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Quality management systems such as Total Quality Management (TQM), Quality Control (QC), and International Organization for Standardization (ISO) 9000 focus on the continuous improvement of products and services, customer satisfaction, and participatory management. Although much has been written about quality management systems and their application in business, industry, and (more recently) education, little connection has been made between these systems and educational assessment. This Digest explores the three most prestigious awards recognizing quality improvement in business and industry and describes how the criteria for business and industry assessments of quality can be correlated with vocational education assessment.

QUALITY IMPROVEMENT AWARDS

The Malcolm Baldrige National Quality Award recognizes quality improvement among manufacturing, service, and small business. The primary goal of the Baldrige Award is customer satisfaction. The award criteria reflect the following seven categories (Izadi et al. 1996, p. 62): leadership, information analysis, strategic quality planning, human resource development and management, management of process quality, quality and operational results, and customer focus and satisfaction.

The Deming Application Prize, established in honor of Dr. W. Edward Deming, is awarded to companies that continually apply Company-Wide Quality Control and have achieved a certain quality standard (ibid.). The focus of this award is quality achievement of Deming's 14 points, which are verified through the use of statistical methods. The judging criteria consist of 10 major categories (ibid.): (1) policy and objectives, (2) organization and its operation, (3) education and dissemination, (4) assembly and disseminating information, (5) analysis, (6) standardization, (7) control, (8) quality assurance, (9) results, and (10) future plans.

In 1987, the ISO published a series of global quality system standards called ISO 9000, which are designed to improve productivity and reduce costs in the marketplace. "The ISO 9000 series intends to stimulate trade by providing third-party assurance of an organization's ability to meet specifications and perform negotiated standards" (ibid., p. 65). The focus of ISO 9000 is on the organization's quality system--its design, development, production, and servicing capacities, not on product quality. ISO 9000 Registration attests that a company has a "documented quality system that is fully deployed and consistently followed" (ibid.).

VOCATIONAL EDUCATION ASSESSMENT

The reception of any one of these quality awards hinges upon the positive assessment of a company's quality operations and achievement of continuous improvement, which results in a certification of excellence. In vocational education, assessment is also a way of determining how and to what extent quality improvement systems are changing

educational practices and outcomes. Skill standards describe the essential knowledge, skills, and behaviors critical to an occupational area; assessments measure the achievement of those standards; and certifications result in credentials that state the standards that have been achieved.
When comparing the standards for the quality management systems awards to vocational education standards of achievement, two themes are evident: assessment of standards for learning and performance (student and employee) and assessment of education/management process and design (school and business/industry). Inger (1995) points out that although vocational programs have traditionally measured student economic outcomes such as job placement, occupational competence, program completion and retention, and earnings, the Perkins Act of 1990 has shifted the focus toward accountability measures that are tied to student learning--basic and advanced academic skills, higher-order thinking skills, knowledge of the world of work, and so forth. He proposes that vocational education assessment requires more than information on student outcomes. It requires "valid and reliable information on...the need for vocational education as expressed by students, employers, and society, and the educational processes employed in the programs" (p. 1).

Quality system awards such as the Baldrige Award, the Deming Prize, and ISO 9000 Registration offer blueprints for assessing quality in vocational education as well as in business and industry. Criteria for the Baldrige Award can be used to assess the educational institution's effectiveness in meeting customer needs and expectations, the "customers" being students, parents, alumni, and taxpayers. Student satisfaction, retention, and recruitment become the parallel educational focus to customer satisfaction, customer retention, and market share gain. The Deming Prize offers the strategy of using statistical methods as a means of assessing vocational education enrollment, completion, and recruitment patterns; student progress; and teacher performance. The goal is toward continuous improvement through the leadership of quality teams and development of skilled workers (the product) who are of value to the employer (the customer). The ISO 9000 Registration attests to the use of established standards as a benchmark for meeting quality requirements. It offers support to the establishment of standards against which curriculum, course objectives, and administrative procedures can be measured and documented (Izadi et al. 1996).

