Toronto Metropolitan University

Faculty of Engineering & Architectural Science

THE NORMAN ESCH AWARDS

12 YEAR IMPACT REPORT

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SECTION 1

THANK YOU FROM LEADERSHIP

Toronto Metropolitan University

Faculty of Engineering & Architectural Science

A MESSAGE FROM THE PRESIDENT

When we first signed the agreement with the Norman Esch Foundation in 2013, we had a bold vision: to redefine what it means to be an engineering graduate in the 21st century. We knew that technical excellence alone was no longer enough; our students needed the agency, the resilience, and the financial support to turn their ideas into impact.

Over the past decade, the Norman Esch Engineering Innovation and Entrepreneurship Awards have become the cornerstone of that vision. I have had the privilege of watching this program grow from a nascent idea into a powerful engine for economic and social change. What started as a 'first vote of confidence' for a handful of students has evolved into a legacy with global impact.

Within these pages, you will read the stories of our Esch alumni: founders of internationally recognized firms, leaders in top Fortune 500 companies, and innovators who are rewriting the very codes that govern our electrical and medical systems.

At its heart, the Esch Awards program was about empowerment. It provided the stability that allowed our students to grow as individuals, giving them the freedom to develop the lifelong skills they needed to succeed. We are proud to have levelled the playing field, ensuring that the next great Canadian breakthrough was limited only by a student's imagination, rather than their financial means.

This report is an opportunity for celebration. Looking at these success stories, it is clear that the program has accomplished far more than its original mandate; it has raised students of great potential to heights far beyond what they once imagined. For that contribution, we offer our sincere thanks to the Norman Esch Foundation.

— **Mohamed Lachemi**
President and Vice-Chancellor, Toronto Metropolitan University

A MESSAGE FROM THE DEAN OF FEAS

On behalf of the Faculty of Engineering and Architectural Science (FEAS) and the hundreds of students whose lives and careers have been transformed by the generosity of this foundation, I want to express my most sincere thank you.

For over a decade, the Norman Esch Engineering Innovation and Entrepreneurship Awards acted as a primary engine preparing students for the unique technical and societal complexities of this generation. Through a staged and tailored pedagogical approach that mirrored the lifecycle of a professional venture, the awards challenged our students to apply their technical skills within the complex, non-linear constraints of the real world. This was experiential learning at its best, equipping students with skills they will carry into every chapter of their lives. The program unlocked new levels of learning, reaching not only top academic performers but also those with untapped potential, identifying those ready to answer the call for change.

At FEAS, we recognize that society's expectations of universities are evolving. Graduates must be adaptable and globally minded, with the capacity to create meaningful impact. The Norman Esch program allowed us to be an early leader in this space, pioneering the experiential pedagogical practices that have since become central to our faculty. As highlighted in our 2025–2030 Strategic Plan, this foundation gave us a crucial head start in developing the capacity to address innovation in fields such as clean technology, artificial intelligence, robotics, and sustainable infrastructure.

As Dean, I am incredibly proud of what our Esch winners have achieved. They have raised over $122 million in follow-on capital, created hundreds of high-value jobs, and, most importantly, developed a resilient entrepreneurial mindset that will serve them throughout their careers. The Norman Esch Foundation did more than fund projects; it helped us redefine the very identity of a TMU engineer.

By naming our largest lecture hall in the foundation's honour, we hope to preserve the legacy of the Norman Esch Foundation, celebrating its profound impact on our students and its lasting contribution to society.

— **Sri Krishnan**
Dean, Faculty of Engineering and Architectural Science, Toronto Metropolitan University

THANK YOU FROM THE CEIE TEAM

On behalf of the Centre for Engineering Innovation & Entrepreneurship team at Toronto Metropolitan University, we would like to share our sincere gratitude for the foundation's role in our community.

In putting this report together, we've had the chance to look back on the journeys of our students, many of whom have shown incredible resilience and passion. Entrepreneurship is a path of extreme highs and lows, and your support has been the steady hand that allowed these students to grow as they navigated those challenges.

There is something truly special about the diversity of their projects; these students aren't just building businesses, they are solving problems of personal resonance and creating a tangible good for Canada. For hundreds of them, the Norman Esch Awards provided the vital support that allowed students to turn a big idea into a reality. Whether it was the ability to buy essential equipment or simply the gift of time that financial relief provides, your support is the reason these ideas didn't just stay on paper.

You didn't just fund projects; you kick-started the careers of people who are going out to change the world. You opened doors to life-changing opportunities that otherwise would have stayed shut, and allowed our students to grow in ways they never thought possible. For that, we are deeply grateful.

— **The Centre for Engineering Innovation & Entrepreneurship Team,**
Toronto Metropolitan University

SECTION 2

EXECUTIVE SUMMARY

Toronto Metropolitan University

Faculty of Engineering & Architectural Science

EXECUTIVE SUMMARY

The name Norman Esch has become a hallmark of excellence within the Faculty of Engineering and Architectural Science (FEAS) at Toronto Metropolitan University. For over twelve years, the Foundation's support has been a cornerstone of the FEAS student experience, fostering a culture of innovation and empowering students to exercise agency in solving complex societal problems. What began as a modest funding competition had evolved into an innovation powerhouse, fundamentally defining the Faculty's entrepreneurial identity.

The central theme of this report is the transformative power of investment - how a financial seed, paired with a belief in human potential, can create transformative and far-reaching impact. Having deployed over $4.1 million to 564 students, the awards have made a significant difference in education, economics, and, at times, the unexpected.

$4.1M

Awarded to TMU Students

Ultimately, this report is a story about the students. It provides evidence that removing financial barriers offers more than just capital; it provides the psychological safety required to take bold risks. With the support of programs like the Esch Awards, students no longer had to choose between working a part-time job to pay rent and spending those hours building a prototype. This report demonstrates that by alleviating the pressures that stifle early-stage entrepreneurship, we can democratize innovation, thus ensuring that a student's success, and the brilliance of their ideas, is not constrained by their circumstances.



The following outlines the impact the Norman Esch Awards had on the TMU community and beyond.

Educational Impact

- Career Readiness: TMU graduates who participated in the Esch Award Program consistently reported that their Esch project provided a competitive edge in the workforce, often serving as the decisive factor in securing jobs. [See Section 7: Impact Stories Page 31]
- Learning from Practitioners: By creating access to over 50 industry experts as reviewers, the program bridged the gap between theory and practice. This provided students with mentorship from seasoned professionals who advised based on relevant real-world experiences. [See Section 8: Appendix A- Esch Committee Page 60]
- Skill Diversification: The program facilitated the development of versatile skillsets, empowering engineers to make impact through non-traditional career trajectories such as consulting, business, and entrepreneurship. [See Section 7: Impact Stories Page 31]

Economic Impact

- Alumni Success: Over the years, several Esch Award alumni have successfully transitioned their projects into commercial entities. These ventures have collectively raised over $122 million in capital and have created more than 250 jobs.

Unexpected Impact

- The Ripple Effect: The legacy of the Esch Awards started a ripple effect across the university, contributing and growing the culture of entrepreneurship that bleeds throughout many facets and faculties. The growth in interest and participation in entrepreneurship has encouraged the development of more on campus facilities, programs and resources to support entrepreneurship and entrepreneurial mindset development. Additionally, it has prompted the support of many external stakeholders to contribute to the growth of this ecosystem.

The outcomes of the Norman Esch Engineering Innovation and Entrepreneurship Awards prove that targeted investment in student potential yields dividends far beyond the initial grant. As we look toward the future, the seeds planted by the Norman Esch Foundation will continue to reap impact both in the lives of students and throughout the country.

SECTION 3

BACKGROUND & MISSION

BACKGROUND & MISSION



NORMAN ESCH
Canadian lithography entrepreneur

In 2013, Toronto Metropolitan University established the Norman Esch Engineering Innovation and Entrepreneurship Awards to honour the legacy of Norman Esch, a visionary Canadian lithography entrepreneur and dedicated philanthropist. Having invested his own life savings to build a successful enterprise from the ground up, Mr. Esch's professional journey served as the blueprint for the award program, encouraging students to leverage venture creation as a medium for learning.

The program was created recognizing the need for a profound evolution in the role of the engineer. In an era shaped by hyper-competitive global markets, climate urgency, and increasing social complexity, technical proficiency alone is no longer sufficient. Canada needs problem solvers and innovators with not just meaningful lived experience but also a deep-seated commitment to serve the communities they are a part of.

Unfortunately, traditional education was not designed to develop that kind of person. The Norman Esch Foundation, along with the Faculty of Engineering and Architectural Science, understood that the modern-day engineer had to be more than theoretically trained. A holistic approach to education was needed to cultivate resilience, agency, problem-solving, and a creative mindset. In response, the university invested heavily in building a world-class experiential ecosystem, launching its renowned Zone learning network, state-of-the-art makerspaces, and incubators.

As the resources at TMU began to grow, it quickly became apparent that infrastructure alone was not enough. Even the most advanced facilities remained out of reach when the primary obstacle for students was financial survival. Time spent working to make ends meet was time stolen from innovating in the lab. The Esch Awards were designed to fill this critical gap, ensuring the university's resources could be fully utilized, not simply to produce better graduates, but to develop better citizens whose ambitions are not limited by their bank accounts.

At its core, the Esch Award program was an act of faith in the next generation, a belief that given the right conditions, the right support, and the freedom to lead, students were capable of extraordinary things. The program trusted our youth, empowering them to take on real problems while having the support and ecosystem of the institution to derisk the challenges that come with creating impact.

This spirit of trust, empowerment, and access influenced the four core pillars guiding the program's mission:

1. Cultivating Self-Directed Agency For Essential Skills Development

While traditional co-ops and internships provided value, they often restricted a student's growth to predefined tasks within someone else's vision. Agency was the critical catalyst for developing the leadership, resilience, and independent thinking required to cultivate innovators equipped to tackle the challenges of the modern era. Rooted in the experiential learning philosophy of John Dewey*, the Esch Award program's methodology allowed students to work on their own ideas, leading their projects from inception to completion. By granting students total intellectual ownership, the program transformed them from passive participants into primary architects of their own professional development.

2. Solving Real & Critical Problems Through Venture Creation

Technical proficiency is only impactful when applied to solving meaningful, real-world problems. The Esch Awards moved students beyond project-based work, challenging them to engage as practitioners within a complex market. By encouraging a focus on new value creation, students were required to interact with stakeholders, understand user needs, and solve real societal problems. This applied approach ensured that students developed a practitioner's mindset, one characterized by adaptability, user-centricity, and a commitment to solving problems that actually matter.

3. De-Risking Innovation for Real-Time Impact

The program utilized a unique three-stage funding pipeline to de-risk the innovation process: Ideation ($5,000), Development ($8,000), and Market Readiness ($25,000). This structure allowed students to test, fail, and pivot without the financial worry, creating clear parameters for staged growth. By building their ventures while still in school, students addressed societal problems in real-time, leveraging a rich ecosystem of institutional knowledge. Ultimately, the program proved that students did not need to wait until graduation to take action, allowing them to be impactful contributors to the economy and society today.

4. Closing the Accessibility Gap through Financial Autonomy

In the year of the award's inception, the Ontario government issued more than $1.3 billion in grants and loans**, highlighting the dire financial need of the student body. By 2025, nearly half (48%) of post-secondary students experienced financial insecurity***. This burden created a "forced choice," where talented students were often compelled to sacrifice their innovative potential for immediate survival. The Esch Awards addressed this inequity through strategic financial assistance, allowing students to "buy back" their time. This ensured that the opportunity to lead and create was based on the quality of an idea and a student's willingness to work, rather than their financial circumstances.

Ontario Newsroom, 2014
***Post-secondary students feeling the financial crunch: CIBC poll 2025*
****John Dewey and Experiential Learning: Developing the theory of youth work, 2012*



SECTION 4

PROGRAM DESIGN & GOVERNANCE

Toronto Metropolitan University

Faculty of Engineering & Architectural Science

PROGRAM DESIGN & GOVERNANCE

> **"Do not go where the path may lead, go instead where there is no path and leave a trail."**
>
> – Ralph Waldo Emerson

The Norman Esch Engineering Innovation and Entrepreneurship Awards were intricately designed to fulfill the program's four pillars: Cultivating Self-Directed Agency For Essential Skills Development, Solving Real & Critical Problems Through Venture Creation, De-Risking Innovation for Real-Time Impact, and Closing the Accessibility Gap through Financial Autonomy. Rather than operating merely as a conventional scholarship, the Esch Awards functioned as financial backing to fuel an experiential learning model. This model offered students the opportunity to apply engineering principles to real societal challenges through the practice of entrepreneurship.

The process encouraged learning by doing, proving that entrepreneurial mindsets are forged through lived experience rather than passive study. By engaging students in the non-linear process of building something from nothing, the program developed their capacity to navigate uncertainty, create tangible value, and lead through ambiguity. Ultimately, by removing monetary barriers and placing students in conditions of real-world value creation, the program cultivated not only technical proficiency but a profound sense of purpose and agency that will endure long after graduation.



The Three-Stage Approach

To operationalize these principles, the Awards were structured as a tiered, three-stage funding journey that mirrored the lifecycle of a venture. This approach allowed the program to meet students at their specific point of need, scaling support and resources as their concepts matured from initial ideas into viable solutions.

Stage 1: The Interaction Award ($5,000)

Ideation & Problem Discovery

Goal: This initial grant enabled students to explore new ideas by subsidizing their time. During the earliest stage of innovation, capital is scarcest while curiosity is most essential. These funds supported students during problem validation and necessary preliminary research.

