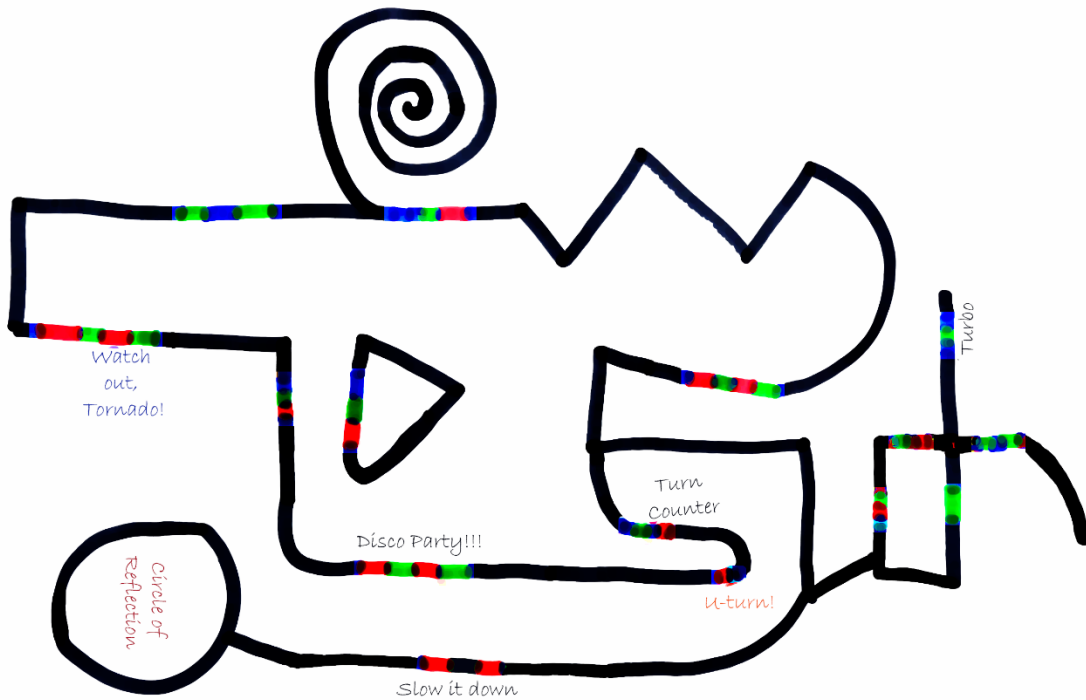


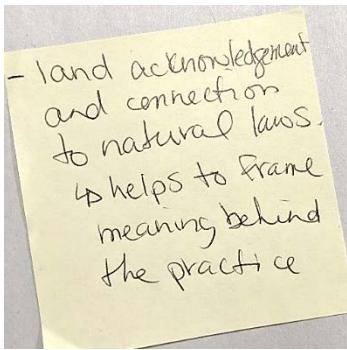
Strategies for Indigenous Community & Youth
Science, Technology, Engineering & Mathematics Outreach



Report of Retreat at Dialogue April 2019

Fairmont Banff Springs Hotel

Banff, Alberta, Canada



In the spirit of respect, reciprocity and truth, we honour and acknowledge Moh'kinsstis and the traditional Treaty 7 territory and oral practices of the Blackfoot confederacy: Siksika, Kainai, Piikani as well as the Stoney Nakoda (including the Chiniki, Bearspaw, and Wesley First Nations) and Tsuut'ina nations. We acknowledge that the territory of this retreat and dialogue is home to the Métis Nation of Alberta, Region 3 within the historical Northwest Métis homeland. Finally, we acknowledge all Nations, Indigenous and non, who live, work, and play and, help us steward this land, honour and celebrate this territory. This sacred gathering place provides us with an opportunity to engage in and demonstrate leadership on reconciliation.

Authors:

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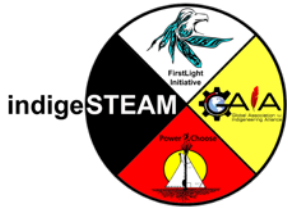
Cover artwork: the program drawn by one group for their Ozobot robot. Ozobots are about 1" big and programmed by drawing coloured lines.

Photos by: W.Hutchins, unless otherwise indicated.

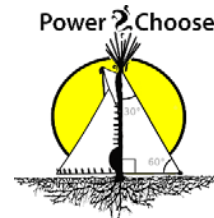
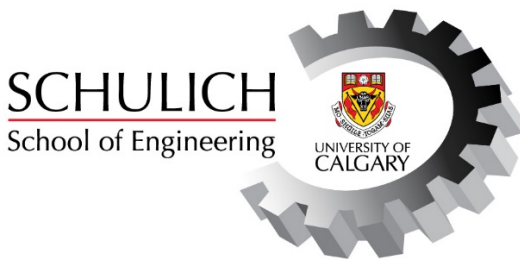


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Sponsors





Executive Summary

Many are working on ways to improve engagement with Indigenous youth towards STEM (Science, Technology, Engineering, and Mathematics) literacy, education, and careers. In 2015 in Canada, the 94 Calls to Action from the Truth and Reconciliation Commission have accelerated the conversation and catalyzed incredible new innovative approaches to Indigenous youth STEM outreach. IndigeSTEAM is powered by a group of Indigenous STEM professionals who are passionate about STEAM – with the A representing Arts, Agriculture, Architecture; humanities, social innovation, creativity and fun. We believe that incorporating these aspects into STEM outreach will lead to more successful outcomes for all youth; in their careers and overall life outcomes. Through the incorporation of Indigenous wisdom and teachings, we can engage youth in a space of cultural safety and inclusion.

On April 11 and 12, 2019, approximately 40 Indigenous and non-Indigenous STEAM professionals, mentors, educators, parents and community members came together to dialogue and share proven practices in reaching Indigenous youth in K-12 Outreach and beyond. The outcomes were unexpected and transformational. The initial agenda was designed in round table format, introducing cross cultural and interdisciplinary discussion on how to engage and support Indigenous youth from kindergarten to grade 12, into the post-secondary space, and onto professional careers. The initial plan was for there to be a discussion on Indigenous worldviews, existing barriers or challenges for Indigenous peoples in STEAM, different educational and communication models to reach youth in a culturally relevant way and strategies to go forward to support youth and mentors involved in this space. The discussion morphed into something deeper and more powerful.

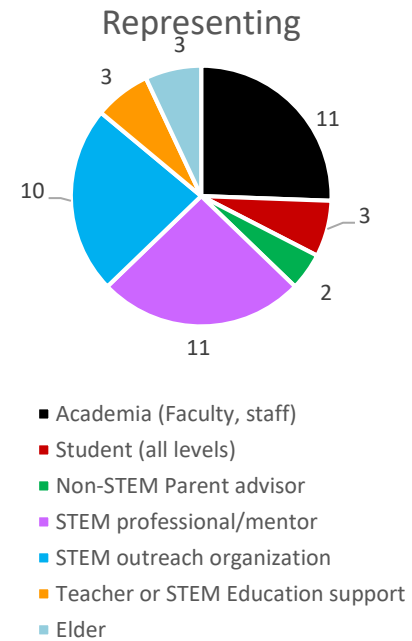
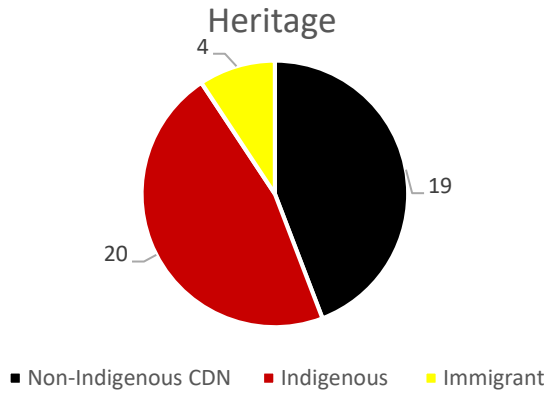
Key Outcomes – Participants better understood the importance of:

1. **Two-Eyed Seeing.** Honouring different ways of knowing and working to co-create an ethical space between Western teachings and Indigenous science and knowledge.
2. **Relationship.** Relation to the land, relation to one another, relation to one's self, relationship with Nations, communities, Elders, leaders and cultural protocols.
3. **Time.** Creating and building effective relationships and connections with Indigenous peoples and their communities requires a commitment to honour the different perspectives on time. Time being circular, long term and not driven by one way of knowing.
4. **Community.** In addition to the Communities and Nations we serve, participants felt a deep desire to create a community for Indigenous and non-Indigenous peoples working in this space for more collaboration, support and co-creation.

