

State of the College Address

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In 1965, a private engineering college with a fine regional and perhaps national reputation had to close its doors - 42 years after its establishment and after having survived drastic drops in enrollment as a result of the Great Depression and World War II. During its entire existence, the college never showed a deficit, however, the gradual increase in operating costs and competition from local colleges forced the college to request assistance from the state. The Fenn College faculty gathered in Stilwell Hall on April 17, 1965 to discuss the transfer of operations to the State of Ohio.

Thirteen years later, in 1978, the year that I joined this college, many of our departments were close to enjoying their historic peak-enrollment. Some departments at that time had a senior class of about 70 students and were operating with a handful of faculty members but have since seen a substantial drop in their enrollment figures - in some cases down to single-digit senior class sizes.

I would not be fair to those departments if I did not present the other half of the picture. In that same year, 1978, one department with only a few graduate students celebrated the receipt of a small federal grant – its first. Today, that department enjoys a record of substantial funding receiving over five million dollars during the past five years and retains over 70 graduate students who are working with nationally and in certain cases internationally-known faculty researchers.

Was this all planned or was this the result of a series of incremental adaptations in response to changes in the environment? If the latter holds true, these changes are often not visible to the eyes of those experiencing them at any given period of time, but show rather dramatic effects over the long-haul particularly to an outside observer.

To explore the dynamics of how an academic unit changes and why it changes will help us to determine our course of actions. Over the years, Fenn College has transitioned from a private and primarily undergraduate regional college with some applied research activities and excellent teachers to a university-engineering college with excellent young Ph.D.s - many recruited from the top 25 engineering schools in the nation - with a very active and vibrant graduate program and leading-edge research activities relative to its size.

Although, this transition occurred over a span of two to three decades, we are still somewhat coping with our dual personalities. And that might be just fine as long as the identity that emerges reflects the virtues of both a fine undergraduate teaching college and a robust leading-edge research oriented graduate program.

The question that remains then is how are we to define and prioritize our functions, focus, and activities including the teaching of undergraduate and graduate students, cooperative education, basic versus applied research and university and community service?

Clearly to define our priorities, we need to begin by reaching out to all of our stakeholders (faculty, students and, staff) and then develop a flexible and agile roadmap. It has been my personal experience through the last three decades as an educator that employing rigid strategic plans leave little room for revisions and alterations of objectives and goals and doom the plan to failure. If not allowed to adapt, such plans lose their relevancy in a very short period of time in our fast changing world.

We must understand that the university is in the business of production and dissemination of knowledge, i.e. research and teaching. In that sense, we are all knowledge workers. The demand for knowledge worker, like any other type of worker, changes with market conditions. Just like the worker in a factory producing typewriters had to be trained and retrained in different professions, so must the knowledge worker to keep abreast of the rapidly changing technologies that often require a broader participation of expertise. Thus, in order to solve increasingly complex problems, we need to go beyond a discipline-focused approach and engage in interdisciplinary and perhaps trans-disciplinary efforts.

Michael Gibbons, Secretary General of the Association of Commonwealth Universities, writes in a report supported by the World Bank: "Leading edge research has become a more participatory exercise involving many actors and experts who move less according to the dynamics of their original disciplines and more according to problem interest." I know that some of you have already done this very successfully and today I ask you to offer your expertise to other colleagues who may not have had such an experience.

To accomplish this, I ask you to remove any artificial barriers that may exist among the departments and begin to look at the ways and means by which we could collaborate on course development, program development, joint research initiatives and development of pedagogical techniques to improve the learning experience of our students, the primary

goal being to improve our students' retention and graduation rates. I am asking you to consider a paradigm-shift, one that places less emphasis on the way that we are separated by our individual academic departments and brings more focus on the way that we can be brought closer together through our common interests and activities.

Whether in research, teaching or service, we need to understand the needs of our constituencies and respond accordingly in a fast and flexible way while keeping our high academic standards intact. In that sense, I could see the benefits of forming Rapid Response Teams which could be configured according to the opportunity or problem that is presented to us in order to address the issues at hand. It is not an easy task, but it can be done and if done properly, this agility will differentiate us from other providers of higher education.

To understand the needs of our constituents we must actively become engaged in the life of the community that we serve - the Japanese *Gemba* concept. We must go to where the action is taking place: high schools, industry, academia, and funding agencies.

Allow me to use the umbrella term of "customers" to describe those who are the recipients of our services, that is, our students, the industry who hires our graduates, our alumni, Northeast Ohio communities, other CSU colleges and organizations and other universities. Additionally, allow me to identify our local high schools, community colleges, other colleges who send students to us as our "suppliers". In this analogy, we add value to our students by imparting knowledge upon them and preparing them for industry. In that sense, we need to implement a vertical integration along our value chain to better understand the needs of our customers and work in close partnerships with our suppliers. Fenn Academy is one such example of a seamless partnership with our suppliers and customers and we can do more.

