

# USING INSTITUTIONAL ENTREPRENEURSHIP TO ‘REVERSE-ENGINEER’ A LARGE ENGINEERING LEADERSHIP INSTITUTE

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**Abstract** –Leadership is poised to become a major feature of engineering education, but the question of how to grow programs within the institutional context of engineering faculties remains largely unanswered by the literature. Our analysis of a single historic case study of Canada’s largest engineering leadership institute sheds light on some of the strategies used to grow from a small program to a stable educational unit. We find valuable insights on how to generalize these findings by applying concepts from institutional entrepreneurship to make sense of founder strategies.

**Keywords:** engineering leadership, institutional entrepreneurship, organizational change

## 1. INTRODUCTION

The field of engineering leadership education has been growing rapidly in North America [1]. Multiple universities have established programs, but most research has focused on describing individual programs, with some recent efforts analyzing patterns across programs [2-3]. However, very little is known about the institutional changes required to launch a new engineering leadership program, which is a complex and highly contextual challenge. The exceptions are individual reflections from program leaders in the US [4-5], but these tend to focus on program content, and both were initiated in a top-down manner.

This paper examines how the Institute for Leadership Education in Engineering (ILead) at the University of Toronto grew from a small co-curricular program, Leaders of Tomorrow (LoT), into a permanent entity [6]. In particular, we investigate how the theory of institutional entrepreneurship (IE) can illuminate some of the strategies used by program founders. Institutional

entrepreneurs are defined as “actors who envisage new institutional configurations as means of advancing interests they value highly, yet are often suppressed by extant logics” [7]. We apply concepts from institutional entrepreneurship such as the importance of timing, partnerships and networks, and connecting resources to opportunities, to illuminate how institutional change was enacted in this case.

The purpose of our paper is to support the growth and expansion of engineering leadership initiatives at Canadian universities by sharing some key insights from our own development. While the paper focuses only on a single case study, the key findings, grounded in institutional entrepreneurship, can be applied in other universities.

## 2. METHODOLOGY

Our study employs a single case study approach to look at the development of a multi-faceted engineering leadership institute from 2002 to 2016. We draw on secondary data from past annual reports and other historical documents. In a few cases we corroborate key events with the relevant actors through informal interviews. In our analysis we employ a modified analytic induction approach to develop contextually relevant descriptions of the IE strategies employed by engineering professors who designed and grew the program. We developed a timeline of the key events and turning points in the institute’s development, and then tried to match these pivotal moments to concepts from institutional entrepreneurship.

## 3. INSTITUTIONAL ENTREPRENEURSHIP

The concept of institutional entrepreneurship comes from the organizational theory and sociology literature as

a way to make sense of how individuals are able to exercise agency over organizations and institutions despite being influenced themselves by existing rules and norms of the organizations. The concept has been built upon by practitioners and academics working in sustainability and resilience, and is nicely summarized by Westley et al:

“An institutional entrepreneur may seek to shift dominant social norms and rules, institutional logics, beliefs and meanings, and structures of power and resources... Because success cannot be achieved through command and control, it must be realized through a deft mobilization of energy, i.e., choosing the right time and place, working through networks and partnerships, and connecting resources and opportunities to create social tipping points.” [8]

Mapping this simplified definition of institutional entrepreneurship onto the context of ILead’s development, we argue that ILead seeks to change beliefs and meanings about what it means to be an engineer, and how leadership features in that new belief. The organization also seeks to shift structures of the curriculum, so that leadership development ultimately becomes a central (mandatory) feature of an engineering education. We will use the three ideas from the latter part of the definition (time and place, working through networks, and connecting resources and opportunities) to structure our findings.

## 4. RESULTS & DISCUSSION

We begin by sharing a high level synthesis of the stages of ILead’s growth over its lifetime. This is meant to summarize the external picture of how the institute has developed. Next, we analyze a few key inflection points in the institute’s evolution by looking at the choices and strategies that led to key outcomes and try to match them to concepts from the literature.

### 4.1 Summary of Growth 2002 to 2016

ILead’s growth can be roughly split into three phases, which are based on different levels of resourcing (human and financial) and complexity of operations.

From 2002-2006, the Leaders of Tomorrow (LoT) program was led by the Chair of Chemical Engineering to offer leadership development programming to students through a structured summer program, in-term workshops and speakers and a student-led working group.