The participants expressed a desire to make this retreat a bi-annual collaboration and will establish monthly virtual Talking Circles in between in-person events to listen, support and learn – maintaining the momentum established in our inaugural event. The vision is that once we have created a strong foundation of cultural safety, we can then welcome Indigenous youth to join us and learn from this work, developing sustainable communities of support with mentors and youth in the STEM professions. We invite the corporate sector, government and the education sector to join us on this journey.



Participant Demographics and Organizations/Institutions Represented



Number of participants – total 43

Day 1 only – 12

Day 2 only – 7

both days – 24

Number of participants who received bursaries to attend – 11 plus 4 presenters and 3 Elders

Value: Registration for all. Rooms and/or expenses for some.

Organizations Represented

Community

Mistawasis Nehiyawak
 First Nations Technical Services Advisory Group
 Siksika Board of Education
 TsuuT'ina First Nation
 Indian Resource Council of Canada

Academia

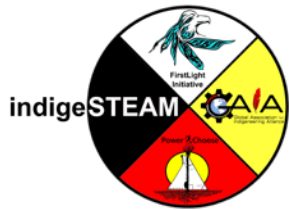
Mt Royal University
 SAIT
 UCalgary, Schulich School of Engineering
 UCalgary, Cumming School of Medicine
 CREATE ReDeveLoP at UCalgary

Charity/Non-Profit

WISEST (Women in Scholarship, Engineering, Science and Technology)
 Shared Value Solutions
 Let's Talk Science
 Good Brain Society
 Beakerhead
 Actua
 Engenuics Technologies
 IndigeSTEAM

Business/Industry

Shell Canada Ltd.
 SMART Technologies
 Indigenous Engineering Inclusion
 Aahksoyo'p Indigenous Comfort Food

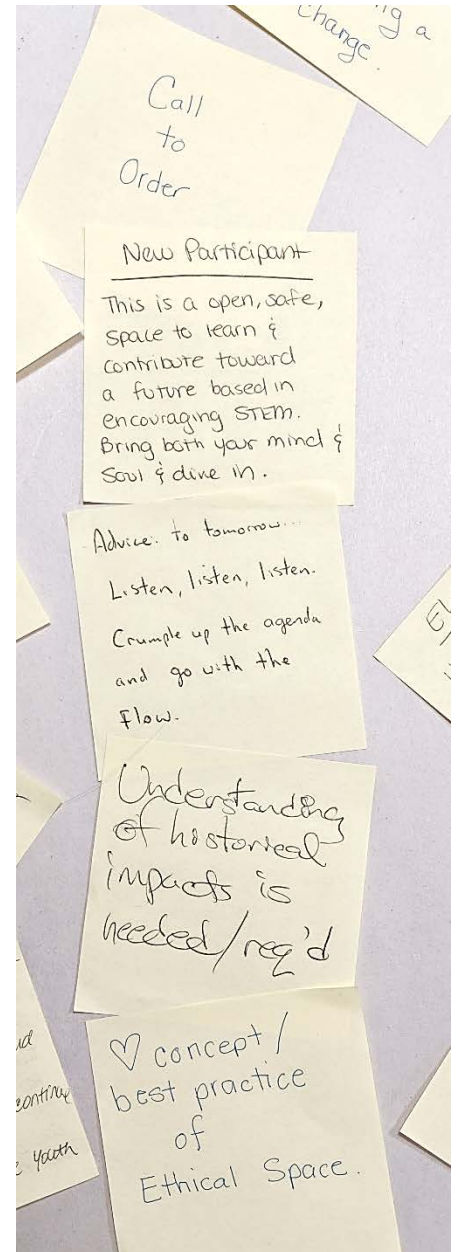


Outcome Reflections

On April 11 and 12, 2019, approximately 40 Indigenous and non-Indigenous STEAM professionals, mentors, educators, parents and community members came together to dialogue and share best practices in reaching Indigenous youth in K-12 Outreach and beyond. The outcomes were unexpected and transformational. The initial agenda was designed in round table format, introducing cross cultural and interdisciplinary discussion on how to engage and support Indigenous youth from kindergarten to grade 12, into the post-secondary space, and on to professional careers. There was to be a discussion on Indigenous worldviews, existing barriers for Indigenous peoples in STEAM, different educational and communication models to reach youth in a culturally relevant way and strategies to go forward to support youth and mentors involved in this space.

What occurred was more grassroots, cultural learning for non-Indigenous participants through Talking and Sharing circles, and from the Indigenous people present. There was also healing and support for the Indigenous STEM mentors walking in two worlds, and lots of discussions over an activity or meal. We asked the questions and got answers and comments via sticky notes and even artwork (see front cover). Here we summarize the thoughts from the hundreds of sticky notes left to us. What also emerged was a solidarity of what is needed. For most of the comments we cannot determine if they were left by an Indigenous or non-Indigenous participant – we were sharing ideas, language and space in ways that most participants had never experienced.

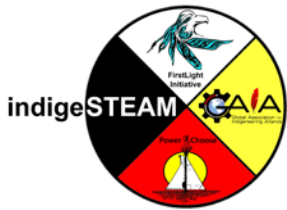
We wish to thank our participating Elders for their wisdom and teachings: Elders Reg and Rose Crowshoe for the Talking circle and Elder Vivian Seegers for the Sharing/Healing circle. Their stories transformed and touched everyone present.



Elder Rose Crowshoe, Deanna Burgart, Elder Reg Crowshoe



Deanna Burgart, Elder Vivian Seegers



Two-Eyed Seeing

Indigenous Knowledge and Western Science represent two different ways of looking at the world around us. *Etuaptmumk* is the Mi'kmaq word for Two-Eyed Seeing introduced by a Mi'kmaq Elder from Eskasoni First Nation, Albert Marshall. It refers to learning to see with one eye the strengths of Indigenous knowledge and ways of knowing, and with the other eye the strengths of western knowledges and ways of knowing, and to learn to use both eyes together to gain a clearer understanding of the world. A Two-Eyed Seeing approach is one way to integrate,



and develop a greater understanding of, and appreciation for Indigenous worldviews in our classrooms. It is also a way to offer First Nations students more opportunities to succeed in the dominant culture without compromising their own culture. **Two-Eyed Seeing in both directions will enable us to walk together.**

Indigenous people are vastly under-represented in STEM education and careers as many don't see that STEM is open to them. Aside from the goals of diversity in STEM industries, this is of concern to Indigenous communities as they are building their future leadership and they are encouraging their communities, especially their youth, to develop Two-Eyed Seeing in STEM subjects. The solution is not just STEM outreach programs to Indigenous youth, but ones that respect Indigenous perspectives, have Indigenous STEM role models and include the whole community (parents and elders) so that youth see this as important and for them. It is also an important way for the non-Indigenous STEM community to learn Indigenous ways of seeing the world.

From the retreat and dialogue, many of the white settler voices who were new to Indigenous spaces learned that there is a long road to their individual learning about how to contribute in a fair, equitable and meaningful way to bring STEM outreach to Indigenous youth. [See Jason Long's story.] It can be isolating for those individuals walking in the two worlds of Indigenous culture and STEM careers, and feedback we received was that retreats such as this give a much needed time to reflect, heal and feel re-energized, in order that they continue to reach out to youth. Such shared insights enable all the participants to understand Two-Eyed Seeing more for themselves, thus helping them to build programs that reach youth with Two-Eyed Seeing as the outcomes.

