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**QUALITY  
PERSPECTIVES**  
in Knowledge Acquisition

Working together to create life-long learning  
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# Journal for Quality Perspectives in Knowledge Acquisition

Working together to create life-long learning  
and individual and organizational success

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## The Journal That Connects Quality and Education

The *Journal for Quality Perspectives in Knowledge Acquisition* (ISSN 2692-4005) is a peer-reviewed publication of the ASQ Education Division, the Global Voice of Quality, and networks on quality in education. The purpose of the journal is to engage the education community in a conversation about significant topics related to improving quality and identifying best practices in education and workforce development, as well as expanding the literature specific to educational quality across these various topics.

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# Journal for Quality Perspectives in Knowledge Acquisition



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## The Observation Tower – a Note from the Editor

Marianne Di Piero, Ph.D.

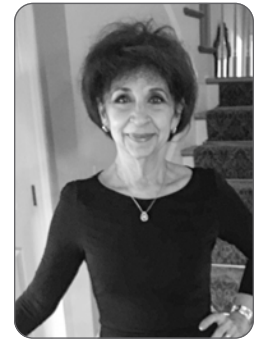
The ASQ Education Division is proud to publish the second issue of the *Journal for Quality Perspectives in Knowledge Acquisition*. This special themed issue features *Profiles in Leadership*, written from a variety of diverse perspectives that capture the essence of leadership from the theoretical to the pragmatic—from higher education and academia to business and healthcare. The authors delve deeply into the facets of their individual leadership styles and relate the experiences and knowledge base from which they have learned to become leaders, as well as discuss the journeys they continue to pursue.

We can long debate whether leaders are born with special characteristics and traits, innate sensibilities that imbue them with a primordial knowledge that emerges simply throughout the course of their life experiences, or whether they learn to become leaders via formal education and training—or perhaps an amalgamation of both. Whatever the pathways, we know that accomplished leaders are immediately recognizable individuals: we admire them; we want to know them; some of us aspire to become like them and to distinguish ourselves via our singular contributions, lending our talents and skills to supra-personal goals that enrich the world, *which is what they do*. They inspire us to seek for the best of ourselves through the ability to strive and create and to remain steadfast, even in the face of overwhelming challenges, *which is what they do*.

This edition of the Journal provides us with a rare opportunity to explore the mindsets of these individuals and to enter into their worlds where we can grow and learn. Lisa M. Walters, Reneta Barneva, and Jennifer Cameron, in *Re-Envisioning the DMAIC Framework in Project-Based Learning to Enhance Statistical Confidence in Data Decision Making: A Case Study to Improve Business Curriculum Research Design*, teach us the centrality of assessment and evaluation of research processes that can, when recast through introspection and examination, yield different outcomes than the ones originally anticipated. The authors impart courage and steadfast commitment to the research endgame, even in the face of obstacles that could, if left unchecked, thwart the entire research initiative. Such insight permitted them to revamp their business statistics training curriculum in innovative ways that will inspire student success.

John R. Dew, in *Reflections on How Quality Influences Leadership*, provides a cogent overview of the literature surrounding thought leaders in the discipline of leadership, from Plutarch and Machiavelli in the times of antiquity and the Middle Ages to the more recent theories of Juran and Deming, which connect leadership with quality initiatives. Dew's article focuses on the manner in which leaders in corporations or in academe must learn to think about the value of incorporating quality and quality concepts, principles, and methods into their organizations. Doing so provides leaders with the knowledge and acumen necessary to understand the nature of the work that must be done.

In *Late Night Drinks in Boston*, Austin S. Lin adopts a creative approach, in the genre of the short-story, in delineating three distinct principles that focus leadership on user-centric quality. Lin focuses on the principles of governance, transparency, and leadership as an operating, community-oriented matrix that permits organizations, such as ASQ, to



Marianne Di Piero

# Journal for Quality Perspectives in Knowledge Acquisition



evaluate member needs and then to fulfill those needs via the right combination of products and services that members actually want.

Sue Peiffer's article, *Profiles in Leadership*, provides insights into the various facets of leadership behaviors that lend toward the kind of positivity that benefits organizations as well as the individuals that work within those contexts. Communicating, collaborating, building trust relationships, listening and responding, and cultivating resilience are key factors in creating successful connections that support organizations as they fulfill their strategic plans.

In *Leadership and Decision Making in Education and Training*, Grace Duffy imparts a unique leadership model, the philosophy of which is connected to her Modular Kaizen approach, a modification of the traditional Kaizen continuous improvement process. Duffy's theory and pragmatic application are designed to avoid disruptions in processes and to keep organizational processes moving fluidly and efficiently, factors which she illustrates in various examples from the healthcare professions, among others. She teaches the centrality of alloying the Modular Kaizen approach with respect and compassion for others in their desire to succeed.

It is my hope that this interesting and informative series of articles will serve as beacons of light, encouraging and supporting leaders and aspiring leaders in their efforts to serve.

**Marianne Di Pierro** holds the Ph.D. in English from the University of South Florida and is the former director of the Graduate Center for Research and Retention at Western Michigan University (WMU). As a graduate education specialist, she has coached more than 100 Ph.D. students across a spectrum of disciplines to degree completion. She holds graduate faculty status at WMU and is experienced in curriculum design, assessment and evaluation, policy development, and conflict resolution. She has been engaged as an expert consultant in graduate education for a law firm and has worked as a training consultant to graduate advising faculty. Di Pierro has participated in national research projects on Ph.D. completion and is principal investigator on several of her own studies that examine variables impacting doctoral attrition and retention. She has published articles in peer-reviewed journals and presented her research at professional conferences. She is the author of the second edition of her book, *Navigating the Dissertation: Strategies for Doctoral Advising Faculty and Their Advisees*, published by New Forums Press in May 2021. Di Pierro is the current editor of the ASQ Education Division's *Journal for Quality Perspectives in Knowledge Acquisition* and serves on the leadership teams for the Education Division and the Health Care Division. She has been nominated as Chair-Elect for the ASQ Education Division. Di Pierro may be reached at the following email address: [marianne.dipierro@wmich.edu](mailto:marianne.dipierro@wmich.edu).



When the research findings for our project indicated no statistical significance in students' confidence level in applying quantitative techniques to real-world business problems, we evaluated and analyzed the study design to examine those conditions that may have contributed to this outcome; the analysis and findings presented in this article reflect a continuous process improvement initiative that we will apply to future research.

## Re-Envisioning the DMAIC Framework in Project-Based Learning to Enhance Statistical Confidence in Data Decision Making: A Case Study to Improve Business Curriculum Research Design

*Lisa M. Walters, Reneta Barneva, and Jennifer Cameron*

### **Abstract**

Traditional quantitative business study depends on statistics, operations research, and project management, often delivered by traditional methods of pedagogy, that is, lecture and exams. For this study, we demonstrated the use of project-based learning (PBL) and its impact on student confidence as it relates to using quantitative techniques to address real-world business problems. However, our research findings indicated no statistical significance in that students' confidence levels remained essentially unchanged after completing three preparatory courses. Given this unexpected result, we evaluated and analyzed the study design and the preceding courses to identify those conditions that may have contributed to this result. We present our analysis and findings in this article as part of a continuous process improvement initiative that will set the stage for us to repeat the study by incorporating innovative quality approaches based upon what we learned.

### **Introduction**

Managers often make decisions for the well-being of their organizations using complex data sets. Although decision makers usually are college graduates or MBA holders, true decision-making courses are rarely part of college curricula. Traditional quantitative business courses depend on statistics, operations research, and project management. However, these courses often rely upon traditional methods of pedagogy: that is, lecture and exams that are still important but that do not always reflect the kind of real-world decision-making processes that are integrally connected with quality improvement. In our original study, we attempted to demonstrate the use of project-based learning (PBL). This attempt, however, did not achieve its intended outcomes, a fact that prompted us to reevaluate our approach. The core involved data-driven recommendations for a real-world organization and not simply those within a hypothetical context devoid of the spectrum of real-world events and situations that students will realistically encounter. The framework incorporated a Six Sigma problem-solving cycle, specifically Define-Measure-Analyze-Improve-Control (DMAIC). Based on experiments, we intended to demonstrate that the PBL experience resulted in a gain in student confidence, which we concluded was critically sound preparation for the decision-making challenges that lay ahead. We also concluded that the PLB approach proffered by the original research study would provide institutions of higher learning with a pantheon of pedagogical approaches that could be applied to their curricula. However, despite these goals and objectives, the research findings indicated no statistical significance in outcomes; thus, students' confidence levels remained essentially unchanged after completing three preparatory courses.

Given this unexpected outcome of no significance, we endeavored to explore and analyze the series of events in our original research process that may have contributed to this result, and we present our findings in this article as part of a continuous process improvement initiative that will set the stage for us to repeat the study by incorporating innovative

approaches based upon what we learned. Objective reflection upon the original process and its outcomes constitutes a key approach.

Research projects frequently open up to the necessity to revamp and reframe them and to return to original ideas imbued with new approaches. This article serves as one example, and its value lies within two perspectives: (a) the need for researchers to critically analyze their own work via a reflective process that enables them to understand which methodological approaches were successful and which required refinement, and (b) to inspire researchers to implement changes to their research protocols and to initiate new studies that permit for the outcomes they envisioned.

## Statement of the Problem

### *The Statistical Skills Gap*

Data analysis is among the most pervasive academic disciplines. The study of data intersects with every aspect of human life. Scientific endeavors, sports performance, and business management, among other disciplines, have benefited dramatically from data analysis in recent years. The ability to collect, analyze, and interpret data is the basis for all types of decision making. As such, digitalization has created a new emphasis on data-driven careers. These include statisticians that analyze real-life problems, data engineers that ensure the flow of data, and data scientists that extract insights from data (Rizvi & Dar, 2017).

Gomez and Peter (2017) described data analysis skills as being essential for employability and for job performance. This is consistent with the finding that quantitative skills are routine business tools in the modern economy (Smith, 2014). However, these data analysis skills, while essential and critically important tools, may not always be sufficient when employed in isolation of other methodological approaches that create a critical lens into complex problem solving. Further, the precise educational training necessary to cultivate these skills and apply them may not reach the levels appropriate to quality work processes.