In 2006 a partnership with another professor of Chemical Engineering who had been working on student development programming while in the Vice Dean’s

office led to significant funding from the Provost. From 2007-2012, LoT received funding from the Provost to hire full-time staff, expand to become a faculty-wide program and introduce the working group model and workshops to other departments. In this phase, major alumni donations were secured, and the first three academic leadership courses were approved, designed and delivered. In 2010, the Institute for Leadership Education in Engineering (ILead) was formed.

From 2010 to now, ILead has grown to a team of eleven people, plus another seven sessional lecturers. A research team was established in 2012 and has grown in size and scope, publishing an increasing number of conference papers and a few journal articles. The number of academic course offerings has grown to 17 in the 2015-2016 academic year, and in 2016 an Assistant Professor Teaching Stream in Engineering Leadership Education will be hired.

### 4.2 Links to Institutional Entrepreneurship

**4.2.1 Choosing the Right Time and Place.** There are three crucial moments where ILead was accelerated forward in its institutional growth, and all three represent examples of excellent timing built on an understanding of the university governance mechanisms.

In 2006, the University introduced a new Academic Initiative Fund (AIF). LoT applied for and was awarded substantial funding which allowed the program to hire full-time staff and start to significantly invest in pedagogy and student relationships.

In 2009, the Dean was prompted to establish a Task Force on Engineering Leadership, which investigated questions of institutional sustainability and organizational model. The task force report recommended the creation of a new organizational unit, and this enabled ILead to establish itself as a vehicle for research, programming and outreach.

Finally, in 2015, ILead initiated a self-study to engage senior administrators across the faculty and kick off a major strategic planning process. The process culminated in a strong recommendation from the team of reviewers to institutionalize leadership in the faculty. This process, linked with a major donation, also laid the foundation for the hiring of a teaching-stream professor in engineering leadership and a significant expansion of staff leading co-curricular programs.

**4.2.2 Working Through Networks and Partnerships.** The collaborative work with and through networks has been a crucial strategy for ILead’s growth.

University-industry networks led to the development of the first course in engineering leadership by an engineer who had recently retired as CEO of a major manufacturing company [9]. This was crucial for establishing the importance of engineering leadership, and building legitimacy. It also opened the doors for more creative and radical approaches to pedagogy in subsequent courses. Networks with industry have deepened through the research program. Also, new courses have been added in which senior leaders and working engineers are invited to share their experience with students through assigned projects and panel discussions. In 2014, ILead formalized its network of relationships with key companies through a membership-based consortium called the Community of Practice on Engineering Leadership.

Underlying ILead's approach to leadership is a strong partnership between engineers and non-engineers, which began with early hiring decisions at key moments when funding increased. In particular, team members with backgrounds in education (Assistant Director) and psychology (Director of Research) have deeply influenced the culture of the organization. This has enabled the development of innovative pedagogy through a deep expertise in educational design. The precedent of hiring social science PhD researchers has also greatly strengthened and legitimized the (often qualitative) research being conducted.

Lastly, ILead is a founding member of the leading network of engineering leadership educators in North America and this has led to productive exchanges on program mission and design. Further, through this network, influential US peers provided enthusiastic letters of support to a critical administrative five-year ILead self-study and review.

**4.2.3 Linking Resources and Opportunities Across Scales.** While much of the institute's growth can be framed in terms of resources and opportunities, the highlighted examples below illustrate how ILead "mov[ed] an innovation into a broader system and creat[ed] transformation through the linking of opportunities and resources across scales." [10]

Firstly, ILead's research team has been able to acquire and grow research funding (from the Dean, matched by industry donations) to investigate engineering leadership and transitions. This is a major feat within a difficult funding climate for Canadian engineering education research. Unlocking the resource (funding in this case) has been enabled by strong relationships and networks with a variety of industry stakeholders, who fund research based on a deeper appreciation of ILead's mission. This

company support signals to the Faculty the strategic relevance of the research to industry.

Secondly, the proliferation of academic courses on engineering leadership (from six in 2013-2014 to seventeen in 2014-2015) is an example of connecting human resources (skilled and passionate sessional lecturers) to opportunities in the growing enrolment in professional master's degrees. All seventeen of these courses are at maximum capacity, many with long wait lists, suggesting that engineering students themselves see a merit in studying leadership.