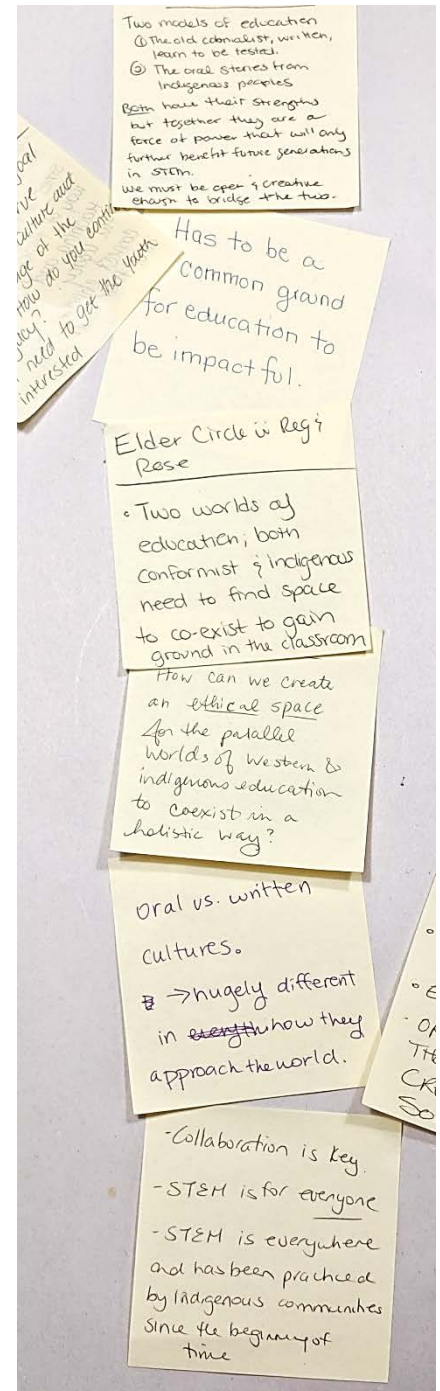
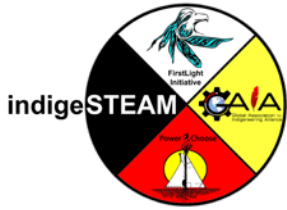


Photo: "Two-eyed seeing" supports wildlife health. Inuit harvester Julia Ogina, of the Kitikmeot Inuit Association (left), shares her knowledge on muskox health with wildlife veterinarian Matilde Tomaselli (right), University of Calgary, in Cambridge Bay, Nunavut, Canada. Photo: M Tomaselli. *Science* 21 Jun 2019: Vol. 364, Issue 6446, pp. 1135-1137.



IndigeSTEAM changes the bolded sentence above into **“Two-Eyed Seeing in all directions enabling us to walk together”** as our vision statement. We recognize the need for training and working with volunteers and audiences who are immigrants to Canada to break the boundaries between them as newcomers and Indigenous communities. There is a growing recognition of a strict separation between two intersecting debates surrounding identity, citizenship, and belonging—the immigrant experience and Indigenous peoples. The dialogue and teaching of immigrants to Canada about Indigenous people should not always be through the white settler voice, but from the intersection of all of us working together.

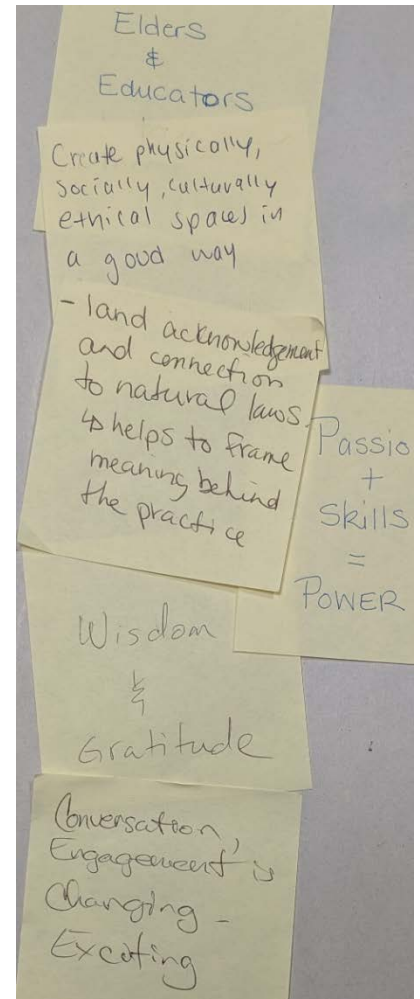


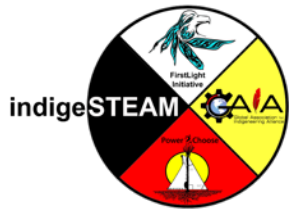
2013 Power to Choose Camp staff Josh Lee, Chinese, shows campers how the human skeleton works during an archeology workshop.

Relationship

When working with Indigenous nations, communities and youth, relationship is of deep importance: relation to the land, relation to one another, relationship with Nations, communities, Elders, leaders and cultural protocols. From the diversity of Indigenous participants and experiences, it was realized through the Talking Circle that these relationships were the focal point of developing effective programs and impact with youth. Understanding that Indigenous knowledge keepers and Elders held a deep connection to the land and specific Nation’s cultural protocols shows that relationships must be built with each individual community with which we seek to work.

In beginning this relationship, it is important to connect with the community leaders, Elders and educators to build trust and truly understand where the youth are coming from. The role of a STEM outreach mentor is not to impart their own beliefs and worldviews, but to help facilitate the conversation around science, technology, engineering and math between the community knowledge keepers and Elders, and then bring safe and fun activities to help youth explore Western science, technology, engineering and math. This creates a deeper connection between the youth and the knowledge keepers of the Nation, allows the STEM outreach mentor to learn from the community, and creates a platform to share other STEM knowledge and perspectives. Connecting with the community in a space of cultural humility allows for the inclusion of cultural protocols that are specific to that nation and community and allows the outreach mentor to avoid a “pan-Indigenous” approach to culturally relevant programming.





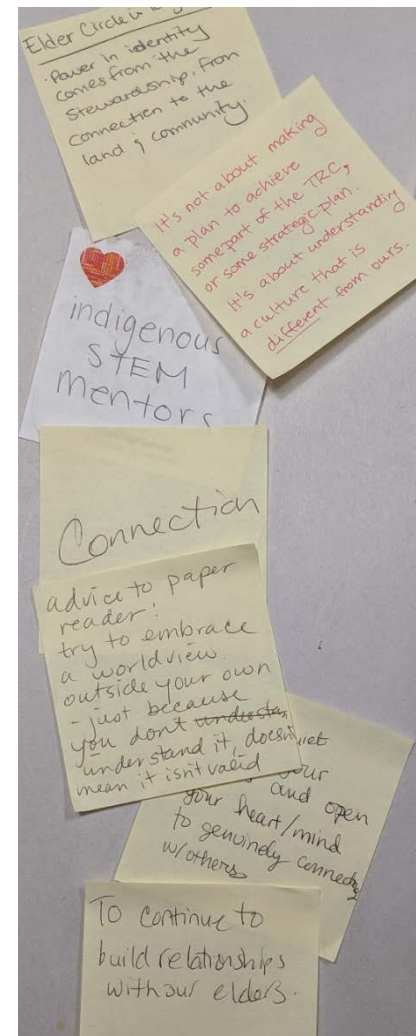
Time

The retreat began with a set agenda, topics and speakers. From the beginning of the retreat, the conversation was directed to and allowed to unfold in a different way. Rather than presenting the topics covered in a Western approach, with speakers, powerpoints and presenters, we sat in a Talking Circle and shared our personal perspectives on how to succeed and thrive as Indigenous people in STEM. Non-Indigenous participants received the opportunity to experience an Indigenous way of sharing, learning and growing. This way allowed the participants to engage the whole self; spiritual, emotional, mental and physical, in a space that was focused on healing, support and growth. With the guidance of Elders, and teachings about Indigenous oral ways and teachings of the Medicine Wheel, all participants benefitted from an immersive and integrated approach to discussing Indigenous youth success in STEM. It was realized that Indigenous youth not only require a culturally safe space to be introduced to science, technology, engineering and math, but will thrive if culturally safe spaces are cultivated throughout both their post-secondary educational journey and their professional careers.



Talking circle used to share personal experiences and relate them to perspectives going forward.

