TOTAL QUALITY MANAGEMENT AS EDUCATION QUALITY ENHANCEMENT TECHNIQUE

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AbstractIn this paper we discuss the importance of the effective implementation of a Quality Assurance strategy. The strategy outlines where the SEUA intends to be in 2010-2011 facing challenges of the time and realizing the available resources using Total Quality Management (TQM), Goal Question Metric (GQM) and Balanced Scorecard (BSC) techniques. Effective implementation of action plan to reduce weakness of the Departments' activities will give opportunity to enhance education quality.

Introduction

One of the most important goals of the state and society is to improve the quality of education. Higher education system in Armenia has an important role in achieving long-term and sustainable human capacity building:to prepare a new generation to be viable and responsive to the current business environment.

The main objective to address this goal is to establish an interface between the career interests of university graduates and the demands of the labor market. The Universities must be sure that provided education is in compliance with international and local labor market needs.

State Engineering University of Armenia (SEUA) needs intensive attention and rigorous efforts to develop strategic management frameworks that will help enhance education quality and prepare qualified specialists. The main reason for University strategy development is better relocation of resources. These essential resources will help administrators determine which programs and services are most efficient to the University mission.

The mentioned goal can be reached by using Deming's 14 principles. The implementation of this principles atthe SEUAmeans: to increase the power of human resource by motivation, to foster an environment of full cooperation between academic staff, administrators, departments, partner companies, governments, and to be recognized through process improvement, team work, and innovation.Therefore the key dimensions can be identified as: process management, assessment of student's needs, fact-based decision making(self-assessment results), benchmarking, continuous quality improvement and control. The process was started 20years ago.

To restore and improve the quality of education the university needs to follow international standards.During the long –term collaboration between Cal Poly Pomona and SEUA different courses weredeveloped. This cooperation gave an exceptional opportunity for faculty and staff to update their knowledge: familiarization with innovative aspects in the field of management; and implementation of new pedagogies in knowledge distribution to the students.

Another important result was the established Students Career Centre with the help of which interface between the career interest of university graduates and the demands of the labour marketwas created in order to improve employment opportunities of graduates. Organized career days with involvement of industry leaders and students helped find out opportunities for future career development and upcoming job demands.

However University needs to improve all the basic factors of education process.In order to achieve this goal an Education Quality Control and Management (EQCM) division was established. The main activities of the ECQM are to:

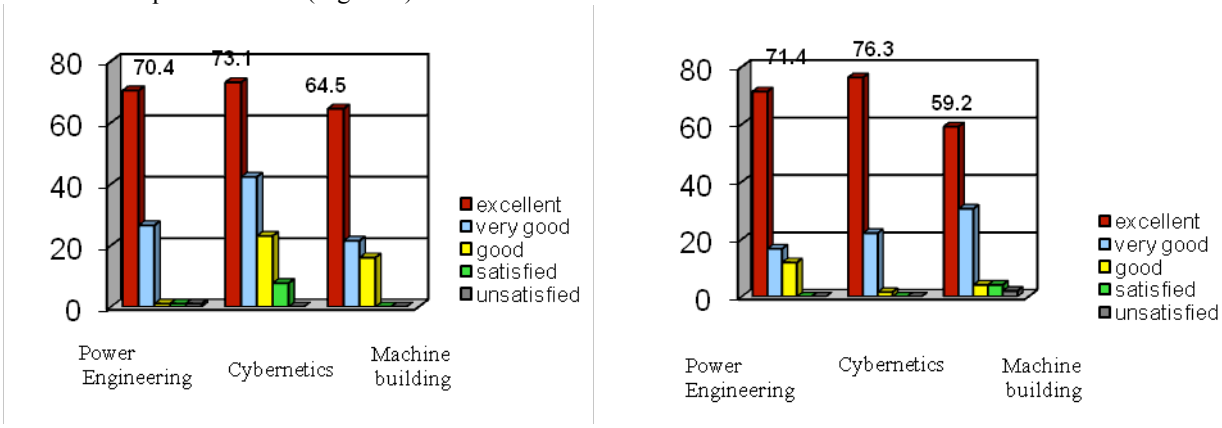
- develop the concept and organizational scheme for the SEUA system of quality assessment and assurance;
- prepare and conduct an internal multiphase process for the self-evaluation of the departments' activities;
- plan and implement measures to enhance the quality of the Faculties' activities based on the results of internal quality assessment;

- improve the processes and systems for final evaluation of the learning outputs and teaching efficiency;
- provide transparency and publicity of the quality assessment results.

Internal assessment, also called self-assessment is designed to identify areas for improvement, to allow the University to develop strategies that will help Faculties enhance their education quality and prepare the University for External Audit.

