



Concurrent Presentations

Theme:
Outreach

Academic, professional, and personal effects for students leading STEM outreach

Presenters

Jennifer Jakobi, University of British Columbia Okanagan
Elizabeth Saville, UBC Okanagan
Sabre Cherkowskil, UBCO Okanagan

The integrative STEM Team Advancing Networks of Diversity (iSTAND) program started in 2014, with the initial objective to engage youth in hands-on science activities. To undertake this program, post-secondary students were engaged as volunteers and staff in outreach activities. This study explores the academic, professional and personal career benefits of leading STEM outreach, from the perspective of undergraduate student leaders. Post-secondary staff from traditional and non-traditional STEM fields led programs and therefore we consider university students in STEM broadly from health to engineering, as well as gender and type of position (paid or volunteer) in this evaluation. Data were collected through an online survey completed by 30 former student STEM outreach leaders from the University of British Columbia. Survey data indicated that STEM outreach had a moderately strong impact on academic, professional and personal career development. Outcomes did not differ between genders and paid work was found to contribute to greater personal and professional impact. The positive influence of outreach on academic and professional decision making was higher in traditional STEM fields than STEM based health-science studies. Future studies are needed to fully understand how demographics and year of study might differentially inform career decision making within as well as between STEM fields to maximize university student leader involvement and create advances in the university-leaders academic and professional development. The outcomes of this research will further inform the relevant impacts of STEM outreach on university student leaders.

Accessibility, Inclusion, and Gender Parity - SuperNOVA at Dalhousie University's Approach to Inspiring the Next Generation of Women and Girls in STEM.

Presenter

Clayton Murphy, SuperNOVA at Dalhousie University

In an effort to reach gender parity in STEM fields, SuperNOVA has established core programming dedicated to all-girls engagement that includes clubs, workshops and camps. The proposed talk will showcase SuperNOVA's intentional program design which creates capacity for girls to explore STEM fields in a safe and approachable way. Key elements used by SN to create this impact include providing mentorship from industry experts and pairing this with high-quality content that promotes deep

learning and connects to provincial curriculum. Programs offered by SuperNOVA that incorporate this approach include ITS (Industry, Technology, Science) For Girls, a program that introduces girls in grades 4-9 to mentors working and studying in the STEM fields; and Girls Count, a weekly mathematics mentorship program that introduces girls aged 11-13 to mathematics concepts through activities, mentorship engagements, and homework help. Female-identifying STEM professionals are invited to showcase a range of careers and industries in these programs. Mentorship is particularly impactful and important, as the mental health of those with a supportive adult is significantly better than those who do not. Guest speakers are recruited to best represent the diversity of STEM professionals and the range of related career opportunities, through the Dalhousie community, industry and conferences such as the Queer Atlantic Canadian STEM Colloquium. SN's all-girl programs are inclusive of all female-identifying and non-binary participants, and have accommodated participants from these groups previously. Past ITS for Girls mentors have self-identified as 2SLGBTQI+ individuals and were able to address intersectional barriers for queer women in STEM fields.

Building STEM Connections Through Indigenous Mentorship Outreach Programs

Presenters

Rebecca McCullough, WWEST Project Manager, UBCO

Jennifer Jakobi, WWEST Chair, UBCO

The Westcoast Women Engineering, Science and Technology (WWEST) and the integrative STEM Team Advancing Networks of Diversity (iSTAND) program work collaboratively with the Indigenous Programs Services, to design and implement an Indigenous Mentorship Outreach Program for post-secondary students. Through this program, Indigenous post-secondary students are trained in the development, implementation and leading STEM activities locally, so they can replicate them in their home communities, in order to enhance STEM programming for K-12 youth. Building connections through creating outreach activities, directly related to BC Education curricular outcomes, and specific school and community needs, has made these learning experiences valued, appreciated and sought after. Indigenous Mentors build professional skills, mentorship abilities and event planning processes, that enable them to grow as youth and community leaders. STEM programs delivered by young adults in community at no cost to community, also allows for inclusive and accessible opportunities for diverse Indigenous communities. Feedback from teachers and mentorship students supports the ongoing development of sessions, and strengthens ties between post-secondary institutions and Indigenous communities. These mentorship programs promote and engage youth in STEM related activities, building the foundation for long term relations as well as recruitment and retention in STEM disciplines.