Cultivating these culturally or ethically safe spaces takes time, effort and participation of all leaders in the spaces they enter. Time to truly engage everyone, the effort it takes to listen deeply, and participants prepared to make such a time commitment with patience and cultural humility. Not only does it take time to learn and listen, but we need to be cognizant of the clash this has with Western time (e.g.: grant deadlines, publication expectations, etc) and encourage STEM businesses and academic institutions to acknowledge that “building and sustaining relationship” takes time and is a valuable and critical outcome on it’s own. Creating safe and ethical spaces will require allowing Indigenous peoples the opportunity to lead the conversation, lead the learning and lead the discussions. There was strong agreement within the group that in order to advance a strategy to create safe spaces, members needed to commit to a series of future conversations, opportunities and events.





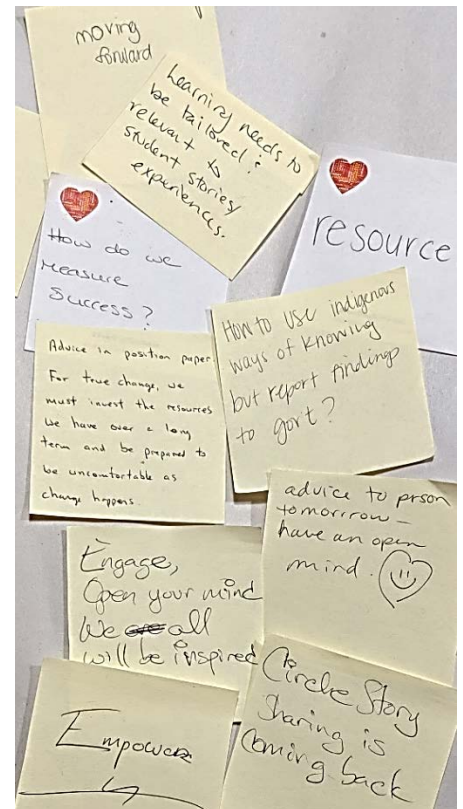
Community

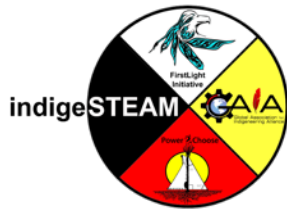
Participants of the event felt the need to build relationships with one another, with the Indigenous nations that we serve, and with the STEM community as a whole, to build and grow the safe and ethical space that was created over the course of the retreat. We recognized that building this community would allow all participants to continue down the individual journey of learning how to honour Indigenous ways of knowing, ways of being and ways of sharing in a safe and collaborative way. Participants were very interested in creating this community to not only support the youth we wish to serve, but to support one another as we build these relationships, programs and opportunities.

It was expressed that a monthly virtual circle would be of great interest and an in-person retreat twice per year. This would allow us to build momentum and understanding that was developed during the retreat. The intention would be that as this community is built, youth would be invited to join in the conversation and participate in future events, eventually learning to lead these conversations with each other, and with younger participants. The monthly virtual circles have not launched at the time of this writing, as many participants entered into summer employment, summer holidays and such, but the intention is to launch in collaboration with Indigenous students and professionals in September, 2019.

Conclusions

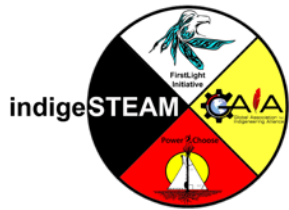
Many participants were unsure what to expect in the course of this retreat, and as it unfolded it became an experience many had not engaged in before in the context of Science, Technology, Engineering and Mathematics. Spending the majority of the two-day retreat in an Indigenous led Talking Circle, sharing the challenges, supports, needs and successes of Indigenous peoples in STEM, and talking about how these needs may be met for the Indigenous youth we serve was an unexpected outcome. Participants not only learned new ideas of reaching youth, but experienced a new way of sharing, listening and learning together. It is the hope of IndigeSTEAM to continue to create opportunities for the STEM community in Alberta, Canada and the world to come together and experience different ways of knowing, being and learning. IndigeSTEAM aims to show Indigenous youth that we, as Indigenous people, have deep knowledge and value as scientists and knowledge keepers to bring to the Western world. We want to instill pride in Indigenous youth and the knowledge that they bring unique value to the STEM professions, and we are committed to working with Indigenous communities, leaders and Elders to help facilitate the conversations that will demonstrate this. It is in connecting with Elders, and reconnecting with the deep knowledge that they bring, that the youth will find their voice and find their place in STEM. Leaders in non-Indigenous spaces can learn a great deal from this as well. It is our hope that we can help facilitate the development of culturally safe spaces throughout the lives and future careers of these youth.



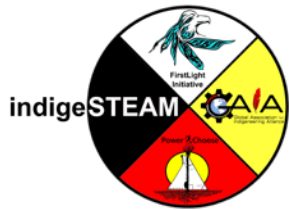


Appendix 1 - Participant Comments via Sticky Notes

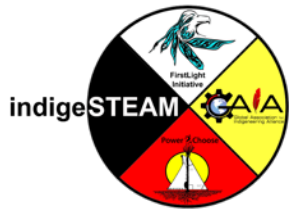
Sticky Note Comment	Category
Oral versus written cultures: hugely different in how they approach the world	Elder Circle
Elders and Educators to merge two systems	Elder Circle
Collaboration is key: STEM is for EVERYONE. STEM is EVERYWHERE and has been practiced by Indigenous people from the beginning of time.	Elder Circle
To continue to build relationships with our Elders.	Elder Circle
Safeguards for everyone involved in making a change.	Elder Circle
Something we are working on is ethical safety: creating a safe space to share their stories.	Elder Circle
Love the ethical space and "nest" learning stories.	Elder Circle
Ethical spaces: intersectional and diverse	Elder Circle
Advice: release or quiet your "ghosts" and open your heart/mind to genuinely connecting with others.	Elder Circle
Understanding of historical impacts is needed/required.	Elder Circle
Has to be common ground for education to be impactful.	Elder Circle
Passion + skills = power	Elder Circle
Passion --> skills --> power.	Elder Circle
Call to order	Elder Circle
Respect versus No Respect	Elder Circle
Story of Original Emotion, Thought and Creation and Sound	Elder Circle
Gave me new ideas to talk about what I am doing/feeling. Looking for my library card.	Elder Circle
Riding a tsunami of strategy.	Elder Circle
Importance of listening and that it is a learned skill	Elder Circle
Helped put many important things into perspective, especially the importance of listening.	Elder Circle
Ghosts are important to acknowledge and understand	Elder Circle
Listening/ story telling should be valued and incorporated into western systems.	Elder Circle
Creating space/ethical space	Elder Circle
I need a library card	Elder Circle
Schooling system must be remodelled to reflect the Indigenous values, beliefs and goals	Elder Circle
Are we properly asking the Indigenous communities what they want? What would they like to achieve through education? Or are we continuing to force the Western education system on them?	Elder Circle
Even through all the initiatives, strategies and government programs, we are still promoting the western education system focused on achieving a university degree rather than learning.	Elder Circle
Integrating oral stories from elders, connects the stewardship of Indigenous learning	Elder Circle
Power in identity come from the stewardship, from connection to the land and community	Elder Circle



