Use of CUQA in Quality Assurance System of Faculty of Engineering Chulalongkorn University

Prof. Dr. Direk Lavansiri
Faculty of Engineering
Chulalongkorn University

Assoc. Prof. Dr. Sucharit Koontanakulvong
Faculty of Engineering
Chulalongkorn University

ABSTRACT

With the emergence of new Education Act in 1999, a formal quality assurance system must be instituted. The Faculty of Engineering had adopted the University-developed CUQA requirements and assessment criteria and had incorporated it into the existing management system since 2001. During this period, training and coaching on CUQA for staff and faculty members comprising more than 600 personnel covering 12 academic departments had been implemented. The implementation was divided into two phases; Quality System setup, and Quality Assessment. The internal audit, self assessment, and opinion survey were conducted to monitor CUQA implementation. The process was verified by the university team and had successfully passed the National Quality Assessment. The step by step implementation, the integration of multi assessment criteria and the opinion survey induced better collaboration and understanding among the Faculty and is found to be effective in the long term aspect. The CUQA system made visible and open management system and laid strong foundation for any further new management elements.

1. INTRODUCTION

The Faculty of Engineering, Chulalongkorn University was established in 1913 to educate government service officers. Later, in 1933, it had expanded to offer a bachelor degree in Engineering. In 1999, the new Education Law was promulgated and required the implementation of formal quality assurance in higher education institutes. The government also sets up the Education Assessment Board (EAB) to set the standards and conduct the assessment of all educational institutes in 2000.

Chulalongkorn University had implemented a teaching assessment system since 1994. With new law enacted, the University decided to widen the quality assurance scope to cover all areas, i.e., education, research, administration, cultural promotion, etc. and hence set the university's own quality assurance standards [1] and assessment criteria [2] called CUQA or Chulalongkorn University Quality Assurance. The Faculty of Engineering then adopted these standards and setup the quality assurance system integrated with quality assessment criteria within the Faculty in the year 2000. The Faculty had implemented the system and conducted five internal audits (once a year) and passed CUQA assessment, and National EAB in 2003, and surveillance audit in 2004. The opinion survey for CUQA implementation was also conducted

every year and shows positive responses on improvement in all areas.

2. OJECTIVES AND SCOPE

This paper describes the development background of quality assurance system adopted by the Faculty of Engineering and summarizes the implementation experiences, assessment results, and the results of opinion surveys.

3. QA SYSTEM FOR THE FACULTY OF ENGINEERING

Based on our quality policy to pursue upgrading teaching and learning, research process with good quality taking into considerations both cultural and ethics, the Faculty of Engineering has therefore adopted the CUQA system which comprised of 14 basic and 7 progressive requirements. The Faculty had then produced 102 procedures covering all operations at the departmental level and the Faculty (Central Administration) levels such as strategic planning, budgeting, curriculum development, teaching and evaluation, laboratory maintenance, research management, etc. [3, 4].

The assessment based on the University criteria (34 indexes) can be grouped into 5 categories; management (8 indexes), academic (14 indexes), research and academic services (6 indexes), cultural & ethical promotion (2 indexes) and quality assurance (4 indexes). The scoring for each criteria ranges from 1 signifying a poor standard up to 7 signifying an international recognition.

These assessment criteria were set to link up to the National Quality Assessment Criteria (8 criteria) and integrated with the Faculty QA system. Table 1 shows the quality procedures linked to quality standards and assessment criteria.

4. IMPLEMENTATION

Before formal QA, the Faculty had implemented a quality system to assess teaching standard since 1994 by which students gave evaluation on teaching quality via questionnairing. The data from these questionnaires were then tabulated and sent back to the lecturers for feedback purposes. However, under CUQA requirements, the QA committee of the Faculty had been setup to overlook the policy and approve the procedures used. QA scope covered all operations and all units of the Faculty including affiliated institutes. Working team from each unit had been setup to review the existing system. The procedures were then drafted to match with requirements and practices. Staff and faculty were trained on requirements, procedures and internal audit practices.