## 5. CONCLUSIONS

Our study of the growth trajectory of a major leadership program throughout its lifespan has shown the relevance of institutional entrepreneurship in the context of engineering education. Organizational growth from within a faculty of engineering requires knowledge of the inner workings of not just the engineering faculty but the wider university, as demonstrated by the initial funding of LoT by the Provost. Program designers need to pay attention to the timing and cadence of governance processes, and work closely with internal champions who can use their social position (as administrators or otherwise) to attract the resources necessary to grow.

Industry partnerships clearly have a role to play in supporting engineering leadership education, by building legitimacy, introducing workplace context, and even funding programs directly. However, not all of those roles will materialize immediately. In the case of ILead, there were at least five years between first engaging an experienced leader in course development and industry sponsorship of research.

By focusing on the organization of ILead as our unit of analysis and applying the lens of institutional entrepreneurship, this paper has begun to shed some light on how engineering educators can integrate leadership into engineering education. The focus, form and scale of engineering leadership programs will always vary widely, but some of the principles presented here should prove valuable in other contexts.

## References

- [1] ASEE Engineering Leadership Development Division. (2016). <http://lead.asee.org/> Accessed Feb 01, 2016.
- [2] Klassen, Mike, Reeve, Doug, Rottmann, Cindy et al. "Charting the landscape of engineering leadership education in North American universities." in *Proc. ASEE Annual Conference and Exposition., ASEE16*, (New Orleans, LA; June 2016), 16 pp., 2016.

- [3] Paul, Robin, Cowe Falls, Lynn G. "Engineering Leadership Education: A Review of Best Practices." in *Proc. ASEE Annual Conference and Exposition., ASEE15*, (Seattle, WA; June 2015), 10 pp., 2015.
- [4] Schuhmann, Rick et al. "Engineering Leadership Education - The Path Forward." in *Proc. ASEE Annual Conference and Exposition., ASEE15*, (Seattle, WA; June 2015), 19 pp., 2015.
- [5] Gonzalez, Roger et al. "Engineering Leadership: A New Engineering Discipline." in *Proc. ASEE Annual Conference and Exposition., ASEE15*, (Seattle, WA; June 2015), 12 pp., 2015.
- [6] Reeve, Douglas, Evans, Greg, Simpson, Annie E, Sacks, Robin, Oliva-Fisher, Estelle, Rottmann, Cindy, & Sheridan, Patricia K. "Curricular and co-curricular leadership learning for engineering students." *Collected Essays on Learning and Teaching*, vol. 8, no. 1, pp. 41-56, 2015. Available as of May 9, 2016 from <http://celt.uwindsor.ca/ojs/leddy/index.php/CELT/article/view/4283>
- [7] Lockett A, El Enany N, Currie G, et al. "A formative evaluation of Collaboration for Leadership in Applied Health Research and Care (CLAHRC): institutional entrepreneurship for service innovation." *Health Services and Delivery Research*. vol. 2, no.31, 2014. Available as of May 9, 2016 from [http://www.journalslibrary.nihr.ac.uk/\\_data/assets/pdf\\_file/0005/125573/FullReport-hsdr02310.pdf](http://www.journalslibrary.nihr.ac.uk/_data/assets/pdf_file/0005/125573/FullReport-hsdr02310.pdf)
- [8] Westley, F. R., O. Tjornbo, L. Schultz, P. Olsson, C. Folke, B. Crona and Ö. Bodin. "A theory of transformative agency in linked social-ecological systems." *Ecology and Society* 18(3): 27, 2013. Available as of May 9, 2016 from <http://www.ecologyandsociety.org/vol18/iss3/art27/>
- [9] Colcleugh, David, & Reeve, Douglas W. "Translating a corporate leadership philosophy and practice to the engineering classroom." in *Proc. CEEA Canadian Engineering Education Association Conf, CEEA13*, (Montreal, QC; June 2013), 4 pp., 2013.
- [10] Moore, Michelle Lee & Westley, Frances. "Surmountable Chasms: Networks and Social Innovation for Resilient Systems." *Ecology and Society*. 16(1): 5, 2011. Available as of May 9, 2016 from <http://www.ecologyandsociety.org/vol16/iss1/art5/>