As you all know, the discipline of engineering is a marriage of science and creativity, science and art, science and economics. It is a discipline that directly or indirectly touches every other discipline of arts and sciences and has benefited humankind for centuries. As educators, we have the enormous task of cultivating the next generation of engineers. It is not enough for us to merely repeat in our classrooms the cold theories of science without examples of their applications. And it is not enough to rely on the applications of theories without an in-depth understanding of their premise. Research bridges that gap and the sharing of our own research experiences, setbacks and triumphs and the creativity and critical thinking that is so crucial to problem solving would manifest the passion in the teacher and will enlighten the student. My father used to say that the ability to do critical thinking is the mark of an educated person. Research, I submit to you is the embodiment of critical thinking.

Indeed, we have the finest teachers/scholars amongst us. The real asset of this college is not its building structure or for that matter its laboratories and equipment. The real asset is our faculty and in that category, we have some of the finest individuals who would

shine at any setting at any university - anywhere. As long as we have the caliber of the faculty that we have now, our college shall not fail.

I recently studied the research funding of our faculty during the past few years - starting from 2001. During this period, and not including last year's unofficial numbers, a total of 49 graduate students received Doctor of Engineering degrees¹ and 339 students received Masters degrees. Our faculty have published in prestigious journals, have chaired conference sessions, have been speakers and Keynote Speakers in national and international conferences, have been invited to do sabbatical studies in major universities overseas, have received Fullbright Fellowship, have become Fellows of their professional societies and have been invited by ABET to review other engineering programs, others have become editors of prestigious international journals. Internally within the university, many of our faculty members have received CSU's Distinguished Faculty Teaching, Research and Service Awards. Additionally, two of our staff members have been honored with CSU Staff Awards and our students have received numerous regional awards and the university's 2006 Valedictorian was one of our own Civil and Environmental Engineering students with a grade point average of 4.0.

To quantify some of the accomplishments that I just cited, during the past three years alone, Fenn College faculty have authored 19 books², 22 book chapters, 113 refereed journal articles in prestigious national and international journals and 202 refereed papers in conference proceedings - in all, 356 publications over a three-year period. They presented over 40 invited lectures and seminars and have applied for 6 US and international patents, received several University Distinguished Faculty Awards and received one Endowed Chair and three new research centers - one receiving a \$2,000,000 grant and another, the Wright Center, a \$27,000,000 funding. As of this month, the college has 85 active grants for a total amount, awarded during the time-duration of the award, of \$17,775,690, not including the Wright Center award.

Borrowing a phrase from an automobile commercial: This is not your father's Fenn College.

I recall that during the formative years of this university, Dr. Walter Waetjen had a speech that was entitled: "We are Young, but We are Good". Well, in regard to Fenn College, I say to you today: "We are Small, but We are Good". And we aspire to grow by attracting more students, by expanding upon our core research competencies and our service to the community and the region that we serve.

Do we have challenges and problems ahead of us to overcome? Yes. Can we work together as one team to address our problems? Yes, we can and we will. Let there be no question about that. And I can assure you that as we travel this road, we will have our

¹ *Annual Degrees Awarded by Major and Gender – College of Engineering*, CSU Book of Trends, pp.98, 2006.

² *FAR reports 2004 to 2006*

share of disagreements within our professional family, but we will coalesce as one group because there is so much that we have in common.

Some cynics might say that it will be hard for the faculty of a small college with limited resources to be both caring excellent teachers and excellent researchers. I disagree. Those who might claim that notion don't know the quality of our faculty. When faculty members truly care about the students and the community that they serve, then extraordinary tasks take place routinely. Not long ago when several of our international graduate students were involved in an automobile accident, a group of faculty members raised funds and one of our faculty members regularly visited the injured students at the hospital and later his wife provided them with home made food. When recently a company wrote to us to request free help on how to operate a piece of laboratory equipment, one of our faculty members wrote: "A mission of CSU is to help local industry. If you can be more specific, I will be glad to try to help you." When a faculty member read about Fenn academy's mission of attracting high school students to various engineering disciplines, he wrote a personal check to support the academy, the amount equalling that contributed by a corporate supporter. When we recently asked several faculty members to help us with a Saturday recruiting event, a department chair wrote back stating that he will be happy to do it and he wrote: "thank you for the opportunity". I ask you, with a faculty like that, how can we fail? We will not fail. We will overcome our current challenges and in the process we will become an even better college.

