

Inventing the Future: Planning for the Next Five Years at Olin College

by

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Executive Summary. Olin College has accomplished a great deal in a few short years. As a result, it has begun to attract significant national attention, not just in the popular press but also at the highest levels of government and academia. It appears to have significant opportunities to help set the agenda for improvement of undergraduate engineering education across the nation in the next few years. However, at this point in time, Olin is neither an early-stage start-up enterprise, nor is it a well-established institution. Signs of fatigue have developed, and sustainability is a continuing concern. With this background Olin College is about to initiate a strategic planning exercise intended to identify a few Big Ideas worthy of our best efforts for the next five years. The reader is invited to participate in this planning process by providing answers to three fundamental questions, including one intended to identify new opportunities.

Historical Perspective. In a few short years Olin College has progressed from a concept to reality. It was chartered in 1997. In 1999 it hired its first employees. In 2000 it broke ground for the construction of the campus and hired its first wave of founding faculty members. In 2001 the first students (Olin Partners) arrived, and testing of educational models began. In 2002 Olin College taught its first courses. Earlier this year Olin College graduated its first class, and completed all preparations for both regional and professional accreditation (we expect to receive final results on these efforts within the next several months). Today, Olin has a total enrollment of about 300 students, a faculty of almost 40, a new campus consisting of five state-of-the-art buildings on about 75 acres, an endowment of about \$430 million, and a rapidly growing national reputation for excellence and innovation. Much has been accomplished in a remarkably short time. These events might be considered the end of the “era of invention” of Olin College—a period marked by intense effort, a culture of experimentation, and a string of successive achievements that consistently exceeded expectations.

In some ways the rapid era of invention required so much in terms of creativity, effort, and resources that it raised concerns about the sustainability of our program. As in any start-up activity, it was difficult if not impossible to predict with accuracy what it would cost to achieve the necessary outcomes during the early years, so budgeting in these years was very difficult. In the absence of experience or data with our completely new educational model it wasn't possible to know for sure what it should cost or how much effort it should take to achieve the desired results. Also, since activities in this period were marked by a very high percentage of “first ever” events and accomplishments, the level of effort and personal stress required from almost everyone in the community was much higher than is normal for a well established program. These conditions led to concerns about sustainability—sustainability of both our financial and our human resources. While these concerns will remain for years to come (in fact, they are always present at some level even in mature institutions), great strides have been made in the last two years in addressing these issues.

For example, the Board of Trustees has made significant changes in management of the endowment designed to increase the rate of return from investments and reduce the long-term financial risks. The College hired the Huron Consulting Group in 2005 to perform a comprehensive review of financial sustainability, and most of their recommendations have been implemented within the last 12 months. These improvements were commended by the recent accreditation visiting team from the New England Association of Schools and Colleges.

As for the sustainability of effort, each year for the past four years the percentage of effort devoted to first-ever activities has declined steadily. In the 2002-2003 academic year, we

invented all educational experiences in the freshman year. One hundred percent of our effort consisted of first-ever activities at Olin College¹. However, in the 2003-04 academic year, when we taught both first year and second year courses, only about half of our efforts were devoted to first-ever activities, since we were able to repeat the first year educational program with relatively minor adjustments. In 2004-05 only about one third of our efforts were devoted to first-ever activities, as we pioneered the junior year educational experience. Last year only about one fourth of our effort was devoted to entirely new activities as we invented the senior year educational experience while largely repeating the three earlier years of the academic program. This year (2006-07) for the first time in Olin's short history we are able to deliver all aspects of our academic program without pioneering an entirely new year of the educational experience.

Of course there are many other dimensions to the development of the College that have been progressing in parallel with the academic program, including the development of the student life program and student services, development of all policies and procedures, construction of the campus facilities, growth and development of the Board of Trustees, cultivation and growth of the national visibility of the College through the media, and establishment of numerous new relationships with corporations and academic institutions, both locally and abroad. These efforts have also begun to stabilize in the last few years.

As a result, Olin College is at a cross roads in its history. It is no longer an early stage start-up institution, but neither is it well established. It is no longer a completely "blank slate" for new students and faculty, but neither is it hesitant to undertake major changes and revisions². However, the intensity of effort required during the first few years has caused some physical and emotional fatigue and a clear reduction in the appetite of our community for major new initiatives. Burnout of faculty and staff is a real concern, especially for those who have been here from the beginning. It is tempting to find a thousand reasons why we don't have the time or energy now to undertake any major new initiatives. Some within our community are close to losing the "can do" attitude that has been so essential to the success of the last seven years³. The importance of this attitude will remain fundamental to Olin for generations to come if we are to build an authentic culture of innovation and change.

