

The Evolution to Academic Excellence: Key Driver for Clarkson’s Overall Evolution to Excellence

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What is a University? The Evolution of Institutions of Higher Education

One of the first descriptions of a university was the designation of “*Studium Generale*,” which stood for “School of Universal Learning.” This ancient phrase implied a gathering of strangers (both faculty and students) from all parts (persons bearing different knowledge and from different regions) existing in one spot (a school).¹ Most notably the Greeks embraced philosophy, poetry, and other liberal arts as endeavors which broadened the mind and they began to include the sciences as a way to further broaden creative skills preparation for students who would later enter professions ranging from medicine to armor making. This became the premise from which American universities evolved and differentiated themselves from singular apprenticeship pursuits.

With the advent of the industrial revolution during the nineteenth century, some liberal arts institutions added faculties that supported economic growth and spurred business development. At the same time, technological institutes sprang into action to create manufacturing professionals and some colleges even specialized in the art of business itself. After WWII a new emphasis began to emerge on research - the creation of scientific knowledge. The complexity of creating scientific knowledge is now recognized by the Carnegie classification system in its highest order of attainment, a national research institution.

As we charter into the 21st century, there is a need to develop a new entity in higher education - one that educates and develops graduates who can meet the challenges of this century. Such an institution must emphasize the creation of knowledge, the development of that knowledge into practical, sustainable solutions to today's problems, and the commercialization/marketing of those solutions to create wealth - all within a global marketplace. This must all be done within a learning community that emphasizes communication and teaming skills that lead to creative problem-solving and within an environment that emphasizes a sound appreciation of humanity’s ethical, moral and respectful principles.

Who is best suited to create this type of institution? *Those with a vision to track the process of economic development – the connection of science to engineering to business coupled with liberal arts to provide the humanistic elements.* Ideally this type of institution would have engineering at the core of its being and value interdisciplinary activity rather than a culture that wants to retain disciplinary purity. The very interdisciplinary intellectual capacity and fundamental mathematics and sciences needed for engineering, technology and business degrees create the “*Studium Generale*” of the future.

Evolution to Academic Excellence Honors Our Founders

General Francis Walker, President of Massachusetts Institute of Technology trekked from Cambridge, Mass., to Potsdam, N.Y., for the dedication of the Clarkson Memorial School of Technology in 1896, mesmerized by the vision of Thomas S. Clarkson’s family and colleagues. For unlike other schools that emphasized engineering in that era, Clarkson opened its doors with the intent to include cultural studies and liberal arts in its curriculum, and a mandate to serve society. Walker is quoted as saying:

¹ John Henry Newman: The Idea of A University, 1854 – www.higher-ed.org/resources/newman-university.htm

“In the present stage of social and industrial change, change almost bewildering in the rapidity of its movement and in the extent of the field over which it is taking place, it is most reasonable to believe that great gaps exist between the public needs and the supply of those needs by the existing institutions of learning. Clarkson is a new type of school, which is out of the ordinary line of ascent; which does not confine itself to a definite place in the educational order, but which seeks objects of its own. As a result of their freedom from obligation to the general system of education, they not only will be at liberty, but they will be strongly impelled to search out those real needs of the American people in the matter of education which are at present unsupplied. It is essential to this function that they should remain in a state of flux; open to all impressions; mobile under all influences; not too soon assuming that they have found their ultimate resting place and have taken on their distinctive character.”

Clarkson today is a different kind of institution that is still mobile in its evolution to excellence and one that has yet to settle on a resting place within the defined order and benchmarking of higher education.

The Challenge and Impetus for the Change We Must Embark Upon

Since the post-World War II GI Bill enrollment expansion, and in particular over our last two decades, we have allowed Clarkson’s future to be largely determined by the external environment – opening us to the volatility of demographic changes and the cyclic economics that have governed our enrollment size and the financial aid needs of our entering classes. This vagrant course has diminished our ability to plan, develop and ultimately define our place in the higher education world. It is time for Clarkson to step forward and control its own destiny.

The Path for our evolution to excellence: undisputed academic excellence, engagement of alumni, and adroit financial management. Why will this path be successful? Our enrollments will stabilize, our selectivity will increase, our faculty, staff and student quality will rise, our alumni will step forward to support the institution, and our financial revenue streams will strengthen. For too long we have tried to do more of the same, without due recognition of the changes occurring in the world within which we operate. The net effect has been to erode the energy from our faculty and staff and has produced results that have not been inspiring. In particular, our financial resources under this old direction lack the power to elevate Clarkson to the level of an institution that ascends to be unique, for others to attempt to emulate, rather than the reverse.