The National Association of Colleges and Employers' (NACE) Job Outlook 2019 survey reinforced this trend. Of the 172 respondents to the survey, 80.9% indicated that problem-solving skills were vital. Similarly, 71.9% indicated that analytical/quantitative skills were crucial (NACE, 2018). NACE advocates the necessity for institutions of higher learning to implement educational programs that develop competencies, as well as assessments of these competencies. Such measures ensure programs of merit, as well as help to produce career-ready students. These two attributes provide the dimensions of quantitative literacy, described as the "ability to understand and

use numbers in a given context" (Hains, Intindola, Lepisto, & Wagner, 2019). And yet, Smith (2014) suggested that quantitative literacy skills are rapidly declining in the West, a finding particularly significant given the NACE findings. The genesis of this finding opens up to the need for additional research to explain why and to examine those elements missing from the student preparation curricula, the objective of our original, and continued, study.

### *Implications for Business College Teaching*

The implications for the discipline of business and for college teaching draw pedagogical concerns. For example, a student can learn how to do a specific quantitative analysis. However, the greater challenge is to know why it is important to conduct such an analysis. An innovative, effective method to teach such a critical context is project-based learning (PBL) rather than adherence to staid methods to cultivate statistical acumen in rote—and devoid of a contextual application. Our original research project remained focused on the following elements: we wanted to understand if students had conceptualized their choice of statistical methodology and were cognizant of how this method functioned as a tool. The hypothesis was that this element could potentially lead to the building of self-confidence in the use of statistics and data analysis. In addition, it would reveal if students maintained only a rote framework—in other words, using a tool without understanding the implications of their specific tool choice. The question was this: Did students actually internalize and comprehend the complexities of quantitative skills dexterity, or did they simply move through these processes in a rote, and therefore subconscious, manner—an element that undermines the authentic application of statistics skills within varied applications, as well as erodes student confidence?

### *Dewey and Kolb – Philosophical Implications for Problem-Based Learning*

Problem-based learning embraces the tenets of both John Dewey (1938) and David Kolb (1984) (Miettinen, 2000). Tension exists between traditional and progressive educational approaches. For example, John Dewey advocated for a balance between these two approaches that would inspire successful learning experiences. In his view, while traditional education was far too rigid, progressive education could be too impulsive or unconstrained. He recommended that education provide for an experience whereby the learner interacts with the content in a hands-on, experiential way. In Dewey's estimation, this interaction created continuity. According to his theory, the learning outcomes from the experience carry forward and shape the future experiences of the learner.

Kolb (1984) formulated a four-stage experiential learning cycle that embraces Dewey's experience imperative. The four components of Kolb's cycle consist of concrete experience, reflective observation, abstract conceptualization, and active experimentation. Kolb identified the need for experience within the first and fourth stages. This cycle suggests a continuity of the experience, similar to Dewey's viewpoint. After a meaningful experience in the first stage, one processes and learns from the experience during the second and third stages, followed by carrying forward of the learning into active experimentation (stage 4). In our estimation, the application of this four-stage experiential learning cycle to the discipline of statistics would provide a viable pedagogical framework for our business college students.

## The Original Research Agenda: Project-Based Learning (PBL) and Student Confidence

This paper describes a core curriculum of three sequential courses in statistical and data analysis for students pursuing the Bachelor of Science in Management that comprised our original study. The study setting is a small school of business within a liberal arts college. The intended analysis measured the effect of the final course in the sequence (thereafter referred to as the PBL course) on the students' confidence to engage in quantitative analysis. The definition of confidence is the individual's self-perceived sense of competence and skill to deal with any variety of psycho-social challenges (Shrauger & Schohn, 1995).

The PBL course uses the Lean Six Sigma (LSS) problem-solving cycle described as DMAIC (Define, Measure, Analyze, Improve, and Control). In working through the DMAIC cycle, the students used two software platforms (Excel and Minitab) that were part of earlier academic courses in the series of three. At the end of the PBL course, a survey measured the perceived confidence of the students in applying statistics and data analysis to real-world business decisions, the embodiment of both Dewey's and Kolb's theories of experiential learning.

## Factors Impacting Student Proficiency in Statistics

Smith (2014) stated that students often struggle with quantitative research. He identified the following factors that may affect students' proficiency:

1. Student Motivation (Breen & Lindsay, 1999)
2. Competence with Statistical Software (Proctor, 2002)
3. Quantitative Aptitude (Schuhmann, McGoldrick, & Burrus, 2005)
4. Aptitude for Data Analysis (Onwuegbuzie, 2000)

5. Understanding Statistics (Corner, 2002; Murtonen, 2005)
6. Teacher's Influence (Knox, 1988).

The study showed that 1, 4, 5, and 6 were highly correlated with proficiency in quantitative research. This identification raises the question concerning the types of actions needed to cultivate these particular factors within and beyond the classroom setting. These four factors are considered key drivers and have the strongest opportunity to positively influence student ability in quantitative research (Smith, 2014). However, the factors stated above demonstrate the tension that exists between traditional and progressive educational approaches.

The work of Dewey (1938) and Kolb (1984) infers that experiential learning can assist with two of the four driving key factors noted by Smith (2014): data analysis aptitude (#4) and statistical understanding (#5). Student motivation (#1) and teacher influence (#6) do not appear to lend themselves to hands-on learning. Competence with software packages (#2) and quantitative aptitude (#3) were not key drivers (Smith, 2014). Although aptitude for data analysis (#4) and understanding statistics (#5) are complex factors frequently dealt with in a classroom setting, it is clear that experiential learning also engages students with the curriculum and enhances their understanding of intricate ideas (Papamarcos, 2002).

PBL is one method of implementing the Kolb cycle, while also adhering to Dewey's principles, and driving the students toward a level of "deeper learning" as they engage in real-world problems (Pellegrino & Hilton, 2012). The concept of "deeper learning" is the development of 21st-century competencies within three domains: cognitive, interpersonal, and intrapersonal. Cognitive domain competencies are related to thinking skills, creativity, problem solving, and content knowledge (Huberman, Bitter, Anthony, & O'Day, 2014). All of these are necessary to develop proficiency in quantitative research. Although some resistance to PBL exists, specifically in terms of those who advocate for specific content knowledge, the approach has become increasingly popular (Huberman et al., 2014).

## Alignment of Course Work With the PBL Experience

The management curriculum progresses through three required courses that involve statistical analysis. Each in turn is more reliant on realistic experimentation. The final course culminates in a PBL experience where students engage a course client from the community and work through a systematic problem-solving cycle to provide data-driven recommendations. The students work continuously with the client throughout the semester, and the course concludes with a final formal report and

presentation. This PBL experience is consistent with the work of Dewey and Kolb, as it emphasizes deeper learning through learner interaction with the content in a hands-on way that resists formulaic or rote approaches.

### **Course One**

The first course is taught at the 200-level. Usually sophomores take the course with an enrollment of about 105 students per semester. No prerequisites exist. This course is an introductory study of statistical methods with application to business and economic problems. The topics covered include the following: frequency distributions, measures of central tendency, measures of dispersion, probability, probability distributions, sampling distributions, estimation, statistical inference, and simple linear regression. The course places an emphasis on the use of statistics in terms of its application to particular types of problems. Most of the calculations are by hand. The instructor provides the theoretical foundation and then initiates problem challenges within the classroom, as practice. In this way, the students can experiment with the concepts. The intent is for the students to understand the mechanics behind the problem solutions. Homework assignments address the weaknesses and strengths of the students in terms of their understanding of the application of specific statistical methods of analysis, as determined by the instructor. A goal of this course is for the students to become confident in solving foundational statistical problems.

### **Course Two**

The second course, primarily for juniors, is conducted at the 300-level. Enrollment is 70 students per semester. The prerequisites include the 200-level statistics course. The course provides a study of the techniques and tools used in analyzing business and economic data, and focuses on estimation techniques and the interpretation of results. The syllabus includes simple and multiple regression methods, time series analysis, non-parametric techniques, analysis of variance, and survey methods. The course emphasizes the use of computer software, specifically Excel and Minitab. The instructor provides the theoretical foundation and then provides the students with various data sets for analysis throughout the semester using the identified software. Each data set has a known solution. The course grade depends upon the ability of the students to successfully obtain that solution. Students are able to experiment with the data sets and then correct their analyses after evaluation by the instructor. A goal of this course is for the students to become confident in solving statistical problems using these software packages.

### **Course Three**

The third course is at the 400-level, taken by seniors, and it constitutes the PBL experience. It is not a statistics course, per se, but an applied quality operations course that requires the use of statistical and data analysis techniques and software, including Excel and Minitab, to collect, analyze, and develop improvement recommendations for a course client. Approximately 20 students take this course each semester in a single section. The prerequisites include both the 200- and 300-level courses discussed previously, and the first level of an Operations Management course, a 300-level course. The first-level Operations Management course is not a statistically driven course; rather, it presents a broad survey of operations management. Its significant role to this 400-level course is its emphasis on Quality concepts as well as notions that may be used in terms of noted improvements derived from the statistical analysis performed for the project. It is a lecture-based course taken by all business students.

#### ***Application of Quality Tools to the Problem-Based Learning Course: Lean Six Sigma (LSS) and DMAIC.***

During the PBL course, a live project is the focal point and serves as a tool designed to provide data-driven recommendations for a client through the use of the Lean Six Sigma (LSS) problem-solving cycle of Define-Measure-Analyze-Improve-Control (DMAIC) (Brussee, 2004). This framework requires students to work in teams and to apply statistics to each DMAIC phase as applicable to the client-based project. The process calls for flexibility in applying various statistics, using software tools such as Minitab and Excel, to engage with the data and to provide recommendations. It is important to note that the use of DMAIC is at a general level to accommodate time constraints, as the students have a single semester to complete the project. The goal is to provide students with the opportunity to select from a variety of potential statistical tools and to employ those that best, and most efficiently, provide the client with usable, valid data. This particular approach embodies the theories of Dewey and Kolb in terms of the transference of acquired knowledge and skills to a pragmatic scenario.

#### ***Operationalizing Lean Six Sigma and DMAIC.***

LSS employs DMAIC to systematically bring forth an improvement in a process (Furterer, 2013). These improvements may be in the areas of efficiency and the elimination or minimization of waste. Additional elements include effectiveness and consistency in meeting identified targets with zero defects.



Each of the five phases of LSS has a specific goal. Each phase has different tools, some that overlap phases. The Define phase aims to identify the project's scope and objectives as well as to understand the high-level process and the stakeholders, and the inputs, outputs, and functionality. The goal of the Measure phase is to understand the process at a detailed level, identifying metrics to characterize the process, and measurement at a base level as the first step for improvement. The Analyze phase identifies the influencers of the process's performance. The goal of the Improve phase is to identify new process operating conditions and improvement recommendations. The Control phase establishes the plan to sustain the gains. For the 400-level PBL course, the students are expected to recommend the improvement and control mechanisms but are not expected to ensure implementation and monitoring due to the semester timeframe of the project.