- See Leon Nsengiyumva's story on page 44 to see how he was able to move on from his job and focus on his project with the help of Stage 1 funding.

Stage 2: The Development Award ($8,000)

Market Validation & Prototyping

Goal: Once a problem was confirmed, Stage 2 funds supported students' prototyping. Recipients demonstrated they had moved beyond theory to proof of concept. This capital was typically deployed to purchase materials for experimentation, fund deep dives into customer discovery, and refine the value propositions based on real-world feedback.

*See Issam El Missaoui's story on page 40 to see how Stage 2 helped him travel to do deep-dives with real customers.

Stage 3: The Market Readiness Award ($25,000)

Execution & Acceleration

Goal: The final and most significant stage was reserved for ventures ready to enter the market. Winners at this stage had a functional prototype and a validated business model. These funds were often used for scaling and execution, such as hiring developers, securing intellectual property, manufacturing initial inventory, or executing a go-to-market strategy. This stage acted as the bridge to external investment, preparing the venture for angel or venture capital funding.

- See Nicholas Burgwin's story on page 50 to see how Stage 3 acted as the seed funding that propelled his startup forward.

The structured stages of the Awards were reinforced by critical, complementary design elements. First, acknowledging that financial barriers are multifaceted, the program granted students full autonomy over fund allocation (whether to provide themselves a stipend for dedicated time, alleviate tuition pressures, or invest directly into prototypes and operations). Second, the program was designed with a realistic understanding of the student experience. Recognizing that participants must balance demanding academic and personal obligations, the Awards ensured essential flexibility by empowering students to define their own milestones and timelines, allowing them to align their venture objectives with their individual capacities.

The Practitioner Ecosystem

Students' success through the pipeline required more than just money; it needed the support of an entire ecosystem of seasoned mentors and supervisors. A key component of the program's success was due to the deep engagement of industry practitioners, seasoned entrepreneurs and innovators. Students were mentored and evaluated by these practitioners, ensuring feedback was grounded in market reality. Every step of the way, students had access to dedicated advisors who provided the consistent guidance necessary for both personal and professional growth.

Integrated Support Ecosystem

The Awards act as a key that unlocks Toronto Metropolitan University's broader innovation infrastructure. Winners are not left to build in isolation; they gain access to a network of specialized physical spaces designed to accelerate hardware and science-based ventures:

Innovation Boost Zone (IBZ)

Serving as the primary incubation hub, the IBZ provides access to essential makerspaces for early-stage prototyping, alongside legal counsel, mentorship, and business development workshops. All winners at all stages of the Esch awards are automatically accepted into the Innovation Boost Zone, giving participants consistent access to advising and support as needed.

Design Fabrication Zone (DFZ)

For hardware-heavy projects, winners can access the DFZ. This facility offers advanced rapid prototyping tools, 3D printing, and fabrication equipment necessary to turn digital designs into a physical reality.

- *This space supported winners like Will MacLaughlin on page 52 and Morgan Kool on page 46.*

Science Discovery Zone (SDZ)

For ventures requiring biochemical or medical testing, the program provides pathways to the SDZ's wet labs. This access is critical for students who would otherwise be unable to afford the high compliance and equipment costs of private laboratories.

- *This space supported winners like Narjes Allahrabbi on page 48.*

By combining staged capital with rigorous governance and access to state-of-the-art facilities, the Esch Awards ensure that every dollar invested yields maximum return in student development and economic impact.



Governance and Review Process

The integrity of the Esch Awards is maintained through a rigorous, practitioner-led governance model. Unlike academic grants, often reviewed solely by faculty, Esch applications are evaluated by the Esch Committee – a diverse body of 50 industry professionals [See Appendix A on Page 60]. This committee includes serial entrepreneurs, venture capitalists, senior engineers, and alumni who have successfully navigated the startup journey themselves.

Practitioner-Led Review

Every application is independently scored by three distinct reviewers from the committee. This ensures that student ideas are stress-tested against market realities, not just academic rubrics. Feedback is provided regardless of the outcome, turning the application process itself into a learning opportunity.

The Pitch

For Stage 3, the stakes are raised. Finalists must pitch their ventures live to a panel of judges, simulating the pressure of a real-world investor meeting. This performance-based assessment ensures that winners possess not just a good product, but the communication skills necessary to sell it.

SECTION 5
AWARD IMPACT

Toronto Metropolitan University
Faculty of Engineering & Architectural Science

AWARD IMPACT

The impact of the Norman Esch Awards over the past twelve years was made evident through both the hard data and participant testimonials. This section demonstrates the program's outcomes in three key areas: Educational Impact, Economic Impact, and Unexpected Impact.

Across 29 intakes, the program distributed $4,161,700 to support 564 student projects. These figures represent more than just financial transactions; they signify a strategic investment in student potential that has yielded significant results at both the personal and national levels.

564

Student projects supported across 29 Intakes

Educational Impact

The awards redefined the academic experience by transitioning students from passive learning to active, intellectual ownership of their work. This section demonstrates how the program fostered a "learning-by-doing" culture, equipping participants with the critical thinking and adaptive skills required to lead in an increasingly complex professional landscape.

EDUCATIONAL REACH

The educational value of the Esch Awards began long before the formal application. Through specialized training and outreach facilitated by the Innovation Boost Zone, prospective applicants were equipped with foundational skills in problem-solving and value proposition design. This early engagement established a high standard for project development and ensured that students were prepared for the rigours of the application process and beyond.

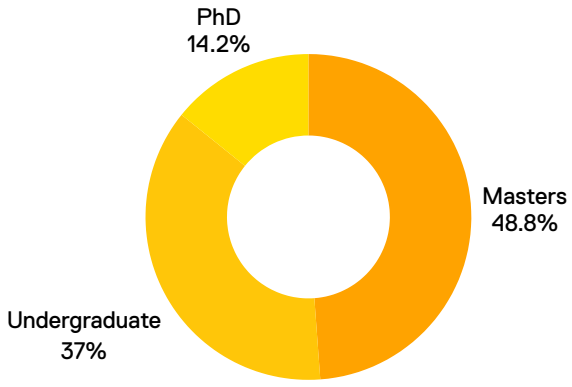
The table below illustrates the program's extensive reach over the past 12 years, highlighting the volume of students who engaged in this experiential learning journey year over year.

TABLE 1. AWARD RESULTS OVER THE YEARS

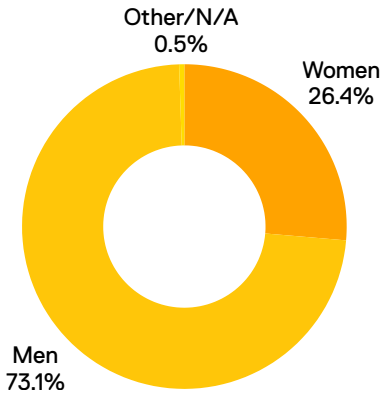
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Totals
S1 Applicants	69	64	82	102	96	124	111	101	85	88	109	111	130	1272
S1 Winners	29	24	27	28	21	28	26	25	19	22	33	38	39	359
S2 Applicants	37	27	27	30	34	29	23	28	14	20	26	29	40	364
S2 Winners	10	9	7	12	11	13	9	13	7	13	14	15	14	134
S3 Applicants	22	14	7	11	10	13	12	18	15	9	7	14	13	165
S3 Winners	4	5	3	5	5	4	3	7	6	4	4	5	3	58
Applicants	128	105	116	143	140	166	146	147	114	117	142	154	183	1801
Winners	43	38	37	45	37	45	38	45	32	39	51	58	56	564

In addition to reaching a vast number of students within the Faculty of Engineering and Architectural Science, the Esch awards also saw diversity in the types of students participating, from varying levels of degree to gender.

GRAPH 1. APPLICATION DISTRIBUTION BY LEVEL OF DEGREE



GRAPH 2. APPLICATION DISTRIBUTION BY GENDER



**The program maintained a representative reach, with applicant gender ratios consistent with the baseline percentages seen across the Faculty of Engineering and Architectural Science.*

SKILLS AND CAREER READINESS

The Esch Awards program served as a defining catalyst for professional success, with many alumni citing their projects as the differentiator that secured their entry into the workforce. Beyond technical proficiency, the program prepared students with a versatile "entrepreneurial toolkit", equipping them for high-stakes environments. By experiencing end-to-end product development, budget management, and team leadership, students mastered essential skills like intellectual property strategy, market validation, and strategic problem-solving.

This preparation enabled our engineering students to pivot into diverse, high-impact roles, including roles in management consulting, venture capital, and R&D leadership, where they applied engineering logic to complex business challenges. Equally important is the program's influence on practicing engineers. These graduates entered the field as intentional, socially conscious practitioners who looked beyond the blueprint. As stewards of innovation, they weigh the societal and environmental consequences of their work, ensuring a more profound impact on the global engineering landscape. [See Section 7: Impact Stories Page 31].

ITERATIVE LEARNING

The Esch Award program's influence was perhaps most profound in how it handled those not yet ready for funding. By providing rigorous, constructive feedback to applicants who are initially unsuccessful, the program turned a "no" into a vital educational touchpoint. This iterative loop encourages students to use rejection as a diagnostic tool, allowing them to refine their prototypes, sharpen their business models, and reapply with increased resilience. In doing so, the Esch Awards have fostered an environment where failure is not a dead end, but a necessary step in personal and professional development.

Economic Impact

Beyond individual transformation, the aggregate economic impact of the Esch Awards is profound. The program functions as high-efficiency seed capital; recipients consistently leverage their initial grants to unlock significant downstream funding, ranging from provincial and federal grants to institutional venture capital. The initial investment catalyzed exponential success, resulting in over $122 million in capital raised and over $82 million in revenue generated, while creating over 250 jobs.

The following tables and statistics outline the transformative reach of these investments, along with application and winner data over the years.

TABLE 2. FUNDING VS. ECONOMIC IMPACT OVER THE YEARS

	2012/13	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	360K	320K	320K	320K	320K	360K	360K	360K	360K	360K	360K	360K	360K
Esch Awards Fund ($)	298K	272K	275K	278K	278K	315K	277K	360K	301K	314K	377K	435K	382K
Raised Capital	148K	270K	467K	1.1M	1.8M	4.6M	15.6M	15.6M	39.0M	40.1M	81.2M		122M
Leverage ratio	0.4	0.3	0.5	1.1	2.1	3.4	7.5	9.37	15.26	14.36	21.68	19.42	26.74
Annual Revenue Generate ($)			50K	290K	1.6M	2.2M	2.1M	4.9M	8.0M	9.3M	39.6M		85M

Unexpected Impact

While the Norman Esch Awards were designed to invest in student potential, they have sparked a series of unexpected outcomes, prompting a cultural shift within the university.

INSPIRING THE NEXT GENERATION

The visible success of Esch alumni created a "demonstration effect," demystifying the path to entrepreneurship and inspiring a new generation of students to pursue entrepreneurship and engage with the broader Zone Learning network. Seeing their peers transform classroom theories into market-ready ventures made innovation feel accessible, encouraging students to leverage every resource the university ecosystem had to offer.

INFRASTRUCTURE & ECOSYSTEM GROWTH

The Norman Esch Awards served as the primary catalyst for what has now become a comprehensive innovation ecosystem at TMU. Recognizing the immense potential of student-led ventures, the institution significantly increased its investment in resources specifically designed to support student entrepreneurs who wanted to scale their impact. Using the the architectural framework of the "Esch Model", many TMU programs and spaces were established to support the growing need for entrepreneurial resources, they included:

Innovation Boost Zone (IBZ)

Evolving alongside the awards since 2013, the IBZ has supported over 575 startups, which have collectively generated more than $260 million in revenue, investment, and grants (outside of the Esch program). The incubator remains at the technological forefront, providing timely resources and specialized lab environments that evolve as student projects become more complex.

Lab2Market (L2M)

Inspired by the need for research commercialization, this initiative focuses on graduate-level innovators. What began as a local need has expanded into a nationwide program, supporting over 1,674 researchers across 52 universities, proving that the staged approach pioneered by Esch is scalable at a national level.

SDG-Focused Programming

To meet the growing student drive for societal impact, the university launched programming centred on the UN Sustainable Development Goals (SDGs). In the past year alone, over 250 students participated in these co-curricular challenges, applying the same disciplined project-management skills fostered by the Esch Awards to global sustainability issues.

By establishing the first staged approach to funding and mentorship, the Esch Awards did more than support 564 projects; it provided the successful proof-of-concept required to build a world-class institutional infrastructure for innovation.

IBZ DESIGN TEAMS

The success of the Esch Awards revealed a significant demand for year-round, project-based learning opportunities. This led to the creation of Innovation Boost Zone Student Design Teams, providing a structured environment for students to tackle complex technical challenges without the immediate pressure to commercialize.

IBZ Design teams are self-directed groups that now operate in tandem with the Esch Awards. Many teams utilize the Esch program as a strategic funding, applying for grants to finance the high-cost materials and prototyping required for their projects. This synergy ensures that the most ambitious student-led initiatives have both the technical space to innovate and the financial support to execute at a professional level. [See Section 8: Appendix D - Student Design Teams Page 74].

EXTERNAL SUPPORT

The notable success of alumni, coupled with the positive outcomes from the Esch Awards and similar TMU programs, captured the attention of numerous government and community organizations across Canada. Aligning with the mission of learning through venture creation, organizations such as FedDev, Experience Ventures, Mitacs, and CEWIL contributed funding to support the cause. These partnerships fueled the growth of on-campus resources and expanded TMU's ability to serve students at all degree levels nationwide.



