

# DOING MORE WITH LESS – GOING LEAN IN EDUCATION

A White Paper  
On Process Improvement in Education

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## **ABSTRACT**

Today's American educators face unprecedented challenges. Formerly setting the standard for excellence, American schools now chase it with sobering implications for the future. Amid societal calls and government mandates for improved student performance, educators find themselves tasked with meeting annually increased performance expectations but doing so with diminishing financial and political influence – essentially, doing more with less. Concerned educators and community leaders searching for an answer will be interested in a highly successful management approach that has been newly revised for education. The approach is based on the work of quality guru W. Edwards Deming who repeatedly demonstrated that excellence can be achieved at the least cost through process improvement.

While originally studied in manufacturing, Deming's principles have proven equally applicable to service industries, including education. Schools and school systems are organizations in which workers must rely on multiple complex processes to accomplish their tasks and provide value to the customer. These processes occur at the administrative, instructional, and student learning levels. Deming's approach, dubbed "Lean Thinking" for its ability to do more with less, focuses on removing steps within these processes that are not necessary and do not add value.

This paper presents a brief overview of Lean management principles and their applicability to education. It also presents examples of how Lean Process Improvement has been used to improve education delivery and student performance while simultaneously saving costs.

## **TODAY'S EDUCATORS ARE EXPECTED TO DO MORE WITH LESS**

American educators are faced with seemingly impossible challenges in the 21<sup>st</sup> century. They are expected to prepare today's youth for work in the international companies that make up our global society using an education system that was developed over 100 years ago to train factory workers to follow directions in American assembly line jobs.

### **EXPAND SERVICES**

In addition to teaching skills in reading, writing, and arithmetic to school-aged youth as they did a century and a half ago, today's educators are expected to provide a laundry list of additional deliverables using that same original system. These deliverables include technical computer skills, often without the benefit of sufficient equipment to accomplish the task, before-and-after school daycare, early childhood and family training programs, expanded curriculum offerings, counseling services, diversity training, post secondary experiences, enrichment and sports programs (and these equitably to both sexes.) Additionally, they must provide federally mandated special education services that are non- or under-funded as well as English as a Second Language services to new immigrants. These language services are expected to overcome all barriers for new English Language Learners so that within one year they can perform at the same level of government-mandated competency in all subject areas as those students whose primary language is English. Our education professionals are expected to provide transportation to and from school as well as community ed programs for adult learners. They must be certified in every area for which they are responsible and maintain that certification by taking ongoing professional development courses. They are also held accountable by federal, state and local governments both for student performance achievement as well as for operating within a budget that must be finalized before government funding allocations have even been determined. Our once simple public education system has become a complex bureaucratic monolith that is often truly beyond the authority of our educators to control.

### **IMPROVE STUDENT PERFORMANCE**

This scenario should provide more than enough stress and pressure for educators. Unfortunately, the challenges do not end there. America spends \$50 billion annually on education (3<sup>rd</sup> in the world at the primary level and 5<sup>th</sup> at the secondary level). In spite of our educators' best efforts, the National Assessment of Educational Progress (NAEP) results show that between 67% and 87% of American students cannot perform at the government-mandated competency levels.

### **MEET GOALS**

Educators themselves are frustrated with the system and how it hampers them in achieving desired results. "It's time to admit that public education operates like a planned economy, a bureaucratic system in which everybody's role is spelled out in advance and there are few incentives for innovation and productivity. It's no surprise that our school system doesn't improve," states American Federation of Teachers President Albert Shanker. The system discourages and burns out educators rapidly. American teachers, on average, leave their profession after only three years. Their departure is purely a job dissatisfaction issue - none entered the profession to make money.

## KEEP STUDENTS IN SCHOOL

Students, too, are struggling with a system that no longer serves their needs. American high school dropout rates are among the highest in the world with estimates that 2,500 students drop out of secondary school per day. In some urban metropolitan districts, dropout rates for minority students approach 60%. Only 40% of those students who drop out of high school have jobs, and those jobs don't pay a living wage. One in four who drops out will likely be arrested for crime. These dropout rates have already begun a financial drain on the American economy in such areas as welfare and government assistance, a drain that will only increase significantly over time.

## MEET WORKPLACE REQUIREMENTS

Another facet of this economic drain is the loss to the American economy of the potential social and financial contributions these young people would have made had they stayed in school to fully develop their recognized capabilities. Experienced educators and dropouts themselves agree that students who leave the school system do so not because of insufficient intellectual capability, but because they feel the

system/program is boring, out of touch with the real world, and a waste of their time. American business leaders who depend on our education system for their labor resources clamor for better prepared entry-level workers than our system is turning out, including those who do indeed graduate from high school.

