



TRAINING

A Better Starting Point

Exploring a best practice to teach lean Six Sigma to beginners and young professionals by Gary G. Jing

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amping up young professionals and college students and bolstering beginners with lean Six Sigma (LSS) philosophy, methods and tools can greatly benefit organizations and their process improvement efforts. So much of this teaching and training starts in the classroom—in both corporate and university settings.

This column explores a best practice to quickly and easily equip LSS beginners, young professionals and college students—that is, future quality professionals—with practical LSS capabilities to be ready to use immediately in the workplace.

Some background

The practice being described is based on the firsthand, result-driven curriculum I use at the University of St. Thomas (UST) in St. Paul, MN. The class is called Lean Six Sigma (LSS) ETLS640, a graduate dual-level class. Usually, half of the students who take the class are young working professionals. Thus, the practice is aimed at and styled for young professionals.

So far, most LSS books are structured for a broad audience and not specific to college students or new graduates. Most books focus on the solid coverage of the LSS body of

TABLE 1

Corporate vs. university LSS training and teaching

Corporate	<ul style="list-style-type: none"> ■ The focus is on project execution and outcomes with measurable impact. ■ The curriculum likely is customized to fit the organization's specific needs and unlikely to cover the entire lean Six Sigma (LSS) body of knowledge (BoK).
University	<ul style="list-style-type: none"> ■ Although different professors and instructors have their own way of handling classes, the traditional pedagogy generally is focused on covering and transferring the LSS BoK, supported by various activities including lectures, exercises, projects and reports. ■ If the goal of university class is to measure up to corporate LSS training, there are obstacles to overcome. <ul style="list-style-type: none"> ○ Class is time-bound and does not allow extra time as needed to implement improvements and demonstrate results in many cases. ○ As outsiders to an organization, it will be more difficult to actually change processes, although recommendations may be acceptable. ○ As a result, typical university teaching emphasizes knowledge instead of real-life application experiences, as do many third-party providers of certifications. ○ If university teaching involves doing projects, it's more likely to stop at making recommendations on improvements instead of conducting implementations.

knowledge, and not necessarily customized for the unique needs and learning style of young professionals.

Generally, young professionals can be impatient when they are required to read extensively. Many prefer a fast-paced learning environment, as well as learning at the point of need. And they are good at finding the vast amounts of free resources in the public domain on almost all subjects related to LSS, which supports a just-in-time learning approach.

I inherited the ETLS640 course after the previous professor retired. At that time, I already had taught LSS in corporate environments for two decades, as well as in university settings in recent years. In the spirit of continuous improvement, I systematically evaluated the previous UST curricula, as well as curricula from six other institutions. Following the Baldrige framework for education, I identified opportunities and improvements for the course in four areas:

1. **Strategic planning:** What objectives should the college LSS class set?
2. **Customer focus:** How must the various customers' needs be prioritized or balanced?
3. **Measurement:** How do we measure success?
4. **Results:** What results do we pursue?

Through the evaluation, I identified a mismatch between traditional university teaching and employers' needs as they relate to LSS. LSS training started in corporate environments in which the key driver was delivering measurable results and savings from projects.

Now, more universities offer LSS classes in which demonstrating measurable project outcomes can be challenging because of the nature of university teaching being time-bound and disconnected from for-profit deliverables.

Thus, a gap existed between university teaching and employers' LSS needs. Similar gaps exist between most LSS

books (focusing on knowledge) and employers' needs in project execution capability. My curriculum strives to effectively bridge these gaps.

Fortunately, my corporate experience allowed me to explore a unique and unorthodox corporate-like approach to structure ETLS640 to bridge the gaps. The new curriculum gave more emphasis to employers' needs, which led to a better approach to teaching LSS in university settings through real-world practice. This, in turn, equips students with the capabilities to leverage LSS and be ready to use these techniques and approaches at work.

The challenges

As mentioned, there was a mismatch between the objective and style of university teaching and employers' LSS needs. For LSS, employers typically need employees with practical, hands-on and results-driven capabilities to solve problems with measurable impact, emphasizing project execution and outcomes.

This need is more aligned with what a vocational school offers, not what university teaching typically emphasizes. Often, university teaching focuses more on knowledge and not necessarily real-life application experiences. See Table 1 for a breakdown of differences between corporate LSS training and university LSS teaching.

Leveraging my corporate experience and practice, I devised an unorthodox alternative approach to overcome the challenges:

- Emphasize experience-focused, results-driven project activities.
- Stress a learning focus on project execution, as well as the ability to learn the needed knowledge at the point of use.
- Treat students more like apprentices in this setting.