Our history is one of graduating and developing students who lead and practice technology. Our focus must be on this “product.” While we have recognized to some extent the influence of nanotechnology, we have not fully grasped that “technology” has moved beyond our roots in engineering to embrace a new knowledge-age definition that includes biotechnology and info-technology. In short, we have not broadened our vision of technology to include contributions from the life sciences, to embrace the vitality of new disciplines within engineering, and to appreciate how businesses operate with the sophistication of integrated technology systems. Furthermore, we have not as an institution taken to heart that graduating high school seniors are expanding their career choices -- national interest in engineering as the preferred major has fallen 35% in the last ten years, and as equally compelling, women now account only for 18% of prospective engineers and underrepresented minorities 22 percent.² We have not recognized the dramatic changes in demographics - the changing fraction of underrepresented individuals, the geographic shifts in population centers, the socioeconomic profile of our constituents - nor have we fully recognized

² A survey by ACT, the standardized test provider, as quoted by Kelly Field in “Battling the Image of a Nerd Profession.” The Chronicle of Higher Education, July 9, 2004. P. A15.

the need to introduce new majors to draw more women into the technological workforce so that their talents can be developed and utilized. In short, we need to and should be obligated to deliver a Clarkson education that is appealing to a broader range of potential students.

In addition to lagging behind in reacting to changes in student interest, the marketplace, and the demands of employers, we have failed to react to the role Clarkson must play in the regional economy. The vitality of our regional economy and the vibrancy of the community surrounding our 640-acre campus are critical to marketing Clarkson to the world. We must now recognize that the creation of knowledge can no longer be our end goal. Clarkson must be a leader in developing intellectual property, transferring technology to the marketplace, and becoming a central part of the economic enterprise that values innovation, creativity and creates wealth. Implicit in this direction is the development of research at all levels of the institution.

Given this unsettling background of an institution dependent upon its external environment, a plan to become more efficient at “business as usual” is not sufficient for creating the Clarkson of the future. We must revitalize our position as an institution of higher learning in order to provide a more comprehensive, unique image that remains true to our core mission and values.

Our Vision to Engineer Clarkson’s Future

Clarkson is at a point of singular opportunity in its history. Our time is ripe to leverage the confluence of the achievements of our students, our faculty’s growing research success, and the influence of our alumni in society. Clarkson’s evolving strengths and vision for the future intersect precisely with the growing needs of our technologically driven society – a society that depends upon a workforce capable of creating, adapting and managing technology regardless of discipline of study or natural individual talents.

To fulfill our vision for academic excellence, we are uniquely positioned to further stake our legacy to society based on our commitment to technology and our leadership in marrying coursework, research and extracurricular pursuits in engineering, business, science, health sciences and arts. The pioneering efforts of our faculty have already drawn national recognition ranging from our oldest example, Interdisciplinary Engineering and Management (or Industrial Distribution as it was known at its inception 50 years ago), to our world-class research in fine particle science coupled with materials engineering, to our widely-heralded, team-based Student Projects for Engineering Experience and Design (SPEED) Program.

Clarkson’s distinctive place in the higher education order is attainable as we each continue to promote and explore innovative ways to arrange the basic building blocks of traditional fields of study to reflect new avenues for interdisciplinary education, research breakthroughs, and solutions for society.

Our final building blocks in evolving to excellence are marshalling our financial resources and engaging our alumni in powerful partnerships. Raising the bar in these areas will also influence our rankings and reputation. Using sound financial models to leverage our return on investment, we will focus our resources so that all of our initiatives make both strategic and financial sense.

Clarkson Will Be the University in North America Where:

Our curriculum and extracurricular programs attract, educate and motivate individuals who are driven to enterprise and to make contributions to the regional and global economy in an ethical, responsible and sustainable manner.

Our students know they are the center of the educational process and all employees demonstrate an unparalleled commitment to creating a person-to-person connection within our living, research and learning environments.

Our campus community stimulates the intellectual environment that attracts a diverse pool of exceptionally talented women and men who will rise to be leaders of the 21st century with the passion to create enterprises that benefit society.

Our faculty collaborate, innovate and create knowledge across disciplinary boundaries and educate students to have a particular appreciation for the opportunities that lie at the intersection of traditional disciplines.

Our research partners, major corporate affiliates, and employers trust Clarkson for maximizing their investments, achieving results, and providing a deep world-ready talent pool for their future workforce.