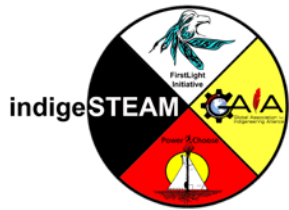
Two worlds of education: both conformist. Indigenous people need to find space to co-exist to gain ground in the classroom.	Elder Circle
How can we create ethical space for the parallel worlds of western and Indigenous education to coexist in a holistic way?	Elder Circle
Land-based learnings and stewardship are the foundation.	Elder Circle
Find parallels	Elder Circle
build ethical spaces	Elder Circle
Authenticity and longitudinal effort	Elder Circle
Safe space	Elder Circle
Natural laws. Emotion. Thought. Creation. Respect is key!!	Elder Circle
How do we teach kids to listen? We conform them to listen. Can we do it differently?	Elder Circle
If you don't believe in your heart that you are enough, how can you contribute?	Elder Circle
Free will of a student to listen and learn is far more effective than forced conforming.	Elder Circle
Advice to person tomorrow - have an open mind	General
Talk to others! Everyone's experiences are unique	General
Advice to tomorrow: Listen, Listen, Listen	General
Crumple up the agenda and go with the flow.	General
Vulnerability and Courage	General
A river of knowledge	General
togetherness	General
Enable	General
Listening	General
Ethical space	General
Moving forward	General
Connection	General
No action items (from the meeting), but a true deep meaning and understanding.	General
Empower	General
Vulnerability during working hours	General
Compassion	General
Wisdom and Gratitude	General
Growth	General
Openness	General
Enlightening and uplifting	General
A sense of belonging	General
Truth and relationships	General
It's not about making a plan to achieve some part of TRC, or some strategic plan. It's about understanding a culture that is different from ours.	General
I accidentally put my belt on backwards - whole story!	General
Engage, open your mind. We all will be inspired.	General
Collaborating and relationship building is key.	General
Concept/best practice of ethical space	General



To new participants: this is an open, safe space to learn and contribute toward a future based in encouraging STEM. Bring both your mind and soul and dive in.	General
Conversation, Engagement is Changing - Exciting	General
A rediscovery is happening. Return to the teachings of Land-based learning.	General
Land acknowledgement and connection to natural laws: helps us to frame meaning behind the practice.	General
Create physically, socially, culturally ethical spaces in a good way	General and Question/need
25 years. 35K Indigenous students. 40 Universities. I want to talk about it all...	Outreach example
Indigenous peoples have ALWAYS know about STEM, so the community needs to determine what THEIR STEM looks like. Relationship-building, collaboration first.	Outreach example
By paralleling the strengths of two worlds of education, both mainstream and Indigenous, ACTUA allows/practices STEM in a way that benefits the students though mainstream grades/interests but does so by strengthening through community. There needs to be more models like this.	Outreach example
Development of networks within Indigenous communities takes time, patience and structured safe space. Each community is unique and for each program or project developed, the community own those TEK rights to those projects. They are not suitable or at least not duplicatable straight across the board. This can account for many engagements, time and money.	Outreach example
Excited to hear about the work they are doing with Indigenous communities	Outreach example
Collaboration. Learning can be fun.	Outreach example
OZOBOTS ARE AMAZING	Outreach example
Territorial acknowledgement can be stated with more substance by expressing history and significance.	Outreach example
Creative approaches inspire encouragement for Indigenous youth pre-high school.	Outreach example
OZOBOTS are great! Perfect learning tool for STEM storytelling.	Outreach example
Connect with ACTUA in STEM programming and how to connect with communities.	Outreach example
Without giving the communities the power to control what their STEM education looks like, you risk re-colonization.	Position paper advice
There are two models of education: Old colonialist, written, learn to be tested. The oral stories from Indigenous people. Both have their strengths but together they are a force of power that will only further benefit future generations in STEM. We must be open and creative enough to bridge the two.	Position paper advice
Take the time to consider the applicability of the may creative approaches to teaching and learning in the work you do.	Position paper advice
Try to embrace a worldview outside your own - just because you don't understand it (or believe it) doesn't mean it isn't valid.	Position paper advice
There is value in both traditional knowledge and western science and we should respect (both) those views.	Position paper advice
Rethink the overall goal. How can we preserve Indigenous culture and knowledge of the Elders? How do you continue the legacy? You need to get youth interested.	Position paper advice



For true change, we must invest the resources we have over a long term and be prepared to be uncomfortable as change happens.	Position paper advice
I need to know how to help teachers begin to incorporate STEM into their teachings	Question/need
Consistent STEM programs are needed every weekend to ensure continued enthusiasm by participants	Question/need
How might we incorporate story into all STEM learning?	Question/need
How to use Indigenous Ways of Knowing but report findings to government?	Question/need
How do we measure success?	Question/need
How can we support the Indigenous students that come to engineering (or STEM) such as inclusive teaching practices	Question/need
How can we engage current undergraduate students in furthering these efforts?	Question/need
Indigenous STEM mentors	Question/need
Resources	Question/need
How might an educational charity use time more wisely when constricted by grant cycles?	Question/need
Circle story sharing is coming back	Story Circle Teaching
Learning needs to be tailored and relevant to student stories and experiences.	Story Circle Teaching
Reading takes place in the imagination with experience and reference.	Story Circle Teaching
Circle platform without pictures inspires thought and imagination.	Story Circle Teaching
Imagination! Learn to effectively visualize and imagine. Stop reliance on pictures.	Story Circle Teaching
Power of seeing and doing from new AND traditional perspective	Story Circle Teaching
Never show people pictures!	Story Circle Teaching
100% the way to go and push awareness of this model. This model definitely addresses the needs better than the current educational model in place.	Story Circle Teaching
We need to change the way we look at learning.	Story Circle Teaching
The current education system needs to change in order to make positive change.	Story Circle Teaching
There are ways to strategize and versatile and meaningful relatable education model through expression of students' lives and being able to share those stories.	Story Circle Teaching
Inspiration - Great Wall of China --> 20 ft, line up.	Story Circle Teaching
Bringing an idea to the classroom in real time to allow imaginations to build their own experience.	Story Circle Teaching
Thinking of ways to integrate this into hands-on activities.	Story Circle Teaching
Learning that I need to brainstorm on ways to bring the experience to the classroom.	Story Circle Teaching
Life is an improvisational drama and we need to equip students with the tools then need to succeed - the story circle model can help.	Story Circle Teaching
The assessment-based education model that dominates today is failing us, especially Indigenous youth.	Story Circle Teaching



Appendix 2 – Participant Feedback and Reflections (Anonymous or not)



An Unexpected Indigenous Experience

Jason Long [Photo from Jason's LinkedIn]
President of Engenuics Technologies Inc.

Published on May 11, 2019 <https://www.linkedin.com/pulse/unexpected-indigenous-experience-jason-long/>

I attended the IndigeSTEAM workshop on April 11 organized (primarily) by Deanna Burgart. I will declare that it was "amazing" as I will guess many people would predict. But I'd like to write about my experience and describe why it was amazing for entirely different reasons than what I expected.

I didn't expect to be so shocked at the depth of my misunderstanding despite freely admitting that I barely know anything about Indigenous culture or how New Comers* impacted their lives. I didn't expect my reason for attending to completely shift within the first 30 minutes. I didn't expect to have to stand up to leave a Talking Circle* because I couldn't control my emotions.

The conference opened with a Talking Circle with two Elders*, Reg and Rose, welcoming us. Deanna offered Tobacco* to Reg and Rose and asked them to speak. Reg accepted and began speaking, starting with explaining about the Tobacco. Reg is an amazing story teller. By the end of his first sentence I think everyone was captivated.

I'm not going to share with you the specifics of what he said. I don't think that's right. One of the things I took away is a need to stop summarizing to "get the gist" and actually invest time to listen to the stories that people have to tell. This is so especially true when it comes to listening within an Oral Society* as the Indigenous people are. I believe it is an injustice to Reg to summarize his story and distribute it so easily to hundreds or thousands of people via social media.

By now, you've probably noticed the asterisks (*) beside certain words. These are very significant words that I wrote down that were so powerful in Reg's story, or new to me, or for some other reason really resonated. I also want to say I will do my best to write this article using "I" and not "we" because I don't want to project any of my conclusions / observations / opinions / accusations onto anyone else. If something strikes a chord, I hope that you will explore that within yourself.

We were asked to tell our names and give one other name of a person or place who had special meaning. Of course my boys Adym and Ben were the first to come to mind. A little part of my "follow the rules" mentality popped up and said "that's two names, you can't do that" but more significantly I didn't think just those two names fully met the task. I wanted a word that captured my friends and mentors who have supported my life. I wanted a word that captured the privilege that I've had without discounting the lack of privilege that others have had that enabled my opportunities. I wanted a word that expressed my gratitude for everything that I have, everything that I am, and the ability to pursue the dreams of anything and everything I want. And so I chose my word to be "Canada."



