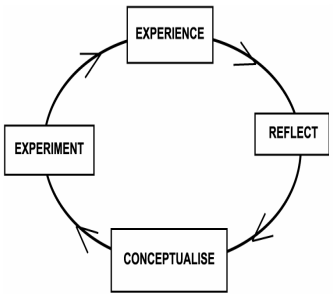
Continuous Quality Improvement

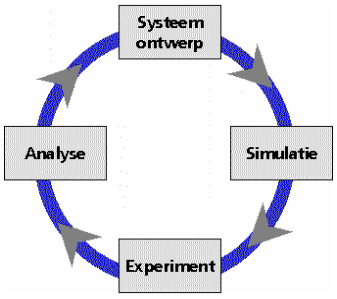
Fads come and go in higher education almost as fast as they do among teenagers. One current fad is that of "Continuous Quality Improvement" (CQI).

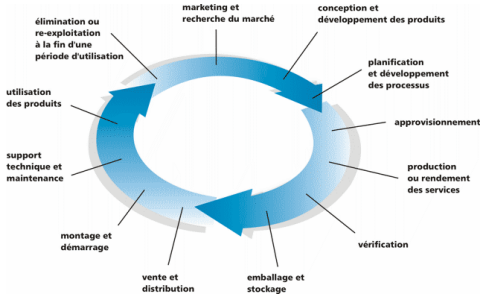
CQI is actually not a bad idea. By recognizing that maintaining quality is a process, not a product, changes that are proposed can be assessed in terms of their effect on quality. Inversely, if a need for improved quality is perceived, effective changes to accomplish that can be planned.

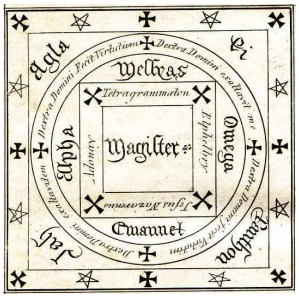
Unfortunately a common implementation of CQI that is currently trumpeted in higher education is the Quality Circle. This is a process in which a goal is defined, studies of various types are executed to learn where the product departs from that goal, and changes are implemented to bring the product closer to the goal. One popular model breaks the circle into five steps, while others have chosen anywhere from four to eight or ten steps:



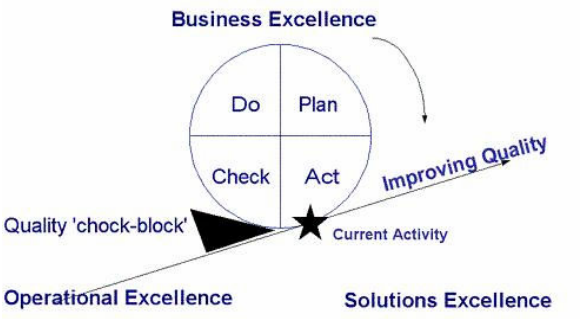
The system is limited to neither one culture nor one historical era:







W. Edwards Deming, who revolutionized both the U. S. Census and the Japanese automotive industry, had but four steps but added a chock block to prohibit backsliding:



Quality Circles might be an appropriate way to maintain the quality of a tangible product of fixed design. Suppose, for example, the goal is to produce an automotive shock absorber (actually a damper), painted red and having a chrome-plated shaft. Measurements of the finished product are easily made, and manufacturing processes adjusted to maintain the specifications. The shade, smoothness and gloss of the red paint can be measured and corrected. If the chrome plating is not uniform, or is damaged during manufacturing, adjustments can be made.

This process is not unlike the concept of "negative feedback," well known among electrical engineers as a method of stabilizing and reducing the distortion of electronic amplifiers. It is an excellent method for stabilizing a system, ensuring that the output meets defined specifications. However, any changes made within a time interval shorter than the delay of the feedback loop will tend to be averaged out, as the system favors stability, not change.

