

## ILead Research Team (IRT) Archives

A perfect introduction for curious students, educators, researchers or professionals, the ILead Research Team (IRT) Archives are summaries from a selection of the institute’s academic work in **engineering leadership education research**. Originally created for a student audience, anyone curious about developing leadership capacity in engineering classrooms, workplaces, and organizations is encouraged to explore these posts, or download the full papers.

Learn about Troost ILead’s full engineering leadership education research program at: <https://ilead.engineering.utoronto.ca/research/about/>.

Post date	Title	Citation	Full article	IRT Archives summary link
Jan. 2021	<b>Engineering leadership: Grounding leadership theory in engineers’ professional identities</b>	Rottmann, Cindy, Sacks, Robin, & Reeve, Doug. (2015). Engineering leadership: Grounding leadership theory in engineers’ professional identities. <i>Leadership</i> , 11(3), 351-373	<a href="#">Read the full article on TSpace.</a>	<p>This grounded theory study explores whether and how engineers identify themselves as leaders.</p> <p>Drawing on data from focus groups and interviews with 54 engineers, the research team defined three distinct “engineering leadership orientations” that felt like a better professional fit for research participants: Technical Mastery; Collaborative Optimization; and Organizational Innovation.</p> <p><a href="#">Read the summary.</a></p>
Feb. 2021	<b>The role of “togetherness” in developing teamwork relationships and shared meaning</b>	Sheridan, Patricia K., Kinnear, Penny, Evans, Greg, & Reeve, Doug. (2015). The role of “togetherness” in developing teamwork relationships and shared meaning. Paper presented at the American Society for Engineering Education Annual Conference and Exposition, Seattle, Washington, USA.	<a href="#">Read the full article on TSpace.</a>	<p>The authors of this study looked at student interactions in team-based engineering design projects, analyzing everything from their conversations to their body language. They observed that the analysis of individual team-member behaviours alone was insufficient to help them understand how what appeared to be the same behaviours and dialogues could produce opposite results on teams.</p> <p><a href="#">Read the summary.</a></p>

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Mar. 2021	<b>Equity as rebar: Bridging the micro/macro divide in engineering ethics education</b>	Rottmann, C., Reeve, D. Equity as Rebar: Bridging the Micro/Macro Divide in Engineering Ethics Education. Can. J. Sci. Math. Techn. Educ. 20, 146–165 (2020). <a href="https://doi.org/10.1007/s42330-019-00073-7">https://doi.org/10.1007/s42330-019-00073-7</a>	<a href="#">Read the full article on TSpace.</a>	<p>Personal and professional ethics are irrevocably tied to social impact, leaving engineering ethics incomplete when decoupled from equity. In this paper, Rottmann et al. sought to understand how engineering educators can prepare students to practice ethical and equitable decision-making in the context of their professional lives.</p> <p>The authors identified concrete actions that engineering educators, senior administrators and accreditation bodies can take to incorporate ethics and equity into the curriculum.</p> <p><a href="#">Read the summary.</a></p>
Apr. 2021	<b>Charting the landscape of engineering leadership education in North American universities</b>	Klassen, Mike, Reeve, Doug, Rottmann, Cindy, Sacks, Robin, Simpson, Annie, & Huynh, Amy. (2016). Charting the landscape of engineering leadership education in North American universities. Paper presented at the American Society for Engineering Education Annual Conference and Exposition, New Orleans, Louisiana, USA.	<a href="#">Read the full article on TSpace.</a>	<p>Klassen et al. offer a framework for comparing 15 North American Engineering Leadership (EL) programs. The authors identified over 200 different program elements, from courses to workshops to services for student leaders across the 15 schools. They suggest that engineering leadership programs can be grouped into three distinct clusters: technical integration, developing social impact, and influencing core curriculum to reach all engineering students.</p> <p><a href="#">Read the summary.</a></p>

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May 2021	<b>An intersubjective analysis of engineering leadership across organizational locations: Implications for higher education</b>	Rottmann, Cindy, Reeve, Douglas W, Sacks, Robin, & Klassen, Mike. (2016). An intersubjective analysis of engineering leadership across organizational locations: Implications for higher education. <i>Canadian Journal of Higher Education</i> , 46(4), 146-173.	<a href="#">Read the full article on TSpace.</a>	<p>Rottmann et al. present an integrated definition of engineering leadership rooted in the experiences of 82 engineers working as technical specialists, human resource professionals, entrepreneurs, politicians, and student interns.</p> <p>The authors explore five leadership narratives drawn from the experiences of engineers with a range of roles and responsibilities.</p> <p><a href="#">Read the summary.</a></p>
Jun. 2021	<b>I have a PhD! Now what? A program to prepare engineering PhDs and postdoctoral fellows for diverse career options</b>	Didiano, T. J., Wilkinson, L., Turner, J., Franklin, M., Anderson, J. H., Bussmann, M., Reeve, D., Audet, J. (2019). I have a Ph.D.! now what? A program to prepare engineering Ph.D.'s and postdoctoral fellows for diverse career options. Paper presented at the American Society for Engineering Education Annual Conference & Exposition, Tampa, FL. <a href="https://www.asee.org/public/conferences/140/papers/26276/view">https://www.asee.org/public/conferences/140/papers/26276/view</a> .	<a href="#">Read the full article on TSpace.</a>	<p>Didiano et al. present the development and evaluation of U of T Engineering's intensive career preparation program, The OPTIONS Program (<u>O</u>pportunities for <u>P</u>rofessional Careers: <u>T</u>ransitions, <u>I</u>ndustry <u>O</u>ptions, <u>N</u>etworking and <u>S</u>kills).</p> <p>OPTIONS is a nine-week, non-credit program that brings together a small group of graduate students and postdoctoral fellows for weekly two-hour sessions. Participants 1) reflect on their strengths, interests, and desires; 2) learn to communicate skills and expertise through job search strategies; and 3) apply networking tools to clarify career aspirations.</p> <p><a href="#">Read the summary.</a></p>

