

Reflections on Best Practices in Engineering Academic Administration

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The University of Massachusetts Lowell's administration has increased dynamism and ambition. Feeling the need for more personal interaction and making larger contributions, a full professor accepted the position of Associate Dean for the James B. Francis College of Engineering. The primary focus for the position was strategic development of academic and research programs, with other assignments in support of day-to-day operations of the College.

The new Associate Dean successfully began the position by meeting with all interested faculty and staff regarding their perceptions of strengths and opportunities for UML. This exercise proved to be clarifying, with the communicated strengths including: 1) balance of practical training with engineering education, 2) geographic niche with local access, 3) excellent value proposition, and 4) highly collaborative environment. Faculty proposed many opportunities for advancing teaching/learning including project "maker" space, new engineering minors, more social events, and greater alumni involvement. Some of the suggested research opportunities included rationalization of research spaces, establishment of graduate student offices, improving the quality of doctoral students with standard offers, and development of larger research centers. Faculty also suggested administrative initiatives such as constant communication and enforcement of policies, hiring and re-allocation of College staff, new faculty mentoring programs, and increased faculty awards.

With these ideas and a reasonable mandate from the faculty, the Associate Dean undertook new program development leading to some impressive successes and failures. Working with faculty, two interdisciplinary minors were successfully developed that included Energy Engineering and Biomedical Engineering. An inclusive, consensus building strategy was used in the development of these programs, such that the Dean & Chairs first suggested members to serve on the development committees, after which those faculty suggested additional members. As a result, the core courses and inter-departmental requirements were openly negotiated such that the proposed minors were developed without surprise, harm, or delay. A similar strategy was taken to overcome opposition of a new doctoral funding model in which high quality students receive a standard package including a ½ teaching assistantship (TA) and a ½ research assistantship (RA); chairs initially resisted due to potential loss of TA positions, while faculty and graduate program coordinators raised other concerns. These issues were addressed through iterative discussion that lasted nine months but resulted in general agreement and a successful roll-out.

Undergraduate engineering education was of critical interest to this Associate Dean, who performed extensive analysis of undergraduate retention and success. Having taught the required first semester course "Introduction to Engineering I" for several years, it was believed that student success could best be improved by increasing the student's self-efficacy through improved faculty instruction. Accordingly, a studio model for engineering education was proposed (see figure, next page) in which "lecture" and "recitations" would be taught within an "Invention Factory" providing the most common capabilities for realization of engineering concepts. The underlying goal was to replace a significant amount of lecture content with direct student-led inquiry in the context of engineering design and analysis. The resulting proposal called for approximately 6,000 square feet of laboratories with a \$1,000,000 capital investment and annual operating expenses of approximately \$400,000 per year. A support model was concurrently developed relying on cash donations, equipment grants, and tuition to realize the concept. Unfortunately, the proposal was declined by the Administration given timing and other concerns.

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To increase financial and academic leverage, the Associate Dean undertook development of a \$2.5 million STEM Talent Expansion Program (STEP) proposal. However, the proposal's inclusion of three regional academic partners necessitated a refocusing of the concept away from the studio model and towards the development of an engineering faculty learning community and improvement of instruction. While the NSF program director suggested likely success, the resulting proposal was not funded and thus the studio model was invalidated. There were other failures related to research funding, including the development and declination of an Interdisciplinary Graduate Education Research and Training (IGERT) proposals as well as an Engineering Research Center (ERC) proposal.

While the STEP proposal was a failure, the development of relationships with the academic partners led to the development of new two-way articulation agreements. In this model, students enrolled in two year programs would undertake a regular series of courses intending them to transfer to UML. However, these agreements were revised under the North East Consortium of Colleges and Universities in Massachusetts (NECCUM) agreement such that students could take required engineering courses at UML and have them transfer back to their host institution towards completion of their Associate degree. As a result, students would be better prepared for their engineering coursework at UML, and retention and completion rates of engineering students at all institutions would rise.

Upon reflection, this Associate Dean suggests that the successful program development occurred due to the cooperative strategy employed and careful consensus building during early concept formation. Conversely, the failures occurred due to the lack of a cooperative strategy employed during the early development of the failed programs: either the vision was not sufficiently well articulated or the collaborator(s) were not sufficiently engaged to develop and advocate for a shared vision. In other words, clarity of vision is not sufficient; process matters.

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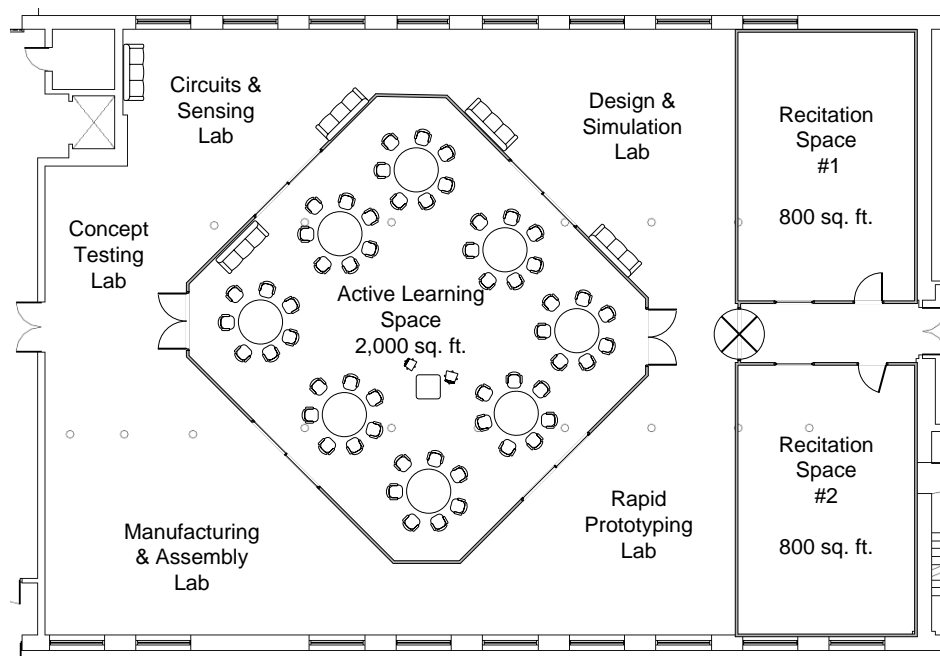


Figure: Proposed "Invention Factory"