

## Teaching exploration and practice of the international students on Civil Engineering Surveying course

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### Abstract

according to the practical situation of international students in civil engineering, the teaching mode, the teaching mode, the teaching mode, the teaching method and the method of teaching materials are proposed, and some suggestions are put forward to cultivate international students' professional skills in this field. This work can guide to the practical situation of our country in this field.

### Keywords

International students, English teaching, civil engineering survey.

### 1. Introduction

Surveying and mapping major is a traditional professional, is to measure, draw various types of maps, service in the construction, planning, resources and other auxiliary professional, to train professional mapping personnel as the main task. Because of the progress of modern computer technology, Internet technology, information technology, sensor technology, the traditional can only be done by professional surveying and mapping personnel through the measurement of the data collected by the external industry or computer graphics can be accomplished by the majority of the mapping tasks can be done by remote sensing, image processing, etc.. Modern mapping technology in computer technology, sensor technology and other new results of the latest achievements of the support, has a past service engineering construction of this more single purpose gradually transformed into a part of people's life, widely used in positioning, navigation, interstellar exploration and other fields. Become "research and the earth related basic space information collection, processing, display, management, use of science and technology". Many foreign university of Surveying and Mapping Engineering Department (Professional) in the last century, the 80's by the Mapping Surveying (term) was renamed as "geo-information" or "Geomatics", according to the views of academician, the corresponding translation into "the earth space information science" [1]. Modern surveying and Mapping Science and technology, the integration of information technology, the development of information mapping technology, in the global scope of cooperation and competition, the global demand for international mapping of a large number of people, China's participation in the development of international mapping personnel work, has a very important significance

With the enhancement of China's comprehensive national strength, surveying and mapping equipment, theory of Surveying and mapping, engineering, construction and other areas of fruitful results, attracting many international born Chinese study, and mapping as a service in all kinds of engineering construction disciplines, civil engineering, bridge, military, land, mining, communications, Railway etc. professional required professional basic courses. This paper is according to our civil engineering, international students, opened civil engineering surveying course teaching, makes a comprehensive discussion on the course in the course of training objectives, syllabus, teaching, practice experiment, the examination, the results of the classified etc. problems are also discussed.

## **2. International students' characteristics and the development trend of international students**

International students, the short of international students, refer to the foreign students enrolled in their own schools. With the goal of international common ability training, combining with the national higher education series, taking into account the characteristics of the country's national conditions, to develop qualified engineering technology or academic research for the purpose of education.

International students often come from different countries, with different cultural basis, and beliefs, culture, tradition, life habits are also very different, for example, 2013 civil engineering students from Pakistan and Zimbabwe two countries, their national, provincial, parish and so on, we have a brief introduction to the national basic education stage, only in the "science" course, for latitude and longitude, altitude and so on.

In addition, as the official language of these two countries have English, so the English speaking ability is relatively smooth, but they are more like to communicate with native speakers or very poor Chinese for fun. Due to the lack of necessary engineering, construction, geography and analytical geometry, the proper nouns and mathematical words in the teaching should be described by the standard interpretation of scientific dictionary, or they may be confused or confused.

With the frequent exchanges between China and the world, and the relative surplus of higher education resources in the future, this trend will be more obvious, and it also creates a good opportunity for Chinese science and technology to the world.

## **3. Teaching practice of International Civil Engineering Surveying Course for civil engineering specialty**

At present, most of the non professional surveying courses in Colleges and universities are set up in geography, surveying, mapping, mining and other professional, subject to the school system, professional tradition, home industry, graduate employment, and students' professional basis and focus of different, in teaching materials and teaching content. The measurement of collecting foreign some non surveying and mapping professional science, engineering surveying, engineering surveying, construction surveying course teaching outline, concluded that, the general will be surveying the basic concept, the shape of the earth, basic principles are briefly introduced, focusing on three instruments (process) elevation, angle and distance measurement, is different with the domestic textbooks, foreign materials first introduced the use of modern instruments, the use of traditional instruments placed behind and significantly reduced the length, which in successive versions of the same materials, feeling particularly noticeable. Such as height measurement instrument, the order of presentation is electronic leveling instrument, automatic leveling instrument, micro tilt leveling instrument, dumpy level, and length decreases obviously, this kind of phenomenon in the use of distance measurement, angle measurement instrument has the same rules.

In view of the teaching practice of the course, the core issues are discussed.

### **3.1 training objectives and teaching syllabus**

The following factors should be taken into account in the formulation of training objectives and teaching syllabus:

To meet the conditions of the students. The vast majority of students after graduation to return to employment so should be closely linked to the geographical location of the students, technical conditions, development level, combined with school equipment, develop appropriate training objectives and curriculum. Such as the standard of measurement, in addition to the introduction of the commonly used metric in our country must also be the imperial feet, American foot unit level ruler; record form should also be introduced. For example, due to the use of non sexagesimal angles of some countries, so must sexagesimal system of degrees, minutes, seconds, the decimal system, radian, degree of (grade) of instruments and equipment, lack of necessary teaching information can let the

students contact the domestic students, send e-mail to provide and proofs, photos, videos etc., to enrich the students' knowledge capacity, increase students' employment application.