Our Evolution to Excellence Will Be Achieved By:

Building our national academic reputation and focusing our resources in signature areas in each of our three schools and in our research centers that stretch the boundaries of the schools;

Offering a core curriculum and setting graduation requirements – both curricular and co-curricular -- that support Clarkson's vision by demanding interaction among disciplines as well as provide a platform for a common experience for all graduates to distinguish the Clarkson education;

Bringing faculty, staff and administrators together in support of Clarkson's vision through their own individual active collaborations across disciplines and departments;

Shedding light on visible examples of the research, development and commercialization pathways undertaken in an environment where our core values of teamwork, service, diligence, integrity, diversity, vision and growth are emphasized;

Expanding Clarkson's boundaries beyond its 640 acres in New York to include global interactions, external partnerships to leverage our expertise, and the advantage of our extensive alumni network.

The Premises We Accept:

Our overall enrollment and faculty size must stay within a range that ensures the delivery of a personal learning, research and living environment, while being of a quality and reputation to draw a broad base of corporations and organizations that recruit our talent and collaborate in our research enterprise. This premise is supported by three driving realities:

- In a national survey conducted by George Dehne in 1997, 36% of all polled prospective college students said the ideal university size was between 3,000 and 3,500 students (far and away the largest positive response to all size ranges). Dehne reports now that students are shifting from this most popular ideal size toward institutions with enrollments of 5,000 to 7,000.

- In 2001, Campbell Research Company conducted a comprehensive survey to quantify the perceptions of Clarkson alumni about their experience with Clarkson as a student and as an alumnus, and to determine what drives them to become engaged with the institution both as a volunteer as well as a donor. Alumni from the 1980s, and in particular, the late 1980s -- a decade where Clarkson's enrollment was at its largest with a high of 3,800 students -- are proportionately the least satisfied when they reflect on their student experience and have the lowest participation of alumni in the life of Clarkson today. While there were several changes in the Clarkson administrative structure and even higher education as a whole during this period, the loss of personal connection back to the institution is evident in the survey respondents' qualitative answers. The survey report summarized that these younger alumni were more likely to see the educational experience as a transaction that was a consumer choice carrying no responsibilities or obligations beyond the initial term of service. This diminished personal affinity back to Clarkson is manifested in low giving percentages from these class years and lower alumni reunion participation.
- A critical mass of qualified and diverse students is needed to draw employers to a college campus today. Information from the National Association of Collegiate Employers and its representatives affirms this fact.

While our historical roots in engineering education must remain strong, our reputation and comprehensive programs in the School of Arts & Sciences and the Business School must match the stature of the Coulter School of Engineering. The Coulter School and our other two schools must continue to evolve and become world-class within select areas. For graduates to succeed in the 21st century, the deployment of technology cannot be isolated only to those pursuing quantitative education. A significant step will be redirecting our curricular offerings to be more consistent with the changing needs of the technological marketplace and providing all graduates with universal learning opportunities to build a career. Inherent in this premise is moving the function of planning and ultimate accountability closer to the product -- particularly the schools and research centers.

Essential to achieving academic excellence is our full commitment to diversity among our faculty, staff and students. Not only is this the right thing to do to provide an environment that reflects the world our graduates will enter and eventually lead, it is imperative to make Clarkson a top choice for developing the broad base of talent that our global partners desire and expect us to deliver.

Marshalling our financial resources includes a review of all our revenue streams --tuition revenue, auxiliary enterprises, endowment income, contract research, private gifts from alumni and friends, and federal, state and foundation grants. We are also committed to tapping new sources of revenue, most notably the commercialization of our intellectual property coupled with a commitment to helping entrepreneurially focused faculty and students gain access to sources of capital.

Historically underutilized as a marketing resource, Clarkson alumni are one our greatest assets and advertisements. One in 12 is a CEO, owner or senior executive of a company. In the last twenty years, our alumni body has more than doubled. The oldest of these 18,000 recent graduates are now just reaching their peak years of social and business influence. We must employ their good will more effectively in bringing future generations here as students through efforts in admissions as well as philanthropy.

The Goals We Will Attain:

Over the next five years, we will achieve a stable undergraduate student body size of 2600 to 2800 students, or 680 new students per year. During this five-year period, we will dedicate our energies to and invest aggressively in the development of our academic reputation. This includes growing our applicant pool to become more selective versus an emphasis on overall enrollment growth.

Based on the foundation of a stronger academic reputation, the subsequent five- to- ten- year period will focus on controlled enrollment growth to an undergraduate student body of 3,000 and a graduate student body of 600. This presumption leads to an ideal faculty size of approximately 240 members, also stated as an undergraduate student-to-faculty ratio of 12.5 :1. To maintain the distinctive nature of Clarkson as one of the foremost engineering institutions, approximately 40% of the student body and faculty should lie within the School of Engineering. The School of Arts & Sciences and the Business School will each then represent 30% of the student body respectively, noting that the Interdisciplinary Engineering & Management students are counted within the Business School. This student body should maximize the utilization of our physical plant.