SECTION 6

THE ESCH 20/20 CHALLENGE

Toronto Metropolitan University

Faculty of Engineering & Architectural Science

THE ESCH 20/20 CHALLENGE

Resilience in Action: The Esch 20/20 Challenge

Faced with the "once-in-a-generation" disruptions of 2020, the Norman Esch Foundation, the Faculty of Engineering and Architectural Science (FEAS), and the Centre for Engineering Innovation and Entrepreneurship (CEIE) aimed to do more than just keep the program running. In June 2020, we launched the Esch 20/20 Challenge.

The societal impact of COVID-19 inspired us to look for ways to support our communities and mitigate the economic and social consequences of the lockdown. At its core, an entrepreneurial mindset is built on adapting to limited resources and building from the ground up, exactly what our students were forced to do during these challenging times. We recognized an opportunity to help students sharpen their skills while providing tangible relief to their communities.

57
Students supported in a 4-month program

The Esch 20/20 Challenge was a four-month program that saw 57 students develop solutions for pressing problems faced by local non-profit organizations. Working alongside CEIE advisors and three "Challenge Owners" (Feed It Forward, The Design Fabrication Zone & Creative Technology Lab, and Wasaya Airways), teams competed for three $8,000 awards. The winning teams spent the remainder of the summer using those funds to implement their solutions directly with our community partners.



WASAYA AIRWAYS CHALLENGE

"The solution by Voyager will greatly improve our operational efficiencies in cargo and passenger bookings. We hope that the new system will reduce workload, operations cost, and improve Wasaya's efficiency."

– Derrick Flynn, Director of Flight Operations Wasaya Airways



When airlines are delivering supplies to remote communities across Ontario, the costs can add up. Wasaya Airways carries a social responsibility to Northern Ontario communities to ensure essential living supplies are delivered and therefore continues its services regardless of whether there is sufficient client demand to turn a profit.

The Wasaya Airways Esch 20/20 Challenge required students to develop a solution to help the airline save operating costs in transporting passengers and delivering essential cargo to small communities in Northern Ontario.

Voyager Systems, the winner of the Wasaya Esch 20/20 Challenge, proposed to develop a payload management and flight planning application to help Wasaya by reducing operating costs.

During the summer, the team had the opportunity to travel to Wasaya Airways' headquarters in Thunder Bay and Sioux Lookout, Ontario. They were able to absorb the expertise of upper management as well as take note of what could function more efficiently. In turn, this helped them gain a better understanding of what the application needs to provide for the airline in order to address their cost issues.

Voyager Systems decided that an application that automatically updates the flight schedule data in one centralized location would be the most efficient and functional for Wasaya Airways. This system is planned to begin testing with Wasaya at the end of October, which will last two months.

FEED IT FORWARD CHALLENGE

"The software solution developed by IdeaMosaic will optimize our operations as well as enable us to scale and grow in the future. The system will act as a membership model platform that will track, record, and share patron visits. With the hard work of the student team at IdeaMosaic, we are targeting a deployment of this system by the end of November 2020 for testing and a launch in 2021."

– Yoram Shalmon, Project Manager, Feed It Forward



Feed It Forward (FIF) is a Canadian non-profit with the goal of ending food insecurity and feeding Canadians who need it. FIF understands that not all Canadians can afford to buy enough food to feed themselves and their families. Because of this, FIF operates a pay-what-you-can store that provides fresh/prepared food to the food insecure. The store is able to operate thanks to money donated by the public, and products are sold through a point system. However, all of the transactions at the store were recorded by hand, which presented some limitations. The FIF Esch 20/20 Challenge required student participants to develop a solution that ensures the store's demographic is actually experiencing food insecurity.

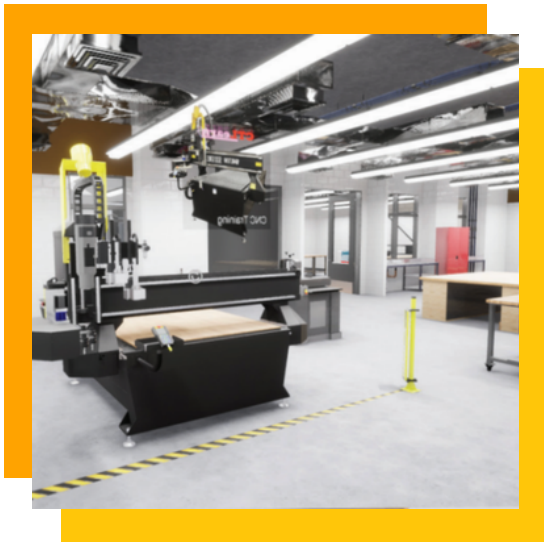
IdeaMosaic presented the best solution to FIF's problem. They proposed developing a store management software that would provide FIF staff with a user-friendly tablet dashboard to manage the store. As a result, this would improve efficiency and capacity of existing resources in the FIF store, enable FIF to easily scale to new stores and improve FIF's ability to develop better relationships with customers.

IdeaMosaic worked closely with the FIF leadership team throughout the summer to develop their solution. Three software developer students were hired by FIF to support this project, leveraging an additional $10,800 of government support towards hiring youth (Canada Summer Jobs program), in addition to the amount budgeted from the Esch 2020 award. Two of the students were Software Engineering students from Ryerson University. The software is on track to be completed at the end of November 2020, with the hope of being implemented into the stores by mid-November. The IdeaMosaic team will continue working with FIF to implement this software.

THE DIGITAL FABRICATION ZONE CHALLENGE

"The potential impact of this new training software is massive. Whereas we previously were limited by physical space and safety regulations to 30-40 individuals per session, we now have the opportunity to train up to 10,000 individuals through this virtual platform. There is a real paradigm shift on what we can expose to our students as the software is designed with the actual processes of operating equipment."

– Andrew Jepson, Technical Coordinator, DFZ/CTL



The Digital Fabrication Zone (DFZ) Esch 20/20 Challenge required students to develop a solution to help DFZ participants train in the various equipment and processes within their Creative Technology Lab (CTL). The DFZ has faced the challenge and limitations of a physical workspace, which were only increased by the pandemic.

veREM was selected as the winner of the DFZ Esch 20/20 Challenge. They proposed to develop an interactive 3D recreation of the CTL. This interactive software was accessible both through desktop and virtual reality. Essentially, people can gain a full understanding and training of the lab space and equipment before even setting foot in it.

Over the summer, the veREM team worked very closely with the DFZ on developing the software to ensure that they not only replicated the physical space, but also the procedures and processes involved. In the scope of the 12-week period, the team was able to simulate a CNC router for students to train on, while all other equipment was replicated with extremely high graphical fidelity.

The veREM team has also been awarded the ENCQOR 5G Demonstration Program for a very similar virtual, collaborative, high-fidelity training application. veREM will be using this project to garner further attention to the possible solutions that virtual reality can provide for the workplace training and employee development sector. By showcasing this project, veRem will be able to demonstrate the powerful impact the ways in which virtual reality can tackle a multitude of different problems.

SECTION 7
IMPACT STORIES

The following section profiles thirteen alumni whose journeys exemplify the core mission of the Esch Awards: to develop better citizens. By transcending the boundaries of traditional technical education, these individuals leveraged the program's unique ecosystem to accelerate their personal and professional evolution. Their stories reflect a decade of success, illustrating how the agency and ownership fostered through the awards have translated into meaningful careers, impactful ventures, and a lifelong commitment to solving complex global challenges.

Toronto Metropolitan University

Faculty of Engineering & Architectural Science

ADHAM EL-KHADEM



VENU

ESCH STAGE 3 WINNER
2022

THE ELITE APPRENTICESHIP: HOW A "FAILED" STARTUP BUILT A GLOBAL CEO

Most people see a failed first startup as a dead end; Adham El-Khadem saw it as an elite apprenticeship. Although his food-delivery engine, Buzz, was ultimately halted by the global pandemic, the structure and credibility provided by the Esch Awards ensured that the journey was anything but a loss.

By treating his startup as real-world work experience, Adham parlayed his early challenges into top-tier job offers and, eventually, the launch of Venu—a company now recognized by Deloitte as one of the fastest-growing tech firms in the Middle East.

FINANCIAL AUTONOMY: BUYING OXYGEN

This transformative journey began during Adham's time as an international student at TMU. Before finding success, he was caught in the common struggle of balancing high-level Master's studies with the financial demands of living abroad. To fund his vision, he worked two jobs in parallel: playing professional handball and performing grueling outdoor sales for a local charity.

The moment he won his first stage of the Esch Awards, the trajectory of his life changed. The grant provided financial oxygen. It allowed him to quit his sales job and focus entirely on his business.

This is the power of flexible funding: it didn't just buy software; it bought Adham's time. It was the first moment he felt his ideas were being taken seriously by the Canadian market, giving his venture a level of legitimacy that a classroom alone could not provide.

THE ENTREPRENEURIAL MINDSET: LEAN & RESILIENT

As Buzz progressed through all three stages, Adham gained access to a network of practitioners who helped him navigate the shortest path to growth. Mentors taught him

the "lean" methodology—testing, pivoting, and focusing on product-market fit.

While external factors like the pandemic eventually made Buzz's original model unviable, the internal skills Adham developed remained indestructible. He learned how to build growth funnels and generate traction—skills that made him an immediate standout in the professional world. He realized that a startup isn't just about the product; it's about the process of validation.

UNLOCKING UNCONVENTIONAL CAREER PATHS

The impact of this entrepreneurial track was so significant that Adham soon found himself receiving prestigious job offers that had little to do with his original engineering degree.

He was recruited for a leadership role at the University of Waterloo to help other students validate their startups and received an offer for a Product Management and Growth role at Clue, a Canadian tech firm with over $50 million in revenue.

These opportunities were a direct result of the "real-world" experience he gained through the Esch program. He had transcended the typical "junior engineer" path to become a strategic asset capable of driving business growth.

IMPACT NOW: FROM STUDENT TO FAST 50

Ultimately, Adham chose to bet on his own resilience. He took the foundational lessons from his first venture—the importance of being inbound-focused and staying profitable—and applied them to his new company, Venu.

.

Today, Venu is the leading platform in the MENA region for booking event spaces. Its rapid ascent, culminating in its recognition by Deloitte as one of the fastest 50 revenue-growing tech companies across the Middle East and Cyprus, is proof that early failures are often just the building blocks for future success.

For Adham, the Esch program was the bridge between being a student with a dream and becoming a CEO with a global footprint.

THE ESCH IDEA
Buzz

Buzz is a one-stop search engine where you can search, compare and track all types of information related to any product or service in your city all while getting notified whenever you're nearby a store that has a deal for you. Buzz is your first smart search engine dedicated to products and services. Your all in one guide for any product or service in town.

*For media mentions, refer to Appendix C (pg. 71)

ALI GOODARZI

AÊTAVA

ESCH STAGE 3 WINNER
2023



THE ARCHITECT OF DISRUPTION: RENOVATION FROM SERVICE TO SOFTWARE

The story of aêtava isn't just a tale of a successful startup; it is a narrative of structural renovation, where an architect realized that to build something truly tall, he first had to tear down his own blueprints.

When Ali Goodarzi first entered the Norman Esch Awards program, he looked at interior design through the precise, traditional lens of an architect. He had a service-based business that worked—a safe, steady agency where he and his team did the manual heavy lifting for clients. It was a comfortable structure, but as he moved through the first stage of the Esch program, the foundation began to shift.

FINANCIAL AUTONOMY: THE LUXURY OF DISCOVERY

The funding provided a rare luxury in the bootstrapped startup world: the ability to stop "doing" and start "discovering."

Ali used the award capital to buy himself out of the daily grind. He stepped away from his drafting table and the immediate revenue of client work to conduct forty intensive, one-on-one interviews. This is the essence of financial flexibility: the Esch Awards allowed Ali to pause a revenue-generating business to investigate a scalable one.

THE ENTREPRENEURIAL MINDSET: THE WRECKING BALL

For a self-described shy introvert, this research phase was a "butterfly effect" moment. These conversations acted as a wrecking ball to his original concept. He realized that the market wasn't looking for another design firm; they were looking for empowerment.

"The service-based model is going away," Ali noted, reflecting on the shift toward automation. "It democratizes interior design service for regular people... we needed to follow that trend."

This realization led to the most radical phase of his journey. Most founders would have used Phase 3 funding to buy ads for their existing service. Ali chose the entrepreneurial path: he scrapped his "safe bet" business—which already had a healthy pool of fifty customers—and began rebuilding aêtava from the ground up as a technology platform.

IMPACT NOW, NOT LATER

He traded manual labor for digital infrastructure, investing in server costs, AI tools, and the development of the "Style Board" canvas. The transformation was total. Aêtava evolved from a human-led agency into a sophisticated app that allows customers to design their own spaces, assisted by AI and fueled by strategic trade partnerships.

Ali didn't wait for the industry to change; he used his skills to force the change himself, democratizing high-end design for the average homeowner immediately.

UNLOCKING UNCONVENTIONAL CAREER PATHS

This shift didn't just change the business; it redirected Ali's life. The promise of the platform grew so rapidly that he began scaling back his traditional career in architecture firms to dedicate himself fully to his venture.