On the other hand, Olin has attracted a collection of exceptional people who have a remarkable capacity for work, a selfless dedication to the academic achievement of our students, and a missionary zeal for creating a new model for engineering education that is based on innovation and continuous improvement. There are some among us who may lose interest in Olin if the goals of the next five years are very much less ambitious than those the last five years. It is a common phenomenon in a start-up enterprise for some of those involved in the founding of the organization to eventually lose interest in the more routine tasks associated with maintaining the status quo, as challenging as this may be. If Olin is to retain its most creative and productive people, we must envision now a future that goes well beyond sustainability. It must include goals and objectives that are worthy of our very best efforts—goals that bring a commitment and a zeal that is comparable to the level that characterized our last five years. In recent years it has been

¹ As a result, we experienced some calibration problems with the workload for students in Fall 2002, which required that we halt all instruction at one point, revise the level of effort required, and restart the program with more realistic expectations for student effort.

² For example, the curriculum for all three BS degrees officially expires in May 2007, and the faculty has undertaken a comprehensive review of the curriculum this year with the potential for a complete reinvention if necessary.

³ In the beginning, Olin faced many challenges that required unreasonable faith, courage, and personal commitment in the face of enormous risks and potentially endless demands on time and resources. For example, recruiting exceptional faculty members to a new institution without tenure, without a Ph.D. program, and without even a campus was regarded by most experienced observers as very unreasonable. Similar challenges existed for recruiting the first students and administrators. It would not have been possible except for the "can do" attitude of those members of the community who led the way in the first few years.

common to hear members of the community say that they have never worked so hard in their lives—yet there are few things they would rather be doing. I sincerely hope we are able to maintain this level of enthusiasm for Olin's agenda for the next five years.

Looking Beyond Our Borders. Olin College was created specifically to rethink the way engineers are identified, prepared, and inspired to lead America's technology enterprise. In recent years the importance of this mission to the nation has become increasingly clear. Perhaps Thomas Friedman's recent book *The World Is Flat* provides the most accessible explanation for the general public of the nation's need for rapid improvement in the ability to sustain and accelerate our capability for technology innovation. This message was reinforced and supported with research by the recent report from the National Academy of Engineering entitled *Rising Above the Gathering Storm*. The Council on Competitiveness also produced a *National Innovation Initiative* that outlines steps that are imperative to sustain the US economy in the face of growing global competition. Earlier this year President Bush announced the *American Competitiveness Initiative* intended to (among other things) enhance the ability of the country to compete in technology innovation.

There is a growing realization that the country doesn't just need more engineers—it needs more *innovators*. There is a difference. Engineering, as it is defined and taught at many traditional universities, is more about applied science than about invention or innovation. Innovation always involves entrepreneurial thinking along with intentional creativity, neither of which have been significant components of the traditional engineering curriculum.

As a result, there is a growing realization within engineering schools that the undergraduate experience is of major importance and in need of serious reform. Many engineering schools are now considering a comprehensive revision of their undergraduate curriculum for the first time in many years, and they are looking for successful educational models that address all of the dimensions to the needed changes. Although we are very new and largely unproven at this point, Olin College is frequently contacted by other engineering schools for advice on what needs to be done in this area⁴. Furthermore, in the past 12 months the National Science Board has repeatedly called on Olin College—the only undergraduate institution to be invited to present in this forum—to share its experiences in engineering education with colleagues at other institutions. In addition, the Spellings Commission on the Future of Higher Education—in their effort to develop recommendations for the improvement of all of higher education across the nation—invited testimony from Olin College last spring. That the educational experiments underway at Olin have attracted national attention is now becoming clear. As a result of these and other events, Charles Vest, former president of MIT, and James Duderstadt, former president of the University of Michigan, (along with many other well known engineering educators) have visited Olin in the past three months.