Elder Reg described his early Indigenous schooling experience to us. By this I mean the Indigenous school in his community, not the Residential school he attended later. This is the one detail I will share because I think it is so relevant to the Western education system. When Reg first went to this school, the Elder there brought all the students together. He said, “you are all Little Birds* and you are here together in this Nest*.” Reg described this with such warmth and as I looked around it was clear that every person listening to his story felt the warmth from the image he painted in our minds with his words. His picture was of a learning environment that was so safe and so free. He looked forward to going to his learning nest each and every day.

I heard those words so clearly. That picture is etched in my mind, and I doubt I will ever not think of Reg and learning when I see a bird or a nest from this day forward. A story that was impactful. My mind quickly stole that experience and took it back to my culture and my problems and will now, yet again, enhance my privilege. I will use that to support the statements I make that education rooted in meaningful relationships and support between students and teachers is so important. Education that follows the path of questions and interests is the key to engagement and motivation. Education that encourages and quenches a thirst of knowledge and defies conforming is how we truly learn. I have been building a library of research papers that have evidence of these claims. Dozens of papers, and there are probably dozens or hundreds more. But I feel like the power of Reg’s story dwarfs any of the words in all of that literature.

There were Indigenous people in that room who were unbelievably intelligent, articulate, and who have clearly worked immensely hard to understand and accept two cultures despite the history that those two cultures have shared. Reg described the concept and importance of creating and nurturing Ethical Spaces* and finding the Parallels* between cultures. I saw such deep trust and genuine belief and excitement that our cultures can learn from each other and that both have incredible value to share.

I realized personally, that despite the work I've done in my own culture and what I am pretty confident in labelling as exceptional effort and success in helping others, I am in no position to start “helping” the Indigenous community yet. I don’t yet have the GENUINE belief that I saw from those people, and I really want to grow that. I truly believe in the idea of it, but I just haven’t invested enough to get there or make any claims that I can help. From that, I am extremely worried about the possibility that the genuine trust and hope I felt from a few representatives of a culture that I really know nothing about, will be taken advantage of (again) by a superficial, short term, hero-based offer of “helping.” I hope that is not true of governments, companies, and individuals who are working with Indigenous people around the world. I don’t know. As with any seemingly unsurmountable, massively complicated issue, my comfort is to know with 100% certainty that I can take my own responsibility for what I do, and hope that I can positively impact some people directly and indirectly.

I went into this “event” looking for opportunities to “help.” I planned to market my skills and be a hero to “these people” which when I write that seems so, so “Western” of me. I come from a culture of privilege. I was riding a perspective of false, superficial “understanding” with a short-term view of “fixing.” I didn’t take out my book or my brochures that I had planned to show. I didn’t take pictures of the people and the activities and the Talking Circle and the Smudge*. I would be honored to share the story of this day in spoken words and try to paint a picture in your mind. Or I challenge you to find a person like Reg and earn his story.

Attending yesterday was amazing. It was amazing because of what was shared, and how I was touched and connected. In the end, my “amazing” experience was amazing because it reminded me about the core drivers behind what I do. I invest in people. I take time to build relationships. I seek to understand long before ever hoping to be understood. Real success that I’ve had was driven by these core values and authenticity. At this moment, I have no right and no real



ability to start "helping" without working very hard to earn trust and truly learn about a culture that I think I can have a positive impact on. I need to genuinely understand and believe that I will learn from them. And I need to be invited to do that.

Elder Reg's Indigenous name is "". Elder Rose's Indigenous name is "". To know why they refer to themselves as "Reg" and "Rose" is an incredibly powerful story that I now hold a small part of because I was in that Talking Circle. A story that I feel is too powerful to write about, and that words on paper cannot do justice to. A story that you should seek out to find. To build trust, to make an offering and have that accepted to be granted the right to hear that story from a person.

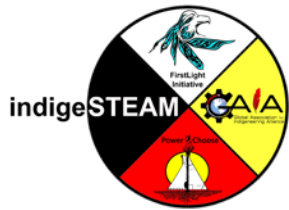
The last thing I want to acknowledge is the fact that in even in writing about this experience I benefit. I'm looking forward to sharing this. I feel good about that. I think I will receive thanks and praise for sharing. I'm looking forward to that praise and validation. I will be grateful for that astonishing characteristic about Western privilege and how it propagates and finds a way to keep reinforcing itself for my benefit. It comes with EVERYTHING, even out of the most dire situations.

Now I will shut up and go invest effort into learning more. I will listen. I will give without expectation of receiving (even though I know my privilege will guarantee I receive). I will listen. I will get uncomfortable. And I will listen. Maybe, MAYBE in a few years, when I have truly invested, when I have truly listened, and when I have truly heard, I will share about my experience. I hope I will run in to some of you during that time who are doing the same thing.

An Email Comment:

*I was honoured to join so many incredible Indigenous and non-Indigenous people passionate about Indigenous youth success in Science, Technology, Engineering and Mathematics (STEM). As an Indigenous woman who is taking steps to reconnect to my culture, I wanted to **explore** better ways to reach youth in culturally relevant ways, better ways to connect with communities in a long-term relationship-based way, and better ways to empower Indigenous and non-Indigenous mentors in a culturally safe space to learn from one another. As an engineer, I have been doing the work of examining how much of my work experience was developed in a Western or Eurocentric environment, and it is important ~~to me~~ to develop strategies to support Indigenous students and professionals in these spaces who are often called upon to do additional, uncompensated, emotional labour in addition to their studies and their jobs in the name of reconciliation. It was important to me to create a retreat space where we could come together, with multiple Indigenous voices, and create a safe space where we could share our wisdom, challenges and stories on what encouraged us to go into STEM, and what additional supports can help us thrive in the environments we work in. I wanted to create a space for all mentors to come, connect, recharge and "fill our cups up", because we cannot serve from an empty cup.*

Thanks to the teachings of Elders Reg and Rose Crowshoe and Elder Rev. Vivian Seegers, I believe we created that space last week. I am looking forward to continuing the conversations and building this community we have started.



Going forward survey:

1. Provide your thoughts on how should STEM outreach professionals share their passion and enthusiasm for STEM subjects in a way that makes the most sense to Indigenous culture, beliefs and knowledge systems?

Get to know the culture, the youth - listen, listen, listen. Find out what they need and want, and connect it to that.

A big question. Personally I am not a big fan of presentation-type talks and I think that it would be more effective to have STEM professionals tell their stories in small groups and then given people a chance to dissect, analyze, explore it from different directions according to their own experiences.

The biggest learning I took away in this space is that it takes time and patience. STEM outreach professionals, both Indigenous and non-Indigenous, must take the time to listen to the communities they wish to work with. Every First Nation and Metis community has different perspectives, teachings, protocols, needs, resources, capacities, wisdom and stories. We must be willing to take the time to ask for their needs and perspectives and then develop a program that fits their vision.

I have pondered approaches to STEM outreach with teen and adult audiences that would invite curiosity and meaningful discussion while engaging with individuals from Indigenous, industrial and academic communities on this topic. We can share our knowledge and passion for a STEM subject by talking about it; but in order to inspire enthusiasm in others, applicability in their lives must be demonstrated. Such applicability is identified by taking the time to listen, understand and appreciate your Indigenous audience or, in this case, partner in learning.

2. What kind of training should we be providing to non-Indigenous STEM mentors?

What you did was great - you gave us a greater insight into the culture, lessons about creating an ethical space, inspiring greater respect and humility, so we can listen instead of press non-indigenous agenda. Also you somehow managed to open up a room full of science-minded strangers, to embrace their humanity, experiencing the power of being vulnerable and authentic and opening space for others to do so, which is a key to bridging a gap and making meaningful connections between two worlds that have historically seen each other as 'others' rather than fellow humans.

Another big question. As a traditional, Western-trained scientist, it has taken many years, conversations, and relationships for me to even see the differences in worldviews. So I would say that relationship building and listening need to be a big part of the training.

Non-Indigenous STEM mentors who wish to work in Indigenous communities should have a space to learn about Indigenous worldviews and perspectives. A space to step into an approach that does not separate the four parts of self. Non-Indigenous STEM mentors should have a space of cultural safety where they can ask, learn, err and listen without blame, shame or judgement. Non-Indigenous STEM mentors should be given the time to explore new ways of approaching teaching, learning and listening.