## DIMINISHING FUNDING

Unfortunately, the situation gets even worse. American society has had a long history of supporting public education. That support began with the indirect authorization in the U.S. Constitution of a public education to "promote the general welfare." Taxpayers, whose money is collected at federal, state, and local levels to fund public education, have routinely and generously approved funding to generation after generation of American learners. Yet even these loyal investors are losing confidence. Overburdened taxpayers across the country have recently demonstrated through failed school levies their disenchantment with the ineffective existing system.

*"Training the workforce of tomorrow with the high schools of today is like trying to teach kids about today's computers on a 50 year old mainframe. It's the wrong tool for the times."*

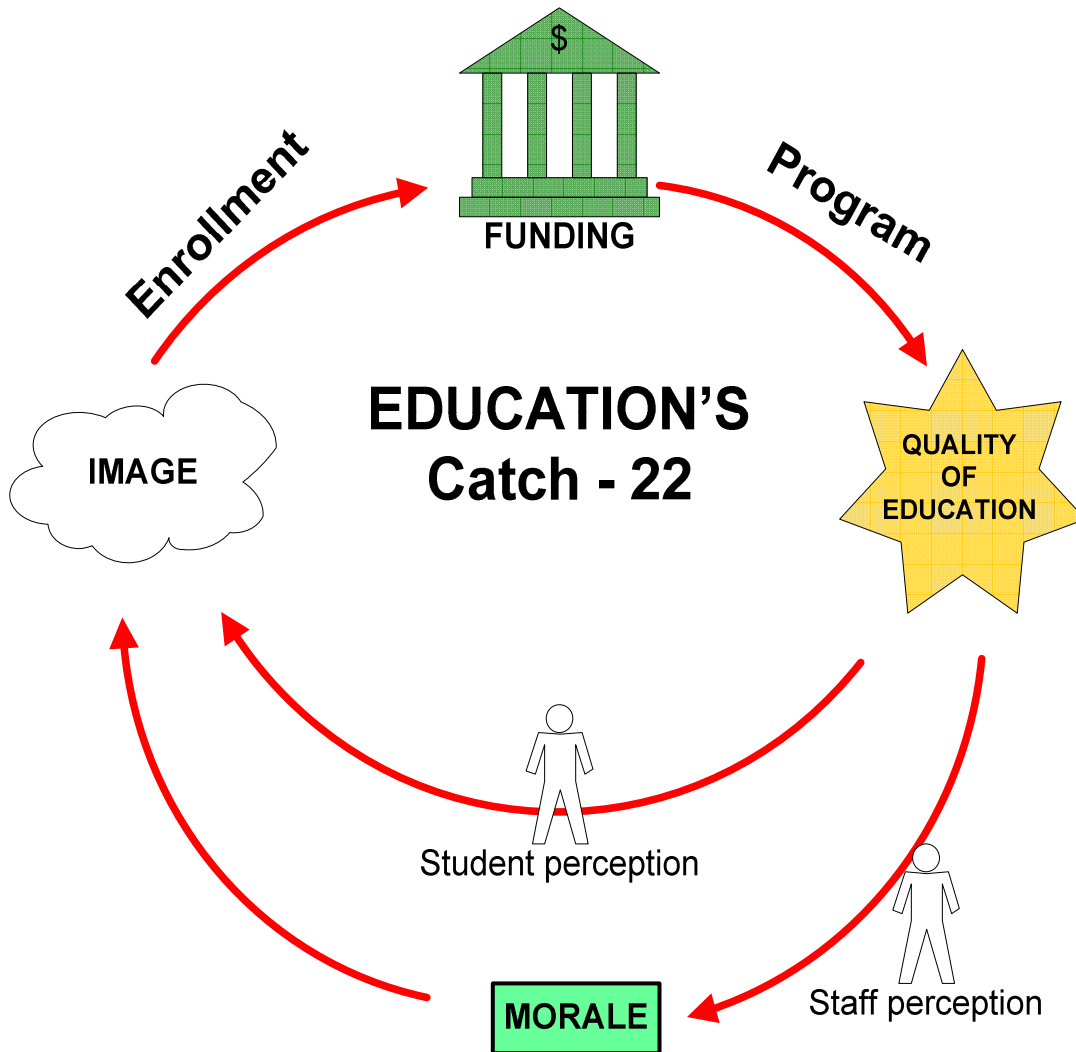
Bill Gates, keynote speech at the 2005 National Summit on High Schools held by the National Governors Association and Achieve, Inc.

*"Insufficient academic skills among entry-level workers as well as inadequate abilities to work in teams, think critically and communicate could imperil the success of America's youth and the competitiveness of the U.S. economy."*

October 3, 2006 report issued from the following business research consortium partners: The Conference Board, Corporate Voices for Working Families, the Partnership for 21<sup>st</sup> Century Skills, and the Society for Human Research Management.