It appears that Olin College may now have an opportunity to play an important role in the inspiration of other engineering schools to consider fundamentally rethinking the undergraduate educational experience for engineers. To play such a role is, in fact, our long term aspiration as

⁴ For example, the rate at which we receive requests for visits to campus by colleagues from other institutions has increased in recent months. There seems to be a steady stream of visitors now who are keenly interested in our educational model. In addition, we are receiving an increasing number of requests for members of our community to provide keynote talks at other universities about our program. Many members of our community have been involved in this activity. For illustration, this fall I have been asked to make keynote presentations at the School of Electrical and Computer Engineering at Georgia Tech, the College of Engineering at the Stevens Institute of Technology, and Olin has been invited to enter into a partnership with California Polytechnic Institute and State University at San Luis Obispo on project-based learning. Sherra Kerns has been traveling abroad making similar keynote presentations at major universities in Europe this fall, and has been invited to join the Board of Visitors at the Thayer School of Engineering at Dartmouth College.

expressed in the current strategic plan. One of the original motivations for the creation of Olin College was precisely this—to serve as a kind of “*poster child*” for needed improvement in engineering education nationally. I believe that we now have a real opportunity to step into that role in the next few years—if we devote our energies and efforts to this purpose. Of course, even with our best efforts the success of this type of activity depends largely on circumstances beyond our control, and the attitudes and opinions of colleagues at other institutions. Nevertheless, it is certainly an important national need and a calling that is tailor made for Olin College. We should regard it as a privilege to be able to make an important contribution in this area. It is a calling to a higher purpose, one that is beyond self interest. Perhaps this challenge is worthy of our best efforts—one that will result in making the next five years even more rewarding than the last five years.

Planning for the Future. With the preceding historical perspective and the opportunities facing us beyond our borders, Olin College is poised to undertake a comprehensive strategic planning exercise intended to provide focus and prioritization of efforts for the next five years. Our current strategic plan, *From Promise to Reality*, will officially expire at the end of this academic year. It is our intent to engage a professional facilitator to lead a planning discussion, appoint a strategic planning task force that will engage the entire campus community in a discussion of the future, and develop a proposal for a revision to our strategic plan by the end of the year.

Because of the importance of looking beyond our borders we hope to engage stakeholders that are not located on campus. The voices of the Board of Trustees, the President’s Council, all of our program advisory committees, our corporate sponsors, partner institutions, alumni, parents, and friends are an important part of this process. We intend to facilitate conversations and feedback from all of them this year.

In thinking about the next five years, we have pragmatic concerns about sustainability and incremental improvement to address, but we also face important new opportunities that must be addressed at the same time. I believe it is critical that we engage in a conversation marked with at least some Big Ideas in spite of the current fatigue and worries about resources. Unless we can identify plans that are worthy of our continuing best efforts, and enhance our *Can Do* attitude, we risk becoming just another small college.

However, the reality of the financial situation requires that we couple any Big Ideas with the identification of new resources that will be required to initiate and sustain them. Our current financial model is under considerable stress just to sustain the remarkable educational culture that we have created here, at our current size of about 300 students. Any significant growth of enrollment, faculty, or educational initiatives will require incremental resources to create and sustain the new activities. Thus, it is important to realize that any plans that would require new resources will have to be contingent on our ability to identify and develop a source of funds to enable them. We cannot assume that just because we all agree that a certain new program is exactly what we need that we will be able to move ahead with implementation on our own time table. The timing of any such new activities will necessarily be dependent on our success at generating a new source of revenue to support the activity. As a result, there is an obvious coupling of our strategic planning effort with our parallel effort to engage new stakeholders and develop increased levels of fund raising. Both of these important activities—strategic planning and development—must proceed together in a coordinated fashion.

A Few Possibilities. In order to illustrate the kind of Big Ideas I hope will emerge from our collective discussion about the future of Olin College, I have chosen three ideas that have been constructed from suggestions from many different people. I think each of them is worthy of consideration, for different reasons. First, I could envision Olin College establishing a Center for Innovation in Engineering Education. The purpose of the Center would be to attract scholars in the field of engineering and education, to study and document the effectiveness of various approaches to teaching engineering and innovation. In order to determine whether our approach is as effective in comparison with more traditional methods as we suspect, and to identify

opportunities to improve the efficiency and effectiveness of our approach in more cost-effective ways, it is necessary to perform careful educational assessment research in which the performance of a control group is compared to the performance of an experimental group over a significant period of time.⁵ These results then need to be published in mainstream education journals where they will be reviewed by peers, and eventually verified by independent experiments at other institutions. Results from this kind of research are necessary in order to advance the state-of-the-art in engineering education, and to persuade other larger institutions to consider improvements to their program. In addition, the Center could provide workshops for the improvement of teaching of engineering, and also short courses on how to teach in the collaborative, team-focused approach that is central to Olin's educational model. Although there are several other centers in existence now around the country, none has the advantage of having an entirely new institution focused on innovation in engineering education to serve as a major laboratory for the research. Perhaps the Center could attract funding from federal and private foundations, or corporations interested in advancing educational models that promise to improve the nation's global competitiveness.