As a non-Indigenous mentor, I took the University of Calgary 4-day Indigenous Relations Training short course last year as a first step, an introduction, to working across cultural barriers confounded by intergenerational trauma induced by the residential schools and forced adoption systems. While this type of brief learning platform provides only a glimpse into cultural understanding, it is for the recipient, a humble admission of knowledge gaps and a good place to start. Since the cultural learning curve is long, reinforcement of understanding and extended learning (perhaps in weeklong modules designed by Indigenous elders) could be offered to STEM mentors.



3. What kind of training should we be providing to Indigenous STEM mentors?

Training re ethical space communication to bridge the gap of understanding

Cultural training. Conflict resolution. Boundary setting. Where to go when things go awry.

Indigenous STEM mentors should be given safe places to share frustrations and challenges when working in a Western/Eurocentric environment. They should be provided cultural supports that help support them along the journey. Indigenous STEM mentors need safe places to share their journey in STEM as often we feel isolated when navigating “two worlds”.

Just as non-Indigenous STEM mentors would benefit from continued learning of cultural ways of knowing, Indigenous mentors may benefit from workshops that focus on integration of Western and traditional ways of delivering curriculum. A sharing of Indigenous and non-Indigenous STEM mentor brain power. Results from such a workshop would then be reviewed by Indigenous elders and industry champions for input. This training exercise, I think, would evolve over time to a meeting of minds that brings people together.

4. What kind of partnerships will help to make something work?

It would be good to see more representation from the primary education field (eg calgary board of education)

...have embedded Indigenous people that are happy to/have the energy to talk/explain which is very helpful.

I believe creating spaces where we invite both Indigenous and non-Indigenous people to the conversation, in both Indigenous and non-Indigenous formats of delivery, where we can create ongoing dialogue, relationship building, trust building and cross-communication will allow us to delve deeper in both our self-work and our outside work towards reconciliation. Support from Organizations and Educational Institutions in the way of sponsorship and participation, will allow these “ethical spaces” of cultural safety to build and thrive. The relationship should be transformational as opposed to transactional, involving a commitment of all parties to create a safe place to learn together.

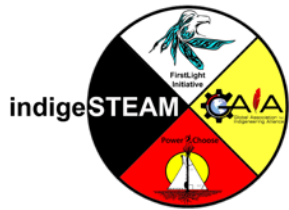
...secure support from industry, government and academic partners, both Indigenous and non-Indigenous, to achieve sustainability through:

- economic support through financial gifts
- intellectual support through collaborations
- mentoring support through industry internship programs,
- incoming support through alliance with communities and academic feeder programs, and
- outgoing support from communities and industries who receive our graduates as STEM professionals.

Advances in this area are based 100% on relationship-building. And relationships are, generally speaking, a consequence of people (just people) taking the time to listen to one another and to exchange ideas. In order to achieve this, I efficiently arrange communication platforms for people participate in; a sort of *hurry up and relax approach*, which I've had some success with.

5. We are already thinking fall meeting again. What should the content be?

Looking forward to the fall meeting. More of the same. If there is some way to do an exercise/activity that could put us in the shoes of an indigenous youth, so we can get a perspective that we otherwise are blind to, that would be great. Also, maybe hear more about projects where the bridge has happened in a positive way, like the First Light, GAIA, Power to Choose, ACTUA (I know we heard from them, but more would be great) to get inspired by what can be done, that would be great. Also, absolutely keep what you already did, the circle experience, and learning from the Elders was priceless.



I wonder if it might be helpful to narrow the focus on elementary vs jr-high vs high school vs post-secondary or at least have break out groups ? Lots to learn from one another but also challenges specific to each group.

I would love to see part Talking Circle and part presentation/workshops. I would love to see a combination of Indigenous and non-Indigenous approaches brought together, and more Indigenous people invited to the conversation. The beauty of the diversity in the room was that we all got to see that Indigenous people bring a rich diversity to the conversation.

Agreed. I would invite people to submit a topic to you in advance, with the objective of giving a 15-min talk using either slides or a flip-chart, followed by either a 10-min activity or Q&A. The objective of your "topic" is to introduce an idea to the group that is either negative (and needs brainstorming on how to transform it to a positive) or positive (and needs input to help it grow and/or show applicability). You might improve the value of this exercise by having Indigenous and non-Indigenous people team up to show multiple perspectives of the same topic and create intra-group relationship-building. Just an idea.

6. If we do monthly circles, what would the format be? Specific content ideas?

I am not sure at this time...but looking forward to seeing how this turns out.

I like the concept of monthly circles, but do not feel that I have the connection/relationship with folks from IndigeSTEAM to fully participate in a circle. I only spent one day in Banff and while it was informing and valuable, it was also somewhat isolating as I knew no one in the room except for Reg and Rose.

I would propose a Zoom Conference Call (Video conferencing where people can see each other and the platform allows for recording.) I suggest 2 hours once per month.

Here is a suggested format:

0:00 – 0:20 – Round of Introductions of who is on the call, name and where from

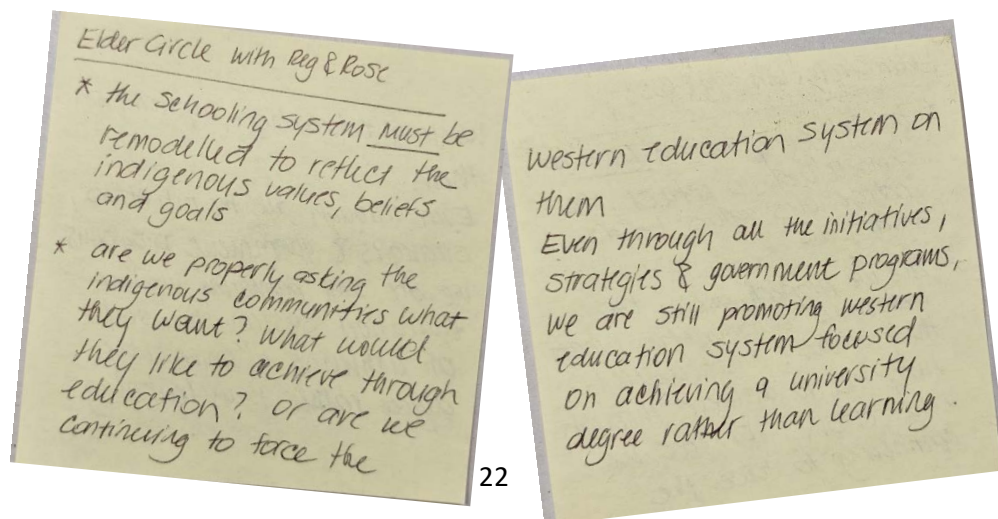
0:20 – 0:40 – Webinar from one participant to teach something – this could be recorded and shared on website or blog (ie: presentations that were planned for day 2 of the retreat)

0:40 – 2:00 – Talking circle – whatever you need to discuss.

Following Talking Circle, protocol and respecting everyone's time to allow everyone to share.

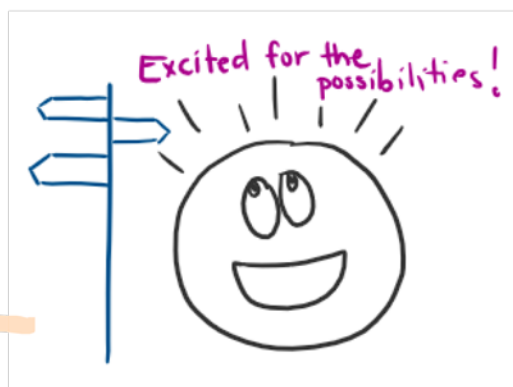
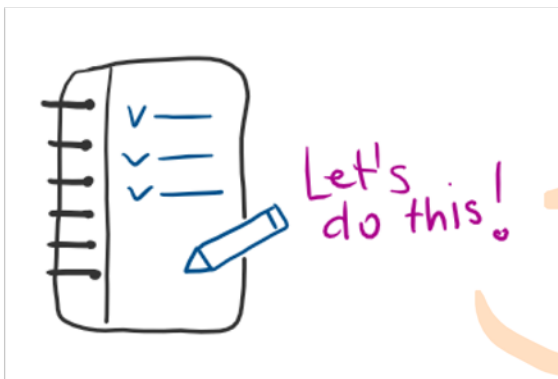
(This would not be recorded).

