



Sustaining Successful Continuing Professional Engineering Education Programs by Systematic Assessment of the Key Performance Results

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Abstract

Excellent continuing professional development programs comprehensively measure their key performance results with respect to several elements: academic achievements, financial results and quality of the programs offered. Additionally, the customer and people (staff) feedback needs to be critically reviewed, and societal impacts cannot be ignored. Based on the International Association for Continuing Engineering Education Quality Program Self-Assessment Model, the Engineering and Interdisciplinary Professional Education unit at the University of Kansas Continuing Education has developed a systematic process for self-assessment, quality management and financial sustainment, and charted a path for achieving excellence. This paper will focus on people, programs and processes, and will show the approach that this unit has taken to define the organizational leadership, implement the strategies and adhere to the University and the Continuing Education Division policies.

Introduction

The University of Kansas Continuing Education Division provides post-graduate non-credit professional development and lifelong learning opportunities for working professionals, including engineers, educators, attorneys, law enforcement professionals, fire fighters, doctors, and health and public safety officials. Its customer base includes 105 Kansas counties, 50 U.S. states and 56 foreign countries. Among the continuing professional development programs, the Center for Engineering and Interdisciplinary Professional Education (CEIPE) unit, comprised of aerospace and other engineering and interdisciplinary short courses and conferences, is the most internationally recognized unit. It is known for its unique and advanced engineering short courses, live online engineering technology certificates and customized engineering management certificate program. CEIPE is completely self-supported, and the generated net revenue is generously shared with the School of Engineering and its various departments at the University. CEIPE receives a strong international presence in its public courses; foreign participation is 36-40% and to date, participants from 56 countries have attended its public courses. CEIPE conducts about 50-55 in-house courses every year. At least 40% of these in-house classes are held abroad. Although CEIPE has served the professional engineering community for 36 years and has been successful and financially sustainable, it is very important for CEIPE to maintain the quality and strive for excellence to support a complete eco-system of learners, educators and administrators.

In search of a quality improvement strategy, Continuing Professional Development (CPD) administrators often adopt various models available for such assessments. In an early attempt, CEIPE considered Baldrige Performance Excellence Program¹. It is used in both private and public sectors, including higher education organizational performance measurement, and the journey toward excellence uses specific questions for self assessment of organizations and is more suitable for university extensions or continuing education divisions. While web-based

tools could be customized to some extent to fit the CEIPE needs, it was not a turnkey system that could be specifically used for CEIPE to measure or assess the quality of its people, programs and processes. Sloan Consortium Quality Scorecard for Online Program Administration² was also considered, but only 25% of CEIPE programs were online and this model did not encompass the complexities in people, programs and processes that CEIPE experiences in face-to-face programming. The Key Performance Results suitable for CEIPE were not considered in any of these systems. However, a web-based tool for quality management and benchmarking developed by the International Association for Continuing Engineering Education (IACEE) was found to be most suited to a CPD unit like CEIPE. The IACEE quality management and self-assessment toolset, derived from an international project titled Development of Accreditation in Engineering Training and Education or DAETE³, established a self-assessment matrix especially suited for continuing education activities. The matrix is based on the European Foundation for Quality ManagementTM (EFQM[®])⁴ model (Figure 1) that allows the lifelong learning organizations to clearly focus on five Enablers criteria and four Results criteria of the continuing education activities. The self-assessment matrix is also extended to a benchmarking process that enables each CE organization to compare itself with similar organizations. While the benchmarking capability was an added attraction, the primary reason behind choosing this tool was its simplicity and relevance to the needs of CEIPE. This paper will describe how CEIPE used this self-assessment tool to chart a path for improving the quality of the organizational effectiveness and how it is striving toward excellence.