Today, the "architect" has fully embraced the role of "Tech CEO." What began as a traditional service has become a growing market disruptor now expanding into the B2B sector. The Esch Awards didn't just fund a product; they provided the catalyst for a founder to dismantle his own comfort zone and build a platform that could actually scale.

THE ESCH IDEA

aêtava

Furnishing your home should feel exciting, not overwhelming. Yet for so many people, it is the opposite: endless scrolling, mixed styles, costly mistakes, and spaces that never quite feel like home. aêtava is a platform that provides users with a simple, enjoyable way to design their space with confidence.

AMIR FARD

CITYOPTIMA

ESCH STAGE 3 WINNER
2025



FROM PERFECTIONISM TO PILOT: THE RESEARCHER WHO REJECTED THE SAFE PATH

Across many Canadian municipalities, multi-million dollar infrastructure decisions are often made using little more than guesswork and outdated spreadsheets. Amir Fard recognized how these limitations can lead to inefficient capital planning, unplanned repairs, and increased long-term costs that affect community services and sustainability. He knew that for small to midsize municipalities, a single miscalculated road repair or a missed pipe leak isn't just a budget error—it is a catastrophic expense that drains resources from schools, parks, and emergency services.

While completing his PhD, Amir was sitting on a breakthrough. His idea, CityOptima, used AI analytics to give municipalities a "flight-controller" view of their assets, predicting failure before it happened. But like many academics, Amir was caught in a trap.

THE MINDSET SHIFT: OVERCOMING ANALYSIS PARALYSIS

"I was very focused on the product side and wanted to make it perfect," Amir admits. "I had a tendency to postpone pilot projects."

The Norman Esch Awards acted as the catalyst that forced Amir's idea out of the lab and into the light. The program's staged structure provided a critical entrepreneurial constraint: a deadline for reality. To move forward, Amir had to stop "tweaking" and start testing. The awards pushed him to launch his pilots nearly a year earlier than his perfectionist instincts suggested—a timeline shift that would prove vital to his success.

FINANCIAL AUTONOMY: THE COURAGE TO SAY "NO"

The true turning point arrived with Stage 2. Amir faced a career-defining dilemma: he was at a financial breaking point and had a lucrative job offer on the table from a global consulting firm. This was the "safe" path—the trajectory

expected of a PhD graduate. But the Esch funding changed the calculus. It provided the financial runway to reject the "golden handcuffs" of a corporate salary. Amir turned down the giant to bet on himself.

"The recognition was very important," Amir reflects. "Feeling that I had access to resources as a newcomer, and that there was no difference between me and a Canadian citizen, was very special." The award was not just a financial support; it validated his identity as a founder.

IMPACT NOW, NOT LATER

By rejecting the safe path, Amir accelerated CityOptima's growth. That speed was rewarded immediately. By the end of the summer, those "early" pilots had proven their value in the real world. CityOptima transitioned from "testing" to "traction," securing two major paid contracts from municipalities eager to modernize their budgeting.

UNLOCKING UNCONVENTIONAL CAREER PATHS

Amir's journey illustrates a powerful shift in career trajectory. instead of becoming a specialized cog in a massive engineering firm, Amir built his own machine.

Today, CityOptima is no longer a "paper-napkin idea." It is a vital tool for municipal leaders, helping them meet Sustainable Development Goals (SDGs) by eliminating waste and ensuring infrastructure longevity. Amir Fard didn't just build a startup; he built a way for Canadian communities to see their own future more clearly.

THE ESCH IDEA
CityOptima

CityOptima tackles the critical challenge of poor data management in small to midsize municipalities, crucial for making informed infrastructure maintenance and budgeting decisions. Addressing these issues with a platform that integrates mapping (GIS) technology and AI analytics, CityOptima enhances data accuracy and resource planning. By using CityOptima, a municipality can more precisely assess the future infrastructure needs and allocate budgets more effectively, avoiding costly emergency repairs.

*For media mentions, refer to Appendix C (pg. 71)

BOLIS IBRAHIM



ALL2ONE CHARGE CONTROLLER

ESCH STAGE 3 WINNER
2016

REWRITING THE CODE: FROM STUDENT LAB TO CHANGING THE LAW

In 2014, Bolis Ibrahim was an electrical engineering student at Toronto Metropolitan University with a bold vision: he wanted to stop renewable energy systems from "bleeding" power. While solar and wind held massive potential, mainstream charge controllers were inefficient, robbing systems of the energy they worked so hard to harvest.

Bolis' solution was the ALL2ONE Charge Controller—a smart-grid-ready device designed to isolate and monitor energy sources individually to ensure maximum power harvest. But like many student innovators, Bolis faced a hurdle that often kills hardware startups before they even begin: capital intensity.

FINANCIAL AUTONOMY: THE HARDWARE CATALYST

For a first-time founder building physical hardware, traditional venture capital is notoriously difficult to secure. "It's relatively easy for software," Bolis recalls, "but notoriously difficult for hardware."

The Norman Esch Awards provided the breakthrough Bolis needed. Across three stages, he received $38,000 in non-dilutive funding. This wasn't just a grant; it was a lever. Bolis used the Esch funds to match a grant from the Ontario Centres of Innovation (OCI), effectively doubling his capital without giving up equity.

"The Esch Awards were the first-ever outside funding we got," he says. "Without it, it would have been nearly impossible to raise additional capital."

THE ENTREPRENEURIAL MINDSET: THE LIVING ROOM LAB

With the funding secured, Bolis made a critical decision: he didn't pay himself a salary. Instead, every dollar was poured into the hardware.

He transformed his cofounder's into a modest R&D lab, purchasing oscilloscopes and power supplies that allowed them to build and test prototypes late into the night. This demonstrates the "bootstrapper mindset"—prioritizing the product over personal comfort. Remarkably, some of that original equipment, bought with Esch money, is still in use today at his current headquarters.

IMPACT NOW: MERGERS AND MARKET LEADERSHIP

Bolis's original venture, Argentum Electronics, didn't just survive—it thrived. By 2022, Bolis recognized a strategic opportunity to stop competing locally and start leading globally. He executed a merger with other key players to build Cence Power.

Today, Bolis serves as the President of Cence Power, leading a team of over 20 employees. The company has moved far beyond prototypes, having completed over 2 million square feet of real estate projects. Their DC power distribution systems—manufactured right in Ontario and shipped worldwide—are setting new standards for safety and efficiency in lighting and telecom applications.

UNLOCKING UNCONVENTIONAL CAREER PATHS

Bolis isn't just selling products; he's changing the rules. Cence Power is an early-mover in Fault Managed Power Systems (FMPS), a revolutionary new classification of electricity that combines the safety of low voltage with the power of high voltage.

Their innovation has been so significant that it inspired changes to the Canadian Electrical Code—the first new power system classification since 1978. Bolis didn't just become an engineer who follows the code; he became a leader who rewrote it.

THE ESCH IDEA
ALL2ONE

The ALL2ONE Charge Controller is a simple-to-use electrical device that combines inputs from multiple power sources, which can differ in power over large ranges, into a single output. The ALL2ONE is intended for use with solar panels to solve power efficiency issues related to partial shading of a string and panel mismatch, but the device can be used to efficiently combine DC power coming from any source and distribute it to different loads.

*For media mentions, refer to Appendix C (pg. 71)

ISSAM EL MISSAOUI



YADAG

ESCH STAGE 3 WINNER
2025

HARVESTING SUCCESS: HOW SEED FUNDING UNLOCKED A GLOBAL LABOUR SOLUTION

When Issam El Missaoui arrived in Canada in 2023, he brought a specialized insight from his background in Moroccan agriculture: the food supply was facing a labour crisis that had become as urgent as water scarcity in threatening farm viability. Billions of dollars in crops were being lost because growers could not secure harvest crews.

Despite the clarity of the problem, the business did not yet exist. It was during his first semester in the Master of Engineering Innovation and Entrepreneurship (MEIE) program that Issam met his co-founder, Parsa Faramarzian, and established the foundation for Yadag.

The venture's growth was defined by an aggressive jump into the Esch Awards. Rather than starting with ideation, the team used their well-established problem statement to apply directly for Stage 2.

THE ENTREPRENEURIAL MINDSET: FALLING IN LOVE WITH THE PROBLEM

This funding was pivotal for their strategy. They used the capital to move out of the classroom and into the field—literally. By travelling to agricultural hubs like Niagara to interview growers, the founders discovered a critical market reality: while they had initially considered domestic labour, the real "painkiller" was needed in the foreign worker program, where growers were drowning in administrative complexity.

This is the essence of the entrepreneurial mindset: flexibility. The Esch funding allowed them to invalidate their first assumption and pivot to the real opportunity before wasting resources building the wrong thing.

ISSAM EL MISSAOUI YADAG

FINANCIAL AUTONOMY: HIRING THE BUILDERS

By the time Issam reached Stage 3 in 2025, the focus shifted from research to execution. The Stage 3 funding was used to hire the company's first software developers to build and push the Minimum Viable Product (MVP) into the market.

This phase transformed Yadag from a researched concept into a functional operating system. Having the financial flexibility to hire technical talent at this exact juncture allowed the team to convert their findings into a scalable product capable of handling the high-volume needs of industrial farms.

UNLOCKING UNCONVENTIONAL CAREER PATHS

The ability to prove technical traction early was the decisive factor in Yadag's transition to a venture-backed startup.

"The Esch Award was a market validation itself," Issam notes. "It gave us the traction we needed to convince new investors. We wouldn't have been able to raise more money if we hadn't proven that traction first through the Award—it was a butterfly effect."

Issam didn't just graduate with a degree; he graduated as the CEO of a high-growth startup. He bypassed the traditional entry-level job market to create his own ecosystem.

IMPACT NOW, NOT LATER

Today, the velocity of the venture is evidence of that early momentum. Yadag has grown from a first-semester pitch into a platform with 30,000 worker sign-ups, with a target of 50,000 by the end of 2026.

The company has already secured $350,000 in pre-seed funding and is targeting a $100,000 revenue milestone this year.

What began as an immigrant's observation has evolved into an ambitious startup with a national impact. By providing the capital to first understand the customer and then build the solution, the Esch Awards enabled Yadag to scale from a solo vision into a global labor partner poised to enter the U.S. and European markets. Issam is ensuring that the farmers who provide our food—and the workers who harvest it—are finally supported by a system as resilient as they are.

THE ESCH IDEA
Yadag

Yadag is reimagining the agricultural labor system by making it faster, more ethical, and more intelligent through technology that serves both farms and workers. Yadag helps farms find, onboard, and manage workers faster—with tools for compliance, mobility, transparent ratings, and a reward system that brings accountability and dignity to the process.

*For media mentions, refer to Appendix C (pg. 71)

KATRINA CARLTON



GROUNDSUP

ESCH STAGE 3 WINNER
2023

THE EMPATHY ENGINE: HOW A STARTUP JOURNEY REDEFINED CORPORATE INNOVATION

For Katrina Carlton, the dream was simple but ambitious: take a waste material and transform it into something meaningful. GroundsUp was born from a desire to reimagine discarded coffee grounds as high-quality, functional art and furniture, creating products that not only served a purpose but told a story. By winning all three stages of the Norman Esch Awards, Katrina turned a risky "school project" into a tangible reality. But the most profound lesson she learned wasn't about materials science—it was about the resilience of the human behind the innovation.

FINANCIAL AUTONOMY: THE FREEDOM TO FAIL FORWARD

Transitioning from Vancouver to the Master of Engineering Innovation and Entrepreneurship (MEIE) program in Toronto, Katrina faced a steep learning curve where the cost of living was high and the cost of prototyping was higher.

"Resins are expensive," Katrina explains. "I was trying to make my own, doing a lot of prototyping... sometimes it worked, sometimes it didn't."

The Esch funding acted as both a safety net and a fuel source. It allowed her to "fail forward." Without this financial flexibility, she admits she might have opted for an "easier" idea or stopped testing before finding her formula. Crucially, the Stage 3 funding gave her the rarest gift an entrepreneur can ask for: time. It allowed her to bypass the immediate pressure of the job market, giving her a full year to build her workshop and explore the limits of her creative spirit without the "trap" of rushing into a generic entry-level role.

KARTINA CARLTON GROUNDSUP

THE ENTREPRENEURIAL MINDSET: RESILIENCE & SELF-AWARENESS

The journey brought Katrina face-to-face with the "mental hard" of entrepreneurship. As she pushed GroundsUp toward growth, the line between her personal identity and her business began to blur.

The breaking point came at what should have been her highest moment. When she received the email confirming she had won the Stage 3 award, she felt a flicker of a smile, put her phone down, and realized she was burned out. It was a moment of stark clarity: she had reached the finish line, but the cost had been her well-being.

Recognizing that her health was more valuable than any product, Katrina made the brave decision to move on. This wasn't a failure; it was a masterclass in risk assessment and decision-making—core pillars of the entrepreneurial mindset.

UNLOCKING UNCONVENTIONAL CAREER PATHS

While she initially viewed the transition as a setback, she soon realized her startup experience was a foundation for a different kind of impact. Today, Katrina works as a Senior Innovation Analyst at Axiom Builders, a role that bridges the gap between the corporate world and emerging technologies and innovations. This is a position rarely accessible to recent graduates. Her entrepreneurial training has become her greatest professional asset, allowing her to offer a unique brand of empathy-led coaching. Because she has "been there," she can translate the needs of startups to the executives at a major construction firm.

