

TO : Professor Zhiguo Gong, Head of Department – CIS/FST
FROM : Kam H. Vat – CIS/FST
SUBJECT : Feedback and Comments for Program Annual Review – CIS
DATE : October 16, 2007
CC : Professor KM Mok, Dean of FST

First, I would like to extend my sincere thanks to the Faculty for the opportunity rendered by our University's Initiative to gather comments from individual teaching staff, regarding our program in Computer and Information Science. My comments hereby provided are related to our undergraduate program leading to the degree of Bachelor of Science in Software Engineering/Computer and Information Science.

1) General Comments

Our current undergraduate CIS program was established more than 15 years ago. It is really time to review the substances of our program so as to provide the best possible training/education to our students in order to prepare their specialization in related professional areas such as industrial software development or academic computer science research and development. It is also my hope that our program could eventually be accredited by international bodies, be it in the context of software engineering, computer science, information systems, information technology, or information science. But, we need to articulate our program philosophy and objectives pragmatically and clearly so as to convince both the local and the international communities that we have something really good to offer, be it from the perspectives of program context, content and structure, or from the angle of teaching and learning strategies as well as assessment methods.

2) Dilemmas of Current Program

Our existing program was originally a five-year program transplanted from the Portuguese education system; so, it is composed of modules and credits representing quite a heavy load of study schedule for our undergraduate students finishing it in a duration of four years. We really need to take some of the burden off our students' shoulders, taking into account the suggestions of the Computing Curriculum – Software Engineering or Computer Sciences, produced by the Joint Task force on Computing Curricula of the IEEE Computer Society and the Association for Computing Machinery, published respectively on 2004 (<http://sites.computer.org/ccse/>) and 2001 (<http://www.sigcse.org/cc2001/>).

3) The Issue of Student-Centeredness

As Professor Mok, our Dean, has recounted for our reference, we are developing an education system that is student-centered. We need to think about how to educate our students, not just in terms of knowledge or theories, but also there is a society in which they are preparing their journeys (into professional software practitioners, I mean), so that they must become an integral part of contributions to our community. In this light, our program must cultivate effective classroom teaching, which requires our professional commitment in the teaching act, founded on the planning and implementing of student-centered instructional activities and timely assessment of student performance. So, by student-centeredness, I mean an approach to learning through a variety of knowledge

building processes (relevant to software engineering and computer science), and that teaching should encourage students to work actively towards understanding within a framework of personal responsibility and institutional freedom. So, keeping a portfolio of student activities and performance starting from right after their admission becomes important. We should be interested not just in the grade earned at the end of each semester's work in a specific course, but also the record of academic work performed preferably with both the peer-based and instructor-based comments gathered from some retrievable coursework evidence (such as documents or work products in electronic form) to be included in the student's portfolio as one of his or her lifelong records in learning, authenticated and kept by the university. Surely, it is the student's CV in the making, in one sense, but a person, a professional in the making, indeed.

4) The Issue of Professional Practice

An important guiding principle of the SE2004 curriculum guideline is that the education of all software engineering students must include student experiences with the professional practice of software engineering. It is expected that graduates of software engineering programs need to arrive in the workplace equipped to meet these challenges and to help evolve the software engineering discipline into a more professional and accepted state. Students, for example, need to understand the importance of professional conduct on the job and the ramifications of negligence. They also need to recognize that professional societies (ACM, IEEE, AITP, AIS world-renowned bodies) through their codes of ethics and established subgroups emphasizing professional practice, can provide a support network that enable them to stand up for what is ethically right. It seems, through my conversations with many of the past and current students, that our internship program offering summer jobs to our students in Macau, can hardly provide opportunities of training genuine enough to come close to this expectation of professional practice. Many of the summer jobs are actually clerical in nature, instead of jobs providing opportunity to apply their learning in the field. We need to recruit some professional mentors in the field coaching our students, just as accounting students accumulating their experience from certified accountants in the field of auditing. It is my belief that to seek for international accreditation from recognized bodies for our program, we need to work out this issue of earning professional practice for our students during their four-year education in our program.

5) Issues to be addressed in Annual Program Review

a. Standard of students being admitted

My perception indicates that their ability to learn is well grounded, but their language ability to absorb and express in the English language is yet to be improved. Most students are not used to reading in English, even Internet-surfing are based on the Chinese Web sites. This could present some learning difficulties if the course requires some background reading to prepare for class discussion or to complete inquiry-based exercises.

b. Ratio of students admitted vis-à-vis the total number of applicants

I do not have any information on the total number of applicants applied, and the exact number of students admitted each academic year. Perhaps, our FST General Office staff could provide this information for reference purpose.

