

A BLUEPRINT AND FRAMEWORK FOR EXCELLENCE©

James L. Melsa, Dean Emeritus
College of Engineering
Iowa State University

Today, I want to propose as a **reality** that change is demanded in higher education, so let me begin by telling a story illustrating what a reality is. This story was printed in a New York paper a few of years ago. **This is a true story:**

"A man was leaving his office in Manhattan to go home to New Jersey, and he decided to stop and have a few drinks with his pals. As a result, he was driving home on the New Jersey turnpike at about 10:30 that night; his car skids and he gets into an accident. It involves about twelve cars. No one is hurt seriously but it is a mess. When the state police come, the man is standing on the side; he tries to talk to the trooper -- he's somewhat inebriated -- and the trooper says 'go stand over there.'

"And standing on the side while they're clearing up the mess, he sees no one is paying attention to him. So he gets into the car and he goes home, puts his car in the garage, and goes to bed. The next morning at 8:00 a.m. there's a knock on the door [remember this is a true story] and a state trooper says, 'Are you Mr. Thomas Turndal?' He says, 'Yes, I am.' 'Were you on the New Jersey turnpike last night about 10:30 p.m.?' He says, 'No, I got home at 6:30 like I usually do. I ate dinner, watched TV for a while and then went to bed.' The trooper says, 'Do you own a 1984 Lincoln town car with license plate RB724?' He says, 'Yes, I do.' The trooper says, 'May I see it?' He says, 'Sure, it's in the garage.'

"So he goes out to the garage, opens the door and there sits a New Jersey state trooper's car parked in his garage." This is a **reality** of the kind you just can't ignore. Universities are facing realities like that right now.

Changes in the pace of technological development, in the nature of the marketplace, and the need to answer the question "Who is the customer and what does he or she want?" are some **realities** that indicate that *business as usual* will not be acceptable. Whether we like it or not, these realities are demanding changes in higher education. To quote an old Chinese proverb, "If we don't change our direction, we might end up where we are headed." Stated in another way, the current world is like a race where you run the first four laps as fast as you can, and then you gradually increase the pace.

Change is necessary **because many of the things that we are doing can be done better**. This is the basic tenant of the continuous improvement philosophy, an important characteristic of the quality movement in business, education and health care. The wisdom that used to be "if it isn't broken, don't fix it" has now become: "if it isn't broken, you can still improve it and continue to improve it!" This is perhaps the most difficult type of change to make because things seem to be OK. We must avoid falling into the trap that good enough is perfect and rather adopt the cry that perfect is good enough.

Second, change is necessary because **some of the things that we are doing don't need to be done**. *Futility* is doing something well that doesn't need to be done at all.

Finally, change is needed because there are **things that we should be doing that we are not doing**. It is this third category that I find most exciting. These changes demand fundamental rethinking of every organization.

The reality is that universities must become **learning organizations** that are skilled at creating, acquiring, and transferring knowledge, **and** at modifying their behavior to reflect their new knowledge and insights. Universities are, of course, skilled at creating and acquiring knowledge. We'll talk later about how well they may be doing at transferring knowledge. Universities must also become skilled at **modifying their behavior** to reflect new knowledge and insights, as their students will need to do when they are in the workplace.

Paradigms, our mental model of reality, can have a dramatic and often blinding effect on our ability to see new ways of doing things. A paradigm is a set of rules and regulations that defines boundaries and tells you what to do to be successful within those boundaries.

Let me give you an illustration of how paradigms filter our perception and can block out important clues to the need for change and how to create that change. This story deals with the first time the British encountered the Gatling gun in combat. At that time, the British marched into battle in long columns. They wore bright red uniforms with white stripes - perfect targets. The person manning the Gatling gun had a feeding frenzy. Within a few minutes 500 British soldiers had been killed.

The British commander sent a message back to his general. In this message, he didn't ask for less obvious uniforms, recommendations for new tactics, or even for a Gatling gun of his own. The message he did send was: **"Send 500 more soldiers!"**

Today, universities cannot stand in the middle of a cauldron of change and try to ignore it. We cannot simply ask for 500 more soldiers, just a few more faculty members, a little more money. The reality is *business as usual* will no longer work -- change is needed. To quote the noted philosopher Yogi Berra, change is necessary because **"the future isn't what it used to be."**

Three realities, in combination, are potentially lethal to our organizations. The first **reality** is that change is demanded. The second **reality** is that we have learned some false models for the causes of our successes. And, finally, there is the **reality** that these false models can limit our ability to see the need for change and the ways to make that change.