## DWINDLING ENROLLMENT

That perceived loss of a quality education offering in public schools is directly responsible for the introduction and phenomenal mushrooming of both the Home School and Charter School movements. Both are seen by participants as better, more effective, and more controllable delivery systems for quality education. Millions of parents across America have lost faith and/or patience in the traditional public school system. They have transferred their children into home, charter, or private school programs resulting in reduced enrollment and diminished funding. The classic system response to that loss of funding coupled with the aging of communities has been cuts. For many districts this results in school closings, mergers with ensuing loss of identity, staff cuts leading to increased class size, and dropped programs. These actions perpetuate the downward spiral of public education.



## THE SOBERING REALITY

The perception of the downward spiral in public education is pervasive. In its 2004 public opinion research, “Equity and Adequacy: Americans Speak Out on Public School Funding,” the Educational Testing Service (ETS) reports that the public “widely perceives waste in education spending and has doubts that additional funding necessarily would lead to a tangible improvement in education quality.” This is sobering news. No longer can educators count on

unquestioned community support, either political or financial.

*Educators above all other groups understand the consequences to society of not providing expanded services, not meeting performance goals, and not preparing today’s youth to succeed in tomorrow’s world – they deal with those consequences every day.*

Truly, the challenge today’s educators face seems impossible. They must provide education services that meet increasing global societal and business demands with diminishing funding and support. In essence, **our 21<sup>st</sup> century educators are tasked with doing more with less.** Fortunately, others have traveled this road and charted a successful course for educators to follow.

## DOING MORE WITH LESS

Many organizations in today’s world have faced a similar do-more-with-less challenge. Interestingly, those who have successfully met it, regardless of industry, share a commonality - the focus on process improvement. This approach to improving performance (**doing more**) while using the minimum amount of precious resources (**with less**) has been nicknamed “Lean” by researchers at Massachusetts Institute of Technology (MIT) for its ability to do just that. Lean Process Improvement does NOT equate to layoffs nor downsizing. Rather, the Lean Approach focuses on doing more with existing resources.

## NEW RESEARCH POINTS EDUCATORS TO LEAN

In its landmark 2004 study, “Organizational Improvement & Accountability – Lessons for Education From Other Sectors”, the Rand Corporation concluded that Lean Process Improvement offers educators the most powerful improvement and accountability model available to meet the challenges of the 21<sup>st</sup> century.

## LEAN IN EDUCATION

The Rand Study called for the Education Industry to adopt Lean Process Improvement Principles and reap the benefits other industries have realized. Lean Education Enterprises responded to this challenge by creating *Le<sup>2</sup>*<sup>™</sup>, the Lean Program specifically designed by a practicing licensed k-12 educator and a Certified Lean Master to meet the unique needs of education.

## WHAT IS LEAN?

Lean is a program of organizational improvement that empowers each and every worker in a school system – from student through superintendent – to increase their personal performance

and job satisfaction through process improvement. Lean engages everyone in streamlining their work processes by identifying and eliminating the steps within the process that are wasteful, unnecessary, or may even prevent them from doing their job. In Lean, the focus of each process step is adding value.

### **LEAN VIEW OF PROCESS**

Everything we do, whether in our personal life or work life, is a function of process - making a sandwich, conducting a meeting, preparing a report – they all are processes. Each process is made up of a series of discrete steps that include a defined beginning step, a defined end step, and multiple steps between the two. This series of process steps yields an intended result (product or service) that is desired (valued) by someone (customer.) The important relationship among customer, value, and process distinguishes the Lean philosophy:

**Lean views a process as a function of the value added in each process step as it is perceived by the customer.**

In Lean, “Value” is defined as **the worth of something to the customer/end-user as measured by his/her willingness to pay for it in time or money.**

It follows, then, that if a process step doesn't add value, it shouldn't be done. Stated another way:  
**If the customer/end-user doesn't value what's done in a process step enough to wait or pay for it, why waste the time, money, and effort to do it?**

The answer is you don't, unless it's necessary to meet government mandates.

### **HOW DOES LEAN WORK?**

Lean partners school workers from every department and at every level to improve the processes that make up and facilitate the delivery of the education service. It enables and supports those who perform each process and know it most intimately to streamline and cut the wastes of time and resources from the process itself, a little at a time.

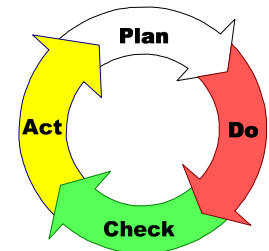
The Lean program is not accomplished by creating more work for already overburdened school employees. Rather, it is a liberating program. It simply allows workers to use their creative genius to do their jobs more effectively and more efficiently.

Lean is a respect-based improvement program. It respects each worker as a human person. It respects each individual's knowledge and contribution. It promotes growth in both areas so workers as well as students learn and improve.

Lean also recognizes the importance of each process and person to the overall success of the organization's mission. With respect as a core value, Lean improves essential trust relationships at the same time it improves processes - worker to worker, worker to company, and company to worker. The health of these relationships directly shapes the image of the organization, both internal and external.