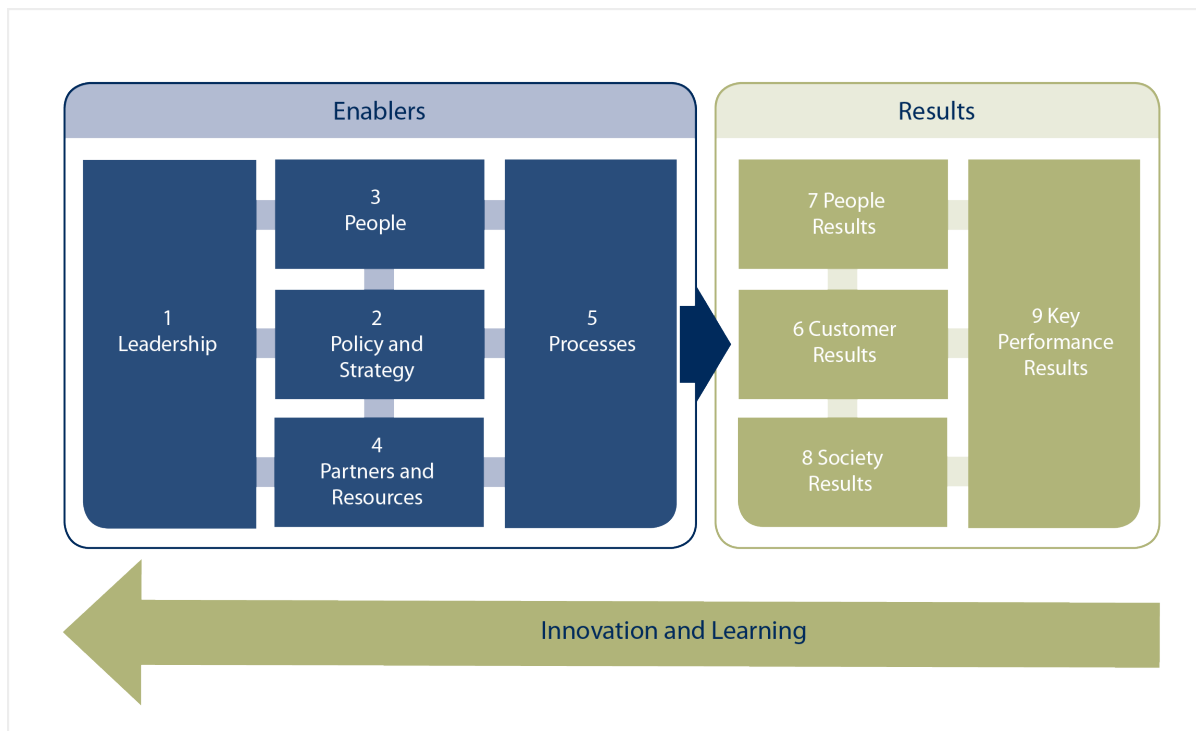


Figure 1. European Foundation for Quality ManagementTM (EFQM[®])⁴ model 2003, the foundation of IACEE self-assessment model for quality management and benchmarking

The IACEE Quality Management and Benchmarking Tool (IQMBT)

In the EFQM-based IQMBT model^{5,6}, there are nine criteria which are grouped into enablers and results categories. The five Enablers (process to enable quality of an organization) in the IACEE Quality Program Self-Assessment Matrix (Figure 1) are Leadership, People, Policy and Strategy, Partners and Resources. The four Results criteria (outcomes of the enablers and indicate the quality standard) include Customer Results, People (Staff) Results, Society Results and Key Performance Results. Each enabler or result criterion has several sub-criteria and each sub-criterion is assessed by five levels from no quality to highest level of achievement. These five levels have the following characteristics:

- Level 1: Quality depends solely on the individual (no processes)
The activities depend on individual initiatives, and entire unit is not involved.

- Level 2: Process awakening (basic processes)
Some shared responsibility with some short-term planning. Some process definition, however no documentation. Performance is assessed occasionally.

- Level 3: Vision through processes, professionalization and a guarantee of quality (intermediate processes)
Established standards, procedures and directives known throughout the organization, unit or service. Medium-term objectives and indicators are defined for assessment.

- Level 4: Systematic assessment and improvement of processes (sophisticated processes)
Established procedures are systematically assessed for potential improvement. Clearly defined processes and activities are established with customer in the mind.

- Level 5: Aiming for external excellence (excellent processes)
Exchange of knowledge and experience exists within and outside the organization and the procedures become industry standards. Experiences and best practices are shared with others.

For example, the Enabler Criterion 1, Leadership, has four sub-criteria, and each sub-criterion has five levels for self-assessment. These sub-criteria are described in Figure 2. During the self-assessment process, an organization (in this case CEIPE) needs to ask itself four questions:

1. Where are we now?
2. Which level is that?
3. Where do we want to go?
4. What will be that level?

It is an organization's responsibility to correctly assess the level to which it presently belongs and then determine what will be its next level, why will it be its next level, when will that level be achieved, who will work on the tasks associated in achieving that level, and how will it be achieved. Once that organization has answers to these questions, it needs to document and

embark on that journey toward excellence. A year later, the organization re-evaluates/re-assesses and documents its accomplishments again.