Professional characteristics. Civil engineering is different from the bridge, construction, water conservancy and other professional, so in the choice of teaching content should be closely combined with the characteristics of the subject, appropriate to move part of the knowledge to self-study content, such as line measurement, management authority in the measurement and construction measurement knowledge can require students in learning basic lofting knowledge, according to its own characteristics to be self-taught, teaching can be in the form of speech, working practice, group discussion to consolidate.

Practice link. In mobile measurement data acquisition system, satellite positioning technology, remote sensing technology, robot measurement equipment and mapping software, data processing software, data management software, electronic map, navigation technology, geographic information system (GIS) and other modern surveying and mapping tools increasingly popular environment, should be appropriate to weaken the traditional optical instrument, strengthen the electronic, automation, intelligent and information characteristics, appropriate to strengthen the use of total station, RTK GPS, mapping software, for future Chinese mapping equipment to lay the foundation.

In addition, the theory of class, practice class, practice class and optional subjects of learning counseling, should become an effective complement.

### 3.2 selections of teaching materials

Materials should be in accordance with the syllabus, and extensive collection of domestic measurement English version, bilingual edition, reading edition of teaching materials, also should be collected extensively adopted abroad materials, in-depth study, select suitable materials.

(1) The type of teaching material. The selection of the teaching material non-professional survey. Now the vast majority of bilingual teaching in the domestic surveying and mapping of the professional, the content is mostly too deep, and the term is too professional, is not conducive to the teaching of non surveying and mapping. The author collects many of the materials that belong to this category. But foreign university's measurement science teaching material mostly in the resources, the water conservancy, the energy, and the environment and so on the curriculum, the choice of appropriate teaching material is really not easy.

(2) Hierarchy. As a lot of areas of master's, doctoral students stage work needs to be based on mapping, so many colleges and universities in this stage of the measurement of the course. Although the level is not appropriate, but because of its emphasis on practical, can not be avoided to consider, into the selection range.

(3) Professional field. Although domestic and foreign colleges and universities a lot of non mapping specialty have opened the measurement course, and some even set up the principles of geographic information system, geographic information system application and development course, but directly facing measurement of civil engineering school textbooks are not uncommon, the author thinks that may be due to soil professional wood are mostly distributed in many industries of colleges and universities, graduates employment wide pan, so direct reference to some applications in the field of surveying teaching materials in Colleges and universities can be.

country of teaching material. The author believes that, from the United States, Canada, Britain, Holland, Australia, Germany and other developed countries can be considered, but must pay attention to the efficiency of our teaching mode is different from the west, the choice of teaching material is important, we must take some of the material as a reference, data to be treated.

Supplementary teaching materials. Specific professional teaching materials, specific software, as far as possible, as the main materials, but can be used as supplementary materials. Now the Internet in every corner, not as great scourges, must all accept, guidance. A PDF version of the information, animation data, excellent course, professional forums, web pages, surveying and mapping enterprise website and brochures, teaching version of the software and classroom live video, practice teaching

video on the web is very good, especially the serious lack of knowledge of the construction site of students, the sense of reality is particularly important. In addition, due to the measurement apparatus, display screen of small, dark, not easy to onlookers, recording video display to students is a good choice. Such as Highway Surveying Manual of Washington State Department of Transportation、History of Surveying、Mathematics in Surveying Committee from International Federation of Surveyors (FIG) Get Excited about the Mathematics & Science in Surveying、Central Federal Lands Highway Division的ADVANCED SURVEYING AND MAPPING TECHNOLOGIES, Systems Overview & Applications Engineering ELSEVIER Surveying (Edition Sixth) is a good teaching reference, and I have become the selected materials.

Also some from the field of Surveying and mapping of top class characters written papers, conference proceedings, popular science readings can be used as teaching aids, in-depth study of students are of great help.

### 3.3 software teaching

In the course of measurement, we can not do without calculation. The author uses the English version of EXCEL and scientific calculator as a tool to draw the general use of CASS in our country, and introduces the MAPGIS, SUPERMAP and GIS and other ARCGIS software in the teaching.

The author describes the measurement of foreign colleges and universities teaching website, so that students download the appropriate guidance and experimental data. At the same time, the shortage of foreign language materials in the library and the reference room is added.

### 3.4 teaching mode

Because of the changes in teaching methods, in addition to the outline and class allocation should be adjusted, but also must choose the appropriate original materials and the main reference books, reference sites, resource sites, etc., to prepare or choose practical English teaching materials.