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Jul. 2021	<b>Sports, art and concrete canoes: Engineers learning to lead outside the formal curriculum</b>	Rottmann, Cindy, Sacks, Robin, Klassen, Mike, & Reeve, Doug. (2016). Sports, arts and concrete canoes: Engineers learning to lead outside the formal curriculum. Paper presented at the American Society for Engineering Education Annual Conference and Exposition, New Orleans, Louisiana, USA.	<a href="#">Read the full article on TSpace.</a>	<p>Analyzing survey results from 1203 undergraduate students, Rottmann, Sacks, Klassen, and Reeve sought to identify the non-classroom activities which most shaped students' engineering leadership development.</p> <p>Findings suggest that leadership programming, student government and industry-based professional development activities were most effective at helping students develop their leadership skills, while internships, design competitions and professional development activities with an industry focus helped them hone their engineering skills and identities.</p> <p><a href="#">Read the summary.</a></p>
Sept. 2021	<b>Wisdom Through Adversity: Situated Leadership Learning of Engineering Leaders</b>	Chan, A., & Rottmann, C., & Reeve, D., & Moore, E., & Maljkovic, M., & Macdonald-Roach, E. (2020, June), Wisdom through Adversity: Situated Leadership Learning of Engineering Leaders Paper presented at 2020 ASEE Virtual Annual Conference Content Access, Virtual Online. 10.18260/1-2-35583	<a href="#">Read the full article on TSpace.</a>	<p>In this paper, Chan et al. offer a qualitative exploration of the workplace struggles of 29 senior engineering leaders, examining how adversity has taught them to lead. This paper provides a window into the challenges that senior leaders experience day-to-day and where the value of those challenges lie.</p> <p><a href="#">Read the summary.</a></p>

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Oct. 2021	<b>Gendered patterns in senior engineers' leadership learning</b>	Macdonald-Roach, E., Rottmann, C., Chan, A., & Moore, E. (2020). Gendered patterns in senior engineers' leadership learning. Paper presented at the Canadian Engineering Education Association Annual Conference, Montreal, QC.	<a href="#">Read the full article on TSpace.</a>	<p>In this study, Macdonald-Roach et al. seek to understand the workplace leadership learning experiences and career trajectories of female engineers, when compared to their male counterparts. built upon previous work which investigated the career histories of 29 men and women this paper, led by a student researcher, is based on a secondary gender analysis of eight senior engineers' career history narratives—four men and four women at comparable career stages in similar organizational types.</p> <p><a href="#">Read the summary.</a></p>
Nov. 2021	<b>Where's my code? Engineers navigating ethical issues on an uneven terrain</b>	Rottmann, Cindy, Reeve, Doug, Sacks, Robin, & Klassen, Mike. (2018). Where's my code? Engineers navigating ethical issues on an uneven terrain. Paper presented at the American Society of Engineering Education Annual Conference and Exposition, Salt Lake City, UT, USA.	<a href="#">Read the full article on TSpace.</a>	<p>Rottmann et al. unpack 15 interviews with engineering students and professionals to examine why it is so challenging to pursue social justice in engineering education and the workplace. These moments of ethical challenge are framed as "critical incidents." This study draws on the lived experience of engineers ranging in age from 18 to 75, working across eight different disciplines.</p> <p><a href="#">Read the summary.</a></p>

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Feb. 2022	<b>Perceived importance and confidence in leadership ability: A national survey of final year Canadian engineering students</b>	Kovalchuk, S., & Liu, Q., & Rottmann, C., & Klassen, M., & Ricci, J., & Reeve, D., & Moore, E. (2019, June), Perceived Importance and Confidence in Leadership Ability: A National Survey of Final Year Canadian Engineering Students Paper presented at 2019 ASEE Annual Conference & Exposition , Tampa, Florida. <a href="https://peer.asee.org/33167">https://peer.asee.org/33167</a>	<a href="#">Read the full article on TSpace.</a>	Kovalchuk et al. investigate how a nation-wide sample of 2,485 final year Canadian undergraduate engineering students perceive the importance of leadership ability; how confident they are in their own leadership; and how these measures interact in comparison to professional and technical skills across demographic and academic variables.  <a href="#">Read the summary.</a>