Enablers: Criterion 1: Leadership			
Sub-Criterion 1a: Development of Vision and Mission	The organization has developed and articulated the mission, vision and values which align with the vision and mission of the institution, and guide the decision-making of the organization at all levels.	Where are you now? Which level? What is your target?	3 to 5
Sub-Criterion 1b: Continuous Improvement of Management Systems	The management of the organization promotes and guarantees the development, implementation, and continuous improvement of the management system.	Where are you now? Which level? What is your target?	3 to 4
Sub-Criterion 1c: Leadership and External Relations	The organization has systematic interaction with customers, strategic partners and other important stakeholder groups, such as learners, teachers, and representatives of social groups in order to operate for common interests and goals.	Where are you now? Which level? What is your target?	2 to 4
Sub-Criterion 1d: Leadership and Motivation	The organization has processes for the motivation and recognition of the staff.	Where are you now? Which level? What is your target?	3 to 4

Figure 2. How excellent leaders develop and facilitate the vision, mission, organizational values, systems and processes can be answered by asking these questions for each sub-criterion. If we know where we want to be and where we are now, it is not difficult to achieve that, but we have to ask the right questions. The questions are embedded in the sub-criteria within each criterion.

The Key Performance Results and Strategic Goals

In order to build the CEIPE vision (how we visualize our organization and how we would like to see ourselves perform) and mission, we used each of the sub-criteria of Results and identified our goals. We assessed the present functional levels of customer and staff feedback diligently, then financial, academic and overall qualities were measured in detail and finally, we set up a goal for each measurable result.

In Table 1, the 2011 levels, as assessed by CEIPE staff, are shown. Except for one (the total number of corporate training days), the levels did not show the high quality that the staff and

management aimed for. Therefore, goals were set for 2012 and at the beginning of 2013 the actual levels of each criterion was assessed again. In some cases, we exceeded our expectations, but in some cases we needed to change our direction to attain the goals. The already defined model helped us plan our activities which we monitored and measured. Each organization can easily accommodate its action plan using this model.

Table 1: Key Performance Results Levels for a major sub-unit of CEIPE

Sub-criteria for Consideration (measurable result)	2011 Level	2012 (goal) Level	2012 (actual) Level	Comments
Number of program days	3	4	4	Accomplished, set next goal.
Total number of courses	3	4	3	Not accomplished. Analyze and do again.
Total number of corporate training days	4	5	5	Accomplished, define best practice.
Total number of participants	3	4	3	Not accomplished. Analyze and do again.
Total number of new courses introduced	2	4	3	Partially accomplished. Analyze and do again.
Return participants or clients	3	5	4	Partially accomplished. Analyze and do again.
New partnerships	2	3	4	Accomplished, set next goal.
Papers presented	1	3	4	Accomplished, set next goal.
Total Net Revenue	3	4	4	Accomplished, set next goal.
Revenue per staff	2	3	3	Accomplished, set next goal.
Revenue per learner	3	4	3	Not accomplished. Analyze and do again.

People, Programs and Processes

The key to any organizational achievement is to have the right people doing the right tasks. In an excellent organization, the leader leads the *people* by providing strategic direction so that the people can manage *processes* to create and maintain excellent *programs* to sustain the organization. The results described in the previous section can only be achieved if the people have the passion and purpose to be motivated, the processes are systematized, and the quality of the programs are systematically measured. IQMBT, through its sub-criteria in each of these enablers (people, programs, processes), provides a definite set of questions that can be asked in each assessment period, a present level can be assessed, a goal for next level can be set and at the end of the year, the entire processes can be repeated.

PEOPLE

In the beginning of FY 2012, the four sub-criteria of the people criterion were assessed. As the staff feedback was analyzed, we clearly understood where we were and where we needed to go. Figure 3 shows the analysis and the next goals set for each criterion.