Because the system had to deal with more than 600 staff members and 5,000 students among 12 departments, the implementation was divided into two phases; Phase 1 on system setup (2001-2002), and Phase 2 on self quality assessment (2003). The implementation of quality system setup started at the Central Administrative units and followed with the departments (there are 8 central administrative units, 12 departments, and 3 affiliated institutes in the Faculty.) The quality assessment was set to link and integrate with QA system so that the audit and assessment can be implemented simultaneously. Table 2 summarizes the QA development timeframe and activities during the year 2001-2004.

Table 1 CUQA assessment items and standard requirements

Assessment items	Standard requirements	Quality Procedures
Management aspect		
1. Leadership		
2. Organizational objectives	objectives & planning (4.1)	Stretegic Planning (QP-FPL-01)
3. Strategic Planning	objectives & planning (4.1)	
4. Supporting Staff Management System	Management & Administration (4.8)	Administrative Manual (QP-FAD-90)
5. Database for Management	Management & Administration (4.8)	
6. Financial Stability	Budget & Finance (4.9)	Budget Allocation (QP-FPL-04)
7. Faculty Development	HR development (4.12)	Training (QP-FAD-15)
8. Supporting Staff Development	HR development (4.12)	
Academic aspect		
1. Curriculum Management		
2. Faculty recruitment	Learning & Teaching (4.3)	Recruitment (QP-FAD-11)
3. Doctoral Degree holding percentage		
4. Graduate enrollment		
5 .Teaching improvement Process		
6.Learning measurement and assessment		
7. Undergraduate Graduation Report		
8. PhD and Master Dissertation		
9. Graduate quality		
10. Teaching facility		
11. Text Quality		
12. Student activities	Student activities (4.5)	Student Activities (QP-FST-02)
13. Start Student Advisory system		

Table 1. CUQA assessment items and standard requirements (Cont.)

Assessment items	Standard requirements	Quality Procedures
Research and academicals service aspect		
1. Excellency Planning	Excellency Development (4.13)	Research Policy (QP-FRE-01)
2. Research Grant	Research (4.4)	Research Granting (QP-FRE-02/03)
3. Publication		
4. Disseminated Research		
5.Technical service quality	Academic service (4.6)	Academic Service (QP-FRE-04)
6. Technical social services		Academic service (4.6)
Cultural and Ethical aspect		
1.Cultural activities	Student activities (4.5)/ Cultural promotion (4.7)	Student Activities (QP-FST-01)
2. Ethical activities	Ethical enhancement (4.14)	Faculty Activities (QP-FAD-26)
Quality Assurance aspect		
1.Quality System	quality system (4.2)	QA Documentation (QP-FQA-01)
2.Internal Audit system	Internal Audit (4.10)	Quality Audit (QP-FQA-02)
3.External Audit supporting system	External Audit (4.10)	External Audit Support (QP-FQA-03)
4. Continuous Improvement system	Corrective & Improvement (4.11)	Complaint Handling & Corrective Action (QP-FQA-04/05)

Table 2. QA development history in the Faculty

Time		Activity
1997	June	1. QA implementation in teaching activity
2001	March	2. QA Faculty Committee and office setup
	May-June	3. System preliminary assessment
	June	4. CUQA requirements training
	Sep	5. QA opinion-1 survey
	Sep	6. QA open hearing
	Nov	7. Internal Quality Audit -1 (only Central Admin.)
	Dec	8. QA introduction seminar (for departments)
2002	Mar	9. Internal Quality Audit training-2
	Apr	10. IQA implementation-2
	Apr	11. QA full implementation seminar
	Aug	12. IQA implementation-3
	Sep	13. QA opinion-2 survey
	Nov	14. University certification audit
2003	Apr	15. Self assessment report
	May	16. Assessment hearing from Alumni
	Aug	17. IQA-4
	Sep	18. QA opinion-3 survey
	Nov	19. National Assessment from EAB
2004	May	20. Self assessment report
	Aug	21. IQA-5
	Sep	22. QA opinion-4 survey
	Nov	23. University Surveillance audit

5. RESULTS

Based on the internal audit after the system implementation, the first internal audit, completed in November 2001, had induced 72 CARs (Corrective Action Request, 24 non-conformances (NC) and 48 observations (OV)) only in the Central Administrative units. However, the situation showed improvement with implementation time. Figure 1 shows the internal audit results conducted from the year 2001 to 2004 of the central administrative unit, departments and three associated institutes. These exhibited that the staff and faculty already got gradually accustomed to the Faculty QA system.