Lean is a dynamic and authentic continuous improvement process. It promotes a constant state of re-evaluation that asks, Can this be done in a better way or with a better outcome? What can be eliminated in the process without reducing value to the customer/end-user? Lean is proactive rather than reactive. It seeks to anticipate and prevent rather than fix and resolve.

Once begun, Lean never ends. Improvements are built upon one another in a recurrent cycle of Plan-Do-Check-Act. Lean is simply the scientific method applied to every facet of operation in a school. People who know their work processes intimately theorize what they can do differently to improve those processes. They test their theory. If the theory works, they implement the improvement and then search for a new improvement theory to test. If the theory doesn't work, they don't implement the change. They then search for another change theory to test. In each case the cycle starts again. Lean is a never ending quest for perfection.



Implementing Lean does not create chaotic anarchy. While workers can independently improve the processes they own, many processes are not wholly owned by one person, but are shared. They may cross departments. In processes that have multiple owners, the proposed change is first reviewed to ensure it is positive for all owners, is in line with vision goals, and meets essential requirements.

The net effect of Lean Process Improvement at both the personal and organizational levels is increased performance, improved satisfaction, and better stewardship of resources (**cost savings.**)

## **LEAN REQUIREMENTS**

A pre-requisite for Lean to be effective and sustainable is strong leadership. Leaders must have a vision for the future and clearly defined goals to achieve it. They must be able to articulate the vision and goals in a way that inspires others to embrace both. All school leaders must be absolutely committed to the program and consistently demonstrate this through their own personal involvement in the continuous improvement process. Lean will always result in improvement. But without the active, ongoing participation and promotion of Lean efforts throughout the organization by top and middle managers/leaders, the program of improvement will not be sustainable.

A second requirement is the development of a Lean Culture. An organization's culture is frequently described as "the way we do things". Often that defines how to stay out of trouble. In organizations with traditional cultures, "staying out of trouble" means not questioning the status quo. Lean can not be supported in a traditional culture **because its essence is to challenge the status quo**. Schools with traditional cultures must transition to a Lean Culture. While challenging, this is not impossible. Cultures, after all, are merely learned habits. Habits can be unlearned and new habits formed. Similarly, new cultures can be cultivated and successfully established. It is not necessary nor is it possible for this transition to happen overnight. Leadership springboards the transformation by showing through action that challenging the status quo will not only be allowed and encouraged, but receive their full support.

### **RESEARCH SHOWS ALL PROCESSES CAN BE IMPROVED**

A core Lean belief is that all processes can be improved. This belief is supported by research findings that suggest **up to 80% of the steps in any process are unnecessary** to achieve the desired process output.

That means the time and resources used in those unnecessary steps could be saved and used elsewhere, to accomplish even more.

The Lean Approach seeks to improve processes by streamlining them. This is accomplished by looking at individual process steps from the end-user's viewpoint to identify, reduce and eventually eliminate anything that does not add value. Anything that does not add value is looked upon as waste. When waste is eliminated, only value remains.

### **WASTE IS NOBODY'S FRIEND**

Waste in any form is never planned. It just happens. Look no further than your own refrigerator to see evidence of this. Leftovers that were intended to be consumed soon somehow are overlooked until they must be discarded because they are no longer fit to eat. The average person does not intend to waste time, motion, effort, talent, assets, nor do they purposefully make errors. But all of these forms of waste happen routinely, accidentally, and to everyone at home and at work.

Waste is not an easy thing for anyone to talk about. It's even more difficult – sometimes outright dangerous - to admit responsibility for waste. While people readily acknowledge that no one is perfect, it is very difficult for them to acknowledge that they could improve. That is often viewed as an admission of deficiency, or that their contributions aren't valuable. The reality, however, is that no one is perfect and everyone can improve. Lean approaches waste identification on a strictly **impersonal** basis – the waste is found in the **process**, not in the people.

Lean also acknowledges that because this is not a perfect world, **there will never be a time when some waste doesn't exist. Not acknowledging that waste can and does exist in every process is essentially being unrealistic.** It will also prohibit the possibility for improvement.

## ORIGINS OF LEAN

The concept of “Lean” is most commonly associated with Japanese manufacturing, particularly the Toyota Production System (TPS). But Lean foundations lie in the Socratic Method of questioning, the development of hypothesis and data driven analysis in the Scientific Method, Henry Ford’s empowerment of people to improve the processes they perform, and the principles of creating a world class organization through continuous improvement developed by quality expert W. Edwards Deming. Toyota recognized the implications and applied the collective genius of these predecessors to its small manufacturing operation. It then refined and expanded its process-improvement-through-waste-elimination focus to include enterprise-wide operations. Today, the TPS philosophy and methodology – commonly known as LEAN and also referred to as The Problem Solving Approach - has become synonymous with the dedicated pursuit of excellence.