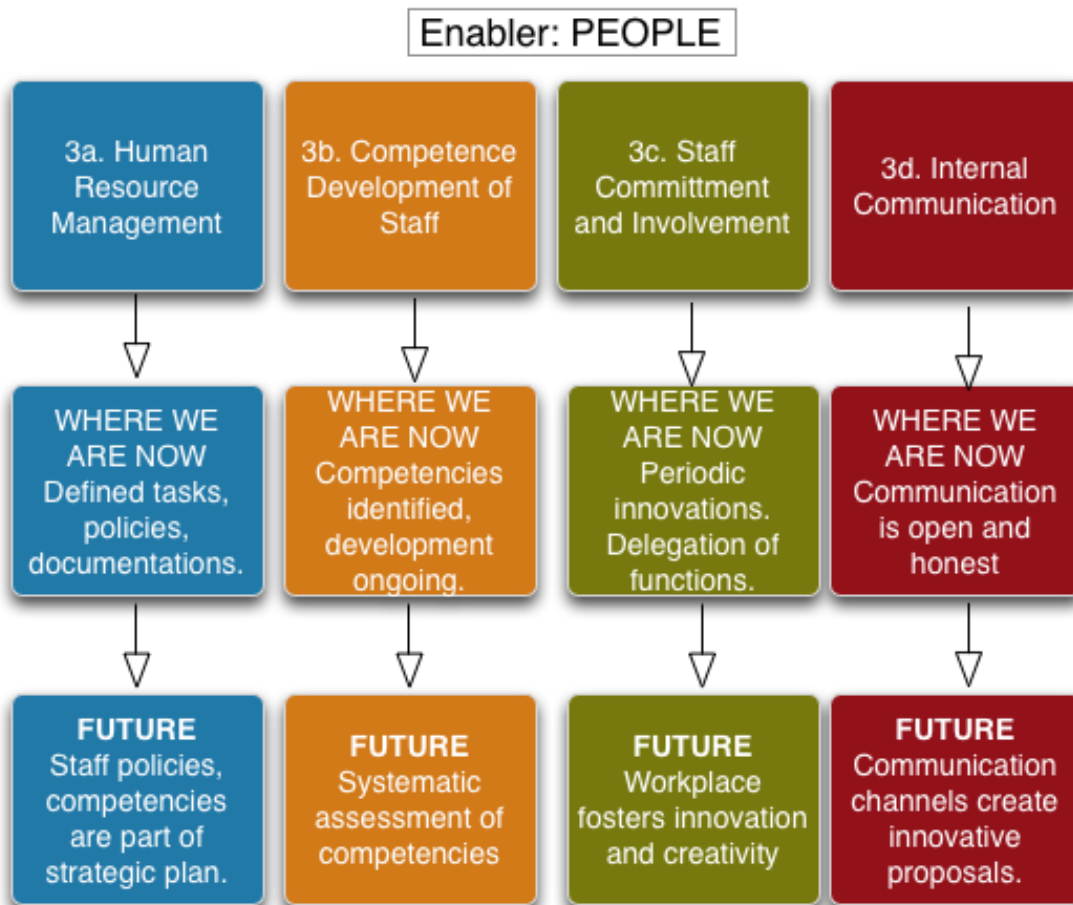


Figure 3. Analysis of PEOPLE enabler: Where we are and where we want to go. Simple goals were set for FUTURE, which were the basis for our next steps.

As seen in Figure 3, we needed to take some actions to achieve our goals. Together, we took the following actions to achieve the above goals:

1. Assess the strengths, weaknesses, knowledge, skills and abilities (SWKSA) of each staff. We found that people have strengths in -
 - a. Strategy (leadership, communication)
 - b. People (leadership)
 - c. Projects (program management)
 - d. Processes (business and financial operations, compliance issues)
2. Group similar programs and projects, and processes together.
3. Self-assign each category of task to a specific person depending on his or her SWKSA.
4. Provide professional development to staff.
5. Meet quarterly to measure progress.
6. Plan to self-assess again using IQMBT to see how far we advanced.

As people played their strengths in operating processes to achieve success in projects and programs, the levels in each criterion were higher in the self-assessment process. At the beginning of FY 2013, we reassessed the sub-criteria and now we have set new goals after achieving all previous goals through a defined set of actions.