The strategy of the 400-level course is to engage in all four phases of the Kolb cycle. Students attempt to take what they have learned in the abstract and apply this knowledge during live experimentation, learning the value as well as recognizing the ambiguity of data analysis. Such project-based learning is fluid in that students may look at the data differently, and using the technology available, they are able to manipulate the data, analyzing and visualizing it in response to various considerations. In this way, the answers derived are not known outcomes, but instead are credible, sound solutions that could offer explanations for the organization's challenges, thereby providing the students with a realistic model of what they will face when met with management problems during their career.

## The Project Objective

This section provides insight into the thought processes of the students and describes the tools they employed to operationalize their client-based project. The study was approved by the Human Subjects Institutional Review Board at their university. The students were engaged in a thorny project involving a local restaurant. The client/restaurant owner presented his situation during his visit to the class as one that involved increasing profit margins for his restaurant. However, this initial and only visit was flawed by several factors that impeded clear communication of the issues at play and that set off a series of misunderstandings.

### *Miscommunication: Failure to Launch*

The client presented only scant data during the visit and did not appear to be aware of the genesis of the problem regarding his restaurant's low profit margins, similar to chefs Gordon Ramsay's and Robert Irvine's clients. For example, the client consistently indicated poor marketing as the culprit, but he was not

armed with meaningful data to support that assertion. It became difficult to move the students' focus from marketing to internal process management for the remainder of this initial classroom visit. During this initial meeting with the client, the students asked questions of the client, then offered ideas and solutions, but without the benefit of gathering and analyzing data, as they had been taught in their PBL courses. This was a point that would later bear importantly as our case study developed. Why did the students fail to rely upon the training they had received in their courses?

### *Initiating the Project: Evaluation and Assessment*

To begin the project, students evaluated the restaurant's online information, including its website and online reviews. The initial impression was that customer feedback clustered in two areas: (a) long wait times, and (b) inconsistency in menu offerings. These data provided the students with an "Aha" moment, as these data began to identify hints to problem areas at the restaurant that required operational intervention rather than marketing approaches such as social media campaigns and student discounts.

The class visited the restaurant and spoke with wait and kitchen staff. In an effort to validate the social media comments, the students asked the staff members to identify what they felt were major issues contributing to profit margin loss. Then the students mapped the high-level process flow for the restaurant.

The mapping identified that waste of pre-consumption food was a problem, particularly on weekdays. This category of food includes food that is inventory-ordered, stored, and prepped prior to delivery to the table. This category of food waste was less a problem on the weekend, as guest demand centered in the bar area. The wait staff stated that long wait times for food from the initiation of an order to the time that the food was served constituted the largest complaint, particularly during lunch time as guests were concerned about returning to work on time—the average in-restaurant time during lunch was approximately 60 minutes. From these discussions, the focus on improvements was on the weekday time period. The class then formed into two groups with half of the students working on pre-consumption food waste, and the other half focusing on long wait times for food from the time of order.

### *Group Goals and Data Collection Periods*

The goal of the pre-consumption food waste group was to recommend actions that potentially could reduce the amount of food thrown away by 10%, which translates into approximately a 3% decrease in costs, a value identified as a reasonable and attainable goal in industry literature (Simon, 2018). Such



### Wait-Time Group Findings.

The wait-time minimization students conducted restaurant time studies from client entry to departure. Using cell phone timers, the students unobtrusively observed the time elapsed, including the following categories: wait time to be seated, wait time for order to be taken, wait time for food to table, elapsed time to complete meal, wait time for checkout, and total wait time. Lunch hours were from 11:00 a.m. through 1:30 p.m.

The data set comprised 50 restaurant guest parties. Minitab's graphical summary function served as the means to evaluate the data from each category. With regard to total time spent at the restaurant, the data were normally distributed, illustrating a mean total time of the restaurant visit of 61 minutes. The minimum total time for the evaluation sample was 52 minutes, and the maximum total time spent was 71 minutes.

The students evaluated each time category for measures of central tendency, maximum value, and minimum value and statistical difference. When the data were abnormally distributed, the students used the median value; if the data were normally distributed, the students used the mean value. The finding from this analysis indicates that guests were waiting for the food to be delivered from the kitchen for a longer period of time than it took them to consume the food. This finding was not surprising to the students, as they had initially hypothesized that the best way to reduce table time was to get the servers to move and serve food more quickly. Moreover, increased efficiency in the front-end processes (seating and ordering) did not alleviate the issue of reducing table time.

The students calculated total table time as the sum of (a) time to take order, (b) time to receive food, and (c)

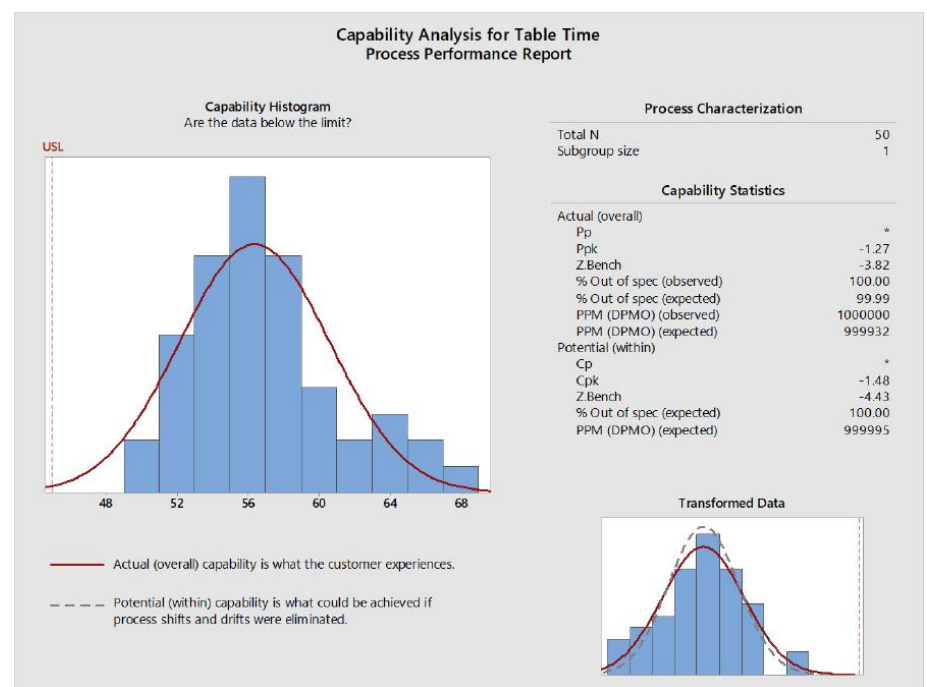
time to eat. The median table time was 56 minutes, with a minimum value of 49 minutes and a maximum value of 67 minutes. The instructor challenged the students to determine the capability of the current processes to achieve the 45-minute specification goal (Jennings, 2018). The students experienced difficulty with the capability analysis because the table time data were non-normal. As a result, they transformed the data and ran an additional analysis. That analysis appears in **Figure 2**.

**Figure 2** illustrates that the current processes used at the restaurant were not capable of meeting the 45-minute specification for table time. Armed with their data, the students conducted the analysis phase by interviewing the kitchen staff and observing the preparation process during lunchtime, which included these inputs: human, machine, material, measurement, supplies, procedures, and environment.

From the observation and interviews, the students determined several elements that could potentially reduce table time. These included (a) capacity of the kitchen in terms of size, (b) consistent use of timers, and (c) standard work.

### Ancillary Factors Impacting Wait-Time Minimization.

In measuring the floor space of the restaurant, the kitchen comprised only 7% of the total. A standard ratio for kitchen space is 33–40% (Decker, 2016). In this undersized kitchen, the grill used was far too small to contend with the number of food items, such as burgers and comparable items, ordered during lunchtime. Further, the small size of the kitchen contributed to bottlenecks in ordering, as well as in food preparation, as kitchen staff tried to navigate the confined space. Despite the use of timers in the cooking process, the hectic pace of the kitchen contributed to burnt food as staff would forget an entrée in an oven.



**Figure 2: Capability Analysis of Table Time to 45-Minute Target Using Transformed Data**

As a result, a luncheon item may have had to be prepared again, thus contributing further to lost revenues.

Lastly, no recipes existed for menu items. This created issues with variation in preparation time, as some cooks created the menu items a bit differently than others. The outcome: some items cooked longer than others depending upon the chef. This inconsistency contributed to the bottlenecks. The lack of recipes also contributed to cost inefficiency of meal preparation, as variations in the measurement of ingredients contributed to inexact amounts of food and inconsistent costs.

The student team recommended expansion of the kitchen, which was feasible as an unutilized section of the building behind the restaurant existed, and a sister venture could support the project with capital for the expansion. Another recommendation included a larger grill and the use of timers.

To control improvements, the students recommended continued monitoring of time as well as regular review of social media review sites. However, the team's recommendations required additional time to implement, another point that contributed to information in the case study.

In reflecting on the project and the lessons learned, the students were excited about identifying critical operational issues to assist the restaurant. Further, the project established the need to collect and utilize data as a tool upon which to base solutions. For this project, if the final answer had been an aggressive marketing campaign to improve volume, as initially proposed by the restaurant owner, profit margins would have worsened. At the conclusion of the project, the course client did not communicate to the students his intention to implement their recommendations, or not—yet one more critical observation that informed our case study, as it would have been important for the students to know the final outcome of their efforts.

## Analytics and Student Confidence

This study sought to determine whether a capstone course for management students that employed data-driven PBL enhanced perceived confidence in applying statistics and data analysis to real-world business decisions. The students had some level of baseline confidence, given the two preceding statistics courses (and prerequisites) taken. According to our hypothesis, the PBL course should have resulted in an improvement in this confidence, demonstrated statistically. Other outcomes may have resulted in the following: (a) a derogation of perceived confidence, and (b) no change in perceived confidence.

To evaluate this purpose, three questions arose:

**Research Question 1:** What is the baseline perceived confidence of students who apply statistics and data analysis to actual business decision making prior to completing the PBL course?

**Research Question 2:** What is the perceived confidence of students who apply statistics and data analysis to actual business decision making after completing the PBL course?