The management consultant, Peter Drucker, has provided us with some valuable insight when he wrote that **"Every organization has to prepare for the abandonment of everything it does."** This is a pretty unequivocal statement. Drucker went on to say that every organization has to learn to ask of every process, every program, every procedure, and every policy: "If we did not do this already, would we begin it now, knowing what we now know?" And if the answer is *no*, the organization has to **do something**, not just make another study. I urge you to subject everything that you do to this Drucker test.

Change, even good change, is never easy. To quote John Kenneth Galbraith: "Faced with the choice between changing one's mind and proving that there is no need to do so, almost everybody gets busy on the proof." It will be easy to find reasons why a change cannot happen; I urge you to avoid such rationalization, to commit to the need to change, and to seek innovation solutions. It will take a combination of aggressive questioning of the status quo, a love of chaos – more out of control than we are comfortable with, and resolve to make significant changes in higher education.

In the midst of the general pressure to downsize and re-engineer, universities cannot reasonably expect to receive more and more resources – 500 more troops. We must find models, as many corporations are, that do more with less people. We must find ways to improve the quality of learning, enhance productivity, and reduce cycle time. It can be done. It has been done by many organizations. The university that finds the right model will be at a significant competitive advantage. And those that chose to ignore these pressures may find that they are no longer in existence.

The administrative hierarchy of education, as it grew up, followed the model of the industrial bureaucracy. This model, with its functional, hierarchical style, was based on the military organization of the 1800s, which was designed to fight trench warfare in which the enemy was the customer. I can assure you that we are no longer fighting that kind of war! The very organization of knowledge into permanent disciplines was grounded on the old industrial assumptions. Departments were established to serve the professors, not the students nor our external stakeholders. As one of my colleagues used to say, "Universities have departments and the real world has problems." To quote Rosenzweig's Rubric: "On most major campuses the academic department emerged as the spokesman for and protector of its members. It also became, not by coincidence, the entity of the campus most capable of producing change, and simultaneously, the one least motivated to do so." It appears to be time to change, although some would suggest that re-organizing a university is like re-organizing a graveyard.

The educational organizations of the 21st Century must be flexible, fluid, empowering, and customer-focused. They must emphasize process orientation and systems thinking and must understand the use of data to make decisions and the use of information-technology to do the job faster, cheaper, and with higher quality. I would like to propose that the new model for the higher education must be **learning based** and must demand **active involvement of students**. Let me expand on each of these two concepts.

Educational institutions that care about educational **outcomes** need to focus on the real needs of learners. For the past three or four decades, universities have been run for the primary benefit of the faculty. *Pedagogy*, which used to mean "sit on a log and talk to a student," has been transformed into "sit on the child and talk to the log."

The shift from a teaching-oriented paradigm to a learning-based paradigm is much more than a simple semantic change. It is a dramatic shift in the way that we think about the educational enterprise. In a teaching-based program, we focus on the teacher, the *sage on the stage*; in a learning-based-based program, we focus on the learner -- the student -- and the "teacher" becomes the *guide on the side*. In the teaching-based model, the teacher works hard while the students *listen* -- some might suggest *rest*. In the learning-based model, the students work hard learning while the teacher listens and guides.

Learning is a **process** that can be **measured** and it can be **improved**. At the university, we must all become students of the *learning* process rather than the *teaching* process. We must apply knowledge and continuous-improvement skills to improve the learning process by enhancing the quality and reducing the related cycle time of learning.

Recent results in cognitive psychology have shown that the lecture-based methodology is one of the least effective approaches to transferring knowledge. We now know that learning is affected by prior knowledge, enhanced by social interactions, tied to particular situations, and requires a wide range of learning strategies. As a learning organization, we must modify our behavior – the way that we conduct our educational experiences – based on this new information.

The teaching-based paradigm focuses our thinking too exclusively on the classroom as the place where learning takes place. Learning can take place in a wide range of ways: intern experiences, summer jobs, laboratories, design projects, research projects, case studies, hallway conversations, as well as in classrooms. I would contend, in fact, that very little learning takes place in our current classrooms where the focus is on the transfer of information from the professor's notes to the students' notes without passing through the brain of either. This is a task that is better accomplished by a copying machine.