Katrina is now a vital bridge in the industry, focused on helping field teams navigate the complexity of managing large construction projects. Drawing on her entrepreneurial background, she explores new technologies, building systems, and creative solutions that simplify workflows and improve how projects are delivered. She also uses her experience to mentor young founders—including students at UBC. "Knowing what it was like to be a startup is helpful," she reflects. “It taught me to separate my self-worth from business outcomes and gave me a deep respect for the resilience this work requires.” Katrina’s story is a testament to the fact that the Norman Esch Award doesn't just fund a product; it invests in a person. Whether that person builds a global company or brings an entrepreneurial soul to an established industry, the result is the same: a more innovative, empathetic, and sustainable future.

THE ESCH IDEA
GroundsUp

GroundsUp specializes in upcycling used coffee grounds into high-quality, sustainable home and furniture products. With a focus on innovation, sustainability, and artistry, we're committed to transforming waste into functional art while making a positive environmental impact. Our mission is to bridge the gap between coffee culture and sustainability, crafting stories that start conversations and empower individuals to make eco-conscious choices in their daily lives.

*For media mentions, refer to Appendix C (pg. 71)

LEON NSENGIYUMVA



FOUNDER OF ODESSU

ESCH STAGE 3 WINNER
2017

THE THIRD WAY: BUYING THE FREEDOM TO BUILD

For many university students, the path to graduation feels like a binary choice. One option is balancing a part-time job to pay the bills, which often sacrifices sleep, social life, and grades. The other is rushing into a "safe" corporate bet the moment the degree is in hand to pay down debt and find stability. Leon Nsengiyumva chose a third way, fueled by a series of strategic wins that redefined his career before it even officially began.

As a student, Leon was no stranger to the hustle. He spent his weeks working as a restaurant server, earning a decent living but sacrificing the mental bandwidth required to innovate. While he was beginning to dabble in technology and product design, his work schedule and the pressure to accept a steady corporate role created a heavy weight. These factors threatened to pull him away from his true passion: building from zero to one.

THE EVOLUTION OF THE ESCH AWARDS: INVESTING IN ROI

Winning the Norman Esch Awards provided Leon with a financially sound way to treat his ideas as a potential revenue-generating business. By treating each stage as a milestone for growth, he transformed a “student research project” into a validated start-up.

In Stage 1, Leon traded his hours as a server for the mental bandwidth to innovate. He deployed this capital into survey campaigns, brand interviews, and data sets to test market positioning and potential earnings, ensuring the solution had a real bottom line.
In Stage 2, Leon moved into deep-tech execution, investing in Image Stitching and Convolutional Neural Networks (CNNs). This grant allowed him to validate the technical feasibility of body-scanning faster than the pace of traditional academia.

The third and final stage provided ultimate leverage. Leon used the grant to anchor government subsidies and hire a team. This runway allowed him to incorporate and prove that he didn't need a conventional corporate path.

THE ENTREPRENEURIAL MINDSET: THE "LANYARD" OF LEGITIMACY

The Esch Awards acted as a "playground" for innovation, but with serious rules. The program taught Leon how to be resourceful, how to reset after failure, and how to command a room of stakeholders.

"Esch gave me the foundation," Leon reflects. "It gave me the 'lanyard' that allowed me to get to know the right people and be taken seriously."

This legitimacy was crucial. It allowed a student to walk into rooms with investors and partners not as a novice, but as a funded founder. He spent the following years deep in the high-octane startup world, serving as a Tech Lead and navigating the chaos of product launches and relaunches. These experiences accelerated his growth far beyond a junior corporate role, granting him a level of product ownership that exceeded even some senior positions.

UNLOCKING UNCONVENTIONAL CAREER PATHS

The most lasting impact of the Esch grants wasn't just the initial company; it was the unconventional versatility Leon acquired. While his peers were learning to follow corporate rubrics, Leon was learning to survive and scale in a landscape without a syllabus. He realized that the skills honed during those high-pressure years, architecting AI/ML solutions, technical product management, and stakeholder negotiation, were high-value assets that could be deployed on his own terms. He moved from the "zero-to-one" grind of a founder to a Product and Technology Consultant who bridges the gap between complex engineering and business ROI.

Today, Leon has successfully transitioned from the 60-hour-a-week startup sprint to a career defined by intentional balance. Operating as a high-value consultant and advisor, he has found a niche that allows him to prioritize his faith and personal life without sacrificing professional impact. Whether he is mentoring nearly 30 companies through the DMZ or acting as a functional CTO to prepare startups for investor due diligence, he does so with the authority of someone who has already been through the fire.

By using the Esch Awards to bypass the traditional entry-level ladder, Leon gained the ultimate entrepreneurial prize: the autonomy to work on his own terms. His story proves that students don't have to wait for retirement to control their time. He built a career that serves his life, rather than a life that serves his career.

THE ESCH IDEA
Odessu

Odessu is an online shopping platform that helps plus-size women find stylish clothes that fit. It presents shoppers with personalized clothing and brand suggestions based on their style preferences, body shape, budget, and size.

*For media mentions, refer to Appendix C (pg. 71)

MORGAN KOOL



ATLAS MEDICAL

ESCH STAGE 2 WINNER
2021

THE SNOWBALL EFFECT: HOW A STUDENT PROJECT POWERED A CAREER AT NISSAN

When Morgan Kool entered her first year at Toronto Metropolitan University, she was an aspiring engineer who—by her own admission—knew "nothing about electronics." Fast forward to today: she is in Michigan, designing the power architecture for Nissan, overseeing the complex logic that manages batteries, starters, and autonomous driving systems.

The bridge between that curious first-year student and the high-level design engineer was built on a foundation of the Norman Esch Awards and a startup called Atlas Medical.

IMPACT NOW: SOLVING REAL-WORLD PROBLEMS

Morgan's entrepreneurial journey began with a mechanical challenge: accessibility. She didn't wait until graduation to tackle a serious issue.

Her startup sought to revolutionize how people move within their own homes. By combining a winch system with a set of modular rails, she and her team designed a device that could be installed on any existing staircase—a simple, elegant solution allowing users to enjoy a safe ride between floors.

FINANCIAL AUTONOMY: CUSTOMIZING THE EDUCATION

Winning two stages of the Norman Esch Awards provided more than just capital to build a prototype; it acted as a strategic "enabler." Morgan used the financial flexibility of the award to step out of the academic "rabbit hole" of pure R&D. She strategically allocated her funding toward industry-standard licenses for UI development and data analytics, as well as specialized programming courses that augmented her university education. This is a key differentiator: Morgan used the Esch funds to buy skills that weren't in her syllabus.

She customized her own degree, filling the gaps between what the university taught and what the market demanded.

THE ENTREPRENEURIAL MINDSET: BEYOND THE CODE

"In a typical engineering degree, you wouldn't learn about marketing, customer personas, or how to pitch," Morgan reflects. The Esch experience forced her to master the unteachable skills of engineering: navigating cross-functional teams, understanding the user behind the device, and mastering the art of persuasion. Whether she is asking for project funding at Nissan today or explaining a design choice to a colleague, she is still using the communication skills she honed during those early startup pitches.

UNLOCKING UNCONVENTIONAL CAREER PATHS

The true impact of Atlas Medical became clear during the cutthroat pursuit of summer internships. In a competitive environment where high grades are the baseline, Morgan possessed a distinct advantage: proof of work. She walked into interviews with tangible case studies, discussing motor controllers, worm drives, and CAD with the confidence of someone who had actually built them. This created a "snowball effect." Her startup experience secured her first co-op in product design, which led to a second in nuclear engineering, eventually culminating in her career at Nissan. Atlas Medical served as the ultimate laboratory for Morgan's professional development.

While the project itself was about helping people climb stairs, the experience was about helping Morgan climb the professional ladder. She didn't just graduate with a degree; she graduated with the mindset of a builder and the resume of a leader.

THE ESCH IDEA
Atlas Medical

Atlas Medical's innovative stair lift system provides a simple and affordable mobility solution. Atlas Medical team has designed a novel system using existing technologies to improve accessibility. They have combined a winch system and rails to create a device that can be installed on any existing stairs. A user steps onto a platform and enjoys a smooth ride up and down.

NARJES ALLAHRABBI

FERTILEAD

ESCH STAGE 2 WINNER
2025



THE DOMINO EFFECT: ENGINEERING THE FUTURE OF FERTILITY

When Narjes Allahrabbi first set out to revolutionize fertility treatment, she wasn't just fighting against complex biology; she was fighting against the clock. In Canadian fertility clinics, the manual process of selecting and preparing sperm for assisted reproduction remains a time-consuming and highly operator-dependent task, often taking up to one hour of skilled andrology lab technician time per case. This workflow bottleneck reduces lab efficiency, increases variability, and places operational strain on clinics and emotional stress on intended parents. As a result of inconsistent or suboptimal sperm preparation—particularly in male-factor infertility cases—clinicians may escalate treatment earlier to aggressive and expensive IVF or ICSI, even when less invasive options like optimized IUI could have been viable.

Narjes knew there was a better way. She envisioned an autonomous sperm preparation device, FertiliTab, that could perform the task objectively in 30 minutes. However, turning a brilliant idea into a medical reality requires more than just a patent—it requires the kind of credibility and capital that is notoriously hard to find at the start of an entrepreneurial journey

FINANCIAL LEVERAGE: THE STRATEGIC MULTIPLIER

For Narjes, the Norman Esch Engineering Innovation and Entrepreneurship Awards served as the essential first vote of confidence. She viewed her Stage 1 & 2 awards not just as cash, but as a strategic lever.

In the medical field, research costs are astronomical and lab access is a luxury. Narjes used the Esch funding to secure a Mitacs Accelerate grant. This move effectively tripled her capital, creating a financial "domino effect"

that opened the doors to the high-tech lab facilities she needed to build her beta prototypes.

"The Esch award was the very first award I received, and it was the biggest motivator of my journey," Narjes shares. "It was the first piece of the puzzle that allowed everything else to fall into place."

THE ENTREPRENEURIAL MINDSET: FROM SCIENCE TO STRATEGY

Beyond the finances, the program provided Narjes with a roadmap. Dedicated mentorship helped her navigate the complex medical landscape and provided the clarity needed to refine her business model.

While she was initially hesitant to approach high-level medical professionals, the mentorship gave her the confidence to pivot toward a B2B model. This shift revealed a faster road to commercialization and a more effective way to reach the clinics that need her technology most. Narjes realized that by addressing her questions early, she could move from a place of uncertainty to one of absolute conviction.

UNLOCKING UNCONVENTIONAL CAREER PATHS

Today, Narjes has transcended the role of "researcher" to become the CTO and CEO of her own corporation. She is no longer just a student with a breakthrough idea; she is a leader building an industry presence. She is now preparing to present her innovations at major global fertility conferences, standing shoulder-to-shoulder with established medical experts.

IMPACT NOW, NOT LATER

Narjes isn't waiting for a tenured professorship to make a difference. By providing that initial "yes," the Norman Esch Awards empowered her to solve a critical issue for families now. She has turned a revolutionary concept into a credible, scalable future for reproductive health, proving that engineering students can lead the way in medical innovation.

THE ESCH IDEA
Fertilead

Fertilead company addresses the challenges of male infertility with an autonomous sperm preparation tool. Initially envisioned as a direct-to-consumer at-home fertility solution empowering couples to take greater control of their reproductive journey, Fertilead was designed to simplify and enhance sperm preparation outside the clinic. However, through early market validation and clinical feedback, we strategically pivoted to a B2B model—developing a clinic-integrated sperm preparation device that enhances IUI outcomes, standardizes workflows, and reduces manual handling variability for andrology lab technicians. As we establish clinical validation, regulatory approval, and market trust through this B2B pathway, our long-term vision remains to reintroduce an optimized, evidence-backed at-home solution built on proven clinical performance.

*For media mentions, refer to Appendix C (pg. 71)

NICHOLAS BURGWIN



FIBOS

ESCH STAGE 3 WINNER
2016

THE RIPPLE EFFECT: HOW A $25K GRANT CREATED A CAREER AND 50 JOBS

When Nicholas Burgwin first applied for the Norman Esch Engineering Innovation and Entrepreneurship Award in 2015, he didn't get it. For many, a rejection at the starting line is a signal to pack up. For Nicholas, it was the first lesson in a decade-long masterclass on resilience. He applied again, won, and went on to sweep all three stages of the award for his startup, Fibos.

Today, Nicholas is no longer the student pitching a master's research project. He is a seasoned founder, a member of the Esch committee, and a mentor who translates "personally earned wisdom" into a roadmap for the next generation.

FINANCIAL LEVERAGE: THE MULTIPLIER EFFECT

Fibos was born from a high-tech breakthrough: expanding the capabilities of strain gauges with advanced fiber optic sensor platforms.

While the technology was sophisticated, the business side was a steep learning curve. "The Esch Foundation money was the start of it all," Nicholas recalls. "It allowed me to get internal TMU money, which we then leveraged to match against government grants. We turned a $25k award into $80k of total starting capital."

This is the power of seed funding: it acts as a magnet for other capital. Unlike rigid government grants, the "unconstrained" nature of the Esch funding allowed Fibos to breathe. It paid for the expensive lasers and hardware that formed the backbone of their technology, proving that a small, flexible check is often more valuable than a large, restrictive one.

THE ENTREPRENEURIAL MINDSET: A REAL-WORLD MBA

The program provided Nicholas with what he calls a "Real-World MBA."

NICHOLAS BURGWIN FIBOS

"You're in the thick of it," he explains. "You're managing money, finding customers, hiring, and sometimes firing. The Esch Foundation gives you the money to gain the experience."