**Research Question 3:** Does a statistical difference exist between students' perceived confidence levels in terms of Research Question 1 results and Research Question 2 results?

## Methodology

This study was approved by the Human Subjects Institutional Review Board (HSIRB) protocol approved by the university. A pre- and posttest consisting of a survey was used. The survey instrument provided the following responses to both Research Questions 1 and 2:

- 5 = Extremely confident; I am ready to go!
- 4 = Confident; I will need some help, but I know I can do it!
- 3 = I'm not sure! I know quite a bit, but I'm not sure what I might face.
- 2 = I think I will struggle out there. I have a long way to go in learning about analysis and stats.
- 1 = I want to hide and hope I never see a number!

The PBL instructor, in an effort to capture perceptions in a short time frame, constructed the survey. The language of the scales was developed to allow the student to better relate to the operational definition of each rating. Its validation was limited to a review of the survey by students who had taken the course in the past, simply for clarification of the scale. The reliability of the survey was not vetted. Twelve students performed this review. No changes to the survey were made because of this review.

The 29 students enrolled in the 400-level PBL course received a link to the survey at the beginning of the semester and again at the end. All respondents were over 18 years of age. The population consisted of 17 men and 12 women. The survey had 100% participation. The time window for taking the survey was one week. Upon students' completion, the instructor exported the survey data to Excel and uploaded to Minitab to complete a comparison of the results using a two-sample *t* test to detect whether a difference existed between the survey means.

## Results

The results for these research questions are found in **Table 2**, Descriptive Statistics of Survey Results, Pre- and Post-PBL course:

**Research Question 1:** What is the baseline perceived confidence of applying statistics and data analysis to actual business decision making prior the PBL course?

**Research Question 2:** What is the perceived confidence of applying statistics and data analysis to actual business decision making after taking the PBL course?

**Research Question 3:** Does a statistical difference exist between the perceived confidence level in terms of Research Question 1 results and Research Question 2 results?

Variable	N	N*	Mean	Median
Baseline Prior to PBL	29	0	2.379	2.000
Change After PBL	29	0	3.7586	4.0000

**Table 2: Descriptive Statistics of Survey Results, Pre- and Post-PBL Course**

A two-sample *t* test using the data from the before and after survey shows a *p*-value of 0.000. Thus, the conclusion is that the mean of pre-PBL survey results is less than post-PBL survey results at the 0.05 level of significance. However, the mean values for each, as illustrated in Table 2, do not clearly correspond to an increase in confidence; in fact, these mean values appear to be within the area of neutrality. Thus, no clear increase in confidence can be demonstrated from these data.

This fact gave rise to questions that informed our case study: If the results were not statistically significant, especially given the intricacy of the PBL course design with its experiential learning component, then why had the students' confidence level not increased?

## Revamping the Study: What Did We Learn?

To answer this question and to determine how to improve this project, in an effort to replicate it in the future and to lend to continuous process improvement, we evaluated our original study. Using the quality methods related to root-cause analysis, several areas of weakness in both the study and in the course content emerged that may have contributed to the lack of statistically significant results.

## The Study Design

Most significantly, the flaws within the study may have impacted the results. Specifically, the survey itself is a likely culprit. It was not adequately validated, nor was its structure conducive to clear delineation among the ratings. For example, each of the first three anchors (ratings 1–3), in terms of linguistic phraseology, inadvertently imply low confidence, which may serve to skew the data. Students who had even a trace of doubt as to their confidence level were compelled to choose any of the first three items. These three items, collectively, pushed the findings into a deficit of confidence result. Additionally, the survey allows for a neutral rating, which really does not inform the perception of confidence or a lack thereof.

Students who indicated that their confidence was neither strong nor weak would be compelled to take the neutral (safe) position, which indicated no value of worth to the study.

## Preceding Coursework

When the PBL course project was initiated, the client framed the problem to the students in his presentation as one of marketing. As a result, the students tended to focus on marketing as part of their questions to the client. They appeared to have abandoned their course preparation. The students had completed prerequisite coursework in Operations Management where they had learned, or so we thought, of the importance of collecting and analyzing data prior to developing solutions. However, it is clear that the students either had not acquired/learned this information via their courses, or had not recalled it, or had simply deferred to the client's perception of the problem and not relied upon the importance of data collection and analysis prior to problem solving. This fact compels the research team to review and evaluate the materials that comprise the PBL course to determine the content as well as the educational delivery modality and to evaluate whether the students are truly learning this information.

## Client Preparation and Interaction

When the course client visited, the problem presented was devoid of data. Further, the client posed marketing solutions as interventions to address the restaurant's financial goals, and he may have inadvertently/unintentionally assumed a position of authority rather than a seeker of knowledge and expertise. Lastly, the client did not clearly express to students at the end of the project whether his restaurant would embrace the recommendations developed, and so a post-research interview process

with the students in a focus group environment with the client would have enhanced the opportunity to explore their working relationship.

### Students' Research Methods

The two research groups (Pre-Consumption Food Waste Group and Wait-Time Minimization Group) collected their data for different periods and lengths of time with varying target populations. The student groups determined their own collection process and did not consult with faculty or with evaluation specialists regarding their data collection procedures. These variances constitute critical gaps in the research process that compromised efficacy of outcomes.

### Continuous Process Improvement: What Do We Do Next?

To improve this study for its next reiteration, several approaches will be pursued. These approaches include study design and course interventions. The structure of the PBL course, including its course objectives, content, and training materials, should be evaluated by curriculum experts to determine if it requires restructuring and redesign. Pedagogical methods for the delivery of information should also be evaluated to determine if these methods are successful in reaching goals.

The PBL course should be evaluated and assessed in terms of its outcomes: Are students actually learning and applying their statistical knowledge in real-world scenarios?

The secondary literature will be evaluated to identify any valid and reliable surveys that may be used or adapted to measure students' confidence. If a new survey is developed or an adaptation is made, that survey instrument will be evaluated for validity and reliability for use. Further, the survey used will not allow for neutrality and will provide clear delineation among the ratings in terms of confidence. Standard Likert-scale rankings will be used to more definitively capture results.

Focus groups will be held with students who have completed the PBL course to identify possible improvements to the PBL course and the preceding courses, including the Operations Management course, that may enhance their confidence in applying statistics to solve live business problems. These focus groups and resulting improvements will be implemented prior to repeating the study.

Other than the PBL course, the research team will determine if students require additional kinds of support to foster their confidence in statistics and its application.

Focus groups should be held with the client to determine the success of the students' recommendations and whether the client actually implemented those recommendations. In addition, the

client should receive specialized training to help prepare him or her to present information to the class to ensure that students have the kind of information they need to engage in the research. These standards will be drafted and implemented before this study is repeated.

Standards for problem-solving phases will be developed for the PBL course. These standards will include specific direction with regard to each phase of the DMAIC cycle, such as measurement timelines. Each team will provide a tollgate presentation prior to moving to the next phase to ensure the adequacy of work on which to build subsequent actions.

### Conclusion

Most research is undertaken with optimism and a certain expectation. However, it is quite frequently an expedition that may lead researchers, ironically enough, in an unforeseen direction. Along the journey we may end up with a more interesting and provocative question than the one we originally pursued. This article captures a journey that leads to continued inquiry and to continuous process improvement in an effort to establish quality.

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Quality principles and methods are invaluable strategic tools that inform the leadership framework, enabling leaders to perceive requisite steps and to communicate them throughout the organization. This powerful dynamic is rooted in the rich history of quality.

## Reflections on How Quality Influences Leadership

John R. Dew

People have struggled with the question of what constitutes effective leadership for the past two millennia. For many centuries in the Western world, Plutarch's (1895) *Lives*, written around 100 A.D., was the foremost book on leadership, as it examined how famous Greek and Roman leaders conducted themselves. Erasmus's *The Education of a Christian Prince* (1516/1997) and Niccolo Machiavelli's *The Prince* (1532/2010) were competing, and strongly contrasting, views on leadership in the waning years of what has been called the Middle Ages. In the East, *The Analects* of Confucius (1885), recorded around 497 B.C., may likewise be viewed as the earliest and one of the most important sources of wisdom about virtue and proper leadership.

Leadership has been explored from the significantly different contexts of monarchies, oligarchies, and democracies. Likewise, leadership has been examined from the perspective of leadership in business, nonprofits, educational institutions, communities, and the military, with many different points of view about what constitutes effective leadership and how leaders are developed or emerge from situations.

In the 1990s, the thought leaders in the quality field rediscovered a lesson they had painfully learned in the early 1950s. Organizations cannot effectively sustain the use of quality methods only as a grassroots movement coming up from within an organization. Quality concepts must be embraced and championed by an organization's leadership, so many opinions were offered regarding how to develop a commitment to quality among an organization's leadership. Fewer opinions, however, have been offered on how an understanding of quality influences the practice of leadership.

Joseph Juran's (1989) book, *Juran on Leadership for Quality*, provided insights for how senior leaders in organizations need to think about quality and incorporate quality concepts in their planning, just as seriously as they consider financial planning. And while some argue that Philip Crosby (1979) did not offer any particularly new contributions to the quality body of knowledge, he did write books, such as *Quality Is Free*, which were useful in helping people in leadership understand the importance of quality principles and methods. Deming (1986) contributed thoughts as to what leaders should do in order to support quality in their organization but also offered some thoughts as to how an understanding of quality, particularly in terms of understanding the impact of variation on repeatable processes, would influence how leaders think about their role as leaders. Quality, Deming would say, provided "profound knowledge" that could shape a leader's perceptions of how the world functions.

So, for the purpose of these reflections, it would be appropriate to offer a definition of what the term *leadership* means. Perhaps in its broadest form, *leadership is the ability to recognize what needs to be done in a particular setting, and the ability to find a way to get it done.*

Quality principles and methods are extremely valuable to leaders because the quality discipline helps would-be leaders perceive what needs to be done, and the discipline provides much practical advice about how to get things done.

A significant part of the quality body of knowledge has its roots in the work of Walter Shewhart, who was W. Edwards Deming's mentor. When Walter Shewhart (1931) conducted his studies of variation in repeatable manufacturing processes and published his work in *Economic Control of Quality of Manufactured Product*, he was not operating in an intellectual vacuum. Shewhart was greatly influenced by the philosophy of Alfred



North Whitehead and references Whitehead's (1978) *Process and Reality* in his book. Whitehead proposed that progress is the art of recognizing and protecting those things that should not be changed, and recognizing and changing those things that should be changed.

