

Developing a Workforce with Profound Knowledge

Our goal at Emergent Biosolutions¹: Create a sustainable culture of organizational excellence.

Our leadership recognized that the foundation of our development strategy required a focus on thinking in systems within a culture of a continuous improvement learning lifecycle (PDSA²) culture. W. Edwards Deming's *System of Profound Knowledge*³ meets this foundational need, allows us to bring systems thinking to all levels of the company, and respects our people and core values. The Capital Quality and Innovation (CQI) Academy for Quality Management Fundamentals⁴ provides a venue for this to take place.

Our initial obstacle to overcome was that employees mistakenly perceived the curriculum as best suited for our “quality” teams. This is far from the truth. The emphasis in the title is better placed on *Management* rather than Quality. The CQI Academy applies to all levels of organizational experience, and applies to every business function. Our investments in CQI Academy participation also pays dividends by:

1. Increasing individuals’ joy in work
2. Developing leadership skills for the good of the organization
3. Teaching a deeper understanding of variation in operations and business support systems

When defining our strategy for employee participation we did not believe that mass enrollment would be successful from a cultural change perspective. Nor did we expect that everyone in the organization would be available to make the commitment of six sessions spaced across 12 weeks. We made a key decision to enroll employees from all areas in manageable cohorts of 7-10 people.

Strategically selecting participants (high performers willing to learn from each major functional area) has helped to obtain the "thinking in systems" buy-in and support in each area for which we had hoped. These individuals have become champions “in-place” for the principles learned in the CQI Academy. It has also been vital for us to obtain sponsors in each functional area.

We’ve integrated the *CQI Academy for Quality Management Fundamentals* into our approach for quality leadership as it provides the effective learning methods to develop a critical mass of people with Profound Knowledge. These learning methods are:

Principle-centered—The CQI Academy delivers a proven, principle-centered foundation of management and quality education. Dr. Deming’s 14 points and System of Profound Knowledge are being applied successfully by leaders in many different organizations in industry, education and government.

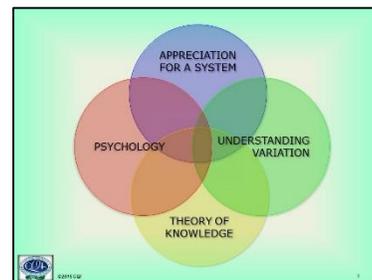


Figure 1- The four areas of W. Edwards Deming's System of Profound Knowledge

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On-the-court—An “on-the-court” vs. “in-the-stands” approach to learning is the heart of the CQI Academy. The use of weekly PDSA cycles is one of the foundational approaches that gets participants “on-the-court” and learning from Day 1 of the CQI Academy.



Figure 2 - Participants are encouraged to try and “fail” until the PDSA cycle is a natural approach to



Learning exercises—Experiential learning exercises are used to effectively demonstrate key concepts in each session.

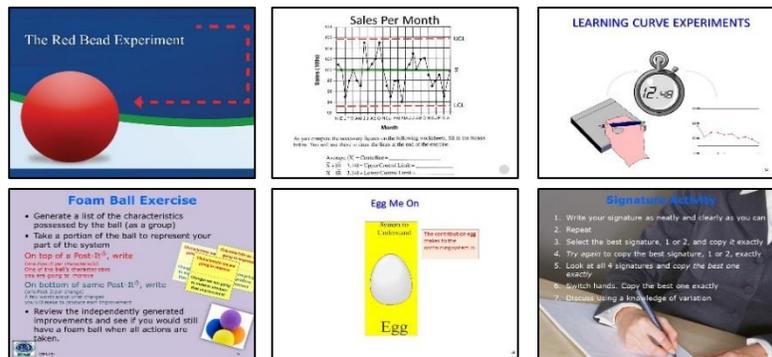


Figure 3 - Six of the many exercises run during the CQI Academy

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Spaced learning and integration—Two-week gaps between each of the six CQI Academy sessions provide an opportunity to apply, absorb, and integrate the principles that are introduced.