## LEAN PRODUCES THE SAME RESULTS FOR EVERY INDUSTRY

Lean thinking is NOT a manufacturing tactic nor is it a cost reduction program. It is a continuous improvement strategy with universal application because its emphasis is on improving processes. The Lean Approach puts the customer first, develops thinking people, and creates a workplace that actively supports and nurtures real ongoing improvement. Lean applications have been effective and successful in every industry in which they have been applied including service industries such as banking, law enforcement, insurance, uniformed services, city and state government agencies, service bureaus, and most recently, health care. When tailored to the individual organization’s specific needs and systemically applied, Lean Process Improvement has produced the same outcomes, regardless of industry:

- Increased performance
- Increased delivery/effectiveness
- Cost savings
- Increased employee satisfaction
- Increased customer satisfaction/quality

## THE IMPACT OF APPLYING LEAN PRINCIPLES IN INDUSTRY

Industry Averages	
Direct Labor /Productivity Improvement	45 – 75%
Cost Savings	25 – 55 %
Space Reduced	35 – 50%
Inventory Reduced	60 – 90%
Rework time reduced (redundant)	50 – 90%
Delivery Improvement	60 – 90%

Summarized results, subsequent to a 5 year evaluation from numerous companies. Companies ranged from 1 – 7 years in lean principles application/execution.

Source: Virginia Mason Medical Center

### ***LAW ENFORCEMENT***

In 2005, the Los Angeles Police Department, a pioneer in introducing Lean to the law enforcement industry, saved 2083 personnel hours in the jail booking process alone.

### ***BANKING AND FINANCE***

In 2000, Jefferson Pilot Financial streamlined its insurance and annuities processes, thereby reducing workload by 45%.

### ***AEROSPACE / MILITARY***

Using Lean principles and tools, Letterkenny Army Maintenance Depot transformed its operation in 3 years from the U.S. Army's worst to its best performing depot in terms of productivity and cost efficiency.

- Won the Public Sector Shingo Prize
- Increased its productivity by 312%
- Achieved a quality rating of 99.993%
- Expanded capacity without increasing personnel
- Accomplishments spared it from de-activation, saving over 1,800 jobs

### ***HEALTHCARE***

Lean has been selectively used in the healthcare industry since 2003. While utilized for only a short time, the results have been dramatic:

- In 2004, Park Nicollet in Minnesota achieved a \$7.5 million savings in just one year.
- Pittsburgh Veterans Administration Healthcare System reduced hospital-acquired, bacteria-resistant life threatening infections by 85%.
- Virginia Mason Medical Center in Washington maximized its existing resources thus rendering unnecessary a \$10 million capital expansion plan while still meeting the demand for increased services.

There is no question that these same outcomes can benefit the education industry.

### **LEAN PROCESS IMPROVEMENT IS APPLICABLE TO EDUCATION**

“Education” is the term used to collectively describe the **SYSTEM OF PROCESSES** involved in providing and supporting the development of knowledge, skill, and reasoning in a student or student community. In fact, every job in education from student through superintendent is defined by the processes of that individual's responsibilities. Processes make up the education service.

## EXAMPLES OF REPRESENTATIVE SCHOOL PROCESSES

Accounting/Business Management/Payroll	Mentor
Budgeting	Negotiations
Certification	Office
Communications	Parent/Community Involvement
Community Education	Personnel/Human Resources
Conferences	Referrals/ Child Study
Custodial/Maintenance	Report cards/student data management
Due Process	Reporting
Emergency Procedures	Special Education
Field Trips/Activities	Student Registration
Food Service	Teaching and Instruction
Fundraisers	Technology
Grade Level/Team/Classroom	Testing
Learning	Transportation

Education is a system full of processes. That means that every school and school district abounds with process improvement opportunities, opportunities not only to improve service and performance, but to reduce the associated costs of waste. And, yes, waste is incredibly costly.

### Process waste directly causes:

IN AMERICAN INDUSTRY	IN AMERICAN EDUCATION (EXAMPLES)
inefficiency	1 <sup>st</sup> and 3 <sup>rd</sup> in the world in education spending (\$50 billion annually) to rank lower in achievement than some third world countries
diminished performance	67% + of students tested on NAEP cannot perform at required “proficient” level
process delays	Number of meetings, committees, task forces, advisory boards; re-scheduled IEP meetings
variation in the quality of the process outcome	unmet AYP
increased costs	greater % of budget needed just to maintain status quo
Unnecessary consumption of resources	communication redundancies and inefficiencies

Process Improvement offers schools the opportunity to realize their full potential, to maximize education service delivery and support.