This leads to another possible definition for the purpose of this article—a definition of the quality discipline. *Quality, as a discipline, is fundamentally an approach to studying change, within the context of Whitehead's philosophy and definition of progress.*

## What Does Quality Contribute?

Quality professionals help their organizations maintain quality by designing quality control actions into work processes and embedding measurement systems to ensure that unwanted change is not creeping into processes. To do this effectively, it is essential to recognize the difference between variation that is common to a system and variation that is being introduced as a “special cause,” which was the major contribution of Shewhart, championed by Deming.

Furthermore, quality professionals help by introducing change to work processes through systematic approaches to improvement, which Joseph Juran and Kaoru Ishikawa (1974) championed. Both quality control and quality improvement rely on quality planning, according to Juran, which means engaging leadership in determining what constitutes progress—what should be changed and what should be maintained—in Whitehead's view.

However, the quality body of knowledge does not stop with planning desirable change and preventing undesirable change in systems in processes. Part of the body of knowledge examines what to do when unwanted change does occur. We call these situations “problems” and they require diagnosis to understand causes, along with remedial actions. Juran observed the importance of solving problems but advocated quality control and quality improvement as ways to keep problems from happening in the first place. Better to have an organization working on preventing fires rather than putting them out. This became the essential and compelling argument that Crosby used in communicating to would-be leaders. The cost of quality is not just the cost of preventing fires, but must be seen from the perspective of the cost of putting out “fires” (quality failures) and the multitude of costs associated with the damage from quality failures in terms of materials, injuries, scrap, rework, lost customers, and legal costs.

Over time, the quality body of knowledge has grown to include a fourth major component regarding the need for innovation, or radical change, which goes beyond gradual improvements. Dr. Deming embraced the idea of quality control and quality

improvement, but he also advocated for innovation. He would ask in his lectures, “Who wants to be the best manufacturer of buggy whips?” So, the quality discipline has embraced many approaches to innovation and creative thinking, from Osborn's (1953) approach to brainstorming to Altshuller's (1984) Theory of Inventive Problem-Solving (TRIZ).

## Recognizing What to Do

If the first step in leadership is to recognize what needs to be done in a certain context, then the quality discipline contributes a great deal to effective leadership.

Many people want to be leaders, perhaps out of their egotism or pride, but when placed in a leadership role they are paralyzed because they do not know what to do. Sometimes this is due to overthinking the situation (the paralysis of analysis), but perhaps it is more often the case that they lack an effective way to frame an issue and understand what actions are needed and resources are available. They lack the ability to recognize what needs to be done. The most common response to an issue by ineffective leaders is to simply reorganize the organization, putting off necessary actions in the hope that the clock may run out or that some miracle will occur. Almost everyone has witnessed the “reorganization of the deck chairs on the Titanic.”

The quality discipline can provide leaders with effective approaches to analyzing a situation, collecting and analyzing relevant data, recognizing the causes and root causes of situations, and identifying how to develop and implement effective plans. It enables participants in an organization to contribute to developing improvements, solutions, and actions to sustain the organization, if the leadership allows. Conversely, it enables people to clearly see when actions or proposed actions by leadership are flawed. Anyone who has read Deming's “14 Obligations of Management” can recognize how quality concepts can be used to critique the failures of leaders.

*While quality as a discipline is the study of change, its methods are all about cognition—how to think about what is happening in the world.*

The quality methods are evidence-based in that they have been applied successfully and critiqued extensively in many diverse settings. Whether we are working in manufacturing, finance, service organizations, nonprofits, government, medical, biomedical, educational, military, construction, aerospace, power production, transportation, or any other endeavor, the quality body of knowledge has been proven to provide an effective approach to thinking about what is happening and recognizing what needs to be done. Attempting to lead without an understanding of quality principles and methods, which enable

people to recognize what needs to be done, is likely to send an organization or community off in a bad direction.

## Knowing How to Get Things Done

While it is vital for leaders to be able to recognize what needs to be done, it is also important that they find a way to get the necessary actions accomplished. There are two pitfalls associated with this realization.

The first potential problem concerns people who can diagnose what needs to be done but cannot communicate, organize, inspire, or collaborate with other people to get things done. It may be due to their personal style or having their voice marginalized due to their social status in an organization or community. Or, it may be due to a lack of time, energy, and commitment to see things through from an idea into completed actions. In some cases, the established leadership will consider ideas for change as a threat and will deliberately silence those who see what needs to be done. Dr. Juran (1964) wrote extensively on this topic in his book *Managerial Breakthrough* in the 1960s, which has been an issue in organizations ever since then.

A second pitfall is that the vision of what needs to be done is insufficient, drawing upon or encouraging actions based on incorrect data, improper analysis, and even harnessing prejudices that may exist in an organization or community. Some actions are proposed because they fit comfortably within the political realities of an organization, even though the proposed changes will have no meaningful impact. In other cases, the quality concepts are simply tossed aside in favor of budgetary or schedule considerations, resulting in eventual failure for the organization and all manner of pain for the employees and customers who are caught up in ill-conceived plans.

Quality methods can most definitely contribute to the leader's ability to get things done. The Quality Body of Knowledge includes methods for planning and communicating change. Methods such as Kurt Lewin's (1951) force-field analysis are extremely useful in anticipating and overcoming resistance to change, while quality methods, such as systematic assessments, using audits, comparison to standards, and frameworks such as the Baldrige Criteria, all contribute to tracking and evaluating change.

In summary, the quality discipline provides potential leaders with an effective way of thinking that helps identify what needs to be done and how to get these things accomplished. Quality serves as a vital resource for shaping how leaders perceive the world around them and how they implement change for the betterment of people, organizations, communities, and the planet.

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Leaders must consider the value of educating themselves about actual member needs within their organizations, and then, through analysis, mindfulness, and purpose, engineer the right combination of products and services to meet those needs. In this way, professional societies are transformed into learning communities through which areas of expertise converge to serve the greater good.

## Late Night Drinks in Boston: Three Principles for Focusing Association Leadership on User-Centric Quality

Austin S. Lin

There were blueberries floating in my beer.

“Haven’t you ever had organic fruits bobbing around in your drinks before?” Shelli inquired. “I don’t think that’s a normal question people ask,” I replied.

Many years ago, I was catching up with a longtime friend and colleague in her hometown of Boston where I was stopped for a few days after a long circuit of international travel. Shelli, who traveled frequently for her own work at one of the Big Four accounting firms, was also in between time zones and bouts of jet lag. But she had wanted to meet me here, Boston Beerworks, to introduce me to some local tastes.

I worked in manufacturing quality in the consumer packaged goods industry at the time and whenever we were able to meet, she and I would find our conversations drifting toward supply chains, financial markets, and corporate stewardship. And if those conversations involved hand-harvested blueberries from Maine being gulped down with a local microbrew, those nights would be that much better. But what I always looked forward to were her takes on consumer products.

Some of Shelli’s greatest hits (shared with her permission—I would dare not otherwise):

*I wish there were more hair dryers that didn’t have to be plugged in. If you can have cordless power drills, why not hair dryers?*

*Why don’t they have travel guides that are way more specific to, say, financial advisors on business trips? I’d pay for one of those.*

*Whenever I travel and a heel breaks on my shoes, I wish I could just snap a new one back on. Why do I have to find a cobbler? Why don’t they have technology for that by now?*

She was voicing the specific needs of a very specific user (a frequently traveling businessperson) that emerged in a specific scenario (needing to efficiently overcome minor mishaps during business trips).

How do people, businesses, and organizations learn if what’s being offered is the same as what’s actually needed?

Regardless of industry or profession, the general maxim (attributed to a major tech company) still holds true: focus on the user and all else will follow.

Optimizing for revenues or profits versus optimizing for user needs in order to gain eventual revenues or profits are two entirely different world views. Understanding that difference is at the heart of how top business professionals operate in the modern era.

In the world of nonprofit professional technical societies, how do we learn what users want, and how do we create structures that best enable such knowledge to progress from ideas to action? How does this user-centric quality apply to members of a professional association like ASQ?

The modern miracle of membership in professional societies is that, year after year, there are tens of thousands of individuals who are a part of your organization, not because they have to be, but because they want to be.

During my tenure as chair of the ASQ Board of Directors in 2020, I found three common principles that were central to any membership-based professional organization that was introspective enough to know there is always a better way of delivering member-valued experiences.

Whether an association was performing at its healthiest peak or enduring its historically toughest pandemic-driven challenges, keeping the end user in focus while making organization-wide decisions protects the present while building for the future.

***(1) Governance serves members; members don't serve governance.***

Nobody joins a society because of how well it writes policies.

As quality professionals, we make it our livelihood to ensure compliance is in place, whether it be for efficiency purposes, such as in standardized operating procedures, or for regulatory adherence.

But as we express our expertise in these areas, it is important that the end user never falls out of the equation. Large organizations require some level of standardized policies by necessity in order to stay healthy, but we oftentimes neglect to ensure that our documentation has a real-life end user as its beneficiary: a member whose participation in the society enables them to create moments that are valuable to their personal and professional interests.

If an organization is spending the majority of its time innovating around member-valued experiences and building the governance infrastructure to better scale those experiences, we're doing the right thing.

If instead an organization finds itself spending more time discussing its governance rather than discussing the members that those policies are meant to serve, then we are neglecting true end-user needs.

***(2) Transparency is not a feature or a bug. It's the operating system.***

Trust is the output of a transparent system that stays healthy over time.

To build a platform for that trust in 2020, ASQ focused on three themes: financial transparency, ASQ culture, and member value acceleration. Any healthy professional society needs all three as the overall system in which our members and employees work, develop, and thrive. ASQ is a member-led organization whose business execution is supported by the professional expertise of full-time employees. Our complementary skillsets combine to form the engine that generates member value. Clarity across these thematic areas is the fabric of our functionality.

*Financial Transparency*—Financial transparency aims to remove jargon from the work that goes into getting ASQ into a financially solid and fiscally diligent state of health. A financial scorecard, which will be deployed in 2021, will help our nearly 3,000 member leaders quickly see how our most critical metrics are trending. Collectively as professional experts, that will enable us to work more uniformly together to keep ASQ healthy.