TABLE 2

ETLS640—a rundown

Objective	<p>Maximize similarity to corporate lean Six Sigma (LSS) training, which is project focused and results driven. This means:</p> <ul style="list-style-type: none"> ■ Best align university teaching in LSS to employers' needs. ■ Quickly and easily equip college students and young professionals with practical LSS capability and be ready to use at work.
Course setting	<ul style="list-style-type: none"> ■ Instead of focusing on theoretical knowledge, the course is structured in a workshop-style setting. The class breaks into multiple teams, each to complete a real-world improvement project from the students' employers throughout the course, following a roadmap with weekly deliverables. ■ This setting allows students to apply the newly learned LSS method and tools systematically in a just-in-time fashion that leads to project completion. A final project report effectively tells the story and journey of what has been done and achieved. This results in a much-needed capability at work that can be showcased to employers.
Course structure	<p>The course is broken into 13 sessions (modules), with the first two sessions covering an introduction and project identification. The remaining sessions follow a 10-step roadmap to apply LSS systematically to complete the projects. The first two sessions explain the foundation for the course and projects, and thus are more critical for success.</p> <p>Sessions follow the design, measure, analyze improve and control LSS framework:</p> <ul style="list-style-type: none"> ■ Define phase: two sessions. ■ Measure phase: four sessions. ■ Analyze phase: one session. ■ Improve phase: three sessions. ■ Control phase: one session. ■ Project wrap up: two sessions. <p>Aside from the first session, most sessions are organized into three segments:</p> <ul style="list-style-type: none"> ■ Review deliverables from the previous session. ■ Introduce new topics for the current session. ■ Start group activities for the current session deliverables.
Weekly schedule	<p>Define</p> <ul style="list-style-type: none"> ■ Six Sigma introduction and project mining. ■ LSS introduction and project definition. <p>Measure</p> <ul style="list-style-type: none"> ■ Team presentation and data collection. ■ Diagnostic mapping. ■ Root cause analysis. ■ Failure mode and effects analysis. <p>Analyze</p> <ul style="list-style-type: none"> ■ LSS data analytics <p>Improve</p> <ul style="list-style-type: none"> ■ Kaizen and 5S visual workplace. ■ Mistake proofing and standard work. ■ Continuous flow, set-up reduction and cell design. <p>Control</p> <ul style="list-style-type: none"> ■ Control plans and project wrap up. ■ Final report review and class wrap up. ■ Project presentations.
Grading	<ul style="list-style-type: none"> ■ Exams account for 30% of the final grade. <ul style="list-style-type: none"> o Two random quizzes: 5% each. o Mid-term exam: 10%. o Final exam (course reflection): 10%. ■ Team project accounts for 50% of the final grade. <ul style="list-style-type: none"> o Team grade: 30%. o Individual grade: Lead key deliverables in team project: 20% (10% for leading each key deliverable). ■ In-person class attendance and active participation accounts for 20% of final grade. <ul style="list-style-type: none"> o -3% for missing each session and -1% for each late arrival or early departure.



- Structure the class more like a workshop, similar to a scaled-down version of a senior design clinic.

See Table 2 for a rundown of the course objective, setting, structure, schedule and grading. Again, this practice was structured to fit young professionals' learning styles and needs. For example, the course is:

- Designed to be more distilled. Materials are light in text, but heavy in bullet-point highlights and graphs to reduce reading burden.
- Focused on “soft” nonstatistical tools and light on “hard” statistical tools. This assumes young professionals are coming into the course better prepared in data analytics and statistics, but less experienced in soft activities.
- Structured around a typical project execution flow (roadmap) to allow learners to easily follow step-by-step procedures and processes to conduct an LSS project.

Results and key takeaways

The new approach, loved by students, yielded impactful results. One student who hadn't yet gained any work experience commented: “I came in the beginning with the expectations of hoping to have a good understanding of basic theory of LSS and being able to use some of the LSS tools in a project. And now at the end of the semester, I would say for certain not only do I have a good understanding of the basic theory and how to use some of the major soft tools, I was also able to better understand my weaknesses and strengths.”

Another student already working and previously exposed to LSS called it one of the better classes in his degree plan and “would almost suggest that it be a required course because any industry will find value in learning the basic material. If not a required class for a master's degree, it should be in a undergraduate degree that falls in the STEM area.”



NEW LSS POCKET GUIDE

Part of the new ASQ Pocket Guide series, Gary G. Jing's new book *Lean Six Sigma for Beginners: Essential Activities to Conduct DMAIC Projects* (Quality Press, 2025) expands upon the information in this article. The 146-page quick guide is perfect for anyone new to lean Six Sigma (LSS) to help them gain the competency to make improvements. Chapters are organized to align with steps in the define, measure, analyze, improve and control framework, explaining the different stages thoroughly. Find out more at asq.org/quality-press/display-item?item=H1645.



The IDEA Survey—a nationwide class evaluation—had the ETLS640 jump from the mid bracket before revision to high bracket after revision.

In addition, the revised curriculum became the basis for *Lean Six Sigma for Beginners: Essential Activities to Conduct DMAIC Projects*, published by Quality Press earlier this year. The book is an excellent resource for students or those new to LSS projects.

There is a gap between traditional university teaching and employer LSS needs. Certainly, we must better upskill students and next-generation quality professionals to better prepare them for transitioning into the job market. **QP**



Gary G. Jing is a Master Black Belt and lean Six Sigma deployment leader, and currently the quality manager at the flagship site of nVent, leading a team of 30-plus quality professionals. He has worked as a continuous improvement director at CommScope in Shakopee, MN, and was on the U.S. delegation to International Organization for Standardization Technical Committee 176 and participated in the development of ISO 9000:2015 as the secretary of subcommittee 1/working group 1, which is responsible for the ISO 9000 standard. He earned a doctorate in industrial engineering from the University of Cincinnati. An ASQ fellow, Jing also is an ASQ-certified quality manager and engineer.