Collaborating to inspire, celebrate and engage: lessons learned from initiatives aimed at fostering a culture of inclusion

Presenters

Sandra Corbeil, Ingenium - Canada's Museums of Science and Innovation

Eleanor Haine, Canadian Commission for UNESCO

Andrea White, Office of Fisheries and Oceans Canada

The Women in STEM initiative by Ingenium, launched in 2019, is driven to engage, advance, and retain the interest of young women in STEM fields. We know women have always made important contributions to STEM fields throughout history, yet gender inequity persists, especially at the highest levels of academia and industry. This underrepresentation results in a lack of visibility of women and non-binary people in STEM. In order to improve this lack of profile the Women in STEM initiative is inspired by the notion of "If I can see her I can be her!". It has created outreach resources including 70+

posters, more than 20 videos, an interactive timeline, and a travelling exhibition that share stories of the contributions of women and non-binary people in STEM. Moreover, its accompanying educational resources and activities, designed for multiple audiences and age groups, serve as launchpads for discussions that shed light on persistent, often implicit, gender biases, how different social identities impact the experiences and representation of women in STEM, and the advantages of diversity in STEM. In combination, these resources educate, inform and build allies to tackle gender inequity.

Collaboration- a key to sustainability and expanding your organization's impact.

Presenter

Fervone Goings, WISEST Team Lead (Women in Scholarship, Engineering, Science and Technology)

Established in 1982, at the University of Alberta, WISEST (Women in Scholarship, Engineering, Science, and Technology) has 40 years of experience in encouraging diversity while empowering women to succeed in STEM. In 2016, WISEST was at a crossroads, a crisis. The dilemma -a growing demand for initiatives attracting women and gender diverse students to STEM within the very real constraints of reduced funds, increased competition for new funding, overtaxed staff, and operational capacity limits. The question we were faced with was how to meet the demand within these constraints? Over time, the answer that emerged was a recognition, that we could only do so much, but if we could leverage relationships with other groups that were value-aligned, and have those relationships develop fruitful outcomes that attracted more individuals to STEM, then we would be able to expand our impact. Based on lessons learned from organizational successes and missteps resulting from WISEST's strategic shift to developing collaborative relationships and partnerships, this session will offer insight and strategy on how to approach collaborations so that they can be true win-win relationships. We will outline the benefits of building a foundational framework based on values-alignment and examine the strategic advantages of 1) giving alumni a voice and platform - leveraging program alumni and committed volunteers, 2) amplification through shared audiences - partnerships with community groups with the same target demographic, and 3) knowing your own value - developing relationships with organizations that want access to your expertise and to your audience.

Connecting and Collaborating: STEM programs for girls and nonbinary youth

Presenter

Larissa Vingilis-Jaremko, Canadian Association for Girls in Science (CAGIS)

Girls, gender nonbinary, and gender nonconforming youth continue to face barriers in their science, technology, trades, engineering, and mathematics (STEM) education. Numerous initiatives and programs supporting these youth successfully operate locally and nationally across Canada. Within this session, organizations with initiatives that support girls, gender nonbinary, and gender nonconforming youth (k-12) in STEM in Canada will be invited to present their work, learn about other complementary initiatives, discuss challenges, successes, best practices, and collaborative opportunities. This will foster a community of practice of shared learning and collaboration to support gender equity in STEM in Canada.