*Culture*—Having a financially solid organization is meaningless if the resulting environment doesn't foster the vibrant community of QA professionals that ASQ has always aspired to become. For ASQ culture in 2020, we simply asked this question to our members and to our employees:

*"ASQ is a place I want to be. Is that statement true or false for you?"*

For our first phase of work, this centered around quantifying a baseline of diversity, equity, and inclusion (DEI). For example, with only 7% of ASQ past presidents being women and less than one quarter of one percent (0.21%) of ASQ Fellows being black, we have not worked hard enough to fully identify the talent that is out there doing amazing work in our profession.

The common misperception that DEI work is focused on fulfilling quotas is simply incorrect. By actively seeking out individuals who are just as highly technically capable but have not had the same privileges, mentors, and networks the majority of members have been privy to, we are raising the standard of quality for the entire profession.

Next steps in our cultural journey in 2022 will include professional conduct and workplace psychological safety, as both are also critical in making ASQ "a place where I want to be."

*Member Value Acceleration*—Once we have a financially stable place where members "want to be," how do we ensure we are delivering the most valuable member experiences in the most effective manner? That is what the member value acceleration group was charged to evaluate. Starting with a prioritization of the most important member journeys—those reasons, actions, and opportunities that brought them to ASQ to begin with—the group's aim in 2021 was to quantify those top processes and scale them globally.

***(3) Leadership is for the members, not of the members.***

While there is certainly a level of honor and privilege to serve in any association's senior leadership, a professional society's org chart should be its least interesting characteristic.

For societies like ASQ where we have passionate volunteers serving at all levels of the society, from board director to section membership chair, what we do for our members is far more important than what our title is while we're doing it.

For ASQ's 60,000 members, likely a solid majority don't know or care who is on the Board of Directors. Instead they are just asking themselves, "How does my membership in ASQ benefit my professional success as well as the relevance of the profession?"

If we can't lead an organization along that inquiry, we're simply not working on the right things.

The best association boards, regardless if they serve local, regional, or national constituents, are active working boards, not passive observers. The best boards should be seen by their members to be functioning more like cross-functional lean sigma teams and less like opaque secret societies. Boards should strive toward being able to clearly draw solid-line connections between executive-level decisions and end-user benefit and to establish metrics that illustrate those connections.

In 2020, for the first time in ASQ's 75-year history, we created a set of leadership key performance indicators (KPIs) to publicly evaluate the performance of the Office of the Chair (past chair, chair and chair-elect), the Board of Directors, and the CEO. I am immensely excited in seeing how we can use these measures, not as a report card but as a baseline for metrics-driven continuous improvement discussions throughout the Society.

By educating ourselves about actual member needs and then engineering the right combination of products and services to meet those needs, professional societies can truly become communities where vast areas of professional expertise converge to serve a greater good.

Closing down a local bar on a Wednesday night is not really a badge of honor worth bragging about, but the ideas Shelli left me with that night have always made me rethink if end users are truly a part of any product or service I help create and deploy. "And now for a product that needs no improvement," Shelli said, finishing her blueberry beer before crossing the mezzanine toward the billiards table. She plucked a pool cue from the side wall. "Are you any good?"

"When I'm naturally the worst at something, getting better is my only option," I offered.

"Let's see if that's true," she replied.

I nodded. "Let's see."



**Austin Lin**

**Austin S. Lin** served as Chair of the ASQ Board of Directors in 2020. He previously served in leadership roles in ASQ's geographic communities in the Greater New York City area and in Silicon Valley. He was the 2013 recipient of ASQ's Feigenbaum Medal for young professionals and in 2015 was elected as a Fellow of ASQ. Lin is certified as a Quality Engineer (CQE) and Six Sigma Black Belt (CSSBB) and holds a B.S. in chemical engineering from Johns Hopkins University. He resides in San Francisco. He can be reached at his email address: [austinslin@asq@gmail.com](mailto:austinslin@asq@gmail.com).

# Journal for Quality Perspectives in Knowledge Acquisition



Successful leaders  
are adept at building  
professional relationships  
scaffolded on trust,  
respect, empowerment,  
and communication.  
Leading to both  
organizational goals,  
as well as the personal  
goals of the individuals  
who comprise the  
workforce, they  
traverse a challenging  
environment that permits  
for personal and  
organizational success.

## Profiles in Leadership

*Sue Peiffer*

Leaders accomplish their goals by motivating, empowering, and preparing their teams to accomplish the work of the organization. Interestingly, the principles of high-reliability organizations also apply to individuals; the principles of mindfulness, sensitivity to operations, anticipation, and containment are interwoven below.

Communication and collaboration are vital; letting your team know why something is important to the organization, the department, and to them and how it supports the mission and vision and ties to the strategic goals helps people understand how their work is important and engages them to do their best work. An example of communicating to engage the team is to share a compelling story and work with the team to identify causes and solutions to avoid the occurrence in the future. If a goal is to decrease errors, sharing a strong example of a customer's experience related to the error engages the team's emotions and offers a compelling mental visual of why it is important to employ best practices and perform their work well.

One of the most important uses of a leader's time is to build trusting relationships. Relationships are the glue that holds teams together and engages them to support you, participate in improvement efforts, and advance progress to achieve goals. An element of building relationships is to care about your team members—to take time to know them better. Ask about their interests, families, vacations, and upcoming events in their lives. You will generally find commonalities that build connections and shared context. An important part of building relationships is to never show people in an unfavorable light. Nothing diminishes trust faster than to cause someone else to be subjected to a negative occurrence in order to personally benefit—gaining advantage or avoiding disadvantage. Another important part of relationship building is to give credit where credit is due. One of the most demotivating things a leader can do to their team is to take credit for another person's ideas or work. A leader who shares great ideas with other leaders not only retains the trust of their team members but builds the reputation of those members. If others have ever stolen your ideas and passed them off as their own, you probably still feel the pain, have great empathy for others when that happens, and hopefully have resolved never to do the same to others. How a leader treats people is a critical piece of professionalism and trust and is of vital importance to the ability to influence a team to accomplish their work.

Knowing what is important to your team members is also essential. My first leadership assignment was as the evening supervisor in a clinical laboratory. On my first foray into scheduling, I worked hard to give the part-time employees a long weekend or several days off in a row rather than dispersing days off randomly into their work weeks. The feedback I received was that this particular group of part-timers preferred to have their time off interspersed into their work weeks because working fewer days in a row was less taxing. Making the identified change did not negatively affect the full-time personnel and the part-timers were grateful and more engaged to know their voices were heard. One lesson learned from this experience was to gather input before making a change, especially when it is something that impacts the lives of those impacted by the change. Another lesson learned and the tenet I adopted at that point and one that has served me well over the years is that if something is important to someone, it is important—period. Accept that it is important and when there are related requests, accommodate them when possible or respond with why it is not possible. The final lesson from this experience is that a single person's solutions are based on the experiences and biases of one and are never as good as when many contribute. Humility is an essential leadership attribute—not the self-deprecating type of humility,

but being humble enough to know your knowledge, skills, and ideas are not always ideal. A single person is never as smart as a collective group of subject-matter experts.

That brings me to another lesson learned: avoid the black holes of information deficit. Follow up with anyone who has given feedback or offered an idea for improvement or brought forth a problem to fix. Even if it is just that you are working on it, passing on updates to those who offered ideas for improvement affirms that you value them and their contributions to improvement and avoids people filling the void with suppositions. Best of all, following up allows a leader to coach on how to solve a similar problem in the future. When I first was named director of laboratory services, there was a line of people outside my door waiting to bring issues. Early on, I started what we in health-care call rounding—going out to the workplace to talk to the employees (an adaptation of rounding on patients to check their status). As I went from lab section to lab section, I collected barriers and needs, uncovered opportunities for appreciation and to coach, discovered more about the staff as I went, and stayed in touch with lab operations. Every time I rounded, I started with offering requested information or a follow-up on progress from the last rounds. After reliably rounding for a few months, staff started “Sue lists” on their whiteboards and felt informed, and there was no longer a line of people outside my office. Over time and as employees grew and felt empowered in resolving their own issues, the Sue lists got shorter and shorter.

Rounding is also a great time to show that you value your team members. It is motivating to give positive recognition not just to those performing work tasks the best, but also (and especially) for those who always see the positive side, who offer great ideas, and who are great mentors to their peers. A caveat is to know how people like to be recognized. A quiet and specific thank you is best for some people and a public recognition is welcomed for others. Knowing the difference comes from knowing your team.

The act of building relationships through rounding offers the opportunity to attend to the critical elements of high-reliability organizations. Frequently checking in with your team and continually looking for failure helps leaders be attentive to the workings of the organization, continually evaluate circumstances and track small failures, resist oversimplification, be sensitive to operations, be resilient, and take advantage of those with the expertise (the subject matter experts—SMEs). Additionally, leaders can ensure integration of a functional corrective and preventive actions (CAPA) system to collect and analyze information; identify and investigate adverse events related to quality, safety, and service; and take appropriate and effective corrective actions to prevent recurrence. More importantly, leaders can elevate preventive actions to avoid the occurrence of adverse events (van Stralen, n.d.). Finally, leaders understand that systems are dynamic, and

while they are rounding they can be alert to improvements and changes that may have a domino effect from functional area to functional area. There are many examples of optimizing a part of the overall process and sub-optimizing the whole. For organizations with departments that work independently but contribute to the whole, improving within a department without knowing the upstream and downstream impacts can adversely affect the overall product or service.

Reluctance to simplify entails avoiding generalizations or labels that keep from digging further into events to uncover the details. Simplification obscures details and promotes developing general solutions that will not reliably improve performance. For example, it is easy to have complete trust in a high-performing individual or a touted “fail-safe” technology, leading us to be less aware of the complexity of the system or less alert to look for mistakes.

Being present with the team members also helps build resilience, which is critical to maintaining function during high-demand events. The three components of resilience are to absorb strain and preserve function during adversity, to quickly recover and return to service after adverse events, and to learn and grow from past events. One element of containment and a key part of humility is deference to those with expertise (van Stralen, n.d.). This element cautions leaders to seek out and listen to credible personnel who have recognized knowledge, skills, and experience, particularly the lower-ranking members of an organization. The COVID-19 pandemic offers great examples of how organizations were propelled to both commit to resilience and defer to expertise. When the cases of COVID were very high and a vaccine was not yet developed, healthcare organizations stopped offering elective surgeries and put a process in place to test those requiring urgent and emergent surgeries. They prepared plans to phase into recovery to return to full service as quickly as possible when it was safe to do so.