During the certification audit by the University in November 2002, our Faculty was certified without any CAR. The National Education Assessment Board conducted the assessment of the University during Nov-Dec 2005 and the assessment results of the Faculty demonstrated our Faculty's strengths, i.e., high caliber students, good ratio of faculty members with higher degrees, number of research units, cultural promotion activities, and QA system. However, more international publications when compared with research grants were recommended as an area of improvement.

The QA system was reassessed in the surveillance audit in November 2004, and our Faculty received two minor CARs on complaint handling

5

and faculty development planning procedures. The QA system was also assessed by 34 indexes (see Table 1) starting in 2003; self evaluation was done first by each unit and internally verified during internal audit. The University dispatched the verification team based on self assessment report submitted by the Faculty. Figure 2 shows the assessment score (1 to 7) of each aspect with department and faculty based.

It can be seen that the scores on research and cultural & ethical promotion yielded better results while the score on academic and management were comparatively low, though above average. The comparison of the assessment scores from year 2003 and 2004 also showed an improvement. The QA opinion survey was also conducted to monitor the impact of QA implementation especially to the students. Table 3 shows the trend of opinion survey responses from both undergraduate and graduate students. In general, positive responses increased with time partly due to QA implementation and assessment. The opinion survey was found to be a good mechanism to stimulate both staff and the Faculty to motivate the change.

6. CONCLUSIONS

During four years of formal and step by step QA implementation, the Faculty successfully passed the National Assessment from EAB with good appreciation. The QA system was designed to be well-integrated with the National and University Assessment Criteria. Apart from that, QA implementation had fostered more professional and transparent working system within the organization. The recording system was also revised and identified by data owners. The recording system was established and every unit knows what to be evaluated. These are the first outcomes of our QA system implementation. With the data collected, the system can be evaluated with facts, thus a more focused improvement activities can then be well planned with specified goals and program. Such improvement can be seen from how the students' responses from the questionnaires apart from the internal audit results. Students can now obtain advanced information for their learning preparation and showed more interest on teaching evaluation.

The implementation of QA system in a relatively established and large organization requires much attention and more careful handling of what to be maintained and what to be improved. The step by step implementation, integration of multi assessment criteria and opinion survey in the QA system helped reduce time and proved to be effective in the long term aspect. The overall participation and collaboration were important and got well supported based on the spirit to improve the Faculty. Future improvement at the international level is under planning including risk management, mutual recognition on unit transfer and program accreditation in the regional and international base [5, 6]. The QA system established will serve as an important foundation for any new management elements to be introduced from now.
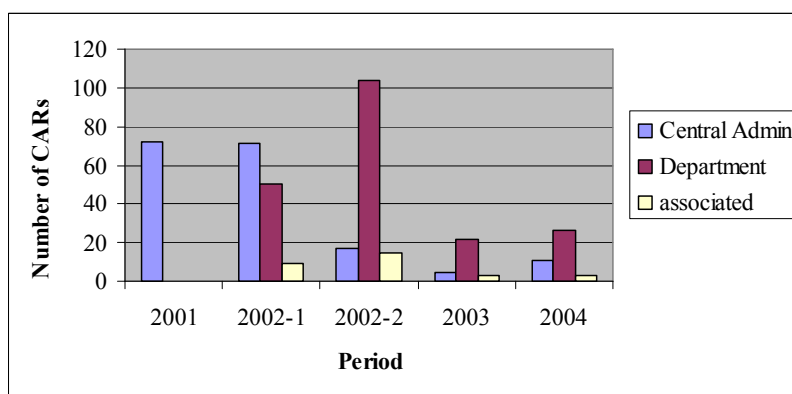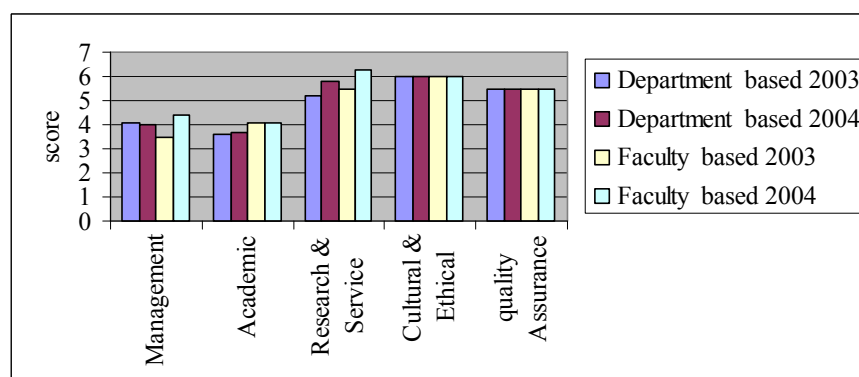
Figure 1. Number of CARs from Internal Audit