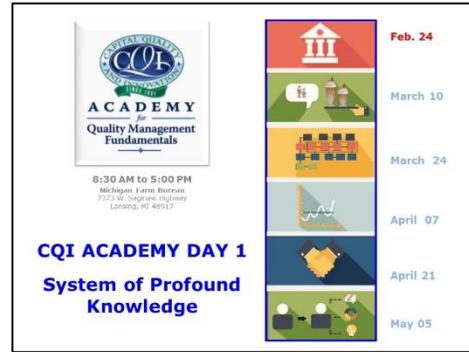


Figure 4 - CQI Academy days are spaced to provide between-session learning opportunities

Learning reviews—Each session begins with learning reviews by participants sharing and discussing what they *learned, applied, or taught to another* since the previous session.



Figure 5 - All participants share at each session

Discussions—Partner, small group, and class discussions explore application of principles in a variety of work settings.



Figure 6 - Small groups capture and share their thoughts with the rest of the CQI Academy

Project assignments—Project-based assignments integrate each day’s learning principles into every participant’s learning project.

Need as a Target for Products and Services	
Need	Possible Products and Services
Personal Transportation	Automobile, bicycle, bus, Segway, zipcar
Transfer of Knowledge	School, television, Internet
Health care	Doctor hospital, spa, nursing home, CVS
Current Affairs Information	Newspapers, radio, TV news, Internet, blogs, podcasts
Food	Grocery store, garden, restaurant, farm, AmazonFresh, OpenTable
Getting Bills Paid	Cash, checking account, credit card, Internet, Smartphones
Shelter	House, apartment, hotel, Dwelleable
Computation (hand-held)	Calculator, slide rule, abacus, Smartphone app

Figure 7 - Concepts are applied to participant projects for improved learning and understanding

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Reading assignments—W. Edwards Deming’s book, *The New Economics*, 2nd edition provides the theoretical basis for each of the six learning sessions.

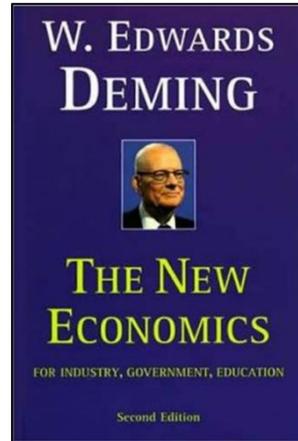


Figure 8

Supplemental materials—Videos, readings, and handouts expand upon and support in-class learning.

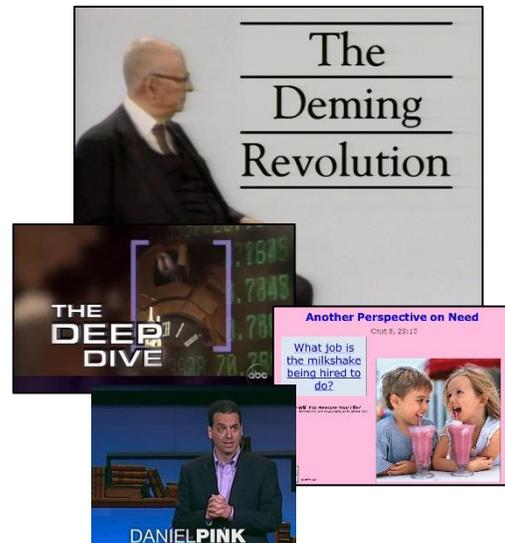


Figure 9

Manager communications—Two-way communication with the managers and supervisors of our participants focuses on what is being learned in class and provides guidance on needed support for participants.

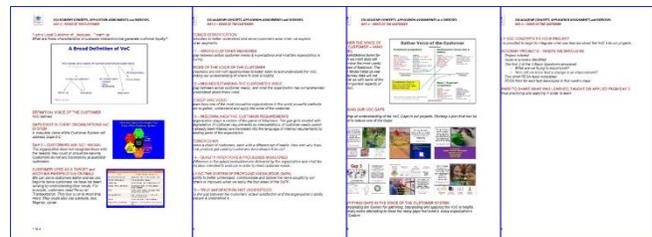


Figure 10 - Each participant's manager receives a synopsis of the principles and activities covered after every session.

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Participant presentations—Participants deliver a Capstone presentation at the end of the six sessions to declare what they have learned and will bring back to their work and community.