To maximize the potential for these monthly idea-sharing events, you want everyone to have a clear, stress-free head. With that in mind, I would suggest either an early morning (7AM) breakfast meeting or a Friday evening meeting (or maybe mix it up, depending on people's schedules as the school year comes to an end).



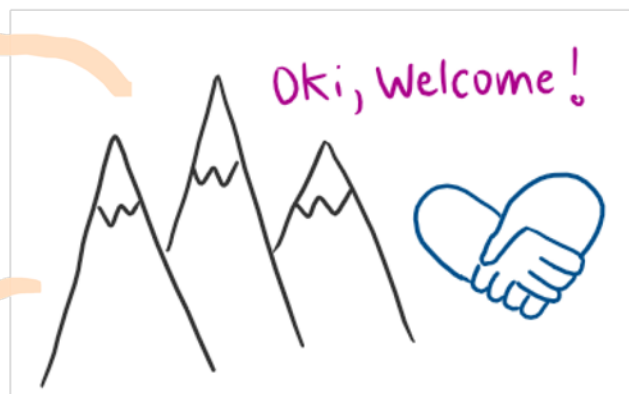
My IndigeSTEAM musings...

I only heard about the IndigeSTEAM conference a couple weeks beforehand. But I was SOOOOO excited. Not only did I know that Deanna would put on an amazing conference, but what could be better than a group of STEM people talking for two days about Indigenous youth, students and professionals!?

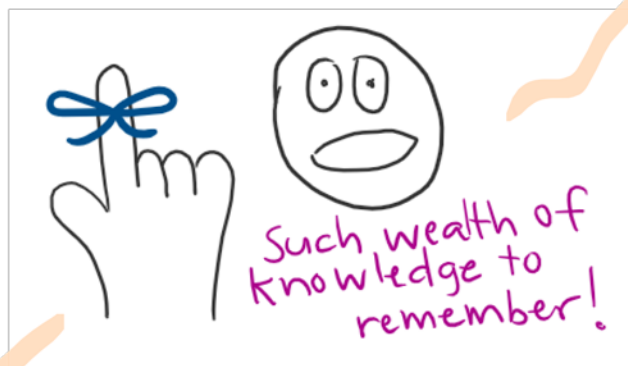


I had my schedule in hand and I was ready for the learning, discussions, and actions we were going to come out with.

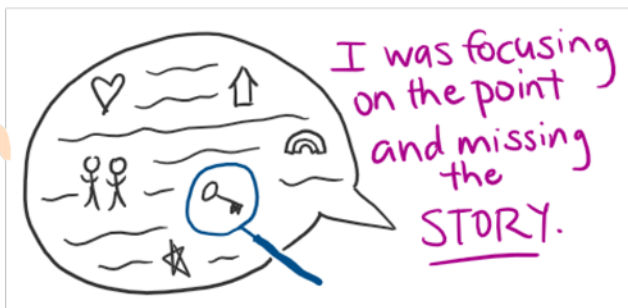
The day started off with welcome and prayer from Elder Reg and Rose. What could be more amazing than listening to this incredible knowledge being shared with a view of the Rocky mountains in the background?



We gathered in a circle. I hadn't brought a pen and paper with me, so I started trying to remember the important points of what Elder Reg was saying. Ethical spaces... detox youth from default system... passion, skills, power... keep the systems parallel... but it was all becoming too much and I was wishing I could write it all down.



After two hours of listening, my brain was full. We took a break. I quickly jotted down salient points. As we gathered into a circle again, I grabbed a piece of paper and pen. It would be easier for me to focus with these tools at my disposal.



But I noticed that now I wasn't listening as intently. I wasn't listening for the meaning under the words. I was only listening to find the words worth writing on a piece of paper. And it dawned on me. There are more ways to learn than with pen and paper.

It felt uncomfortable, but I committed to just simply *listening*. Learning from the oral stories. Without a goal, without a need to have takeaways. Just to listen, and see what I learn.



Simply LISTEN.

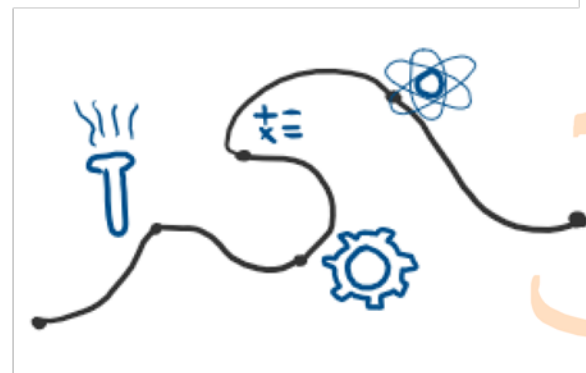
Full of love and appreciation



At the end of the first day I felt lucky. Privileged to have learned what it means to truly listen. That there is huge value in oral stories, in expressing meaning beyond the simple definitions of words strung together.

Day 2. I got this. I had learned to listen, to throw out the schedule, and to be flexible. I got this. What I didn't realize is that there is a responsibility to yourself and to others once you have learned to truly listen to each other.

Ready for day 2!



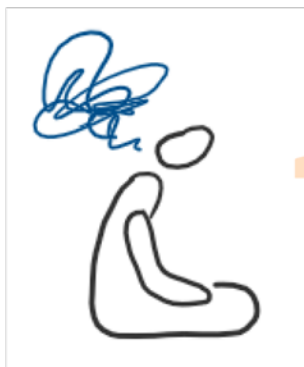
Rev. Vivian started off the second day with a beautiful invitation for the group to share their story of how they came to STEM.

Path to STEM

Many of the stories shared broke my heart. There was so much trauma around the circle. So many challenging paths for people to get to where they were today. I was suddenly feeling like I was holding the weight of 30 people's pain in my heart.



My heart hurts.



Why did I even deserve to be in this circle? I am white, I am a settler. My parents were both University STEM graduates. I maybe stepped over a few hurdles along my path, whereas folks around this circle had climbed multiple mountains to be here.

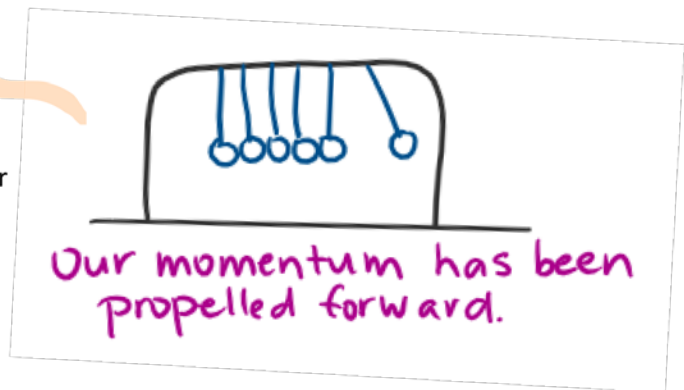
What is my place here?

When I received the talking stick, every person in the circle was now looking at me. And I realized that I had a story too. The sharing circle reminded me to give space to everyone, especially and foremostly to those who have been forgotten. But, it is okay for me to share my story too, even when it doesn't feel worthy of sharing. It is all the stories together that help to make bigger meaning.



As we prepared to close the day, a wonderful woman in the circle reminded us to call the name of a spirit to guide us and help us as we leave. To learn from the stories, but to not hold onto others' trauma. I called my grandmother's name, who had just passed a few months ago. She always knew the right thing to say.

There is still so much work to be done. IndigeSTEAM opened my eyes to a new understanding that I hope to bring into my engineering classrooms. As we each continue our outreach efforts, I know that the connections made here will allow us to further expand our reach and continue moving forward on this journey together.



Thank you to all the amazing folks who help me learn to learn differently. Thank you to Deanna for bringing together this group of amazing individuals doing fabulous work in our community. Thank you for a beautiful two days.

- Written by someone who identifies as a Settler, a woman, a perpetual student, and an Engineer.