In the academic year 1962-63³, Dr. G. Brooks Earnest, then President of Fenn College, described the college's culture in this way: "A friendly, down-to-earth atmosphere is typical Fenn, where students and faculty work closely together. Faculty members sometimes meet with students to discuss problems over lunch, and students often feel free to discuss personal problems with faculty members." I think if Dr. Earnest was with us today, he would be pleased with the way we have maintained that culture and with the additional progress that CSU's Fenn College of Engineering has made in the areas of research, graduate programs and outreach to the community.

I spoke earlier of our commitment to high academic standards. Yet, we have a higher commitment to our professional code of ethics. The second sentence of our code reminds us that we must exhibit the highest standards of honesty and integrity and the first canon is to hold paramount the safety⁴. I know that you all agree with me that these principles are of supreme importance to our profession. We must make sure that our students fully understand and appreciate the significance of our code and fortunately there are plenty of role models for them.

One of our Founding Fathers, Dr. Benjamin Franklin, himself a great man of science and engineering in addition to being a great statesman first became known internationally

³ *A Message from the President*, Fenn College On-Line 1962-1963 Academic Year, <http://www.clevelandmemory.org/fenn2/index.shtml>

⁴ *Code of Ethics for Engineers*, National Society of Professional Engineers, www.nspe.org, Publication # 1102, January 2003.

through his discoveries in the fields of electricity, convective heat transfer, fluid mechanics, principles of refrigeration, electrical battery and storage of electricity.

H.W. Brands in his Pulitzer Prize Finalist and National Bestseller, *The First American*⁵ writes about Dr. Franklin's international fame. William Watson told the England's Royal Society that "None knew more of electricity than Franklin". The secretary to Academy de Science in Paris wrote how "universally admired" the "Philadelphian experiments" were in France. In my opinion, Dr. Franklin was also a true engineer. H. W. Brands writes, "he found knowledge for knowledge's sake to be an unsatisfying formula. The kind of knowledge he prized was that which made life easier, more productive, or happier."

Edmund Morris in his fascinating book, *Theodore Rex*⁶ the biography of our 26th president masterfully describes how Roosevelt went on to win the Nobel Peace Prize for his work in bringing an end to the Russo-Japanese war over the Sakhalin Island. But, Theodore Roosevelt decided to donate the prize money to "a foundation to establish at Washington a Permanent Industrial Peace Committee." To his son, he explained that after consultation with Mrs. Roosevelt, "he could not accept as a personal gift a sum of money earned as a public figure." In a reflective mood upon his presidency in June of 1908, he said, "... my teaching has been plain morality." It is incumbent upon us to make that our teaching as well.

I ask you to encourage your students to think creatively, to view scientific and engineering principles from different angles and to frequently ask questions. After all from Newton's masterpiece, "The Principia" to Lavoisier's questioning of the *Phlogiston* theory, came the ideas of Conservation of Momentum and the *Oxygen* principle which led to the proposition of the Conservation of Mass. *C'est impossible* was the reaction of their contemporaries, but they had the creativity and the courage to see things differently and to submit new views. And the story is the same when speaking of the origins of the theory of Relativity and the String Theory of today - what advances knowledge is the ability of gifted observers to see things differently. And that ability, ladies and gentlemen, is priceless and as educators we should encourage and inspire it.

With respect to our current situation at hand, it seems to me that two of our top priorities should be: 1. recruitment, retention and timely graduation of students, and 2. garnering of external funding in support of our research activities and graduate students. The recruitment and retention issues encompass many academic activities which require direct faculty input and involvement such as offering of new degrees and certificates, collaboration with other institutions, revisiting our curricula and our cooperative education program.

Our physical environment while accommodating, still needs improvements to become conducive to keeping students here for further peer learning after they are finished with their classes. Both physically and programmatically we have to create a learning

⁵ *The First American*, H. W. Brands, Anchor Books, 2000.

⁶ *Theodore Rex*, Edmund Morris, The Modern Library, New York, 2001.

community. We must take actions to make Stilwell Hall as friendly and welcoming as possible for our students, i.e. a home away from home, a comfortable place for learning - the home of a teacher/scholar. As a graduate student, I once attended a seminar by Dr. Albert Einstein's son. In describing his father's style of teaching, he pointed out that students used to come to his home to take their exams and how Mrs. Einstein used to serve refreshments and how she would ease the students' exam taking concerns by talking to them in a motherly fashion to calm their nerves prior to taking their tests (the home of a teacher/scholar).

In short, there is much that we need to do together to change directions and make the college operate within its budget with adequate number of students at both the graduate and undergraduate levels and sufficient external funding for the professional development of our faculty. As we embark on this process, we will have to make some tough choices and make difficult decisions.