An important cognitive bias of which leaders should be aware is the Dunning-Kruger effect. Leaders may exercise poor judgment because they overestimate their own skills. Because they have expertise in one field, they believe they have expertise in unrelated areas. Leaders may also have a small amount of knowledge on a subject and mistakenly believe they know more than they actually do. This cognitive bias leads people to fail to recognize not only the skill and expertise of others but also their own lack of skill (Cherry, n.d.). Deferring to subject matter experts can help avoid failures related to the Dunning-Kruger effect. The world, national, and individual experts in infectious diseases guided us to put the proper personal protective equipment in place and use it properly to avoid acquiring or transmitting the COVID-19 virus. That was deference to expertise in action (van Stralen, n.d.).

One important concept to remember, especially with a volunteer workforce such as committee members from ASQ's technical or geographic communities, is that life happens. We all have timelines and deadlines to hit, but understanding that unavoidable life occurrences happen—such as a death of a parent, diagnosis of cancer, or a job change—and preparing for those occurrences helps a volunteer team be successful. Sometimes team members need help or need extra time to complete their assignments. Working together to support team members helps build trusting relationships and engagement. The team members understand you are prepared to support them when assistance is needed, and they rally to help others and the team to accomplish the committee goals. This was exactly what happened with the talented members of the Healthcare Body of Knowledge (HBoK) content teams. Teams were assigned reviews to ensure the content was accurate, relevant, and readable for a healthcare audience. Review periods were about three months long. Live events occurred for some team members during that time and others stepped up to take on additional reviews and hit deadlines. Even today, I am overcome by the generosity, reliability, and expertise of those magnificent HBoK team members!

Working to make everyone successful is part of the job as quality professionals, but this goal serves us well as leaders, too. If we continually have it in mind to coach and facilitate our people to make them successful, we build their competence, self-confidence, self-esteem, and professionalism. Building a strong and competent team increases the chance of achieving high-quality, efficient work performance. Part of making everyone successful is to take care of business. If there is a poison team member who has not improved performance through coaching or opportunities to improve, help that person out of the organization. A leader is not doing the team or the individual any good by retaining someone who is a mismatch for the position. A team would rather work short-handed than work with someone so volatile and disruptive that they need to walk on eggshells to avoid confrontation.

Leadership is not something that you ever finish refining or ever completely attain the desired error-free state. Life moves pretty fast, making it easier to slip up—a stray misplaced sentiment, a rushed decision, a missed opportunity to appreciate someone can all backfire and threaten the trust and reputation you have spent years building. Therefore, lifelong learning is essential. Seek out articles and webinars related to leadership and observe what great leaders do—how they run a meeting, appreciate team members, address conflicts, or word an email. All of these examples and more are teaching moments in lifelong leadership development.

What distinguishes true leaders could come down to intent; are leaders trying to make the team and organization be the best they can be, or are they trying to make themselves look good?

I have worked for leaders who would rather look good than be good; sweeping unfavorable events or results under the rug and highlighting only the favorable hurts the organization by not recognizing and improving areas of need and denigrates integrity.

Many leadership qualities were highlighted in this article, but if leaders practice servant leadership with the selfless goal to serve the people, they will be fit for purpose. Working with a team to help them achieve their best work and meet customer and organizational goals is a truly rewarding experience. There is nothing better than to coach teams and witness their move toward self-direction or to mentor individuals and see them soar. I wish you all the best as you continue your leadership journey.

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Sue Peiffer

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# Journal for Quality Perspectives in Knowledge Acquisition



Experiential learning serves as a viable pathway in the cultivation of a leadership philosophy steeped in clear communication, compassion, empathy, and inclusiveness. This approach, combined with education and training, lends to initiatives that embrace quality, process improvement, and organizational homeostasis.

## Leadership and Decision Making in Education and Training

Grace Duffy

### Introduction

Leadership in education, like any situation, requires us to be observant, orient our message to the correct audience, make informed decisions, communicate effectively, and act in a timely manner. I have served often as an education and training leader during my 48-year career. A curriculum-based educational system is significantly different than a just-in-time training session in the office or shop floor. The following are some of the education or training situations in which I have found myself over the years:

- University student assistant lecturer: Anthropology 101
- Graduate archaeological field techniques laboratory instructor
- Network Control Program software code instructor
- Field Instructional System (early programmed self-instruction training software) instructional designer
- Network controller hardware engineering maintenance and quality tools instructor
- Systems and Process Management course developer and instructor
- Education manager, instructional systems development, field technical systems
- Manager of corporate technical education
- Head of curriculum for the Quality Certificate for the state of South Carolina
- Developer and instructor for the 6-course Quality Certificate and an Associate Degree in Business with an emphasis on Quality
- Dean, Economic Development, Continuing Education
- Independent developer, instructor, facilitator in both face-to-face and virtual education and training

It should be clear from the list above that I have faced challenges both in formal academic settings as well as in corporate education and training.

### My Philosophy and Style of Leadership

So why is this list of experiences important relative to my leadership philosophy? It is this variety of situations that formed my approach. Early experiences were at the peer level, where communication and empathy were the best way to lead learners to expected outcomes. Later, as a supervisor and manager, I added authority and position power to the equation. In all honesty, the first lessons of communication and empathy were more effective than depending upon authority and power.

I finally codified my personal leadership philosophy in a book titled *Modular Kaizen: Continuous and Breakthrough Improvement* in 2013 (Duffy, 2013). Released through ASQ Quality Press, this book shares a strategically oriented approach to assessing a situation, parsing the requirements into manageable segments, and implementing them based on measurements, feedback, and improvement. If this sounds a lot like the writings of Dr. Joseph Juran or Lean

Enterprise, you are correct. Modular Kaizen is a modification of the traditional Kaizen improvement process designed to provide the same effective results without removing critical personnel from daily operations. Modular Kaizen recognizes the critical need for a monitoring presence to keep change management processes moving effectively. You might also recognize the concept as a form of agile, only specifically designed to allow for busy schedules with lots of interruptions. The idea is to reduce the disruption that usual projects cause to the daily activities of team members. Once again, removing barriers and improving results is a major responsibility of leadership.

Under the concept of Modular Kaizen, the facilitator or Master Black Belt, basically the leader, manages a team or project with sensitivity and planning based on team member existing commitments and by anticipating current and future requirements of the business. In education and training, the leader considers not only the team members designing and delivering the material, but, ultimately, the participant who must absorb the concepts or skills and apply them to real-time situations.

Much is written in journals by the Association for Talent Development and the International Society for Performance Improvement about balancing content with a conducive learning environment. Our recent journey through the COVID-19 pandemic highlighted the benefits and challenges of converting to a completely virtual learning space. Leading virtually puts another layer of complexity into the situation. We lose the benefit of face to face and instant feedback. We lose many of the senses as input to our assessment of a situation or individual's head space.

Eventually, an ASQ colleague who had read and appreciated my Modular Kaizen approach introduced me to a more strategic version of my own philosophy. This approach, called the OODA Loop, was documented by U.S. Air Force Colonel John Boyd, a fighter pilot in the late Korean and Vietnam War era. Boyd (2012) ingeniously organized the thought process to anticipate the next move in critical wartime situations and articulated it into a working model. Although leadership in education is not always a crisis, or war zone, the nightly news has come close to drawing that conclusion on several occasions.

I love this model. It describes how my brain works. The human brain, at least mine, is wired to see patterns, linearly and nonlinearly. We are out of the levels of factored ANOVA or DOE at this point. We are looking at combinations of likelihood of harm and severity of harm considerations in looking for alternative actions. Boyd saw the application of Complex Adaptive Systems in both

military and economic venues. Look on the left of the diagram in Figure 1; there is an attempt at a structure to get the basis for observation. Then we unfocus our eyes and brains into the Orient phase; that is where we let our brains see patterns. These patterns allow us to choose the best decision based on the options available. Then we structure back into the reality of our constraints to get finally to Action. This is how leaders need to function. Look ahead and always gather as much information as possible about a situation.

Orient yourself to the situation by considering the current learning or working culture: Where has the audience or organization come from? Where does the audience or your client want to go? How can we design and deliver education or training that best matches the audience, culture, executive vision, and resources available? Once we have an orientation to our variables, we perform our Design of Experiments to choose the best approach for leading learners or team members to the desired results. You can see in Figure 1 that there is feedback at all stages of the OODA Loop, which is why it is called a loop. It is not really a loop, but a continuously flowing decision and improvement model. It is close to our old Analyze-Design-Develop-Implement-Evaluate model we have used for the past 30 years.

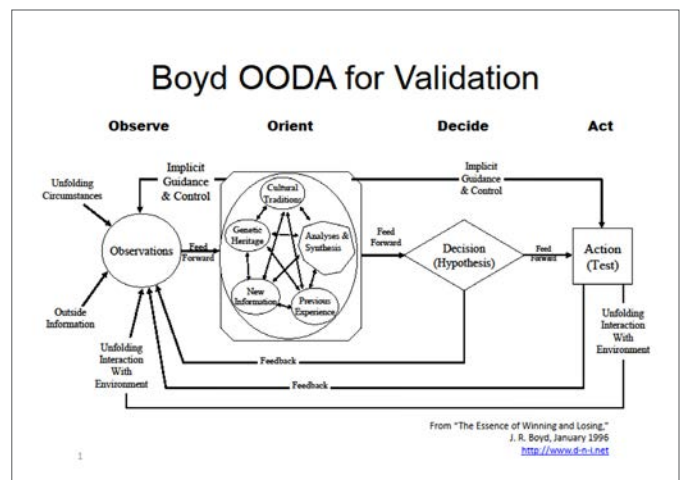


Figure 1: The Boyd OODA Loop

## Goals, Challenges, Institutional Impediments, and Continuous Improvement

Obviously, I have thought a lot about leadership, goal accomplishment, project management, and continuous improvement.

That has been my career since 1973. Of course, I have been more successful in some efforts than in others.

One totally enjoyable project was training 117 nurse managers on the principles of customer satisfaction. A large hospital system contracted with the college where I served as Dean for Economic Development to deliver a series of modules on establishing a culture of customer service in their local four-hospital-facility system. At the time, I did not have the OODA or Modular Kaizen model documented, and yet my client and I used the same top-down design and delivery model.

We observed that a recent merger of two hospital systems had created a cultural conflict between a for-profit hospital and a Sisters of St. Francis charitable establishment. The approach to patients differed between the two working populations. Although the physicians, nurses, and administrators in the for-profit hospital generally had the patient as the target of their efforts, there was still pressure to show capital appreciation and profit from the enterprise. National customer satisfaction surveys showed this half of the new healthcare system was meeting threshold requirements, but minimally in favor of financial performance. On the other hand, the Sisters were all about serving the patient and the Almighty. They had very happy patients and families but such bad financial flows that they were forced to merge with the for-profit system simply to survive.