Higher education is not a fixed product of unchanging design or tangible goals. Attempting to force a process designed for a stable manufacturing environment onto a constantly evolving curriculum can range from frustrating to counter-productive. The goal of Engineering Technology programs might be, for example, to meet the needs for nearby companies for skilled technical employees. These needs rapidly change, the products or services these companies provide rapidly change, and even the companies themselves appear and disappear.

Thus, engineering technology education is an open-ended path whose direction changes as the needs of the prospective employers change. The curriculum content might change monthly, or even weekly; as proposed by advisory committees, adjunct faculty, and returning students who freely share with us what is really happening in their companies.

Suppose Ron teaches a Biomedical Safety class. He learns, via his full-time job, of a new requirement hospitals must meet. He incorporates this into his class the next week, and advises his program coordinator so that material can be a new part of the course.

Perhaps Jim teaches an electronics course. He notices in both his full-time job and in his hobby that certain technologies are becoming more pervasive while others are fading in popularity. Over the next few months of his class he explains and demonstrates these new concepts, and provides his program coordinator with the material he used so others teaching the same course might benefit from his experience.

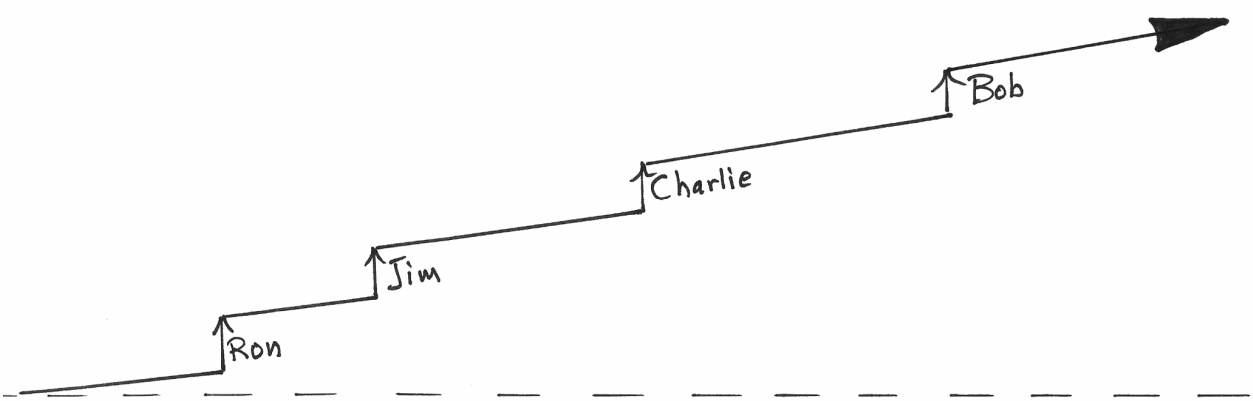
Former student Charlie, now a supervisor in his company, sends email to an old teacher and mentions some skills he wishes his new hires possessed. The old teacher discusses this message with the program coordinator, who has heard similar suggestions from industry personnel on whose behalf he is creating new customized programs. Together they find a new text book that will help the students acquire and practice those skills, and an evaluation method to test them.

Bob, while helping students perform a laboratory experiment, notices that a major problem is that they don't complete one step before beginning the next. He will correct that situation on the spot, with a "feedback delay" of perhaps 10 or 15 seconds.

This is most certainly CQI, in its most direct – and therefore most continuous – form. It happens yearly, monthly, weekly, even daily as we draw from the experience and expertise of our full-time and part-time faculty, our advisory committees and prospective employers, and our past students. It

is not based on formal instruments that can take years to design, distribute, retrieve and assess; and then to finally push through the system the required curriculum changes for implementation of the new ideas. By that time it is unlikely that those ideas would still be relevant.

If the "problem" facing our department is "How do we maintain and advance quality," should the answer be "go slowly around in circles" or "steadily but quickly advance towards the goal?"



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