The process of self- assessment was led by the Head of EQCM division and Deans of Departments. A working group was appointed to analyze the department's activities including not only representatives from each chair, who were interested in enhancement of the education quality, but also the academic staff, administrative personnel, students, employers, as well as co-operation partners. Members of the working group met regularly, discussing the plans of the Self-assessment procedures, collecting and analyzing information required for the final report formulation.

Each member had a specific task to fulfill. Information was collected through communication, informal discussions and different questionnaires (Figure 1).



a) b)

Figure 1: a) Students' satisfaction fromdifferent aspects of teaching methods, b) Employer satisfaction from graduates.

All inputs were discussed at Faculty meetings. Separate discussions were carried out between the faculty and students, alumni, administrative staff and the employers in the market.

Education Process Improvement Techniques

By overcoming difficulties the Balanced Scorecard (BSC) Methodology can be used. The BSC is based on the TQM philosophy, emphasising customer satisfaction, as well as providing information regarding processes and results for continuous improvement of the strategic performance and actions. It proposes useful solutions by presupposing a thorough analysis of the processes and procedures used by the organisation. Each organisation, according to BSC, is divided into four parts (images or perspectives): Financial; Customer (students); Internal procedures (of the organisation); Learning and improvement (ability of constant training, aiming at continuous improvement and competitiveness).Thus, the educational organisation sets targets for each of these four perspectives, collects the evidences of interest in order to verify the performance and quality level by using questionnaires, databases etc.

In BSC it is important to define Key Performance Indicators (KPIs). In order to define KPIs to be used as measures in BSC we employ the Goal-Question-Metric (GQM) method. We present an example from the learning and improvement perspective:

Goal: Continuous improvement effectiveness ofteaching and learning.
Question*:* What appropriate conditions are created?
Metrics:

1. Adequacy of academic plans to the requirements of state educational standards
2. Percent of lecturers with scientific degrees (candidate and doctor of science)
3. Average age of the academic staff
4. The number of published scientific articles per academic staff
5. The number of published teaching materials per academic staff
6. Trainings of academic staff
7. Percent of supported teaching materials and literatures
8. Percent of courses supported by electronic teaching materials
9. Percent of computers connected to internet
10. Number of students per computer used in educational process
11. Teaching (classroom) space per student
12. Adequacy of laboratory equipment to the requirements of subject program
13. Technology enabled classrooms
14. Practical placement availability
15. Adequacy of practical placement work to the requirements of state educational standards
16. Scientific school traditions
17. Participation in the University's research projects
18. Scientific grants
19. Research topics financed from state budget
20. Students average learning achievements
21. Percent of published articles by students
22. Postgraduate and Masters' students participation in the University's research projects
23. Adequacy of graduates knowledge and skills to the requirements of employers

Twenty-three KPIs were included in the self-assessment process which described different areas of the Departments activities. Additionally each Faculty used its own characteristics which described its professional field.

The BSC was applied to the education quality enhancement strategy unit at SEUA. It was used as a development tool for the enhancement and pilot implementation of the strategic plan of SEUA. Goal 2, Objective2.4 of the strategic plan states: "*Create necessary prerequisites and supportive mechanisms to improve the quality and effectiveness of teaching and learning". (Strategic plan, goal 2, objective 2.4)*

Information about the scorecard was distributed to the Departments Quality Management (DQM) team along with the University's vision, mission and strategy. The team participants introduced their initial thoughts on scorecard measures during discussions on the University's strategic objectives. The team debated on each of the four key strategic areas and created an action plan. These steps helped focus attention on the opinions of students and other stakeholders(Figure 2).

