A culture of continuous quality improvement (CQI) has been embraced by corporate leaders throughout the USA during the past decade and by corporate Japan for more than 40 years. The CQI movement was developed and first promoted by Deming (1986) in the 1990s. To help encourage US companies and reward them for providing high quality products and services, the Malcolm Baldrige National Quality Award was created in 1987 through an act of the US Congress. The existence of the Baldrige Award is based on Public Law 100-107 which created a public-private partnership designed to encourage quality from American companies. Only recently have educators embraced the culture of continuous improvement (Schmoker and Wilson, 1993). The Department of Educational Leadership at Northwest Missouri State University has adopted many of Deming’s principles as expressed through the Baldrige process in the form of key quality indicators (KQI). The department has also embraced the principle that the key to success in “Management by fact” endeavors is to continuously monitor clearly stated and defined objectives and/or outcomes through follow-up methods which yield data descriptive of the desired behaviors (Schmoker and Wilson, 1993).

The purpose of this article is to describe ongoing monitoring of department KQI performance indices through a follow-up process. Follow-up strategies have been utilized in many settings but have often, due to loose construction, provided misleading or meaningless data. The application of flawed data has in many cases led organizations into a false sense that “all is well.” Follow-up strategies (e.g. survey, focus group, etc.) utilized in the CQI environment must be constructed with the utmost care. Tightly constructed survey statements can provide quantifiable data on very specific objectives and outcomes, as defined by KQI indicators. The strategies utilized by the department may be adaptable for use by other organizations.

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education (Tribus, undated). These basic assumptions were utilized by Tribus to refine Deming’s 14 points to arrive at four quality principles for use by educators. Department members then applied the modified principles to develop an MBF climate within the department.

Quality principle 1
Redefinition of the roles of persons working in the system is required (Tribus, undated). A redefinition of department chair, faculty, and student roles was drafted. It was determined that faculty work in a system. The job of the department chair then was to work on the system, to improve it continuously with the faculty’s help. Also, since department students study and learn in a system, the job of the faculty was redefined to work on the system, to improve it continuously with student help.

Quality principle 2
Quality is the first consideration when improvement of a system is desired (Tribus, undated). Quality is a standard that is never static but rather keeps moving. Therefore, the development of quality systems is a continuous process. This concept can be also be stated as, “Quality is a receding horizon” (Northwest President Hubbard in a faculty lecture, 1995).

The maxim that quality is never the problem but, rather, quality improvement is the answer to department problems, was internalized by the members. The quality first principle was then applied by department members. It is important to note here that the leader introducing quality improvement processes into the system should make very clear to the faculty that quality is not being pursued because of a perceived lack of quality on the part of the faculty, or to fix blame for some real or perceived failure. Instead, this introduction is designed to develop a culture focused on continuously improving all processes and systems regardless of their current status.

In higher education, quality improvement can be moved forward through a focus on departmental-level teaching and learning systems. According to Deming (1986), the quality of any process is best defined by the customers (i.e. students, consumers, and society) of that process. The department therefore developed a follow-up survey program to continuously assess student perceptions about the degree to which they had been prepared by department programs to meet their professional needs and responsibilities.

Quality principle 3
Quality improvement focuses on process over product (Tribus, undated). This principle holds that “if you want to improve the product, you attend to the processes whereby the product is made” (p. 10).

The process over product principle was then applied by the department. Because of a desire to improve student achievement, department members focused their attention on teaching and learning processes and not on student achievement (i.e. product) as determined by standardized and cognitively-based examinations. MBF standards (i.e. statistical controls) were set and monitored by the department.

Quality principle 4
The perversity principle is ever present (Tribus, undated). This principle holds that “if you try to improve the performance of a system of people, procedures, practices, and machines by setting goals and targets for the individual parts of the system, the system will defeat you every time and you will pay a price where you least expect it” (Tribus, undated, p. 12). The department was cognizant of the potential negative aspects of the perversity principle. By assessing the whole system and not its individual parts, the negative implications of setting and monitoring MBF quantitative standards were avoided.

KQI development process
After continuous improvement principles became encultured within Northwest and the department, faculty moved to identify factors which, if measured over time, would provide trend data on improvement. These factors were referred to as key quality indicators (KQIs) and were identified for all Northwest procedures and curricula. This KQI development methodology was then applied at the department level across the university.

MBF development process
Since the management of the curriculum, in most universities, is the responsibility of the department, faculty as applied at the department level under the supervision of a chairperson, faculty should embrace a process by which systematic review of records is integrated into department activities. This concept is supported within Deming’s Point 5: “It is management’s job to improve the system continually, make better every process for planning, production, and service to improve quality, increase productivity, and decrease costs” (Bank, 1992, p. 66). Department-level KQIs are
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documented through the use of statistical controls (i.e. MBF) and their level of attainment was determined by a study of records. Department members, working in teams, identified eight major KQI statements (Table I). Then 49 more specific demonstrable outcomes were delineated and associated with an appropriate KQI, for example, “communicates effectively, both orally and in writing”, “develops and enunciates a vision for the school”; “models high expectations”; “provides a school climate accepting of and responsive to ethnically and culturally diverse populations” etc. The faculty then incorporated the eight KQI statements and 49 desired outcomes into their course syllabi.