- c. Students' feedback with regard to their difficulties of learning
Many students used to mention their long hours of classes in the week because they have to attend six or seven courses in each semester. Hence, the number of hours devoted to completion of homework assignment or project work, is scarcely available, let alone the extra time to reflect on their learning. This is perhaps largely due to the fact that we compress the 5-year program in a matter of 4 years' time. Yet, many students are also subject to part-time jobs consuming another significant portion of their spare time supposed to be devoted to their study.
- d. Standard of teaching
My teaching is monitored by several measures to ensure my proper and timely delivery of quality course materials as required. Each course is furnished with a outline of course syllabus, detailing the course materials to be delivered, the course activities to be performed, the coursework to be completed, and the assessment method, as well as a set of course resources (be it from the Web or the Library Reserved under the specific course name). Each class is followed by a lecture or lab delivery record, indicating what has been done, what comes next, what housekeeping chore to follow by students, and what resources to acquire. Each delivery record is well kept in the Library Reserve, in both the paper and electronic form (DVD's), including the video of the lecture or the lab for students to review. At the end of the semester, the electronic records of my teaching and my student learning are ported to a generic platform for storage and retrieval upon requested. Typically, I have different sets of DVD for each course semester after semester, for student reference and the perusal of other interest parties.
- e. Accomplishment of student learning outcomes
I used to keep good record of students' work, starting from the beginning of the semester to the end of the final examination. They are kept mostly in electronic form, except for the examination papers, including both the quizzes and tests. Student projects are especially of interest; so, they are well kept in terms of demonstration of software projects, PowerPoint slides of presentation, meeting minutes, as well as any necessary videos of important occasions. These items serve as the basis to assess student coursework, and serve as important data entries in the student's portfolio of the course, showcasing his or her work accomplished, to be retrievable at any time after the semester. They also serve as the important data for curriculum action research to measure and quantify my students' learning outcomes.
- f. Examination results
Since English is the medium to write the examination papers, many students have difficulty in writing clear answers, especially in the context of essay-type discussion. Many students have difficulties understanding common English

words, and they need the help of their dictionaries to even understand the questions. As a summative evaluation device, my examination score is mostly set between 20 and 40 percent of the final grade, to allow more proportion in the coursework (60 to 80 percent) for students to acquire as a measure of formative assessment. Coursework come mostly in the form of personal, pair-based, and team-based assignments, encouraging collaborative learning among students to accomplish their work.

g. Adequacy of resources

The field of software engineering or computer science requires a lot of software support to demonstrate the practical learning of the text-book knowledge. Fortunately, ever since the fruition of open-sourced movement in software development about 5 years ago, I have managed to use a lot of generic free-of-charge platforms such as Eclipse 3.3 and NetBeans 5.5 to help illustrate the necessary understanding in my courses of programming languages, and “software psychology” (more timely called human-computer interaction or interaction design), involving the use of specific software process to illustrate team-based project work using a scenario-based approach of software development, including the use of UML modeling. We need more reference books in our library to help broaden the minds of our students to understand modern-day software development, especially through team-based collaboration.

h. Teaching staff’s comments

Now that the present workload situation allows many a student to take a minimum of six to a maximum of eight/nine courses per semester, it is easy for students to complain of one instructor’s coursework taking up too much the student’s personal study time that should be devoted to another instructor’s assignment, under the pretext of not being able to afford “too much time” in only one course, to ignore the work required by another course. In light of that we might need some guideline to regulate the workload to be assigned in each course of study. That obviously puts constraints on any instructor to design a suitable course delivery plan. Given the current teacher-centered approach, emphasizing the many course hours per week, of knowledge transmission to students, it might not be smooth to shift the focus from what we are supposed to teach (students sit and listen), to what is expected of students to learn (students mobilized to acquire learning by doing). That is indeed another point of balance between the instructivist mode of teaching and the constructivist approach to learning.

i. Request for revising programs/courses

In the short term, I would like to see the junior core course of SFTW 300 Software Psychology, to be re-named properly to Human-Computer Interaction or Interaction Design, to match the internationally recognized course sequence in both the software engineering track and the computer science track. But, there is indeed a need to add on more elective courses for students to pursue based on their own interest, such as User Interface Design, Usability Engineering, Web Applications Development, and Agile Techniques in Software Development.

These courses could serve to enhance our program by offering coherent path to the career of modern-day software practitioners. More ambitiously, I would like to see our department update our program to offer specialization tracks along the internationally recognized fields of Software Engineering, Computer Science, Information Systems, Information Technology, and Information Science. The basic program structure could be derived from the first two years being the core sequence of fundamental courses plus the next two years being the specialized sequence of field-specific courses, plus the practical training period of at least six months' industry project development experience, supervised and coached jointly by both the Department (one or team of staff) and the externally invited mentor on-site the training company.

j. Employer's Feedback

Some of the company feedback I managed to acquire indicates that they need graduate who are job-ready. Those companies often understand that educational experience in school differs from that in the workplace, but they also expect that our school could ease the student transition from academia to the business/industry world by mimicking the reality of the work environment in their studies, teaching students how to work in teams, and provide significant project experiences for students to acquire learning. Other basic expectations from such employers of our students include finding information and knowledge on their own, examining critically what they find, questioning the underlying assumptions, collaborating with other colleagues, and participating in discussion sharing their know-how with their peers. In Chris Argyris terms, it is the double-loop learning that is expected more of our students, rather than just the single-loop learning, regurgitation of basic knowledge by following rules.

Please accept, once again, my sincere thanks for the opportunities to share with you my comments and findings in this brief memo in the occasion of our annual program review.

All the best!

Vat K.H.