Our Fenn College is facing very serious challenges. Chief among them are the enrollment and retention of undergraduate students. In that respect, some departments are doing well and others are struggling. Yet, I believe that it would be a mistake to think of our enrollment problems as discipline-specific concerns. It is a Fenn College concern. "Do not send to ask for whom the bells toll. They toll for thee". It is us, the faculty of this college, who is facing these problems. And until we come together as one faculty and try to understand the dynamics behind these changes and respond as one professional family, we will not be able to solve the very challenging problems that we are faced with today.

We must recognize that the challenges facing our college, and perhaps any college like ours, are increasingly complex. Demographic changes, shift in student expectations and new methods of delivery of higher education are just to name a few. Yet, I firmly believe that such changes can bring about vast opportunities. The choice is ours, whether we wish to see these challenges as opportunities or crises. The view point that we select will ultimately shape our entire response and I would rather see these challenges as opportunities and respond accordingly.

My colleagues, I submit to you that this is an occasion for us to courageously welcome and embrace change as an opportunity. "To be courageous", wrote then Senator John F. Kennedy in 1955 in his book, *Profiles in Courage*⁷, "requires no exceptional qualifications, no magic formula, no special combination of time, place and circumstance. It is an opportunity that sooner or later is presented to us all."

While I do not wish to be too specific as I firmly believe that to implement programs successfully we must develop a shared-vision, I would like to offer suggestions for your consideration. To improve our program efficiency, I suggest that we assess the frequency of our course offerings and to make the most efficient use of both personnel and facilities, reducing part-time teaching while addressing the needs of our students. We need to more frequently solicit feedback from our students, hold Continuous Improvement (Kaizen)

⁷ *Profiles in Courage*, John F. Kennedy, 1955 Harper Perennial, 2000.

events with the front-line staff, and when necessary re-organize to more closely match our students' needs and develop more efficient, seamless operations.

To our staff members, I suggest that we develop a mind-set to continuously try to eliminate non-value adding activities, mistake proofing our operations and taking appropriate measures that would make us more efficient.

As the cost of delivery of higher education is on the rise, I believe there is a real need to resort to collaborative partnerships with other institutions and the private sector to reduce costs and generate external funding. By establishing partnerships and collaborations with other institutions we will continue to deliver a well-rounded education to our students and at the same time we will develop a degree of institutional agility that would withstand the market fluctuations by sharing the benefits of success as well as the risks of failure.

I strongly believe in establishing learning communities that would foster and support an environment that would allow both students and faculty to become excited and passionate about their academic programs. We all know that teaching is of paramount importance to our responsibilities, yet unfortunately that commitment is not always properly reflected to a lay person as long as we refer to our undertakings as: teaching "load" and research "opportunity".

As engineers and scientists, perhaps very few of us have had any formal training in teaching methodologies. Therefore, it is incumbent upon us to continuously educate ourselves in that area recognizing that lecturing is not synonymous with teaching. Active learning which requires students to participate in class as opposed to remaining as passive listeners involves many other classroom strategies. How students capture and perceive knowledge is a fascinating subject. With assistance from our colleagues in the college of education, we can become more familiar with the latest pedagogical findings and even take part in the on-going debate to identify the best teaching/learning methodologies.

To increase our retention rate, I suggest that we start an internal debate in our departmental, committee and college meetings to better identify the most effective ways to help our students and implement the best practices that are commensurate with the needs of our needs.

I submit to you that program assessment, as tedious as some colleagues might consider it, is indeed a very effective way to make improvements in everything that we do. As engineers we know that industry has implemented assessment programs with tremendously positive results. Assessment is a Work-In-Progress and we should continuously modify our programs and procedures to remain relevant to our constituents' demands.

I mentioned earlier that these are some suggestions to start an internal dialogue and to develop a shared-vision. I believe that effective communication is indeed the key to the development and implementation of that vision. I encourage our faculty, students and

staff to communicate with me regarding their concerns. One cannot address a problem if one does not know what the problem is.

Above all, I believe that trust among colleagues, students and staff is vital in any successful operation. I believe in straight talk and an open agenda. I also believe in team work and continuously motivate my staff in the Dean's Office to work together as a team.

Finally, to our departments' administrators and staff I say, we are here to serve our faculty and students. If we kept our faculty happy and content, then our students will be happy, our productivity will increase, our enrollment, retention and graduation rates will improve and as a consequence the entire college will benefit.

In the days ahead, I will work with you to identify the specific actions that we need to take to improve our college's operations and I wish to thank all of you - friends of Fenn College - for attending this event. Thank you.