PROCESSES

Figure 4 shows the various sub-criteria of the IQMBT Process enabler, which level we were in the beginning of FY 2012 and what level was our next goal, and exactly what we achieved at the end of the fiscal year. As seen in the figure, the processes needed more work than we thought it initially would be, so we set our action plan as:

1. Organize a robust program support team.
2. Analyze systems and processes.
3. Improve systems and processes based on our next goal.
4. Establish standards and process flowcharts
5. Create (university policies, state rules, copyright, export control) compliance flowcharts.
6. Collect industry standards.
7. Define indicators for success.
8. Continuously measure the indicators.
9. Relentlessly strive for excellence (next goal level).
10. Plan to self-assess again using IQMBT to see how far we advanced.

At the end of FY 2012, we had achieved our goals and moved forward to set new goal levels.

PROGRAMS

IQMBT provides various criteria in its results section which can be directly used to assess the programs. Among them, the most relevant was the Criterion 6: Customer-Oriented Results. In Figure 5, we describe our assessments and achievements in programs design and delivery to

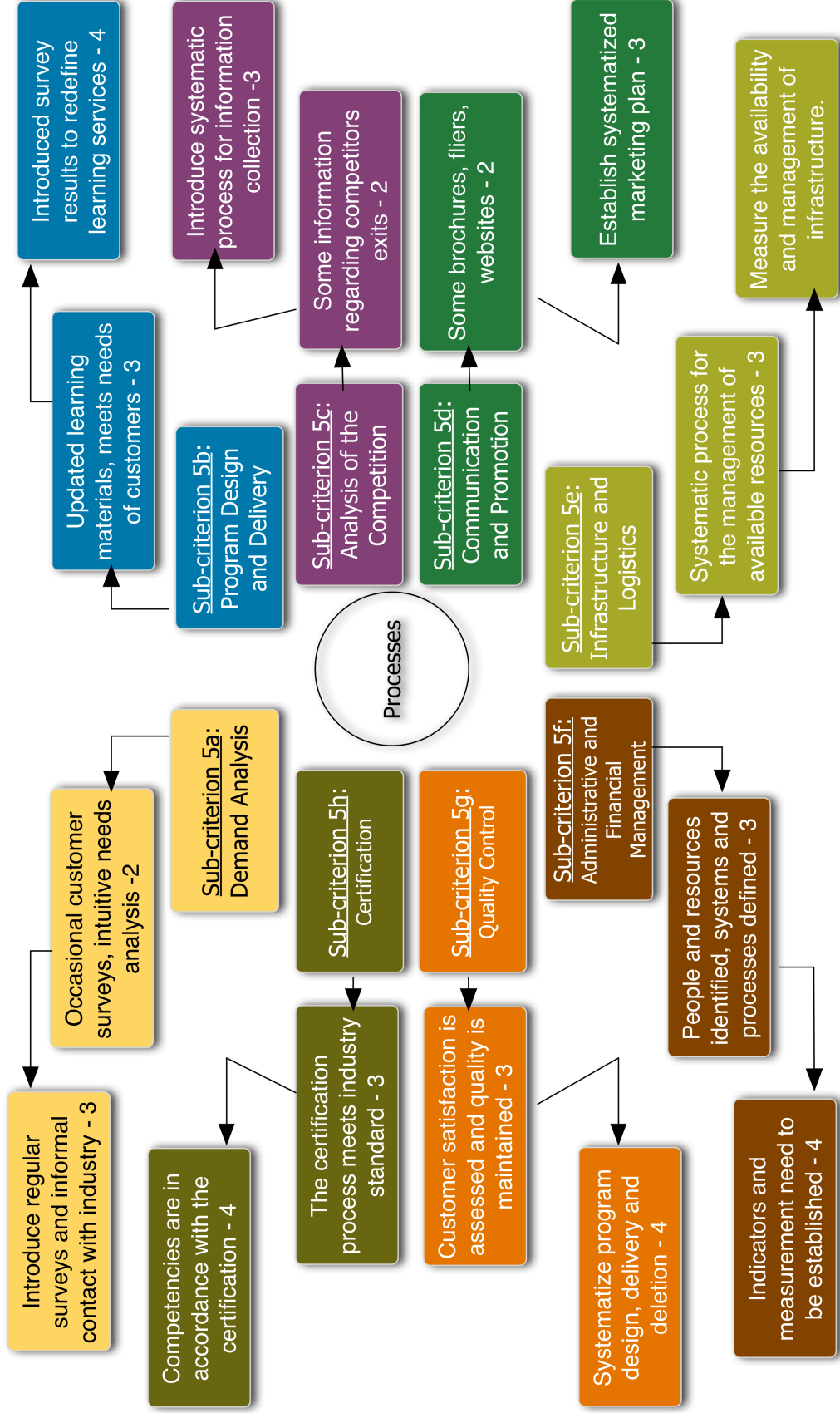


Figure 4. The Process Enabler. Each sub-criterion is defined, the initial level (where were), as identified from staff feedback is given, and which next level we were aiming is also described.

meet the customer oriented results.

