

Discussion Paper

Latest Developments in the Cost Engineering Profession & Higher Education in Mainland China

Professor Yin Yi-lin
Chairman
Education Board
China Engineering Cost Association (CECA)
Dean
Faculty of Economics and Management
Tianjin Technology University

The following paper is based on a presentation given by **Professor Yin Yi-Lin** on the cost engineering profession and cost engineering education in Mainland China. It is a fascinating account of the development of our profession in the largest country in the world and outlines ways in which organisations like PAQS can assist in this development. A strong quantity surveying/cost engineering profession in China will further enhance our professional status on a global scale.

Introduction

This paper examines the development of construction cost management in Mainland China. The current market situation is explored and the development of higher education in cost engineering is explained. This includes the development of cost engineering university courses and the certification process for the accreditation of cost engineers. The role of CECA's Education Board and the accreditation examination entry requirements are also explained. The paper concludes with suggestions on how PAQS, the RICS and other professional cost management associations can assist with the evolution of the profession in this country.

Historical Background

Under the planned economy policy, construction cost management in Mainland China was based on the use of the "constants" approach (i.e. constant labour and material contents, unit rates, wastage, management fees. etc.). These constants were not revised frequently. Project estimates prepared at the project planning stage were the key references for construction cost management. The benefits of utilising the input of different parties and professionals early in the development stages of a project were not generally recognised.

Between 1950-1980 project prices were planned by the government and were based on the Soviet Union's system of construction "constants". Reformation of construction cost management began during the period 1980-1990. Whilst project prices were still established by the government, the use of the competitive tendering system was explored and began to be used.

From 1990 onwards project prices were determined by the market. To enhance the cost management reformation, Bills of Quantities were introduced into tender documents by the Government from 1 July 2003. The government is now investigating the use of an effective whole-process cost management approach.

Current Market Situation

The market demand for construction cost professionals continues to surge. The value of construction works in China rises continuously. By 2010, it is estimated to be more than RMB 1,200 billion. The demand on construction cost professionals is therefore great and urgent.

The total number of people working in the cost engineering field in China is now approximately 1,200,000. The current total number of qualified cost engineers is over 60,000, increasing at the annual rate of about 7,000.

Cost Engineering Firms/Associations

Cost engineering consultant firms are divided into two categories and the current total number of firms is about 5,000.

The scope of services carried out includes feasibility studies, designs, cost estimates, tendering and bidding, works supervision and final accounts. They are governed by different government departments with their own codes and requirements, which may not be inter-related or match with one another.

Most of the professional associations cannot yet play an important role in helping to govern the industry. They are still in a developing stage and mainly carry out academic research and related activities.

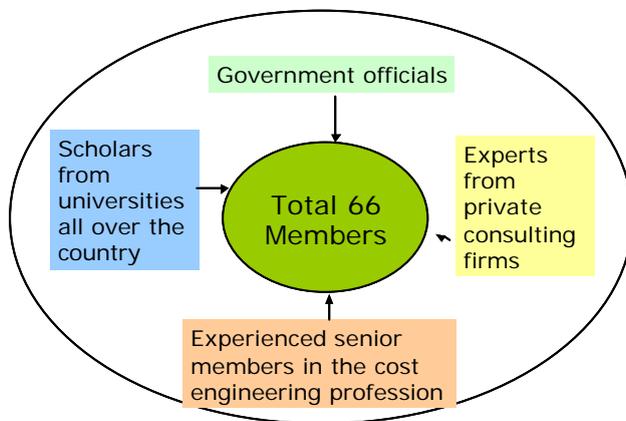
The government treats the monitoring of the qualifications of consulting firms as the first priority, with the monitoring of the qualifications of individual professionals as the second.

The Education Board of the China Engineering Cost Association (CECA)

The terms of reference for the Education Board of CECA are to:

- Prepare development strategies for higher education in cost engineering.
- Establish national assessment standards for higher education in cost engineering.
- Establish the framework for the provision of CPDs to qualified cost engineers.
- Support and co-ordinate research on higher education in cost engineering and provide guidance in compiling teaching materials.
- Co-operate and exchange experience with relevant international organizations on the advancement of higher education in cost engineering.

Membership of the Board comprises the following:



Cost Engineer Accreditation Examinations

The entry requirements for the qualified cost engineers examination are as follows:

Academic qualifications	Relevant working experience
Technical schools in cost engineering	5 years
Technical schools in engineering or construction economics	6 years
Bachelor degrees in cost engineering	4 years
Bachelor degrees in engineering or construction economics	5 years
Masters or double-degrees in cost engineering	3 years
Doctoral degree in engineering	2 years

The contents of the examination cover the basic knowledge and skills required from construction cost engineers, and include construction technology, economics, management, law and case analyses.

Registration of qualified cost engineers is by the Ministry of Construction and its construction administration departments in each Province. Candidates who pass the examination should go to the related department and register within 3 months. The validity period of the registration is 2 years. Re-registration should be done within 3 months before the validity period expires. Before re-registration, the cost engineer should undertake further continual education and professional training certification.

The Development of Higher Education in Cost Engineering

In the 1990s, with rapid economic growth, the construction industry became important to the GDP and more and more universities set up different departments in fields such as international project management, real estate operations and management, and the like. In 1998, the Ministry of Education consolidated the various fields and set up the field of Engineering Management. Construction cost management became a branch of this new Engineering Management field.

In 2002, the first 'cost engineering' course was introduced at my University (Tianjin Technology University) and was approved by the Ministry of Education. Then about 70 students enrolled leading to a bachelor degree in September 2003.

By the end of 2003, there were about 150 universities providing bachelor degree courses in Engineering Management and among them about 50 universities provided bachelor degree courses in cost engineering. The total number of new intake students who major in the bachelor degree of cost engineering is about 10,000 every year. However, there are a number of problems with this higher education in Cost Engineering. Firstly, there is no accreditation system for university cost engineering courses.

Secondly, there is a shortage of good textbooks. One reason is that the cost engineering courses in the various universities are different and the emphasis is also different. For example, some universities emphasize an engineering background and their courses are based on construction science and technology, while others emphasize the systematic integration of economics, management, law, and construction technology.

Another problem is the difficulties in providing effective Continuing Professional Development programs to the large number of qualified cost engineers.

Future Plans

Plans are in place for institutes/universities providing these courses to be accredited by CECA. The academic qualification requirements for qualified cost engineers will be either a pure engineering qualification or a cost engineering qualification, but both have to be obtained from institutes accredited by CECA. Cost engineering programs will however be affected by criteria set by the Ministry of Education, with the relevant professional associations not being consulted beforehand.

The cost engineering profession is regarded as an applied science. The majority of cost engineers will not therefore come from traditional academic universities that put more emphasis on academic research and offer masters and doctoral degree courses.

Potential for Collaboration

CECA are currently drafting the policy and procedures for accrediting cost engineering degree courses in Mainland China. They are seeking the assistance of PAQS, the RICS, universities and other relevant associations to help with this process. Other areas where these associations/universities can help is with Continuing Professional Development programs, joint research work in the area of higher education and the development of good teaching materials.