Most schools throughout the ages have spent endless hours trying to *teach* material that may be better *learned*. Without a focus on learning, the outcome of our well-meaning attempt to transfer knowledge can be: "I *taught*, but the students didn't *learn*," as in the phrase: "I **taught** my dog to whistle, but he didn't **learn**." We have spent too much time worrying about **covering** material and not enough on having the students gain knowledge. In fact, in some cases, we cover things so well that the students can find it.

Many business organizations used to advance the notion that they couldn't define quality but that they would know when they saw it. This mindset did very little to improve quality. Quality began to improve in these organizations only when they realized that quality must be defined by customers. They then translated this definition into meaningful measures to ensure that progress was being made. Learning is also a process that can be measured and improved; we too must come to understand the continuous process improvement methodologies of the quality movement.

Education, like manufacturing, has been using the old quality control paradigm that relies on inspection to eliminate defective parts. Ineffective practices are left in place while more and more effort is put into better inspection practices. Universities are making the same mistake when they use a variety of examination vehicles to "inspect" quality into their product. As the "poor" students are weeded out, the educational practices that resulted in the failures are not questioned. The old paradigm classifies and sorts students into categories under the assumption that student ability is fixed and unaffected by effort and education. The new paradigm develops student's competencies and talents under the assumption that, with effort and education, they can be improved.

Business organizations now demand teamwork. This is where most of our students will spend their lives after their university years. Yet our educational world often tells students not to cooperate in the learning experience, defining that as cheating. There is ample evidence that learning is significantly enhanced through cooperative experiences among students and between students and faculty. Knowledge is unique because it grows and gets better as it is shared and used.

Educational institutions also discourage teamwork skills by continuing to employ competitive grading practices. If a course is graded on the curve, the "smart" student doesn't help others because it will raise the curve and make it more difficult to get a good grade. Students may be happy when there are weak students in the class because it will make it easier to get a good grade and sad when there is a bright student in the class. Yet, the presence of these students could provide extraordinary learning opportunities through peer-to-peer mentoring. It is easy for faculty members to grade on a curve. We don't have to struggle with the task of defining acceptable performance in absolute terms. If we do not believe that there is a finite amount of information in a class, then the grades do not need follow a "normal" curve. I believe it is possible, though a change in process, to change this distribution.

Grading an entire class as a team may engage the entire class in the learning and teaching process. Rather than being welcomed for lowering the curve, the "slow" kid in the corner is now of concern to the entire class. I would contend that even the "smart" kid, who might get a lower grade, will learn more. Isn't that the goal?

In our educational system, we have followed a batch model: we have taught knowledge in batches, known as courses, and put the knowledge in a queue waiting for use later. This is just as bad as having stacks of finished goods in a factory. We should consider deployment of a just-in-time educational philosophy; it has been done with success. Many corporations have found that doing things in small lots actually leads to cost savings and quality improvements.

During the time that many organizations have started to compete by reducing cycle time (designing cars in eighteen months rather than five years), universities have been systematically increasing the

interval required to get a degree. What is the magic about a four-year college education cycle time? Why not three and one-half or three or whatever?

Finally, we must recognize that knowledge cannot be poured into a student. **You can lead a horse to water; but if you want it to drink, you should be sure that it is thirsty.** Learning demands that students be participants not spectators. Knowledge, to be truly mastered, must be constructed, transformed, and extended by the learners. The successful school of the future will empower students with motivation to learn and with the discipline of continual learning. I like to think of this as a shift from a **push** system with the teacher saying, “You will learn this because it is good for you” to a **pull** system with the student saying, “I want to learn this because I need it.”

Education programs have to impart knowledge both as *substance* and as *process*. In the knowledge-based society of the 21st Century, students must learn how to think and how to learn. Indeed, in the knowledge-based society, subjects may matter less than the student’s capacity to continue learning and his or her motivation to do so. Education needs to be viewed as a continuum with degrees as milestones not endpoints. We must reinforce the student’s native thirst for knowledge and create a life-long curiosity and desire to learn.

To summarize, I believe that the successful model of education for the 21st Century must be learning-based and demand active involvement of the student. The 21st Century demands changes in higher education. If we want things to be different, then we must do something differently. It is insane to do the same things the same way and expect different results.