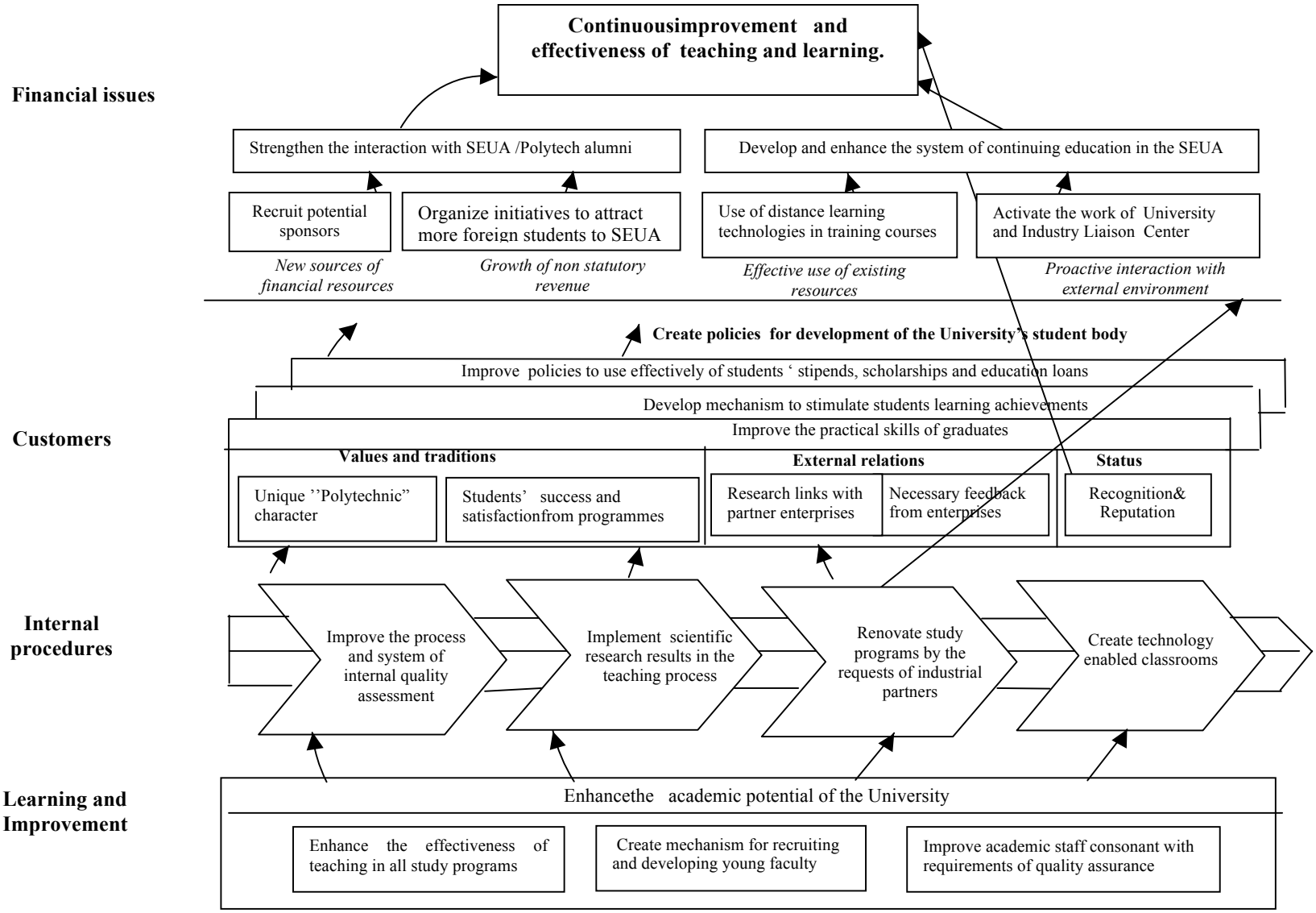


Figure 2: A mapping of Critical Success Factors onto BSC perspectives impacting the improvement of teaching and learning

The EQCM Division management discussed the proposed scorecard and measures, set targets of improvement for each of the measures and started the implementation processes. Balanced scorecard measures were prepared for review by the EQCM division management at appropriate intervals.

Figure 2 visualises the critical success factors for achieving the strategic goal (participation in research) for the unit in terms of KPIs for each of the four perspectives of the BSC.

The QA centre has created the unified assessment scale for KPI values; has carried out comparison of indicators with KPIs approved in the SEUA strategic plan and has determined the average meaning of the self-assessment indicator expressed by units.

Below is an example of the Power Engineering Department self-assessment results. Figure 3 is a Kiviat diagram mapping all KPIs and their values. This is a visual way of revealing the strengths and weaknesses and hence helping focus the efforts towards improvements.

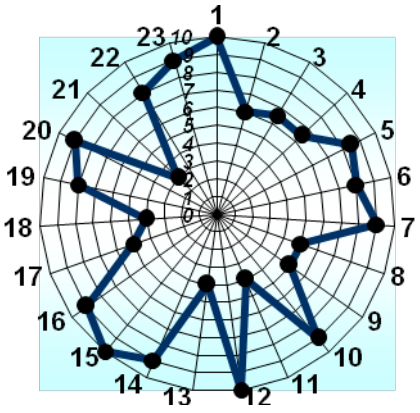


Figure 3 Indicators for the assessment of the Department's progress

Effective implementation of the action plan of the Departments' activities will give opportunity to enhance education quality.