Orienting to these inputs, my client and I decided upon a highly interactive, fast-paced series of video-supported discussions that got the nurse managers away from the conflicting environment and the constant interruptions it created for the managers. The client acted to enable this training by providing a strong backup system that got the managers off-site to the local college for 1-hour sessions that demonstrated customer service and satisfaction techniques applicable to both cultural groups. Not only did the managers learn techniques for listening to their patients and stakeholders, but they also spent quality time with their new colleagues from the other hospital.

More recently, I had the opportunity to train leaders within the Navajo Indian Health Service in Quality Basics. This two-day course is developed based on the ASQ Quality Improvement Associate Handbook. I and a colleague wrote this certification review guide to support the Certified Quality Improvement Associate (CQIA), and the text is now in its 4th edition. The course is taught both in the classroom and virtually. This course has offered me a couple of improvement opportunities since I first developed it in 2003. Certainly it has gone through many upgrades

as the CQIA Body of Knowledge went through periodic revisions. Audience analysis is key to the success of this event. Some audiences just want to learn the concepts. The standard two-day version works well for this audience. Developing a virtual conceptual-level course was fairly simple, although it is critical for the facilitator/instructor to communicate effectively using the delivery software to involve the participant rather than drone on through slide after slide. Face to face provides the visual and aural feedback to know that the audience is engaged. Virtual training takes away many of these observable triggers.

One of two improvement opportunities was modifying the course for clients who contracted this course to prepare their employees for the CQIA certification exam. Concepts alone are not enough. The level of knowledge or understanding of a topic is important when being tested at the depth required by the validated Body of Knowledge. The facilitator must use effective leadership techniques to communicate the importance of both the concepts and the depth of information about a topic. The students also are anxious during the training, knowing they will be tested on the materials. The facilitator has the responsibility to recognize this anxiety and support the students through sample test-question practice sessions. This version of the course usually adds an extra day to the training.

The second of the improvement opportunities arose with the Navajo Indian Health Service managers. Their CEO had placed responsibility for process improvement results into their performance plans and required the managers to work in improvement teams at their different health centers across the reservation. The original two-day Quality Basics course did well for the concepts. Soon after beginning the two-year series of training sessions, the managers started asking me for additional application exercises for them to practice using the Seven Basic Quality Tools. The contract for the original training did not include enough training days to accommodate application exercises, beyond two or three breakout sessions each day. Observing the need for this hands-on experience, I developed a project-based additional two-day tools course that the client added to the training program. I served as both the instructor and the project facilitator for real projects the managers brought from their locations. This course is now part of the standard ASQ learning offerings. Listening to the customer became a huge leadership skill for me in this situation.

## Conclusion

Leadership comes in many versions. Hopefully, we exhibit the versions that respect our colleagues, use resources effectively, monitor action, analyze feedback, and get the results expected. Leadership is so much more than project management. It is listening, communicating, empathizing, and upholding vision while we lead our colleagues toward an exciting and rewarding future.

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Grace Duffy

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# Journal for Quality Perspectives in Knowledge Acquisition



## *Call for Papers*

*The Journal for Quality Perspectives in Knowledge Acquisition (JQPKA)* is a double-blind, peer-reviewed journal that serves a triumvirate of educational research needs: Higher Education; Workforce Development and training in all fields (education, business, medicine, science, law); and K–12. If you are doing something innovative, interesting, and of benefit to the education community, JQPKA wants to know. We are interested in articles from diverse disciplines, which are research-intensive and also case study-focused. Methodologies can include quantitative, qualitative, and mixed-method approaches.

Continuing research and exploration of innovations that lend to continuous process improvement and quality enhancements in the field of education, as education relates to all disciplines and all organizations, are critical, especially during these challenging times that have required modifications in the educational/business delivery modality; crisis management plans; supply-chain reconfigurations; enrollment crises in higher education on both the community college and university levels; academic program excision; impacts on reductions in state budget allocations; concerns regarding the quality of mathematics, science, and English proficiency skills taught on the K–12 level; teacher preparation programs; Ph.D. attrition/retention; graduate advising; preparation for directing dissertations/theses/special projects; the ethics of doctoral advising and writing support; community college collaborations with universities and high schools to support advanced degree initiatives; STEM internships and business co-ops; and accelerated academic programs, among others. Many of these issues relate to the challenges of student retention, career preparation, success, and degree completion on all levels. The disciplinary practice of education is undergoing stimulating changes that educators in all fields, as innovative change agents, must be prepared to address, and the conduit to these changes lies in the collaborations and the learning communities that educators create in an effort to implement purposeful change via their research.

JQPKA is interested in providing such researchers with publication opportunities in an effort to disseminate their findings to all education practitioners. Research findings that relate to any of the elements expressed above, as well as all elements that interface with the enhancement of learning within all learning facets, are all welcome topics.

If you are uncertain whether your topic aligns with JQPKA's publication interests, please send an abstract to the Editor, Dr. Marianne Di Pierro, at her email address: [JQPKAEditor@gmail.com](mailto:JQPKAEditor@gmail.com) or [marianne.dipierro@wmich.edu](mailto:marianne.dipierro@wmich.edu).



## *Author Guidelines*

*The Journal for Quality Perspectives in Knowledge Acquisition (JQPKA)* is a double-blind, peer-reviewed journal that is published online by the Education Division of the American Society for Quality (ASQ). The Journal engages the education community in an academic, scholarly conversation regarding significant topics related to continuous process improvement and the identification of best practices through which quality is anchored. The Journal considers manuscripts that have not been published previously and that are not under consideration elsewhere.

**Topics of Publication Interest:** JQPKA publishes manuscripts of interest to educators in a diverse spectrum of disciplines. It serves a triumvirate of educational research needs: Higher Education; Workforce Development and training in all fields (education, business, medicine, science, etc.); and K–12. The Journal welcomes manuscripts that encompass innovative techniques, applications, theories, ideas, and approaches that are of benefit to the community of educators. We are interested in articles from diverse disciplines that are research-intensive and also case study-focused, that intersect with any aspect of quality and quality performance in education, and that are evidence-based. Methodologies include quantitative, qualitative, and mixed-method approaches. Some examples of potential topics include the following: curriculum reform to enhance student learning outcomes; applying improvement science within teacher preparation programs; incorporating biomedicine and engineering in the Ph.D./M.D. curricula to solve complex interdisciplinary health problems (tensile strength of sutures in ligament repair, printing bone, analysis of leukocyte extravasation); teaching in the 21st-century learning environment; workforce development in hospital systems using Vascular Access Specialist Teams (VAST); employing the Malcolm Baldrige Criteria for Performance Excellence within the university system; community college partnerships with universities and high schools to further advanced degrees; among many others.

### **General Information: MANUSCRIPT FORMAT**

**Manuscript Word Length and Formatting:** Manuscripts submitted to JQPKA should be between 3,500–5,000 words, written in Times New Roman (12 point font); submitted only as a Microsoft Word document; and formatted in APA style, 6th Edition. The manuscript should contain an Abstract, as well as Key Words that reflect its content. It is recommended that authors/co-authors submit final working drafts to a professional editor prior to submission to JQPKA to ensure that their manuscripts are prepared according to these specifications, as well as those that appear under the **Manuscript Content Considerations** heading in this document.

**Figures, Tables, Charts, Diagrams, Illustrations, Photos:** No more than three (3) may be included in a manuscript. Prepare figures, diagrams, charts, and illustrations only as PDFs and in no other format. Tables are to be formatted in Microsoft Word. All figures, tables, charts, diagrams, illustrations, and photos are to be created as separate files, and are not to be included in the manuscript that is being submitted, nor are they to be included at the end of the manuscript. Make certain to clearly label all figures, tables, charts, diagrams, illustrations, and photos with their correct number and title and center this information at the bottom of the respective figure, table, chart, diagram, illustration, or photo. Also, indicate in the manuscript the placement of these elements and highlight using red highlighting. For example:

PLACE FIGURE 3 HERE

Figure 3: Nationwide Doctoral Attrition

PLACE TABLE 1 HERE

Table 1: Annual Review Policies by Department

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### MANUSCRIPT CONTENT CONSIDERATIONS:

Writers should ensure that:

- Research expressed in the manuscript makes a contribution to the discipline.
- Methods applied align with the research questions and answer them.
- Manuscript reflects methodological and conceptual rigor.
- Outcomes/findings result logically and accurately from the data.
- Thesis of the manuscript is met.
- Figures, tables, charts, diagrams, and illustrations actually demonstrate key narrative points.
- Manuscript is well-organized, readable, clear in presentation, and error-free.
- Title of the manuscript equates with/describes its content.
- Internal citations in the narrative align with the references.
- Educational practitioners can benchmark against this study if they so choose.
- Terms are fully identified in the first reference prior to the use of acronyms for this term.
- Use of jargon has been eliminated from the manuscript.
- Exact names of the author/co-authors appear on the manuscript in the exact preferred order.
- Definitions of terms are provided to enhance readers' understanding of concepts.

### OTHER REQUIREMENTS:

Along with their manuscripts, authors and co-authors are asked to submit a headshot photo (in jpg ONLY), as well as a brief biography of no more than 100 words. *These 2 documents (Photo and Bio) are to be submitted as 2 separate documents: Please do NOT combine them into one document.* Please ensure that all bios reflect the author's highest credential: Ph.D., Ed.D., M.A., M.S., etc.

### SUBMISSION PROCEDURES:

MANUSCRIPTS: Submit manuscripts to Dr. Marianne Di Pierro, Editor, at the following email address: [JQPKAEditor@gmail.com](mailto:JQPKAEditor@gmail.com). Include all accompanying figures, tables, diagrams, charts, and illustrations as separate attachments, in this same email.

PHOTOS and BIOS: In a separate email (a second email), please submit photos and bios (2 separate documents) that reflect in the subject heading the following: (1) the full name of the lead author, (2) the identification of the subject (Photos & Bios), and (3) an abbreviated title of the article, and send to [JQPKAEditor@gmail.com](mailto:JQPKAEditor@gmail.com). Refer to the example below:

Peter Genovese et al. Photos & Bios: "Illuminating the Pathway"

For questions or concerns, contact Dr. Marianne Di Pierro at [JQPKAEditor@gmail.com](mailto:JQPKAEditor@gmail.com).