Table I
KQI statements and the number of outcome behaviors associated with each statement

<table>
<thead>
<tr>
<th>KQI statements</th>
<th>Number of outcome behaviors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Can communicate effectively, orally and in writing</td>
<td>7</td>
</tr>
<tr>
<td>2 Coalesce staff around a vision and mission of what the school could be</td>
<td>2</td>
</tr>
<tr>
<td>3 Facilitate, empower and motivate teams of teachers and other constituent groups</td>
<td>2</td>
</tr>
<tr>
<td>4 Function in the role of instructional leader</td>
<td>8</td>
</tr>
<tr>
<td>5 Manage time effectively</td>
<td>5</td>
</tr>
<tr>
<td>6 Demonstrate a commitment to continuous personal and professional improvement</td>
<td>7</td>
</tr>
<tr>
<td>7 Be sensitive to the needs of a diverse population</td>
<td>8</td>
</tr>
<tr>
<td>8 Embrace ethical and legal processes in school</td>
<td>10</td>
</tr>
</tbody>
</table>

As faculty teams became involved in this very specific effort to identify KQIs and improvement trends, it was possible to see those teams beginning to develop what Deming referred to as profound knowledge of the organization. They were more able to see, “the forest as well as the trees”, so to speak. It is at this point that a faculty truly begins to become empowered. It is at this juncture that the process begins to become bottom-up in nature.

In summary, for an organization to be successful, quality improvement programs must be management led and client oriented. Many times these efforts result in a fundamental change in the way companies and agencies do business.

Survey of department program graduates
Recent graduates (1995) from masters of education (n = 21) and educational specialist (n = 15) leadership programs offered by the department were surveyed regarding their perceptions about KQI outcome statements. The survey was constructed in such a manner as to elicit a two-dimensional response from the graduates. Each respondent indicated the degree to which the department had “prepared” them in each of the desired outcomes, and also the degree to which the outcome was perceived to be “relevant” for the conduct of their professional duties. A five-point Likert-type scale (Bell, 1993) was developed to score respondent perceptions, as presented in Table II.

Table II
KQI five-point Likert-type perception scale

<table>
<thead>
<tr>
<th>Department prepared</th>
<th>Professional relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Strongly agree</td>
<td>5 Highly relevant</td>
</tr>
<tr>
<td>4 Agree</td>
<td>4 Above average relevance</td>
</tr>
<tr>
<td>3 Undecided</td>
<td>3 Average relevance</td>
</tr>
<tr>
<td>2 Disagree</td>
<td>2 Below average relevance</td>
</tr>
<tr>
<td>1 Strongly disagree</td>
<td>1 Not relevant</td>
</tr>
</tbody>
</table>

Data analysis methods
For purposes of summary analysis, the 49 survey items were grouped into eight KQI areas. Descriptive analysis was conducted to determine mean and standard deviation values for each item. Through computer manipulation a “grand” mean score was computed and reported for each KQI area.

A t-test was also performed to make comparisons between perceived “prepared” and “relevant” responses. A criterion of $\alpha = 0.10$ was established to identify significant differences between “prepared” and “relevant” grand mean scores for each KQI area (Vockel and Asher, 1995). All data analysis was completed through the use of the MYSTAT personal computer statistical software program (Course Technology, Inc., 1992).

Findings and interpretations
A summary table was prepared to aid in the interpretation of the survey results. Table III displays the statistical analysis results from the data obtained from the completed follow-up surveys for the two survey groups. These findings were shared with department faculty for their review.

A minimum grand mean score of 4.00 was set as a criterion to identify successful KQI outcome performance. Given the critical nature of department graduates (i.e. teachers and school leaders) the criterion was considered rigorous. Department members found that survey respondents reported overall
It was also found that department graduates perceived high overall professional "relevance" for department KQI outcomes. Again, grand mean scores were found to be very high. Scores ranged from 5.00 for KQI 1 to 4.47 for KQI 5.

The department review found that none of the mean scores, for either group, were below the criterion level. However, department members observed that the KQI 5 "time management" grand mean score was below 4.30. A decision was made to review the processes by which "time management" was taught and where it was taught within the system. The department members discussed these findings and each developed a strategy by which "time management" would be addressed within each appropriate course.

Further review of the t-test analysis results revealed significant differences between "prepared" and "relevant" grand mean scores (i.e. probability levels were equal or less than 0.10) for six of eight KQI outcome measures, as reported by specialist graduates. Whereas, significant differences were found in only four of seven KQI measures for masters graduates. To interpret these results, department members determined that although statistical differences were found between perceptions of preparation and professional relevance of department KQI outcomes, the practical differences were small. It was concluded that department graduates were overall very satisfied with department performance on the specified outcomes and few weaknesses were identified by the respondents. Therefore, a decision was made to make no major changes in department course offering, but to monitor future results for trends that may require further action.

**What have we learned?**

The following observations and suggestions are offered to those university departments and faculty considering the adoption of a "Management by fact" quality improvement program:

1. The department quality improvement program should be embedded within an overall institutional program.
2. Department members should be involved in the development and refinement of the model.
3. Measurable outcomes and statistical criteria should be developed at the department level.
4. The adoption and use of KQI outcome indicators may lead to improved instructional practices.
5. The instructional curriculum may be more fully understood and more thoroughly taught to the benefit of department graduates.
6. Department faculty decision making may become more enabled and empowered through the use of quantitative information rather than biased opinion.
7. Greater emphasis on statistical process control (i.e. MBF) may give department faculty a better understanding of where instructional weaknesses and strengths lie.
8. Follow-up strategies utilized in the KQI environment should be constructed with the utmost care.
9. The faculty must be reassured that quality outcomes are not being pursued because of a perceived lack of quality on the part of the faculty, but rather to develop a new culture focused on continuously improving all institutional processes and systems regardless of their current status.
10. Quality efforts can be moved forward in higher education institutions through a...
focus on department-level teaching and learning systems.

- Departments desiring to improve student achievement should direct their attention to the teaching/learning process and not to student achievement as determined by standardized examinations.

References and further reading


Course Technology, Inc. (1992), MYSTAT (a personal computer statistical software program), Cambridge, MA.