Action plan to resolve weaknesses

- Promote enhancement of academic potential of the University and encourage high quality teaching.
- Disseminate new methods and technologies of teaching.
- Create and implement plan for recruitment and development of academic staff
- Develop procedures for faculty performance evaluation.
- Use the faculty assessment results as a basis in signing contracts, promotion and salary progress of faculty.
- Establish attractive salary conditions and benefits for recruitment of young faculty.
- Involve faculty in new training programs organized by Faculty Development Centre (FDC).
- Stimulate student's learning achievements.
- Develop students' satisfaction questionnaires for assessment different aspects of teaching methods.
- Active participation of SEUA Student Councils in education quality enhancement process.
- Improve practical skills of students and expand their industrial internships in partner organisations.
- Conduct an evaluation survey on employer satisfaction from graduates.
- Involve industrial partners in the curricula evaluation and renovation process.
- Create technology enabled classrooms.
- Renovate the outdated equipment of teaching labs throughout the University.

Figure4 depicts the forecasted /expected achievements in 2010-2011 resulting from the action plan to resolve weaknesses.The forecasted results outlines where the Faculty intends to be in 2010-2011 facing challenges of the time and realising the available resources to become competitive in education area.

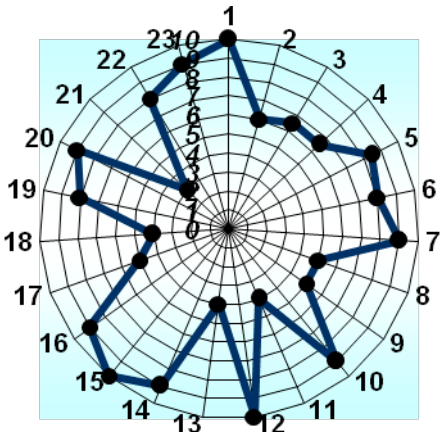


Figure 4 Forecasted / expected achievements in 2010-2011

The key positions and the report of this self-assessment were presented and approved at the meeting of the Council of university held in July, 2009. Summarising we can draw the following conclusions: based on the calculations carried out in the faculties and regional branches the average score of the self-assessment indicators only partially corresponds to determined norms. Each faculty must create an action plan to remedy weaknesses and procedures for improving the main indicators during the next two years (Figure 5).

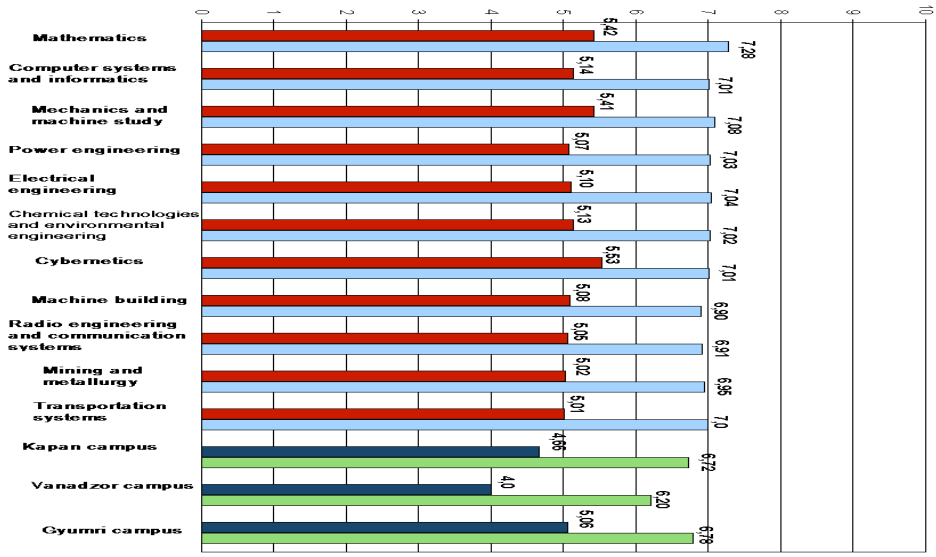


Figure 5 Average score of self assessment indicators by unit for all Faculties
First row: 2008-2009 years results, second row: forecasted results for 2010-2011 years

A summary of the findings were presented at the Workshop held within the framework of the project "Internal Quality Assurance System in Armenian HEI's" (TEMPUS-TACIS JEP No.27178-2006 "ARMQA").

Conclusions and Further Work

In this paper we discussed the importance of the Improvement Education Quality System and effective implementation of TQM toolsforenhancement the education quality. So, experiences from the implementation of an education quality enhancement strategy at the State Engineering University of Armenia (SEUA) were presented.

The challenges in the future involve effective implementation of the action plan that aims to reduce weaknesses. Future work will involve the measurement and monitoring of performance over the short term period and the use of the results for the continuous improvement of policy and strategy for Quality Assurance. All academic programs will be subject to on-going monitoring and review.

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