A common myth in the startup world is the "overnight" multi-million dollar raise. Nicholas's journey serves as a grounded counter-narrative. He emphasizes that the path from a lab project to an $8 million project with GE Aviation was paved with small, incremental steps. The Esch stages allowed him to build the first prototype, which secured the provincial grants, which then attracted Angel investors.

UNLOCKING UNCONVENTIONAL CAREER PATHS

Every founder hits a wall. For Fibos, that wall was a combination of market timing and the global disruption of COVID-19. After years of development and growing a team of 25 people, Nicholas made the difficult decision to shut the business down in 2022.

However, in the world of the Esch Foundation, a closed business isn't a failure—it's an investment in a leader. Nicholas didn't return to the bottom of the corporate ladder. Instead, he leveraged his "lived experience" to launch a new facility that is currently creating 50 new jobs.

The legacy of the Esch award isn't just found in companies that go public; it's found in the people it creates. Nicholas now sits on the other side of the table as an Esch Committee member, helping current applicants avoid the pitfalls he encountered.

IMPACT NOW: THE CYCLE CONTINUES

"It's hard to correlate exactly what that original $25k was worth," Nicholas reflects, "but it gave me the exposure to go out and start companies. It started a chain reaction."

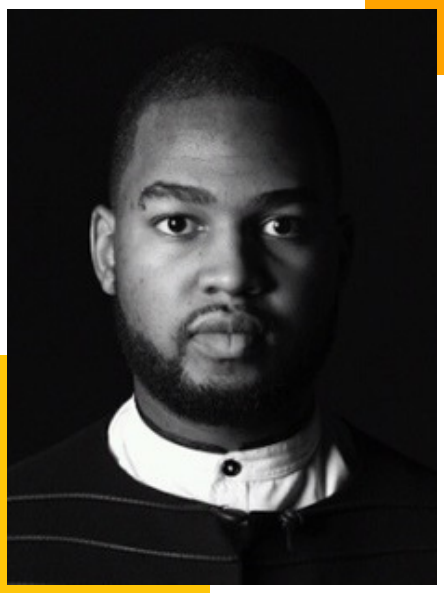
By empowering Nicholas to become a serial builder, the Esch Awards started a ripple effect that is still generating employment and innovation in the Canadian ecosystem today.

THE ESCH IDEA
FIBOS

FIBOS has created a fiber optic sensor measurement platform that that expands capabilities of the conventional electric strain gauge technology in electronics with advanced, affordable optical sensors. FIBOS provides optical measurement solutions to capture pressure, temperature, and vibration data in extreme environments up to 1000°C.

*For media mentions, refer to Appendix C (pg. 71)

SIMBA WAKATAMA



FLO100

ESCH STAGE 2 WINNER
2016

BEYOND THE DEGREE: ENGINEERING A NEW CLASS OF LEADER

For many student entrepreneurs, the distance between a fleeting idea and a flourishing venture is rarely defined by talent alone. It is measured by a fragile set of variables: timing, access, and the audacity to believe they can solve big problems today, rather than waiting for permission later in their careers.

For Simba Wakatama, an early recipient of the Norman Esch Engineering Innovation and Entrepreneurship Award, that realization arrived early—and it nearly ended his journey before it began.

THE BARRIER TO ENTRY

As an engineering student at Toronto Metropolitan University, Simba was deep in the trenches of a hardware startup. Following the classic roadmap, he sought professional validation to turn a concept into a reality.

He brought his designs to a full-service prototyping firm, expecting a partnership. Instead, he received a sobering reality check: a $50,000 quote just to build a single prototype.

"That was it," Simba recalls. "I thought my dream was dead."

For a student, that figure was a wall. But it also represented a traditional gatekeeper—the idea that serious innovation belongs only to established corporations with deep pockets.

THE POWER OF FLEXIBLE FUNDING

The Norman Esch Award intervened by offering strategic autonomy. The program trusts that students are capable of managing resources to best progress their ideas. Simba utilized this flexibility to reject the $50,000 contract. Instead, he used the award funds to purchase a professional-grade 3D printer, investing in his own internal capability rather than outsourcing it.

SIMBA WAKATAMA FLO100

IMPACT NOW, NOT LATER

This was the pivotal moment where the Esch philosophy took hold. The program inspired Simba to stop viewing himself as a "student in training" and start acting as an engineer, making an immediate impact. He didn't wait for a degree or a decade of experience to tackle complex manufacturing hurdles; he used his technical skills to solve the problem in real-time.

He committed himself to the humble, gruelling process of learning, building, and breaking his own designs. This tangible progress acted as a beacon, catching the attention of a senior industry veteran who joined the project as a mentor. This is the "Esch Multiplier"—where a well-timed award empowers a student to "think big," granting them the credibility to attract experts they could never otherwise afford.

UNLOCKING UNCONVENTIONAL CAREER PATHS

While that specific hardware venture eventually concluded, the skills forged during that process opened doors typically closed to traditional engineering graduates.

Simba didn't just learn how to build parts; he learned how to build businesses. He transitioned from a student with an idea into a founder with a methodology. This unique blend of technical rigour and entrepreneurial agility allowed him to bypass standard entry-level engineering roles. He landed a position at OneEleven, one of Toronto's biggest accelerators, where he architected partnership engines for global brands—a strategic role rarely offered to recent engineering grads.

Today, at his new venture, Flo100, he applies engineering logic to business strategy.

"The funding gave me time," Simba says. "Time to learn entrepreneurship without the constant, suffocating weight of financial stress. Time to take the work seriously."

The Norman Esch Award did more than fund a prototype; it accelerated the development of a leader. By empowering him to make a difference now, the program ensured that Simba didn't just graduate as an engineer—he graduated as an innovator capable of navigating any industry.

THE ESCH IDEA
Vibes Headphones

Regular headphones cause damage and hearing loss while blocking the ear, putting you in dangerous situations. Vibes Headphones utilizes bone-conduction technology to completely bypass the eardrum and outer ear without blocking or covering them. Because it uses less of your ear, it causes significantly less damage—making it possible for even those suffering from hearing loss or deafness to hear. Unlike the competition, Vibes Headphones is a fashion-forward alternative and the first luxury headphone of its kind

THOMAS MARTIN



SWTCH

ESCH STAGE 3 WINNER
2019

THE INTRAPRENEUR: HOW SEED FUNDING CREATED A CAREER

In the high-stakes world of early-stage startups, there is a thin line between a project that fades into a resume bullet point and one that evolves into a career-defining venture. For Thomas Martin, a Stage 3 Esch Award recipient, that line was drawn by a series of strategic pivots and a journey fueled by the momentum of the Esch program.

Today, Martin is the Director of Solutions Engineering at SWTCH, a top-two player in the Canadian EV charging network that reported 20,000+ active charging ports in 2025. But in 2017, his path was defined by a bold break from the status quo.

THE ENTREPRENEURIAL MINDSET: TAKING THE DRIVER'S SEAT

The journey began during his time at the Master of Engineering Innovation and Entrepreneurship (MEIE) program. While his initial team was successful in Stage 1, Martin felt a pull to go deeper than the collective was willing to explore. He made the difficult decision to split from the group to pursue a more aggressive vision.

"I needed to be in the driver's seat," Martin recalls. "When you're alone, you can move quicker."

This instinct secured him Stages 2 and 3 of the Esch program. More importantly, it forced him to adopt a founder's mindset. The Esch structure required him to cover every base—market, technology, and finance—teaching him that a viable innovation isn't just about "glamorous" tech, but about surviving the threats that could kill it.

FINANCIAL AUTONOMY: THE BRIDGE TO OPPORTUNITY

In a world where many graduates are desperate for their first paycheck to fund a lifestyle,

Martin used his Esch winnings as a strategic bridge.

This serves as a prime example of financial flexibility. Martin didn't use the money to pay himself a salary; he used it to buy his independence. He approached Carter Li, the founder and CEO of SWTCH, not as a needy job applicant, but as a funded contributor.

Using the award money as his own runway, Martin started as a contractor, effectively "de-risking" his own hiring. The Esch funds allowed him to prove his worth without demanding an immediate full-time salary from a cash-strapped startup. He wasn't just looking for a job; he was investing in his own professional development.

IMPACT NOW, NOT LATER

Martin didn't wait to "climb the ladder" to start influencing strategy. Working out of his brother's condo, he used the insights gained during his Esch project to revolutionize SWTCH's trajectory.

He helped identify a massive gap in the market, narrowing the company's focus to the B2B model that defines it today: enabling electric mobility in multi-family communities and apartments. The strategy worked. SWTCH is now a driver of EV adoption across the top 15 cities in the U.S. and is closing in on the #1 spot in Canada. Martin proved that students can use their technical skills to make a massive commercial impact now, not later.

Martin's journey highlights a career path often overlooked by engineering students: Solutions Engineering and Strategy.

UNLOCKING UNCONVENTIONAL CAREER PATHS

By blending his engineering background with the business acumen sharpened by the Esch program, Martin crafted a role for himself that didn't exist when he started. He is no longer just an engineer; he is a commercial leader who understands the product down to the wire.

"The world is trying to squash your idea and you just have to try and stay alive," he says. While he attributes some of his success to luck, the reality is that the "luck" of SWTCH's success was built on the foundation Martin laid during his Esch stages.

By choosing the path of high-risk ownership and utilizing the Esch Awards to validate his potential, Thomas Martin didn't just find a job—he built a career, earned equity, and helped power a Canadian innovation success story.

THE ESCH IDEA
SWTCH

SWTCH provides electric vehicle (EV) charging management solutions for multi-tenant residential, workplace, and public destination settings. SWTCH cloud software integrates with any type of charger hardware, optimizing charger usage through scheduling, enforcement, and smart energy management. At SWTCH, we are committed to improving EV charging accessibility to realize the social, economic, and environmental benefits of widespread electric vehicle adoption.

*For media mentions, refer to Appendix C (pg. 71)

WILL MCLAUGHLIN

FORMIFY

ESCH STAGE 3 WINNER
2022



THE HARDWARE PARADOX: FROM "IMPOSSIBLE" TO APPLE & TESLA

The journey of Will MacLaughlin and the Formify team serves as a masterclass in how targeted support can transform ambitious students into the industry leaders of tomorrow.

Formify began as a bold fusion of human biology and high-tech engineering: a venture that used a novel software algorithm to translate a simple photograph of a person's palm into a perfectly ergonomic, custom-fit computer mouse. By merging additive manufacturing with existing hardware capabilities, Will and his team weren't just building a gadget; they were reimagining the relationship between humans and their tools.

FINANCIAL AUTONOMY: CROSSING THE HARDWARE GAP

In the world of entrepreneurship, the saying goes that "hardware is hard." Unlike software, where a mistake costs a few lines of code, a mistake in hardware costs real money.

The financial barrier to entry often silences brilliant hardware ideas before they can take physical form. For Will, the Norman Esch Awards were the definitive bridge across that gap. The funding provided the capital to move from a digital render to a product held in the hand. It allowed the team to navigate the complex world of materials science—pivoting from skin-irritating resins to high-grade, biocompatible nylon—without going bankrupt in the process.

THE ENTREPRENEURIAL MINDSET: THE "INTELLIGENT HACK"

The true magic of the Esch journey was the creation of a "safe space" for failure. Through winning all three stages of funding, the team lived an accelerated entrepreneurial life cycle that no classroom could replicate.

They learned the art of the "intelligent hack." Instead of trying to build complex electronics from scratch, they gutted existing circuit boards to bring their prototypes to life faster.

These weren't just technical hurdles; they were moments of character-building. They turned students into resilient troubleshooters who understood that a perfect product is the result of imperfect iterations.

By the time they graduated, they hadn't just studied supply chains; they had built one. They had shipped real products to real customers, proving that students can solve mass-customization challenges typically reserved for major corporations.

UNLOCKING UNCONVENTIONAL CAREER PATHS

The legacy of Formify isn't found in the "startup graveyard," but in the halls of the world's most influential tech giants. The project became an elite portfolio piece—a tangible badge of honour that allowed every team member to stand out.

When they sat down for interviews at places like Apple and Tesla, they weren't just talking about theory; they were discussing how they navigated the "zero-to-one" journey.

Today, these individuals are leading projects at the pinnacle of the industry. For Will, the experience did more than fund a mouse; it defined his identity as a serial entrepreneur and set a trajectory for success that continues to unfold in the deep-tech world.

THE ESCH IDEA
Formify

Formify builds custom-shaped gaming mice by automating design. The current gaming mouse is "one-size-fits-all", which leads to an awkward handgrip on the mouse. With the advent of MJF 3D printing, a personalized shape is now just a software problem, and Formify has solved it. Formify tech stack builds a custom-shaped mouse from a simple photo, giving gamers the edge they want.

YUSUF ABDERRAHMAN



STOCK SHOCK

ESCH STAGE 3 WINNER
2024

FROM CARDBOARD TO CLASSROOM: GAMIFYING FINANCIAL LITERACY

Innovation rarely follows a straight line; more often, it is a series of pivots fueled by the right support at the right time. When Yusuf Abderrahman first conceptualized StockShock, his vision was bound by the four corners of a cardboard box.

As a biomedical engineering student with a passion for finance, he saw a gap in the market for a physical board game that could help young people navigate investing. At the outset, the project was a commercial venture destined for Amazon carts—a retail side project with a clear, consumer-facing ceiling.

THE ENTREPRENEURIAL MINDSET: THE PIVOT TO PUBLIC GOOD

The trajectory of this journey shifted entirely during Stage 2 of the Norman Esch Awards. It was here that the program's mentorship forced Yusuf to look beyond the "toy store" shelf.