Figure 2. Quality Assessment results

Table 3. Improvement responses from QA opinion survey

a) Undergraduate students

Items	01	02	03	04
1. Curriculum suitability for further study	87.4	85.1	85.9	94.7
2. Curriculum suitability for further work	74.3	65.2	79.0	74.3
3. Enough Information before enrollment	83.3	84.1	80.0	85.7
4. Course Syllabus utilization & benefit	69.0	81.6	85.3	70.8

b) Graduate students

Items	01	02	03	04
1. Curriculum suitability for further study	90.5	80.5	80.5	93.3
2. Curriculum suitability for further work	76.7	83.7	65.2	86.7
3. Enough Information before enrollment	47.1	55.8	47.2	85.4
4. Course Syllabus utilization & benefit	83.7	83.3	85.8	88.0

7. REFERENCES

[1] Chulalongkorn University, Quality Assurance Requirements, 2001.

[2] Chulalongkorn University, Quality Assessment Index, 2003.

[3] Faculty of Engineering, Introduction to QA System of Faculty of engineering, Chulalongkorn University, June 2002.

[4] Faculty of Engineering, Quality Manual, Chulalongkorn University, Apr, 2003.

[5] Feisel, L.D., The Fundamentals of Accreditation, International Workshop on Engineering Accreditation around the World, Bangkok, Nov 6-8, 2004.

[6] Lee W. Saperstein, G.D. Peterson, International Recognition of Educational Qualifications of Engineers, ABET, June 2004.

8. ACKNOWLEDGEMENT

Dr. Direk Lavansiri is a Professor in the Civil Engineering Department and now a Dean of Faculty of Engineer, Chulalongkorn University. He earned his Ph.D. in Civil Engineering from the Oregon State University in 1977. He has been teaching since 1978 and used to be the Director of Continuing Education Center of Chulalongkorn University during 1989 – 1999 Address: Faculty of Engineering Chulalongkorn University, Bangkok, Thailand.
e-mail: Idirek@chula.ac.th

Dr.Sucharit Koontanakulvong is an Associate Professor in the Water Resources engineering Department and now an Associate Dean of the Faculty of Engineering, Chulalongkorn University. He earned his Doctor Degree in Water Use Engineering from Kyoto University in 1983. He has been teaching in 1984 and work as QA Director of the Faculty since 2001.
Address: Faculty of Engineering, Chulalongkorn University, Phayathai Rd., Patumwan, Bangkok, Thailand 10330, Tel. 662-218-6479, Fax. 662-218-6425.
e-mail: sucharit.k@chula.ac.th

9. AUTHOR'S BIOGRAPHY