Through collaboration among the three schools, the University and its faculty will develop new core curriculum requirements, with particular emphasis on interdisciplinary initiatives.

To successfully implement the long-range plan, we will clarify the role of all non-academic units in support of the goals and strategies within each School and research centers.

Clarkson's alumni organization will be nationally recognized and sought for its counsel on successful alumni engagement, integration into campus life, and giving programs.

A combination of financial resources (operating budget and endowment) will support the Clarkson Vision and contribute to our reputation through the cache of its endowment size and noteworthiness.

The Metrics We Will Monitor:

Collectively the University will be ranked in *US News & World Report* in the top 100 institutions in five years and in the top 75 institutions in ten years (currently Clarkson has been consistently ranked between No. 120 and No. 130).

In the next five years, faculty and staff diversity will increase. All new faculty hires will reflect the diversity of available faculty within the nationally qualified pool. (This figure will be based on the ethnic and gender percentages of new doctoral graduates in each discipline, which will vary in each school and field of need and will be specified in school-based plans.) Our incoming student body will likewise reflect the diversity and demographics of high school graduates in the Northeast. (Enrollment is now 85% Caucasian, 7% minority, and 8% non-resident alien.)

To increase the selectivity for undergraduate program admission and financial aid, we will grow our application pool by 10% per year for the next five years, to over 4,000 annually by 2009 (currently averaging 2500 applications per year). New student enrollment will reflect greater selectivity from this pool by raising the number of students enrolled from the top 10% of their

graduating class to 40% in the next five years, and to 50% in the next 10 years (currently 33.5% are in the top 10% of their graduating class). The mean SAT will also rise in the next five years to 1225, and in the next ten years to 1250 (currently 1180 for Fall 2003).

Within five years, *US News & World Report* will rank the Clarkson Business School within the top 100 (undergraduate) business programs (currently unranked) with two of its focus areas ranked within the top 20 of its kind (supply chain management program is currently No. 14 nationally). For the graduate Business program, *US News* will rank in the next five years the School in its top 20 list for at least one of the specialty M.B.A. programs.

Within five years, *US News & World Report* will rank the Coulter School of Engineering within the top 50 undergraduate engineering programs (currently ranked No. 82). Within five years, half of the graduate programs will be ranked in the top 50 of their kind and all graduate offerings in engineering will be in the top 50 within 10 years. Graduate programs supporting the research centers and the select focus areas will be ranked in the top 20 of their kind within five years (environmental engineering is now ranked No. 23).

In the absence of comparable national program rankings in *US News* for the Clarkson School of Arts & Sciences, the School will measure its academic excellence by achieving in the next five years national recognition for:

- Its innovative and interdisciplinary undergraduate and graduate programs.
 - Metrics
 - All undergraduate A&S programs will have interdisciplinary requirements for majors (excluding specially accredited programs such as chemistry).
 - Students in A&S undergraduate majors and graduate programs will show increased geographical representation (undergraduate deposits for Fall 2004 represented 23 states, with 70% from New York).
 - Students in A&S majors will show increased representation of first year students from the top 10% of high school classes (new metric still being determined by team; currently 35.10% of A&S students are in top 10% of high school class).
 - Its experiential learning programs in research and community-based projects.
 - Metrics
 - All undergraduate programs will have an experiential learning requirement.
 - Clarkson's School of Arts & Sciences will receive at least one national award for its experiential learning programs within five years.
 - Its curricular initiatives in technology, communication, and ethics.
 - Metrics
 - The number of invited national conference presentations and the number of invited seminars presented by Clarkson faculty on curricular initiatives will increase. At least two such invitations will be expected annually. (Current figures still being collected.)

Within five years, our research will drive our graduate program rankings and we will be recognized within the top 20 graduate programs that complement our focused areas of research.

Within five years, the Alumni Association will have presented at a national conference about a successful program to engage alumni and will have won a CASE (Council for Advancement & Support of Education) Circle of Excellence Award. Alumni giving participation will go from 29% now to 35% in five years and to 45% in ten years.

Within ten years, the endowment will reflect \$100 million per thousand students enrolled (currently roughly \$33 million per thousand students enrolled).

Addenda*

Addendums to this document include a Layman's Guide to the US News Rankings, a draft of recommendations from the Core Curriculum Review Committee and a draft from the Research Centers Task Force on their contributions and role in our evolution to excellence.

Future addenda will include the School-Based plans, which have been under discussion and development in parallel to long-range planning initiatives by the Campus Executive Team and refinement of this Evolution to Academic Excellence document.

**Note –These addendums are lengthy attachments. Copies are available electronically by e-mailing mfisher@clarksson.edu. Please type "Addenda" in your subject line.*