanghai Shanghai. In spite of much start-up work and some disappointing experiences, the college has been on the track of healthy growth and development. After 2009, I would certainly spare some time to go to the United States to conduct some research on the innovation education of American basic education for a relatively long time. Of course, I would often visit NCTM, attend its annual meetings, meet old friends and know about the progress of the mathematics education in the United States, the development of curriculum reform and the development of teacher education. Comparing it with China's mathematics education, I would



offer information and reference for the education development in China when coming back. Meanwhile I would also introduce China's education to American friends. I would continue to act as a nongovernmental messenger to spread Chinese culture and conduct educational and cultural exchanges between the two countries.