Clearly, there are analogies that can be drawn between quality efforts in business/industry and education. "In both cases, the objective is to apply effective processes to the production of quality products. In both cases, standards of some sort are used to define quality; and assessments are used to determine whether standards are being met and quality is being produced. Also, in both cases, the methodologies of Total Quality Management can be applied to increase quality and improve outcomes" (Michigan State Council on Vocational Education 1996, pp. 15-16).

The industry-based skill standards, recently introduced as a means of strengthening the connection between education and employment, offer a benchmark to help vocational

educators improve the quality of education. Two models of skills standards are currently being explored--the skills component model and the professional model. In the skills components framework, the focus is on task performance. In the professional model, the focus is less on what the worker does and more on the functions of the generic job category--how the work is done, e.g., through problem solving, reasoning, using judgment, contributing ideas, and so forth (Bailey and Merritt 1995). The use of both models is consistent with the models for assessing a company's quality management system illustrated in the Baldrige Award, Deming Prize, and ISO 9000 Registration.

USING QUALITY MANAGEMENT CRITERIA

How can vocational educators use quality management assessment criteria to assess the quality of their "product and process?" One example of the educational application of quality management system standards is offered by Clery (1993). Following are a set of 20 recommendations for how the ISO 9000 system's 20 basic elements that affect quality might be applied in higher education (pp. 4-8):

1. Management. Are there job descriptions that define authority and responsibility, training to understand quality policy, documented quality policies, and a clearly stated mission?

2. Quality System. Is everything promised for delivery actually delivered?

3. Contract Review. Are the requirement of service contracts defined?

4. Design Control. How relevant, up-to-date, and accurate is the curriculum?

5. Document Control. Is there a process for maintaining confidentiality and accuracy of records and communicating changes in requirements?

6. Purchasing. Is there a rational plan in purchasing that is coordinated with what is going on in the classroom and laboratory? For example, does every department use the same, compatible word processing software?

7. Product Supplies. To what extent is education involved in helping to develop quality standards at each level of the institution?

8. Product Identification. Who is responsible for making sure that students are on-track and making progress?

9. Process Control. Are there established, documented, and communicated procedures to direct student learning?

10. Inspection and Testing. Have students learned anything? Has new knowledge been created? Are students prepared to do a job for which they are trained?

11. Measuring. Are tests and measurements really testing learning and achievement?

12. Test Status. How are test results being analyzed?

13. Control of Nonconforming Products. How are we helping students with different learning styles? Different experiences?

14. Corrective Action. If there is a problem, what is done to identify the cause and ensure that it does not happen again?

15. Handling, Storage, Packaging, Delivery. How can students' interface with the organization units such as the registrar, bursar, advising, and communications be facilitated? How can student safety and health be assured? How, when, and where will classes be held? In what ways can scheduling and mode and quality of instruction be continuously improved?

16. Quality Records. Can student records be accessed quickly? Are they up-to-date?

17. Internal Quality Audits. How are we ensuring organizational quality through process? For example, would we consider the value of maintaining an extensive library by assessing student use and considering whether information in electronic form might be more useful?

18. Training. How many dollars and how much time is devoted to staff training? Is training making a difference in quality of performance?

19. Servicing. Are students committed to lifetime learning? Is follow-up being conducted on recent graduates to see if they are performing as expected?

20. Statistical Techniques. Are the correct statistical techniques being used and does everyone who uses them know what to do when the process is out of control?

This framework is useful in guiding the institutional process (management and operations) through which student learning occurs. For example, Santa Fe Community College fosters quality improvement by facilitating students through the process of setting standards, documenting goals, and moving toward intended outcomes. They use information about student progress to form the basis for institution-wide assessment. The Santa Fe Community College approach connects student achievement to the mission of the institution and to the specified learning objectives for each program (Inger 1995).

CONCLUSION

Business and industry were the first to introduce the concept of total quality improvement into their operation and management processes; education followed their

lead. It seems appropriate that the criteria used by business/industry to recognize and certify quality achievement through the Malcolm Baldrige National Quality Award, the Deming Application Prize, and the ISO 9000 Registration offer powerful insights into ways vocational education can improve their assessment and certification practices. The information in this Digest is presented to inspire an awareness of the correlation between the application of quality assessment in business/industry and education, and suggest strategies for implementation.

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