Evidence-based approaches to supporting girls in STEM

Presenter

Larissa Vingilis-Jaremko, Canadian Association for Girls in Science (CAGIS)

Girls and women continue to face barriers in their science, technology, trades, engineering, and mathematics (STEM) interests, education, and career aspirations. These barriers are hypothesized to be caused by ongoing societal bias and are expressed by differential evaluation of work (e.g. assignments, applications) and differential access to opportunities (e.g. mentorship). This leads to an under-representation of girls and women in a variety of STEM fields in the educational system and workforce. However, there are evidence-based approaches that can support girls' ongoing interests and aspirations. This session will present research related to barriers girls and women face, evidence-based approaches to supporting girls' interest in STEM, and provide an example of a program that is successfully supporting girls' interest in STEM: the Canadian Association for Girls in Science (CAGIS).

From Hair Ties to Lab Coats: The Impact of STEM Programming on Young Women

Presenters

Madyn Bourque, WISEatlantic
Molly Murray (She/Her), WISEatlantic

Madyn and Molly are both past participants of WISEatlantic programming who are now actively working towards inspiring young girls to pursue Science, Technology, Engineering and Math (STEM) careers. Their talk will detail their experiences as young women in STEM and the role WISEatlantic played during their formative years. Touching on how STEM outreach has impacted their lives and how they've used their experiences to continue that outreach, they will speak on their time facilitating summer camps, retreats and developing and running their own app contest 'Living WISELY' in 2021.

Inspiring Youth Towards SETT in an Aging, Rural Town

Presenters

Gillian Stanton, Inspiring Communities
Morgan Dunn, Inspiring Communities
Jesselyn Nesbitt, Rural Youth Project Coordinator

A 2019 survey by Inspiring Communities highlighted that the aging population, job insecurity and declining education are top concerns for the general population in Digby, Nova Scotia. Statistics Canada (2016) reported 58.8% of residents in Digby have no post-secondary education, and 25.5% residents aged 25-65 have no degree/diploma, which is double the provincial rate of 12.2%. The Inspiring Communities survey highlighted employment is a key concern for youth in their 20s and late teens. Among youth in their 20s, 70% worried about various issues related to jobs and the area's economy. Many of these youth expect they will have to leave the area to find suitable employment and/or to pursue further education or training. Furthermore, technological advancements and cultural change has made navigating life-after-high school become drastically different between generations, thus outdated parental advice. Consequently, the lack of youth from out-migration and a high number of first-generation secondary/post-secondary students results in a gap of role models in programs such as Science, Engineering, Technology and Trades that requires post-secondary education. To overcome the gap in mentorship, since 2019 volunteer panelist annually meet with senior students to speak on their experiences and answer questions regarding post-secondary education. The panel of recent graduates

from the school is diverse in education and lived experiences. The session provides students with support from locals who share stomping grounds. This talk highlights the steps, challenges and successes from this youth-driven project in hopes to inspire more peer-mentorship initiatives.

Island WISE in Cape Breton: Developing an Innovative Board Game to Encourage Girls to Pursue STEM fields

Presenters

Katherine Jones, Cape Breton University

Stephanie MacQuarrie, Cape Breton University

Island WISE hosts a variety of outreach events that engage young women across Cape Breton Island. Our events provide hands-on experience in Science, Technology, Engineering, and Math (STEM) through fun, purposeful, and engaging activities. We strive to include rural and indigenous communities in all our events. It is a fact that women have historically been underrepresented in STEM fields. They are less likely to choose careers in STEM, more likely to drop out of STEM programs, and less likely to advance in STEM careers. It is known that girls' interest in STEM peaks in middle school, but then drops off in high school. Coincidentally, middle school is the most vulnerable time for confidence building in both genders, but especially girls. To tackle these challenges, we developed an innovative board game called "STEMs" to target this age group. The game takes a multi-faceted approach to introduce players to what it is like to pursue a career in STEM fields. It teaches players about successes and setbacks along the way to becoming a professional scientist, and how grit and determination can help them advance despite the challenges that might be encountered. Players will also learn about scientists who overcame significant barriers during their pursuit of science. And players' abilities to overcome challenges will be put to the test with What Would You Do (WWYD) scenarios. The board is designed as a tree, and players travel from the bottom of the tree through the branches that symbolize "STEMs" along their career paths.