## **LEAN EDUCATION – A VISION FOR EDUCATORS**

The concept of continuous improvement is not an unfamiliar one to educators. It is the rare school or district that does not employ some form of Total Quality Management (TQM) or Continuous Improvement Plan (CIP). These strategic models often guide the development of achievement goals for schools and districts that employ them but offer no real practical means to achieve these goals. In many schools and districts, the tactical means to achieving strategic process goals are ultimately determined by people far removed from the actual process itself. This situation actually inhibits or prevents TQM and CIP since plans are often dictated and not owned. That frequently leads to resistance both by individuals and groups, ultimately resulting in incomplete or failed implementation of the plan.

Lean, on the other hand, offers the missing tactical piece – the plan, the tools, the methodologies, and the respect for the untapped expertise of process owners – to achieve strategic goals. Lean is fully compatible with existing TQM and CIP models. It can also be used as a stand-alone CIP.

## **IMAGINE YOUR LEAN SCHOOL**

Any system based on Lean is ultimately a creative operation. It is a system that creates value for its customers, both internal and external, and for society as a whole. A Lean school system respects, involves, and serves all of its people, its community, and the environment. A CORE TENET OF LEAN IS IMPROVING PEOPLE FIRST – it values growth and satisfaction. Every person – not just students - learns and improves every day in an environment of trust and stability, thus promoting high performance. A Lean School is a place that everyone wants to be part of and support – students, staff, parents, and community members alike.

A Lean School System pursues a common vision and clear goals that everyone both owns and understands. It anticipates, identifies and solves problems throughout the workplace. It effectively and efficiently produces and delivers quality education goods and services to meet customer demand.

A Lean school system is stable yet flexible. It is responsive. It facilitates open and multi-directional communication. It engenders positive image, cooperation, teamwork, and success. A Lean school demonstrates a CAN-DO attitude and a track record of improvement. It promotes not only the use of best practices, but their discovery and development.

## **IMAGINE THE IMPACT LEAN COULD MAKE**

The goal of a Lean education system is to allow educators to perform the work they went into education to do. To get an idea of what this could mean, answer the following questions with regard to your own job:

- What things keep you from doing your work?
- What is something you should not have to do?
- What would make your work easier?
- What would make your work more satisfying?
- What would improve the skills and capabilities of those who work for you?
- What would improve your work environment?
- What would make you more successful in your job?

Imagine you could resolve those issues. What difference would that change make in your attitude, your available time, your achievements, your performance, your feeling of fulfillment, your enthusiasm, and your level of stress and frustration? Now expand that thought outward throughout the organization. What cumulative difference would it make if all your co-workers could resolve their own version of those issues? Imagine the possibilities for individuals and your organization as a whole – how much more could be accomplished? That is the focus, power, and ultimate purpose of Lean.

Lean Education Enterprises' *Le<sup>2</sup>*™ program can help educators discover how to improve their school processes and thereby improve their process outcomes.

## **SUCCESS STORIES - CASE STUDIES OF LEAN APPLICATION TO IMPROVE STUDENT LEARNING**

While Lean Process Improvement is a relatively new concept for the education industry as a whole, some forward thinking educators have applied this powerful approach specifically to discover ways to improve student learning. The results of these pioneering efforts to identify and eliminate waste in the teaching and learning processes are consistent with the results experienced by other Lean organizations – improved performance with cost savings.

### **STUDY #1**

#### ***Facility:***

Small private middle school in a suburban metropolitan area

#### ***Project:***

Instructional time loss analysis and recovery plan development

#### ***Project Summary:***

This was a nine-month time-management improvement project to determine the current state and causes of instructional time invasion based on staff observations of annually diminishing ability to meet curriculum goals. The project included staff interviews and data collection to gather the required information, categorization and prioritization of the sources of interruption, and development of both a strategic plan and a tactical plan for managing future invasions of instructional time.

#### ***Results:***

The project resulted in the recovery of an average of 120 hours of instructional time per teacher, higher levels of staff cooperation in planning and scheduling at both the team and school level, and more comprehensive exposure and learning at the student level.

## **STUDY #2**

### ***Facility:***

Large inner city public elementary school in a major metropolitan area

### ***Project:***

Determination of best instructional approach to improve math scores in a Title I school

### ***Project Summary:***

This was a ten month project to determine the instructional approach and teaching philosophy that would produce the most optimal student performance improvements in a school with a poor overall score on mandatory state achievement tests in math. The project employed staff interviews and teacher focus group discussions to determine viable approaches to be tested, the design and creation of an assessment tool that would be used to measure student improvement within the student test groups, data collection, and comparative analysis of the student performance data.

### ***Results:***

The project resulted in the identification of the approach that yielded significantly higher student performance scores (test group average – 116% improvement; highest individual improvement – 343%) and was recommended for adoption school-wide.