While he was focused on manufacturing logistics, his mentors encouraged him to look toward the public sector. They helped him discover a timely alignment: Ontario's recent mandate for financial literacy within the Grade 10 curriculum.

This realization was the catalyst for a fundamental pivot. The mentorship provided the validation Yusuf needed to stop viewing Stock Shock as just a game and start viewing it as a mission-driven educational solution. He wasn't just selling a product; he was solving a policy problem.

FINANCIAL AUTONOMY: FUELING THE DIGITAL EVOLUTION

Moving from a living room tabletop to a universal classroom tool required a complete technological evolution. To bridge the gap between textbook theory and real-world application, Yusuf needed to take Stock Shock digital.

The most transformative moment came through the combined financial support of the Esch Awards and the IBZ Apprentice Program. This is a prime example of financial flexibility: Yusuf used the resources to hire two software interns who became the engine of the company's digital transformation.

Instead of burning the capital on inventory for a physical board game, he invested in human capital. This allowed the team to build the first web-based version of their vision, creating a scalable platform accessible to any student with a laptop.

UNLOCKING UNCONVENTIONAL CAREER PATHS

As the product evolved, so did the founder. The process of winning all three stages of the award served as a personal crucible for Yusuf.

Coming from a biomedical engineering background, Yusuf had no formal training in ed-tech or curriculum design. The journey through the Esch program acted as a crash course in business acumen. He traded technical formulas for market demographics and presentation strategies, learning to articulate his vision to stakeholders with precision. The Stage 3 pitch refined his public speaking and gave him the confidence to navigate the bureaucracy of the school system —skills that have opened doors far beyond the engineering lab.

IMPACT NOW, NOT LATER

Today, Stock Shock stands as a timely response to a growing educational need. With the introduction of the mandatory Grade 10 financial literacy assessment, educators are scrambling for engaging tools.

Yusuf didn't wait to become a policy expert to help. He used his startup to bridge the gap immediately. Stock Shock now integrates with mathematics, business, and career studies, helping teachers make financial literacy interactive.

What began as a physical game on a warehouse shelf has been transformed by mentorship, strategic hiring, and digital innovation into a powerful tool for public empowerment. Through the support of the Esch Awards, Yusuf is preparing the next generation for the financial realities of the modern world.

THE ESCH IDEA
Stock Shock

Stock Shock is an investment strategy board game. Our mission is to develop a million millionaires through our engaging and accessible investment literacy game. Learning foundational investment literacy should be democratized, free and accessible for people of all backgrounds to improve their lives.

SECTION 8
APPENDIX A
ESCH COMMITTEE

Toronto Metropolitan University

Faculty of Engineering & Architectural Science

ESCH COMMITTEE

COMMITTEE CHAIR

John MacRitchie	Assistant Vice-President Zone Learning and Strategic Initiatives

ESCH COMMITTEE MEMBERS

Alex Angevaare	Chief Financial Officer | Innomotics Inc.
Alex Kjorven	Chief Product Officer | Ourboro
Andrea Matheson	Scale Expert, Multi-Exit Entrepreneur
Andrew Opala	Angel and Board MemberAngel and Board Member | Brampton Angels
Ayesha Sabouba	Director, Telecom Engineering - Hydro-One Telecom Inc.
Balaji Gopalan	Director | Toronto Product Management Association
Brian MacDonald	Senior Business Advisor, Ministry of Economic Development, Employment & Infrastructure | Government of Ontario
Charles Boulakia	Principal & Patent Lawyer | Smart & Biggar
Chris Webb	Assistant Vice President, Business Development and Strategic Initiatives | Toronto Metropolitan University
Constance O'Brien Nicholson	Industrial Research Assistance Program | National Research Council Canada
Craig Thornton	Consultant
Derek Jouppi	Founder
Dominic Talalla	CEO | Symbient Environmental Technologies
Ebrahim Bagheri	Professor | University of Toronto and Co-Founder | Reviewer.ly
Ela Borenstein	Director | BDC Biotechnology
Hadeer Hassaan	Executive Vice President, Chief Information & Customer Experience Officer | Bell
Holly Gardner	Founder & Researcher
Irene Yang	Venture Capital Investment | BASF

Section 8: Appendix A - Esch Committee

Joel Liederman	President | ELARAD Venture Management; Director, Corporate Development | IRegained Inc.
Johannes Dyring	Executive Vice President, Business Development and Strategic Initiatives | TMU
John Enright	Professor, Aerospace Engineering | Toronto Metropolitan University
JP Silva	Associate Director, Zone Learning | Toronto Metropolitan University
Karen Killeen	Business Advisor | Springboard Management Advisors Inc. and Consultant | Alderpoint Holdings Inc.
Leona Banfield	Founder & Principal | Ginomai Consulting & Training
Lisa Boreanaz	Regional Director | NRC-IRAP
Mahir Dheendsa	Program Specialist, Data Integration and Transformation
Manfred Koo	Health Care & Hospital Consultant
Mark Farrow	Principal | Farrow Consulting
Martin Croteau	Lecturer | Toronto Metropolitan University
Michelle Sinclair	Senior Innovation Advisor, Innovation, Science and Economic Development Canada | Government of Canada
Mo Shahin	Co-Founder & Managing Partner | Softmills
Moatassem Moatez	Founder & CEO | MyCourier Inc.
Nicholas Burgwin	Sales Director, North America | Isoplus
Olena Kholodova	Senior Advisor, Climate Change and Sustainability
Paul Hacking	Senior Project Manager, Office of Zone Learning & Strategic Initiatives | Toronto Metropolitan University
Pushkar Kumar	General Manager | Carrier Abound
Rachel Zimmer	Entrepreneur, General Manager, Start-Up Advisor, Speaker
Reuven Soraya	Director | Tweepsmap
Saif Husain	Sr. Customer Solutions Manager - Amazon Web Services

Section 8: Appendix A - Esch Committee

Samin Eftekhari	Founder & President - Artin Biomed and Biomaterial Engineer - United Therapeutics Corporation
Stan Ossias	Strategic Partner, Expense Management Practice | Schooley Mitchell and Principal | Wetherfield Greenview Advisory Services
Stephen Pumple	Project Manager | Toronto Metropolitan University
Suresh Madan	Board of Directors | Trillium Health Partners Foundation & The Conference Board of Canada
Tony Redpath	PhD (Physical Chemistry), Scientist, Entrepreneur, & Farmer
Usha Srinivasan	Founder & CEO | BReady Talent Platform
Valerie Fox	Chief Executive Officer | Pivotal Innovation
Victoria Ikede	National AIX Design Lead | Architecture49
Vigen Nazarian	Founder & President | Naprico Inc.
Vincent Hui	Associate Chair, Architectural Science | Toronto Metropolitan University
Zohair Khan	Chief Operating Officer | Airfairness

SECTION 8

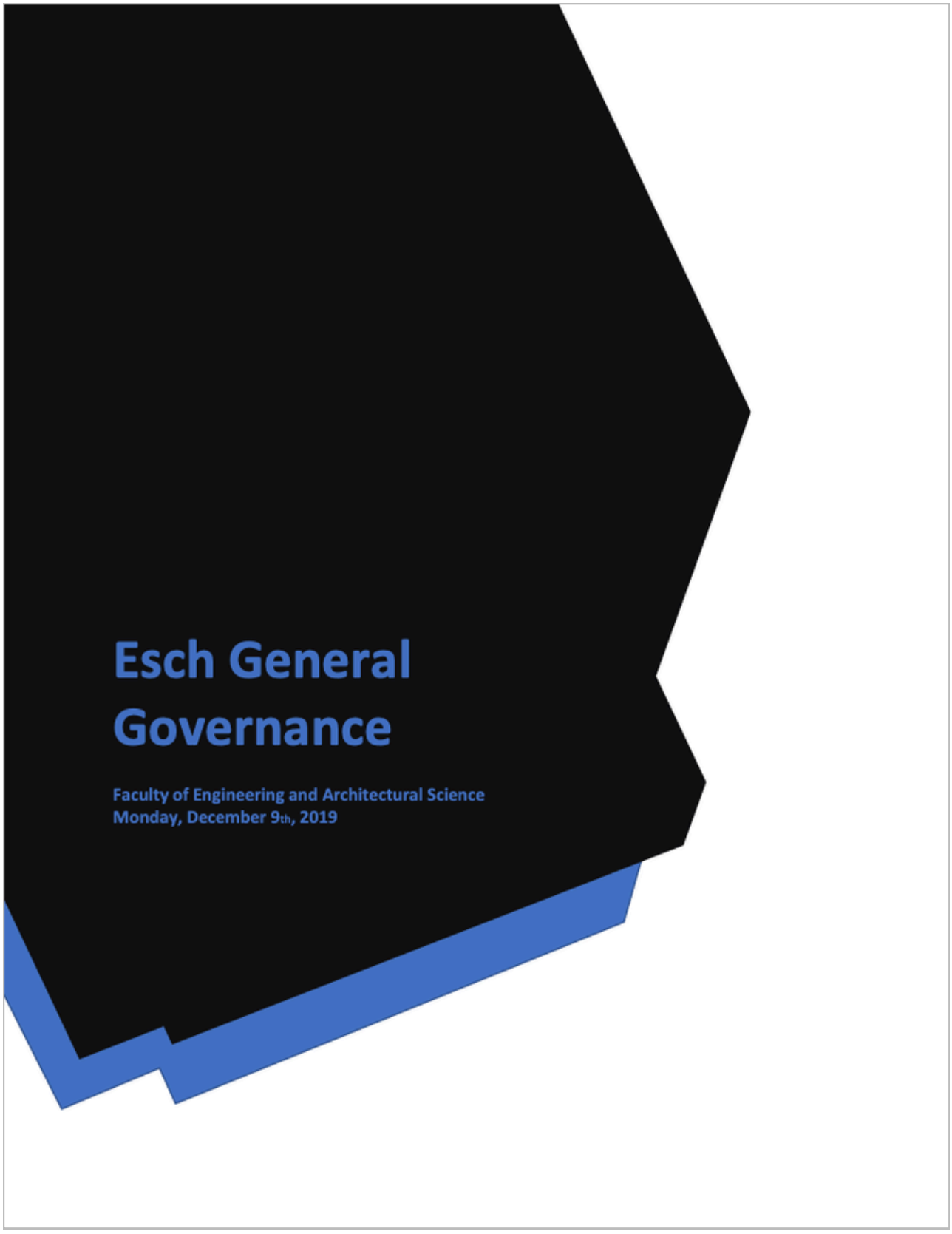
APPENDIX B

GOVERNANCE & REVIEW PROCESS

Toronto Metropolitan University

Faculty of Engineering & Architectural Science

GOVERNANCE & REVIEW PROCESS



Section 8: Appendix B - Goverance & Review Process

Ryerson University | Centre for Engineering Innovation & Entrepreneurship
Faculty of Engineering & Architectural Science

About the Award

Norman Edward Blake Esch (1918 – 2010) had a great zest for life. As a salesman, he became a driving force behind Toronto's printing industry. An entrepreneur himself, Norman was the founder of Graphic LithoPlate, and the owner of many successful companies like Roto-tone Gravure. Norman was a philanthropist who donated generously and created the Norman Esch Foundation before he passed away in 2010.

In 2013, The Norman Esch Foundation realized an ambition to expose Ryerson engineering and architectural science students to the essential skills and wonderful opportunities through entrepreneurship.

The Norman Esch Engineering Innovation and Entrepreneurship Awards provide financial assistance and entrepreneurial coaching to undergraduate and graduate students in the Faculty of Engineering and Architectural Science (FEAS) at Ryerson University. The awards provide FEAS students with the learning opportunity and resources to make an impact, and potentially commercialize their projects through their own start-up. Through a series of stages, the awards enable students to develop new and innovative ideas for products, inventions and technologies that are relevant to the Canadian economy.

To ensure the Norman Esch Awards provide innovative and invaluable financial and mentorship support for students, the Centre for Engineering Innovation and Entrepreneurship (CEIE) has developed an ecosystem of academic, incubation and acceleration programs to nurture students from the initial idea phase through to commercialization. Through this experience, the Norman Esch Awards change the lives of many of our students and enhance the greater community at Ryerson University.

The following awards are available for FEAS students to apply for:

Discovery Award (Stage 1) - $5,000

The Stage 1 award supports students in the initial ideation stage. Suitable applicants will have a promising idea, but are in need of resources to consider further stages of development and/or to conduct a thorough market analysis to determine how to best position their ideas for success in the marketplace.

Feasibility Award (Stage 2) - $8,000

The Stage 2 award supports students who have completed formal market research, which substantiates that there is market demand for their product or service. The award supports successful applicants in the development of business plans or alpha/beta prototypes.

Market Readiness (Stage 3) - $25,000

This award supports students who are ready to enter the market, completed formal business plans and/or alpha or beta prototypes. In preparation for the Stage 3 application, the applicant should be in a position to demonstrate that their idea has commercial potential and has developed a clear go-to-market strategy.

Applications at each stage should address how the idea supports the donor mandate of being relevant to the Canadian economy.