Another Big Idea is the establishment of a new B.S. degree in Bioengineering at Olin College. Most observers today feel that the life sciences will become much more important in the next 20 years, and the intersection of engineering and the life sciences presents perhaps the richest set of opportunities for breakthrough technologies and new industries. Located in Needham, MA on Route 128, Olin is ideally located for interaction with local biotech companies. Furthermore, Boston is a global center for world class medical research, offering the opportunity for collaboration with medical schools and research laboratories nearby. It is hard to identify a location anywhere that is better suited for the development of such a new program. In addition, Bioengineering is a field that opens many other doors in the life sciences, such as medical school, and is of more interest to our women students than our current set of degree programs. If one were to imagine a modest new B.S. program at Olin that might require an increase in our enrollment of about 30 – 50 students, and an associated increase in faculty size of about 3 – 6, it would appear that such a new program might be added to our existing degree programs without the need to build another residence hall. The additional faculty members could be chosen carefully in order to increase the potential for coverage of our core courses. This would improve the redundancy in our teaching assignments and allow more flexibility for faculty members to take developmental leaves when needed. This, in turn, would increase the critical mass of our community of scholars and enhance the sustainability of our program overall.

Finally, another Big Idea might be the complete re-invention of Olin College. Although Olin began with a blank slate only 7 years ago, it has developed a number of distinctive programs that have rapidly become the "*signature*" of the College. These include the Candidates' Weekend process for admission, the SCOPE senior project experience, the EXPO project presentation program, the Integrated Course Block format in the freshman year, and the centrality of the design theme in every degree program. We are proud of these components of our program, and we believe they are very effective. But precisely because we are proud of them, we are unlikely to consider ever replacing them or seriously consider starting over with a clean slate to see if we might invent something even better. Joseph Platt, founding president of Harvey Mudd College, has pointed out that there is no more powerful force for conservatism than having something to conserve. We now have something to conserve, and it is likely to prove to be a powerful force to inhibit the kind of breath-taking innovation and change that characterized our founding.

⁵ For the past seven years Olin College has been intensely involved in the invention of the entire academic program, not in careful educational research projects. The process of invention requires that we make immediate decisions on hundreds of independent variables in order to launch the program, with the decisions being made largely on the basis of our collective experience and intuition. However, the process of careful research involves controlled experiments in which only one variable is changed at a time in order to document the effect of each individual aspect of the program. We simply have not had the time yet to do much of this kind of research.

One way to address this is to consider periodically re-inventing Olin College. This might involve declaring a 4-year time period for the re-invention, and then suspending the admission of a freshman class in the first year of the program. This would have the effect of reducing the teaching load at the College by an average of 25% each year for a four year period. During this period it would be possible to repeat a form of the Olin Partner year, and the re-invention of the entire educational experience one year at a time, beginning with the freshman year, over a four year period. The primary cost of the program would be replacing the revenue lost to the room and board fees for one class each year.

These ideas are only suggestive. Each one has a whole family of variations that would improve the effectiveness and reduce the cost of implementation. They are only a starting point for the discussion that I hope will begin on campus this fall.

Conclusion. In this short paper I have touched upon the historical achievements of Olin College, the current concerns and future opportunities, and the plan to initiate a comprehensive strategic planning effort. In addition, I have pointed out the need for the identification of some Big Ideas in our planning discussions, understanding that these ideas must be coupled with efforts to find new resources to enable them to go forward.

I would like to invite the reader to answer the following questions in light of the background provided, and send me your written responses.

1. How important do you think it is that Olin College work to influence other engineering schools for the purpose of improving engineering education on a national scale? Is there a role for Olin in shaping corporate attitudes about the value of engineers in the new “flat world” economy?
2. What do you see as the major challenges facing Olin in the next five years, and what do you think needs to be done to address these challenges?
3. What Big Ideas do you have that should be considered by the College as it plans for the future, and what suggestions do you have for funding them? I am particularly interested in your creative ideas that go beyond the illustrations provided in this paper (although comments on the illustrations are also welcome).

In order to do the best possible job of developing a strategic plan for the period from 2007 – 2012, we need to harness the considerable creativity and inventiveness of the Olin community. Please take a few moments to send me your thoughts. I will make sure that they are shared with the appropriate committees involved in the planning process.