

Outcome-based learning and evaluation on land surveying professional practice

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ABSTRACT

There are always pressures from the industry that universities should keep up efforts in producing working professional practitioners. Facing new challenges in their jobs, many young graduates just give simple replies to their boss that they have not been taught on handling practical professional duties. The gap of the professional expectation on students' performance should come closer from both sides. This paper presents a new teaching scheme on the integration of professional practicing cases and student training for the land boundary surveying industry.

INTRODUCTION

The Hong Kong Polytechnic University (PolyU) has continuously involved in teaching reform since the institute has upgraded to a university in the early 1990's. Problem-based learning in the curriculum design was adopted in late 1990's, which was aimed to help students to develop critical thinking and disciplinary knowledge-based skills [Tang et al, 1997]. In the 2005-2008 academic triennium, PolyU has adopted the criterion-reference approach for assessing student performance in support of an outcome-oriented curriculum [LTC, 2005]. In recent years, the university promotes e-learning and continues the commitment on the outcome-based approach to teaching, learning and assessment as a strategic move to further enhance student learning [EDC, 2008]. The approach is now termed "Outcome-Based Education" (OBE).

The Department of Land Surveying and Geo-Informatics (LSGI) of PolyU offers the sole undergraduate program in Hong Kong providing professional land surveying education. The subject "Hong Kong Land Boundary Survey", which is taught in the last semester of the three year degree program, is a key professional skill in practice.

It is also the main concern on the land surveying practitioners who employ the fresh graduates. Generally, employers expect the graduates to be capable of handling simple land boundary surveying task in the first couple of months and later in-charge of the boundary determination tasks. So far, LSGI received feedbacks that the graduates working in the land boundary sector needed “close supervision”.

In the university, students’ feedbacks are formally done by “Student Feedback Questionnaires”. The land boundary survey subject continually received highly satisfactory feedbacks. It translates that the students are happy to see the subject results as compared to the efforts they have made. Quite a few students query that if the teaching method and course contents could be improved while the workload should not be increased.

E-LEARNING

In 2006, a small project on the e-learning curriculum development for cadastral survey was implemented. The initial theme was the conversion of paper teaching materials to an electronic environment. Plans, survey information, documents, photos were changed to files and images accessible through internet (Figure 1). Other e-learning functions were tested including computer quiz facilities, assignment and project submission facilities, chat rooms and web references.

Students found the e-learning settings convenient but still they preferred traditional face-to-face communication. There are rooms for further development in this subject. For example, in each cadastral surveying case, an education-movie can be made to demonstrate lively the reconnaissance, data search in government offices, fieldwork, boundary determination considerations and products. It needs technical support and resources on the movie production of surveying cases. At this moment, we are only able to keep files, documents, pictures, plans and photos of a survey case in a folder. When the survey case is illustrated by narrators in edited film shooting, we shall then achieve a higher level of success in teaching professional land surveying practice by e-learning.

REQUESTS FOR CHANGE

To raise the efficiency and enhance the effect of the teaching of professional skills, a new OBE curriculum design for land boundary surveying was launched in 2007. It is

declared in the subject syllabus that students, by taking and passing the subject, will be able to perform a land boundary surveying task conforming to the professional standard as described in the Code of Practice under the Land Survey Ordinance of Hong Kong.

Before the change of curriculum, the subject “Hong Kong Land Boundary Survey” was assessed under a norm-referenced assessment scheme. The assessment of a particular student was made by comparing with the performance of the rest of students in a class. In short, a grade is assigned to a student relatively to the performance of others in one cohort. The scheme worked well for years. Especially, in previous years when education opportunity was rare and precious, students admitted to a university normally presented a positive attitude in their studying life. Nonetheless, students admitted in recent years, although they had also gone through competitions in public examinations, as a whole, presented less stamina in excelling their performance. Professional practitioners have reflected concerns on the absolute standards that the norm-reference assessment system has achieved.

Another view on the less immediate performing capability of graduates is on the ever expanding knowledge base. To make sure students are exposed to world-class development of modern surveying technology, we continue upgrading new technological contents in the syllabus. New computer knowledge including database structure and java languages is not familiar with practicing land surveyors. So do the contents like aerial image processing and comparison, side scanning sonar imagery, InSAR monitoring or 3D GIS models. They represent today’s technology. Students should have exposure to new developments. Yet, the cost is that there are less time for useful practical professional training in engineering and cadastral operations.