## **STUDY #3**

### ***Facility:***

Large inner city public middle school in a major metropolitan area

### ***Project:***

Determination of how to improve student academic achievement, specifically test scores on short-cycle diagnostic tests that enable staff to revise and improve teaching methods and better prepare students for state achievement tests

### ***Project Summary:***

The project included the definition of the entire assessment process, cross functional focus team discussions and collaboration to understand and streamline the entire process, and empirical measurements of the student performance outcomes.

### ***Results:***

The project resulted in a common understanding of the limits of the remediation window, a reduction in the results turn-around time, and enabling of teachers to re-teach identified student areas of weakness. This culminated in the improvement of student performance on achievement tests.

## STUDY #4

### **Facility:**

A large regional comprehensive high school serving sixteen local communities

### **Project:**

Develop a teaching system combining brain research and data analysis to continuously improve student learning

### **Project Summary:**

This project was initiated as an attempt to meet heightened student performance requirements. It incorporated cross-functional team discussions and the ongoing collaboration of teaching staff, students, and administrators as equal partners in quality education. The project also included data collection and analysis, application of the findings, and open communication. Over the ten year duration of the project, continuous refinement was made to the teaching system based on feedback solicited from all stakeholders. Particular attention was paid to designing the system to meet the requirements of challenged learners, thereby focusing on customer needs.

### **Results:**

The project resulted in the development of a nationally recognized system of teaching and learning that achieved a 65% increase in the number of students passing the state language arts assessment test in one year.

Each of the above examples of Lean applied to education targeted a very specific process for improvement. Each process was different, yet all resulted in advanced student achievement.

All school processes in all departments exist to support student learning. All are potential targets for such improvement. Improve the processes, improve the delivery of education services, improve the learning.

## **IMPROVEMENT REQUIRES TIME**

Toyota began its improvement journey immediately following World War II. Starting from scratch as a small postwar operation, Toyota spent the next 60 years developing and refining its process improvement model through trial and error, and expanding it from simple manufacturing to include enterprise-wide operations. In 2007, Toyota became the world's largest and most profitable automaker.

World-class organizations – those who want to be competitive in our global world – have adopted the Lean model to their own operations and begun similar improvement journeys. Improvement, as Toyota demonstrated, does not happen overnight. Improvement is indeed a journey.

It takes time to figure out what and how to improve. Thanks to Toyota, the model to accomplish improvement is done. It's called Lean. Thanks to Lean Education Enterprises, the Lean adaptation for education is done. It's called **Le<sup>2</sup>**<sup>TM</sup>.

**The time to take the first step and begin your school's Lean improvement journey is now.**

## **CONCLUSION**

Lean Management is not a new concept, but it is new for the education industry. There is no question that differences exist between the products of a manufacturing assembly line and those of an education service. But a huge similarity exists in the delivery systems of these organizations, delivery systems made up of thousands of complex processes. As such, many aspects of Toyota's process improvement methodologies and other Lean tools can and do apply to improving the processes of delivering education.

Forward thinking educators recognize both the application and the implications Lean has for improving their school operations and program outcomes. The consistency with which Lean has delivered such improvements in every industry that has applied them demonstrates the universality of its principles. Lean Process Improvement, even in its limited introduction within education, has resulted in increased performance with cost savings.

Lean school cultures promote a positive **CAN-DO** attitude, greater involvement and vested ownership in improving processes that support student learning. School leaders determined to meet today's challenge of doing more with less should give Lean Process Improvement close consideration. It is an effective way for schools to develop and deliver world-class education with currently available funding.

Lean experts can be found with impressive credentials and years of experience guiding process improvement efforts in manufacturing and service businesses. However, unlike products or services that are produced or delivered in assembly line fashion, students are not designed to be replicas of each other. Nor do they flow through a production or service line one at a time.

Only experienced educators can fully comprehend the numerous variables that affect an individual student's learning and how those variables affect the end product – an educated human being ready for work, higher education, and competition in a global economy.

Lean Education Enterprises built this critical understanding into **Le<sup>2</sup>**<sup>™</sup>, the Lean adaptation for education. **Le<sup>2</sup>**<sup>™</sup> is the collaboration of a licensed practicing k-12 educator ***with years of experience implementing Lean Process Improvement in schools*** and a certified Lean Master – the same consultants who will work directly with you in bringing Lean to your school.

Successful educators in today's world are those who meet its challenge.  
For more information on how you can do more with less, contact the Lean Education specialists.

Lean Education Enterprises, Inc.  
- *Streamlined, focused learning*<sup>SM</sup>  
[www.leaneducation.com](http://www.leaneducation.com)

## Bibliography

Brassard, Michael and Diane Ritter. The Memory Jogger for Education - A Pocket Guide of Tools for Continuous Improvement in Schools. Salem, NH: Goal/QPC, 1992.

Casner-Lotto, Jill and Linda Barrington. "Are They Really Ready to Work?" Report: BED-06-Workforc. 2006. [Online] Available.