The Engineering Problem-Solving Process to Make School Tasks in Technology Meaningful and Interesting for Girls

Presenters

Eve Langelier, Université de Sherbrooke

Fatima Bousadra, Université de Sherbrooke

Abir Ouerhani, Université de Sherbrooke

Nicolas Félix Lacombe, Université de Sherbrooke

For two decades, in Quebec as in several OECD countries, engineering and technologies have been part of the official programs of compulsory general secondary education. However, despite the consensus on the importance of quality technological education for all students, several studies reveal major deficits in the training to teach these disciplines, at the international level (Cunningham et al. , 2007; Daugherty et al., 2012; Bousadra et al. 2018; Honey et al. 2014).

Several problems still arise: how to transpose knowledge belonging to very varied authentic engineering practices into school knowledge with an educational aim?

In this communication, we present training devices designed and tested at the Faculty of Engineering of the Université de Sherbrooke and in secondary schools. The devices emphasize authentic activity in the school task proposed to the student. The objectives are to help the student understand the choices that

have been made and to identify the needs of users, the functions of a product as well as the constraints to be managed.

The results show that after a period of resistance experienced by learners, a transformation in perceptions clearly emerges.

New Boots - How our provincial network combines outreach with recruitment to hopefully produce retention!

Presenter

Hélène Savoie-Louis, MAP Strategic Workforce Services Inc.

New Boots: Progressing Women in Trades is New Brunswick's provincial network and resource hub that aims to promote, support and mentor women in non-traditional skilled trades sectors such as: construction, maintenance, manufacturing, automotive, truck and transport and forestry. Our networks goal is to promote, support and mentor girls and women who choose a skilled trade career in NB. Through the years we have changed our outreach activities to include children, teenagers and adults. If most of our work is geared to girls and women by our NB tradeswomen themselves, we now include boys in some of our outreach activities to normalize both gender in our sectors as there is no gender to a career! Come find out about our provincial network and our outreach efforts.

ProGRES: Authentic Mentorship through Research in Engineering and Sustainability

Presenters

Amy Hsiao, UPEI Faculty of Sustainable Design Engineering

Sydney Wheatley, UPEI Faculty of Sustainable Design Engineering

ProGRES, which stands for “Promoting Girls in Research in Engineering and Sustainability,” is UPEI FSDE’s directed effort to contribute to Engineers Canada’s 30-by-30 Initiative and address the issue of underrepresentation of women in the fields of Engineering. This presentation will highlight the key factors contributing to ProGRES’ success, including industry collaboration, community support, and organizational leadership. This presentation will also provide insight from ProGRES alumna on what outreach strategies are effective and why, including the positive effect and lifelong impact that authentic mentorship through independent research can achieve. ProGRES has had a profound impact, not only with the 22 young women who were selected for the program between 2017 to 2019, but with their classmates, high school teachers and counselors, and the communities at large who have heard about the ProGRES experience and now understand better what engineering is and what engineers do. ProGRES focuses on the mentorship relationship to encourage and inspire young women to pursue engineering. The success of the five weeks is founded on cooperation and creativity to offer unique hands-on learning in an academic research environment, i.e. with an independent project, introduction to computer-aided design, programming and laboratory conduct and safety training, site visits and tours, and impromptu experiences to experience the culture and spirit of an Engineering environment. The ProGRES students also have the opportunity to witness various possible career paths in engineering, meeting Engineers-in-Training starting their careers, professional engineers mid-career, and P.Engs. who have leadership, management, or other advanced roles in their careers.