There is pressure from the university administration to produce preferred graduates; there is pressure from the industry, requesting not only text-book knowledge, but also immediate practical capability; and there is pressure from students as they also want to have workable skills immediate after graduation. Without re-allocating time and resource to the existing subjects, a new adoption of the Outcome-Based Education in the subject of Hong Kong Land Boundary Survey was implemented in 2007-2008 academic year.

The subject has 14 weeks of 2-hour lectures plus 2-hour laboratory work. In the old syllabus, the lecture covered the topics of early cadastral history of Hong Kong; developments of cadastral surveying system in recent decades; current government surveying operations; land information systems, cadastre and the Hong Kong cadastral system; Land Registry; land boundary records and evidence; boundary determination concept; private practice; survey law and improvement of survey system; survey case studies; court cases and expert witness; and revision before examination. The laboratory hours were surveying exercises done on campus.

NEW DESIGN UNDER OBE

In the lecture contents of the new syllabus, the history, law, court cases and professional practicing information are introduced in 7 lectures, being half of the time in the old syllabus. In the new time slots, 4 land boundary determination cases are introduced and demonstrated by land surveyors from Authorized Land Surveyor (ALS) firms. By doing that, it works like a working process is repeated 4 times, albeit different cases they are processed under one professional principle.

In 3 weeks, students are asked to pick a survey project from a list of 6 cases and they are required to perform the survey from outset to the end, including information search, site reconnaissance, site survey explanation (survey data taken by the contributing surveying firm), re-establishment of boundary, survey plans and report production. In the end, students have to report their case, facing a professional interview board including members from the government, the private sector and the university. Figure 2a shows the ALS, Mr George Leung, talking to the landowner with a student holding a survey plan. Figure 2b shows the site explanation made by the ALS and Figure 2c shows the traffic means of the group – on bicycles.

ASSESSMENT

The new assessment weightings include: 1) survey computation and plans production – 40% and 2) survey project and professional interview - 60%. It can be seen that if the professional board is not satisfied with the standard of the project work and the answers to the questions from the interview, a student will have to try again next year.

The survey work in part 1 and the production of plans and report in part 2 are assessed upon the standards and requirements listed in the Code of Practice, currently version IV. Grades will be differentiated from full compliance to a level of unacceptable standard. Being the first trial on the grading of students' surveying plans and reports, grades of different examples will be available after this batch of first trial. At the moment, students have ample opportunities in consulting professionals in the industry as well as in the university.

CONCLUSION

No doubt that it is desirable to prepare students to be the “preferred graduates”. This new application of the Outcome-Based Education model in teaching land surveying professional practice in boundary re-establishment is the common goal of our students, the university and the industry. By the case studying methods under the new curriculum, hopefully the spirit of a land boundary surveyor – careful in assessing available evidence and making appropriate decisions – is shown and transferred to the young future professionals.

Thanks to the contributing land surveying firms, Leung Shou Chun Land Surveying consultants Ltd and Gland Surveying, Planning & GIS Co Ltd, for offering cases for studying and assigning professional land surveyors to lecture and work with students. Thanks to the Survey and Mapping Office of Lands Department for sending professional staff in hosting the professional interviews. Indeed, without the participation from the land surveying industry and the Government, the implementation of this new teaching scheme will not be materialized.

Figure 1 e-learning of cadastral surveying subjects

Subject Links

- Hong Kong Land Boundary Survey (LSGI4311)
- Cadastral Studies and Management (LSGI251)
- Cadastre and Land Management (LSGI4301)

Add new link

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2. Right click the document and choose "Save Target as..."

1. Click on the link

2. Browse the document in your computer

3. Click "Save and Close"

1. Click on the link

2. Type the topic of the subject in

3. Click "Save and Close"

Figure 2b



Figure 2a

**Project site reconnaissance
with ALS (blue-cap in
Fig.2a)**



Figure 2c

REFERENCE:

LTC, 2005. Guidelines for Implementation of Criterion-Referenced Assessment, page 1, Learning and Teaching Committee, The Hong Kong Polytechnic University, 8 pages.

EDC, 2008. Web page on Outcome-Based Education, OBE in PolyU, Education Development Centre, The Hong Kong Polytechnic University, assessed at the site http://www.polyu.edu.hk/obe/03_1.php on 3 March 2008.

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