Figure 11 - Examples of recent Capstone Presentations

Post-academy learning opportunities—The CQI Academy Guest Instructor program supports graduates in deepening their knowledge by providing them the opportunity to teach portions of the academy. Many have become mentors and teachers as they continue to learn and expand their quality management capabilities.



Figure 12 - CQI Graduates extend their learning when they become guest instructors

Since we began our journey in 2013, we have seen a broad set of benefits that demonstrate the effectiveness of the CQI Academy in meeting our objective of creating a sustainable culture of organizational excellence. These include:

- Use of the 3 Basic Questions⁵ and PDSA cycles has heightened our ability to implement changes that result in the improvement of safety, quality, delivery and cost.
- Through the CQI Academy's focus on application-based practice and experience, employees better retain quality management knowledge.
- A common lexicon from PDSA⁶ to VoC⁷ is now shared across all levels of our organization.
- We are becoming better at obtaining information relevant to the needs of our customers.
- Making a lean transformation depends upon improving quality—without quality there is no lean. Realizing this has helped us to deliver increased value to our internal and external customers.
- Those with Academy experience, not only have an easier time becoming “Lean Thinkers,” they also pick up Lean Concepts faster and with better understanding.
- When designing or redesigning our systems, we think of a systems view with suppliers, customers, inputs and outputs. This also helps to improve our use of tools such as Value Stream Maps and Linkage of Processes.

The benefits of completing the CQI Academy have taken hold in the organization and we now easily enroll cohorts of individuals from all sectors of our business; quality, operations, facilities, information technology, etc. The CQI Academy allows time for learning to be integrated into how people do their work. Application with practice of what was taught through PDSA learning cycles is key. We have recognized the value in elements of the Deming's System of Profound Knowledge and have gained confidence in our existing and future partnerships with Capital Quality & Innovation.

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REFERENCES

1. Emergent BioSolutions is a global specialty biopharmaceutical company seeking to protect and enhance life by offering specialized products to healthcare providers and governments to address medical needs and emerging health threats. Emergent's mission is simple - to protect and enhance life.
2. Plan-Do-Study-Act. W. Edwards Deming, *The New Economics: For Industry, Government, Education, 2nd Edition*, The MIT Press, 1994, p. 132.
3. The four areas of Deming's System of Profound Knowledge are: Appreciation for a System, Understanding Variation, Theory of Knowledge and Psychology. The four areas are interdependent and issues in the organization should be viewed through a lens using all four areas. W. Edwards Deming, *The New Economics: For Industry, Government, Education, 2nd Edition*, The MIT Press, 1994, pp. 92-115.
4. The CQI Academy for Quality Management Fundamentals is a 6-session, 12 week program produced twice each year by the non-profit, Michigan-based organization, Capital Quality and Innovation (CQI). www.capitalquality.org
5. The 3 Basic Questions are: "1) What are we trying to accomplish? 2) How will we know that a change is an improvement? 3) What changes can we make that will result in improvement?" Gerald J. Langley, Kevin M. Nolan, Thomas W. Nolan., Clifford L. Norman, and Lloyd P. Provost. *The Improvement Guide: A Practical Approach to Enhancing Organizational Performance*, Jossey-Bass, 1996. p. 12.
6. Plan-Do-Study-Act. W. Edwards Deming, *The New Economics: For Industry, Government, Education, 2nd Edition*, The MIT Press, 1994, p. 132.
7. Voice of the Customer.

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Author biographies

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Paige is revolutionizing the fields of learning and development primarily in the pharmaceutical industry. She is the Continuous Improvement Program Manager at Emergent BioSolutions where she is currently leading innovative efforts to create a sustainable organizational culture of excellence that promotes learning & development. A passionate 21st Century Deming practitioner, Paige serves as the Program Director for the non-profit Capital Quality and Innovation. Paige attended graduate school for Science Education at Aquinas College in Michigan and holds a B.S in Biology and Chemistry from Central Michigan University.

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Eric A. Budd is the Improvement Coordinator at Peaker Services, Inc. in Brighton, MI. He is a member of the ASQ Deming Medal Committee. He is a member of the Board of Directors for the non-profit *Capital Quality and Innovation*. Eric is the lead instructor for the *CQI Academy for Quality Management Fundamentals* and has been one of its primary developers. Eric holds a B.S in Information Management and an M.S. in Quality Systems Management.