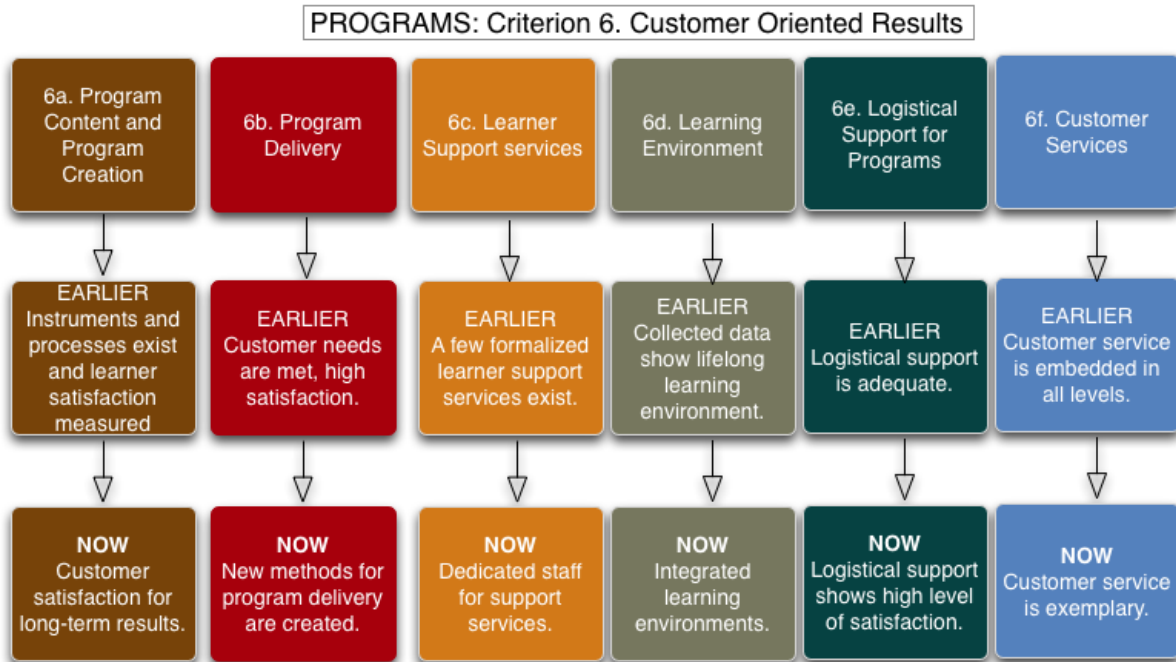


Figure 5. Program results were assessed by using Criterion 6 of IQMBT.

Conclusions and Future Work

IQMBT model is an effective tool for organizational self-assessment that drives toward excellence and enhances the quality of people, programs and processes. The self-assessment process is extremely useful in setting up higher standards for operational and intellectual effectiveness. Using this tool, the University of Kansas Continuing Professional Engineering Education unit was able to set up a clear strategic plan for success and achieve its anticipated goals. While earlier papers have described the tool⁶ and the assessment process⁷, this paper describes how each criterion/sub-criterion was individually assessed, what results it produced and what the next step would be.

Also, based on the IQMBT-induced preliminary assessments in the beginning of 2012, the unit clearly defined its prioritized strategic initiatives and a strategic plan was established with strategic action lists. The four major strategic goals to achieve higher qualities were delineated as:

Initiative 1

Diversify in programs. Create new markets. Develop cutting edge programs. Reach the world. Results anticipated: Revenue generation, more program and course days.

Initiative 2

Create systems and processes for legal compliance.

Results anticipated: Compliance with intellectual property and export control regulations.

Initiative 3

Create and implement a robust international marketing strategy.

Results anticipated: Internationalization, revenue generation.

Initiative 4

Relentlessly pursue excellence in systems and processes.

Results anticipated: Higher productivity, customer satisfaction and financial compliance.

The next step will be to benchmark the organization against similar organizations using the same tool.

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