Seeing the stars? Lessons from a grant application to digitize the archives of women astronomers in Canada

Presenters

Adele Torrance, Ingenium - Canada's Museums of Science and Innovation

Sandra Corbeil, Ingenium - Canada's Museums of Science and Innovation

In 2021, Ingenium Library and Archives submitted a grant application in collaboration with Queen's University Archives and University of Toronto Archives and Records Management Services to fund a project to digitize the archives of women astronomers in Canada, or, at least those archives that were already in our holdings. The grant program's aim is to 'digitize hidden collections' and women are listed as one of the groups that could have hidden histories. Four of the program's core values are: public knowledge (disseminating digitized collections as a public good); broad representation (representing communities that are currently underrepresented in digital collections); authentic partnerships (meaningful engagement with underserved communities); and, community-centered access (digital inclusion, but according to the ethical priorities of a community). Through the grant-writing process, collaborators had to answer questions like: what makes digitized archives a public good and a means to ensure broad representation in not only the historical record, but also in STEM fields today? How would these digitized archives be of service to women in STEM? It begged a very basic question, do women in STEM form a community? Ingenium's Women in STEM initiative celebrates and normalizes women in STEM. It reaches communities through strategic programming and events, a fellowship, and tools such as a poster series, timeline, video series, and teacher resources. This presentation will examine how we connected the dots (or not) between our Women in STEM programming and our aim to make our archives more accessible through digitization.

Techsploration Alumnae Outreach: Young Women 'SETT' for Success

Presenter

Emily Boucher, Techsploration

Since 1998, Techsploration has delivered its award-winning program to provide young women in Grades 9 through 12 with the information and experiences required to make informed career decisions in science, engineering, trades, and technology (SETT) fields – fields where women are still significantly underrepresented. The result? Nearly 60 per cent of Techsploration alumnae go on to pursue studies and careers in these sectors. In 2012, Techsploration launched its Alumnae Tracking Project to re-connect with Techsploration participants over the age of 18 in order to better understand the long-term impact of the program and opportunities to provide further support to alumnae as they navigate studies and career paths in SETT. The information Techsploration continues to receive through this project has become vital to influence the program's growth and evolution, and overall organizational sustainability. Join Techsploration's Executive Director and a panel of Techsploration alumnae and teachers for insight and shared experiences on the impact of structured and consistent outreach to foster continuous engagement in SETT programming. Techsploration's Alumnae Tracking Project has allowed the organization to connect with young women who have come full-circle from program participant to role model. Each year, the non-profit is able to recruit new role models for its core Grade 9 to 12 program from this process. Alumnae who continue to engage with Techsploration post high school are provided with an extended network to support job searches, further mentorship opportunities, and peer-to-peer networking, which has directly impacted career trajectories and the retention of women in SETT.

WISE NL Student Summer Employment Program- A Shift in Pandemic Times

Presenters

Clare Graves, WISE NL

Kelsey Howlett, WISE NL

The WISE NL Student Summer Employment Program (SSEP) provides meaningful summer employment opportunities in STEM to Level 2 females throughout Newfoundland and Labrador (NL). SSEP has successfully employed over 1000 young women in STEM placements in its 32 years of existence. Alumni include a Google executive, university professors and a Rhodes scholar. When the Covid-19 Pandemic shut down the world in 2020, the difficult decision was made to cancel SSEP for the first time in 30 years to protect the safety of our staff, students, and supervisors. For the 2021 program, SSEP shifted to a combination of remote and in-person employment opportunities. This allowed for the inclusion of student participants from more areas of the province. This shift allowed WISE to offer remote positions and the program reached students in more rural areas of the province who may not have been able to participate in SSEP otherwise. In addition to allowing us to hire young women from 11 different communities across NL, by implementing a remote work option we were able to hire 7 Indigenous youth, expanding our outreach to multiple under-represented groups in STEM (young women, rural youth, and Indigenous youth). The overall goal of SSEP is to educate young women in NL about the options for education and employment in SETT and provide them with the opportunity to gain meaningful employment experience in areas which they may be considering pursuing future education. It is our hope that SSEP participants will consider education and careers in SETT going forward.