<<http://www.conference-board.org/publications/describe.cfm?id=1218>

Dennis, Pascal. Getting the Right Things Done, A Leader's Guide to Planning and Execution. Boston: Lean Enterprise Institute, 2006.

Fisher, Jeffry. "Public Education *is* Socialism." [Online] Available

<<http://www.jeffryfisher.net/Statesman/Education/Socialism.htm>, 2004.

Gates, Bill. "Keynote Speech – National Education Summit on High Schools." National Governor's Association, 2005. [Online] Available.

<<http://www.gatesfoundation.org/MediaCenter/Speeches/Co-ChairSpeeches/BillgSpeeches/BGSpeechNGA-050226.htm>

George, Michael. Lean Six Sigma for Service. New York: McGraw-Hill, 2003.

Hart, Peter D. and Robert M. Teeter. "Equity and Adequacy: Americans Speak Out on Public School Funding." Educational Testing Service, 2004. [Online] Available.

[http://www.ets.org/Media/About\\_ETS/pdf/2003report.pdf](http://www.ets.org/Media/About_ETS/pdf/2003report.pdf)

Harvey, Dr. Roger K. and Chester S. Labeledz, Jr. "Case Study – Letterkenny Army Depot: The Army Teaches Business a Lesson in Lean Six Sigma." 2006. [Online] Available.

[www.amc.army.mil/lean/docs/ArmyTeachesBusiness.pdf](http://www.amc.army.mil/lean/docs/ArmyTeachesBusiness.pdf)

Lareau, William. Office Kaizen, Transforming Office Operations into a Strategic Competitive Advantage. Milwaukee, WI: ASQ Quality Press, 2003.

MacInnes, Richard. The Lean Enterprise Memory Jogger, Create Value and Eliminate Waste Throughout Your Company. Salem, NH: Goal/QPC, 2002.

Mann, David. Creating a Lean Culture – Tools to Sustain Lean Conversions. New York: Productivity Press, 2005.

May, Mathew. "Lean Thinking for Knowledge Work." Quality Progress. June 2005.

Miller, Diane – Editor. "Going Lean in Health Care." Institute for Healthcare Improvement. Cambridge, MA. 2005.

"Percentage of students at or above selected reading score levels, by age, sex, and race/ethnicity: Selected years, 1971 through 2004." National Center for Education Research. 2005. Institute of Education Science, US Department of Education. [Online] Available.

<[http://nces.ed.gov/programs/digest/d05/tables/dt05\\_111.asp](http://nces.ed.gov/programs/digest/d05/tables/dt05_111.asp)

"Percentage of students at or above selected writing proficiency levels, by grade level and selected student characteristics: 2002." National Center for Education Research. 2005." Institute of Education Science, US Department of Education. [Online] Available.

<[http://nces.ed.gov/programs/digest/d05/tables/dt05\\_114.asp](http://nces.ed.gov/programs/digest/d05/tables/dt05_114.asp)

"Percentage of students at or above selected U.S. history proficiency levels, by grade level and selected student characteristics: 2001." National Center for Education Research. 2005. Institute of Education Science, US Department of Education. [Online] Available.

<[http://nces.ed.gov/programs/digest/d05/tables/dt05\\_115.asp](http://nces.ed.gov/programs/digest/d05/tables/dt05_115.asp)

"Percentage of students at or above selected geography proficiency levels, by grade level and selected student characteristics: 2001." National Center for Education Research. 2005. Institute of Education Science, US Department of Education. [Online] Available.

<[http://nces.ed.gov/programs/digest/d05/tables/dt05\\_117.asp](http://nces.ed.gov/programs/digest/d05/tables/dt05_117.asp)

"Percentage of students at or above selected mathematics proficiency levels, by age, sex, and race/ethnicity: Selected years, 1978 through 2004." National Center for Education Research. 2005. Institute of Education Science, US Department of Education. [Online] Available.

<[http://nces.ed.gov/programs/digest/d05/tables/dt05\\_119.asp](http://nces.ed.gov/programs/digest/d05/tables/dt05_119.asp)

Rother, Mike and John Shook. Learning to See. Boston: Lean Enterprise Institute, Version 1.3, 2003.

Spears, Steven and Kent Bowen. "Decoding the DNA of the Toyota Production System." Harvard Business Review. September / October 1999.

Stecher, Brian and Sheila Nataraj Kirby - editors. "Organizational Improvement and Accountability -Lessons for Education from Other Sectors." The Rand Corporation. 2004. [Online] Available. <<http://www.rand.org/publications/MG/MG136/>

Tapping, Don – Publisher. The Lean Office Pocket Guide, Tools for the Elimination of Waste in Administrative Areas. Chelsea, MI: MCS Media, Inc., 2005.

Womack, James and Dan Jones. Lean Thinking: Banish Waste and Create Wealth in Your Corporation. New York: Simon and Schuster, Inc., 1996, Second Edition 2003.