Specifically as follows

- (1) Curriculum. Before the start, should the completion of professional foreign language or foreign language teaching of science and technology, at the same time specified more extracurricular reference. You can introduce students from simple and easy to understand introductory information, such as "started with getting"..." Or "to introduction..." Reference books, web pages, courseware, etc., at the same time, the introduction of professional dictionaries, manuals, tutoring materials to students. In order to develop the students' listening comprehension, it also introduces some popular science and technology channels of science and technology channel, which has received good results.
- (2) Determine the teaching software. Reference and absorb the experience of bilingual teaching at home and abroad, the basic mode of the whole English teaching. After research, decided to adopt the "professional vocabulary and teaching materials to prepare experimental preview experimental summary" of the basic mode of learning.
- (3) Making an elaborate teaching courseware. Extensive collection of foreign language courseware, data, reference materials to make teaching courseware. For example, the author in the teaching of network teaching resources, the type of various types of resources, topics, majors, quiz, to student guide, resources data, etc., of course, including a large number of SWF, RM, PPT and other documents and pictures, greatly enriched the courseware, some data from the teaching materials.
- (4) Classroom teaching. 2 weeks before the start of school. Each class, the basic content of the introduction of the basic content roughly 10 minutes, and the way to introduce the main professional vocabulary, and told the students in the position of the reference materials. And then according to the courseware to explain, explain in a small amount of appropriate Chinese language to stimulate students' interest in learning. Late can be taught in English. After the end of a content can be appropriate to organize students to discuss, in order to active classroom language angry. The review link in the classroom is very important; otherwise it is easy for students to only remember some of the professional vocabulary while ignoring the learning and understanding of knowledge.

(5) Summary, counseling and experiment. Can be aimed at the students' knowledge and content of the difficulty, to help students in a timely summary of knowledge, you can list the review outline issued to students. Guidance including teaching materials to guide the learning and reference materials to supplement the understanding, most of the use of after-school. The experimental teaching material should be given in English, and it has a detailed and appropriate operation process.

Assessment. Except the questions according to the traditional Chinese teaching methods can be in the final test out if road practice questions, require students in English and graphic solution. Can also require students to complete the required time in English for a general familiar with the key content, writing about 300 words of the technical notes. For example, I have asked the students to complete understand the differences between How in 45 minutes... And...?" The short passage, the effect is good.

### 3.5 teaching courseware

Research teaching content, combined with many years of experience in the production of Chinese courseware, reference to a large number of data that bilingual teaching should pay attention to the production of courseware:

(1) Professional terminology as far as possible in accordance with the specification. Due to the different sources of information in English, the use of personnel levels, the generation of different, professional background, may introduce some mainstream view. Which requires teachers to have strong ability to identify and inquisitive spirit, especially from the computer information technology and database of modern science professional terminology?

(2) in order to enhance the attraction, we can make animation flash, reference video, reference website and related network teaching website, the author in the teaching of a large number of foreign outstanding teaching website animation material, greatly enhanced the interest of classroom teaching, also learned some of the more authoritative professional terms.

(3) Courseware structure. After a lot of research and practice, the author thinks that the structure of "materials- review- discussions title-outline-details-additional" is appropriate, in addition, according to the progress of the course, it is to provide some ideas to think about.

### 3.6 classroom teaching

In addition to the above mentioned, the author also introduces the discussion link to active classroom atmosphere. Using talk small or talk free form, you can also use a person's question, we discuss the form. In general, students is not easy to bring up the topic I often gives some thinking about the title and radio or multiple-choice questions for everyone to have received a good teaching effect.

For example, the author in the course of teaching after a basic content, given the following considerations:

Pick up the correct statement from the following:

- A. the eyepiece plays no part in defining the line of sight
- B. the diaphragm plays no part in defining the line of sight
- C. the optical centre of the objective plays no part in defining the line of sight
- D. none of these.

Students according to the usual understanding and classroom content, have given their understanding, not only active classroom atmosphere, but also to learn the knowledge, at the same time, we have the initiative to think about learning opportunities.

## 4. conclusions

Through the pilot found that a lot of changes in the past is not appropriate. For example, the international students' English communication is very good, but the ability to understand the professional vocabulary is not flattering, poor oral expression ability of the professional teachers

often has to back the professional dictionary, technology dictionary or dictionary copy content to regulate interpretation.

Surveying and mapping data is classified and the northern and southern hemispheres coordinate translation value, projection and UTM projection, East and West Map schema differences such as for teachers' professional teaching put forward a severe test.

According to the usual assessment and experimental, the final answer point of view, the answer is good, from a certain degree reflects the feasibility of English teaching applied in the course. Practice has proved that, in order to develop the international students' professional skills for surveying and mapping for the purpose, to carry out the whole English teaching, to carry out international academic exchange ability, can be, but also must take a step, must study and promote. Such as professional teacher training, improve the ability of international students in China's employment should continue to be studied.

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