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Section 8: Appendix B - Goverance & Review Process

Ryerson University
Centre for Engineering Innovation & Entrepreneurship
Faculty of Engineering & Architectural Science

Eligibility

The Norman Esch Engineering Innovation and Entrepreneurship Awards provide financial assistance to students in the Faculty of Engineering and Architectural Science (FEAS). While a project may be undertaken by a team, the application must be from one person – the Applicant. Some additional eligibility requirements apply:

- At the time of application, the Applicant must be a current student or recent graduate (within 6 months) of FEAS with a clear academic standing (1.67 GPA).
    - Graduate students in their first semester can use their undergraduate CGPA as the baseline.
    - Undergraduate students in their first semester cannot apply.
- As a student, the Applicant must have full-time undergraduate and graduate status (as determined by the Office of the Registrar of Ryerson University.)
    - Co-op students are considered equivalent to full-time status students
- The Applicant must be available for contact (via phone or in person) during the Esch Review Committee meeting (held during the scheduled committee meeting) if requested by the Review Committee.
    - For stage 3, if selected, the Applicant, must be available to participate in person for a presentation to the scheduled Esch Review Committee meeting.
- Past recipients of Esch Awards may not apply to a stage (Stage 1, Stage 2, or Stage 3) to which they have been previously awarded, even if the application submitted is for a different idea.
- The Applicant can apply with an idea with team members / inventors from other faculties; the external community; from other schools; and/or Ryerson staff and faculty members, with the understanding that:
    - The Applicant should be actively participating in the business and state their current ongoing contribution.
    - The Applicant should clearly state the activities for which he/she is responsible.
    - The Applicant is responsible for the final report and its content.
    - The Applicant, if selected, will receive the award in their name or will need to coordinate payment with their official business (business numbers, SIN, and HST information will be required).
    - The Applicant is responsible for all communication made during and after the selection process.
    - The Applicant, if selected, in communication and press will have their name associated with the idea submitted.

Section 8: Appendix B - Goverance & Review Process

Ryerson University | Centre for Engineering Innovation & Entrepreneurship
Faculty of Engineering & Architectural Science

General Governance

The following section outlines the role and responsibilities of involved departments. Ryerson University's Advancement team manages the Esch Gift Agreement while the Dean of FEAS and the CEIE team oversees the awards program year-to-year.

Advancement Office

Ryerson University's Advancement team manages the Esch Gift Agreement. The appointed Executive Director (ED) of Advancement for FEAS works closely with the Dean of FEAS managing and building out further strategies to deepen the donor relationship. The ED is also responsible for all fund transfers between the Advancement office and FEAS.

Deans Office

The Dean of FEAS works closely and consults with the CEIE Director with respect to the Esch Awards program. Responsibilities of the Dean include:

- Appointment of the Chair of Esch Review Committee
    - The Dean of FEAS appoints and officially invites the Chair for Esch Committee based on the recommendations from the CEIE Director. This a two-year renewable post. The Chair of the Esch Committee cannot be part of CEIE or the MEIE program
- Inviting new members to the Esch Review Committee (Reviewers):
    - Based on recommendations from the CEIE Director and the Committee Chair, the Esch Review Committee members are formally invited to join the committee by the Dean of FEAS.
    - Selected reviewers receive an official letter from the Dean and are requested to provide a copy of their resumes/CVs as reference, and a bio that can be used publicly

CEIE

The CEIE is responsible for the design, implementation and administration of all facets of the Esch program except as otherwise stated. The CEIE makes sure that all student-facing and reviewer-facing material is up-to-date. The CEIE is in charge of promoting the awards and assisting students through both the application and follow-up process. This includes managing the administration of awards, assisting with coaching, providing educational programs to help them progress their ideas, and any additional resources that can help the students. The CEIE team is also the point of contact for reviewers. The CEIE communicates timelines and deliverables and reports on all feedback associated with reviewed applications. The CEIE handles all questions from both students and reviewers. Specific responsibilities of the CEIE include:

- Administering the funds
    - CEIE is responsible for managing the allocation and the release of funds to awardees.

- The Director of the CEIE is responsible for reporting the allotment of funds to the Esch Foundation.
- The Director of the CEIE is responsible for communicating the amount of funds available for the program every intake to the Chair of the review committee. The Chair is responsible to communicating this amount to the Esch Review Committee members.

- Application Process/guidelines
  - The CEIE is responsible for managing the application and award process and ensuring that it complies with all relevant Ryerson policies
- Nominating reviewers for the Esch Review Committee
  - The CEIE will nominate reviewers to the Dean of FEAS.
- Reviewer feedback
  - The CEIE is responsible for communicating the reviewers' feedback to the applicants
- Support in application process
  - The CEIE is responsible for providing support for students interested in applying for the awards.
- Incubation of the winners
  - Each winner is invited to join FEAS' iBoost Zone – if the winners would like to join another Ryerson Zone, the CEIE team will help facilitate the introduction to other Zones.
- Marketing and Recruitment
  - The CEIE team is responsible for all marketing and recruitment for the Esch Awards. Marketing is shared via various mediums including web, in-person and email campaigns.
  - The CEIE is responsible for announcing the winners on its website in a timely manner
- Organizing Esch Committee meetings
  - The CEIE team is responsible for coordinating the Esch Awards reviewing meetings and documenting the reviewers' feedback for the applications discussed.
- Post-application Support
  - The CEIE is responsible for on-boarding new awardees after each award intake. This provides awardees further direction/coaching on the resources available to them.
- Reporting

- The CEIE team is responsible for writing and producing the Esch Annual Report. The report is shared with members of the Esch Foundation and key stakeholders at Ryerson.
- The CEIE is responsible for presenting the success and key learnings to the Esch Foundation and key stakeholders of Ryerson on an annual basis.
- Preparing other reports as requested by FEAS Dean

Chair of the Esch Award Review Committee

The Chair of the Esch Award Committee decides application reviewer assignments, moderates discussions during the Esch Committee Review meetings and ensures the review meeting adheres to the general Esch Awards guidelines.

The Chair is appointed by the Dean of FEAS for a two-year renewable post.

Role of the Chair:

- Oversee and chair the Esch Review meetings - moderating discussions/decisions with the committee during scheduled meetings, making sure the reviewers are adhering to the awards and applications guidelines
- Working with CEIE, identifying new reviewers for the committee (on-going)
- Reviewing and advising on updates to the rules and regulations to the Esch application handbook (every two years)
- Assigning reviewers to the Award applications during each Award intake based on matching expertise to the application domain wherever possible and confirming compliance with conflict of interest guidelines.

Esch Review Committee (Reviewers)

The Esch Review Committee (Reviewers) are volunteer experts who agree to dedicate their time to review, rate and provide feedback to student applications. Committee members are requested to review applications and attend the committee meetings as scheduled.

- Reviewer nominations and assignments are renewable every two years.
- Reviewers are expected to attend the committee meetings.
- Reviewers are expected to typically review 10-15 applications in each intake.
- Reviewers are expected to provide review feedback in a timely manner (deadlines specified by the CEIE Manager). Feedback should be meaningful, educational and constructive.
- Reviewers are requested to identify their areas of experience. Assignment of applications for reviewing purposes will be matched accordingly.
- Reviewers are expected to agree to the Esch Reviewer Agreement, which stipulates conflicts of interest, confidentiality, and attendance requirements
- Once appointed, the relationship between the reviewers and the program is via the CEIE.

SECTION 8
APPENDIX C
ESCH WINNERS IN THE MEDIA

Toronto Metropolitan University
Faculty of Engineering & Architectural Science

ESCH WINNERS IN THE MEDIA

ADHAM EL-KHADEM

- CEO of the Year 2024
- Top 30 Emerging Leaders Under 30, 2023
- Top 500 Hottest Tech Companies at Collision 2023 in Toronto
- TMU Alumni and Friends: A solution to compare delivery service apps - this alum finds the cheapest and fastest option
- Rising Star Winner in the Deloitte Technology Fast 50 program

AMIR FARD

- Hack the World: Meet Our Winner, CityOptima

BOLIS IBRAHIM

- TMU Alumni: Becoming CEO and co-founder Argentum Electronics
- TorontoMet Magazine: An entrepreneur to watch (2025)
- TMU Alumni Rising Stars Nomination
- Electrical Business: The DC shift and the future of power distribution in buildings (2026)
- Made in CA: Erin Law: Cence Power Leading Electrical Systems Into the Future
- TMU Alumni: Three alumni helping to protect our planet (2023)

ISSAM EL MISSAOUI

- Tech Alliance: Enabled Talent and Yadag ranked among top 8 HR tech companies and startups in Canada by F6S

KARTINA CARLTON

- TorontoMet Today Article: Going green with TMU entrepreneurs committed to sustainability (2023)

LEON NSENGIYUMVA

- TMU Fashion Zone Article: Meet 6 Businesses Changing the Canadian Fashion Industry in "Shaping the Six" (2019)
- TMU Fashion Zone: Boss Noir: Celebrating Black Excellence (2020)

NARJES ALLAHRABBI

- FEAS Article: Dr. Narjes Allahrabbi wins 2025 Mitacs Innovation Award
- Toronto Met Magazine: Easing the way to family planning

Section 8: Appendix C - Esch winners In the Media

NICHOLAS BURGWIN

- TorontoMet Today: Let's talk about sensors
- FEAS: The Entrepreneur's Journey to Business Success

THOMAS MARTIN

- SWTCH secures $37.4 million in Series B funding
- MEIE Article: Charging forward with electric vehicle energy solutions
- TMU Alumni Article: How pursuing his masters helped grow the startup SWTCH
- PR Newswire: SWTCH Energy Launches Canada Home Charging Program, Offering Homeowners Free EV Chargers and Cash Back for Charging
- CBC News: Now your EV charger can earn some money for you
- EV Infrastructure News: SWTCH Energy lands CA$10 million credit facility
- Canadians can get a free home EV charger from new SWTCH Energy program
- SWTCH and Kite Mobility Demonstrate Grid Benefits of Intelligent EV Charging and EV Car Sharing
- SWTCH's home EV charging program means free hardware, cash back

SECTION 8
APPENDIX D
STUDENT DESIGN TEAMS

Toronto Metropolitan University
Faculty of Engineering & Architectural Science

STUDENT DESIGN TEAMS

BED DESIGN TEAM

BED Design Team operates with a mission to educate the engineering community at Toronto Metropolitan University on the latest trends and innovations in Biomedical Engineering. The team identifies and develops new biomedical projects while hosting educational workshops that are open to the entire campus community.

BYTE

BYTE is an open-source AI and computer science lab modelled after a student-led startup. The team brings together developers, designers, and innovators to build high-impact AI projects from the ground up. Operating with a startup mindset, BYTE encourages members to explore cutting-edge technologies, contribute to open-source systems, and develop projects with the potential to scale into real-world ventures. Our mission is to transform student potential into tangible innovation through collaboration, experimentation, and a drive to solve meaningful problems.

C.L.A.W. [CYBERSECURITY LEADERSHIP & ANALYSIS WING]

CLAW is TMU's premier cyber operations and intelligence unit. We are dedicated to talent development through red-blue adversarial simulations and real-world threat response. Supported by TRUFLE's research arm, CLAW integrates operative labs, professional mentorship, and AI-enhanced drills to train the next generation of cybersecurity leaders.

FRONTIER

As we move closer to space than ever before, the next great challenge is deciding what we do once we arrive. Frontier invites you to help answer that question. By conducting original research, building advanced space technology prototypes, and sharing your vision for the cosmos, you can play a direct role in shaping our future among the stars. Join us and help define the next era of exploration.

GLUCOSENSE

GlucoSense is a cutting-edge, non-invasive wellness device that tracks blood glucose trends, empowering pre-diabetics to manage their health through personalized insights. With a focus on preventive care, it helps users understand the impact of their food and lifestyle on glucose levels, offering a proactive approach to wellness before the need for medical intervention.

MASA

MASA is the first university astronomy club dedicated to blending educational insight with hands-on exploration. From deep-dives into the wonders of the universe to live telescope sessions and interactive activities, we provide students with a complete gateway to the cosmos.

NULLCANCER

NullCancer is built on a simple, powerful mission: to "zero out" the threat of cancer. We believe in a future where we can work so effectively that the disease is stopped before it ever takes hold. This is achieved through an integrated approach that combines CDetect, our advanced early detection system, with NeuroPulse Guardian, our specialized therapeutic technology.

RECABILITY

RecAbility is a startup dedicated to the power of inclusive sports and recreation. Our mission is to make physical activity accessible to everyone through innovative, first-to-market products designed specifically for the disability community. By filling a critical gap in the industry, RecAbility aims to redefine the sports landscape and drive positive, lasting change for athletes worldwide.

TAKEOFF

Takeoff is a design team at Toronto Metropolitan University dedicated to lowering the barrier to entry for aspiring engineers. Through robotics-focused events and short-term challenges, we provide the hands-on experience needed to bridge the gap between the classroom and the professional world.

TECH HARVEST

This initiative focuses on urban biodiversity and sustainable gardening through the application of engineering and farming principles. By implementing rooftop gardens, hydroponics, and vertical farming, we create accessible ways to increase native wildflowers throughout Toronto. Our mini design projects aim to reduce the city's carbon footprint while restoring local ecosystems.

TMU WAVE

This submarine design team specializes in underwater reconnaissance. TMU Wave is on a mission to pioneer underwater ROV (Remotely Operated Vehicles) development, opening up unique opportunities for students to gain hands-on experience with underwater robotics technology.

TORONTO AUTONOMOUS SYSTEMS COLLECTIVE (TASC)

TASC is a student robotics team had previously worked on developing BattleBots and is now working on a rover. The team is dedicated to designing and developing innovative, robust, and competitive battle bots that can withstand and excel in any combat scenario.