Actua For-credit Land-based InSTEM Program

Evaluation Report

Prepared for: Actua

Prepared by: Shift Insights

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This evaluation report was prepared by Dr. Daniel Munro of Shift Insights.

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I. Introduction

Actua's For-Credit Land-based InSTEM program helps Indigenous youth connect with Indigenous Knowledge and communities, develop STEM skills and knowledge, and improve their sense of community and belonging. Over the long term, the program aims to increase Indigenous youth participation in STEM education and careers by addressing the barriers Indigenous people have faced and continue to face, including colonialism and the intergenerational trauma of the residential school system. The program offers opportunities for learning and growth that embrace Indigenous ways of knowing and emphasize practical, land-based experience.

This report offers insights on how well the program achieves its key aims. It examines feedback from participants, instructors, cultural practitioners, and others to understand impact and guide improvements. More conventional evaluation metrics examined include the program's impact on participants' skills, knowledge and interest in STEM and Indigenous Knowledge, and their education and career intentions. As an Indigenous-led, Indigenous youth-focused, land-based program, it is also important to examine how the program affects participants' sense of belonging and community, learning and growth, and connection to the land. As the evaluation team learned from program coordinators and Elders, nurturing a sense of belonging among Indigenous youth is an essential first step in building skills and knowledge as it helps to acknowledge and address the active and persistent effects of colonialism and residential schools in damaging community and confidence.

The evaluation of Actua's For-credit Land-based InSTEM program reveals positive achievements in developing a sense of community and belonging among participants, as well as learning and growth in Indigenous Knowledge, STEM skills and knowledge, and positive interest and intentions with respect to STEM education and careers. While difficult to quantify through conventional evaluation measures, the positive impact of the program is revealed through feedback from participants, instructors, delivery partners and Indigenous Elders and cultural practitioners.

II. The Program

Project Need and Opportunity

While Indigenous youth are a fast-growing population in Canada, their participation and achievement rates in digital skills and science, technology, engineering and mathematics (STEM) education and careers are below the national average.[1] Efforts to address the gaps through

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[1] For example: Ontario's assessment of grades 3, 6 and 9 students' math skills reveal significant gaps between Indigenous and non-Indigenous students. (Government of Ontario. 2018. *Strengthening Our Learning Journey: Technical Appendix to the Third Progress Report on the Implementation of the Ontario First Nation, Métis, and Inuit Education Policy Framework*; the OECD's Programme for the International Assessment of Adult Competencies shows that those who identify as Indigenous score lower than non-Indigenous on proficiency in problem solving in technology rich environments and numeracy. (Statistics Canada. 2013. *Skills in Canada: First Results from the Programme for the International Assessment of Adult Competencies)*; and data from Canada's 2021 Census show that those who identify as Indigenous are less likely (13 percent) than non-Indigenous/ non-minority (28 percent) and minority (47 percent) populations to hold a bachelor's degree. Among those who hold bachelor's

mainstream education systems have been complicated by the legacy of colonialism and the residential school system. Mainstream education, and particularly STEM curricula, rarely include Indigenous Knowledge and experience as valuable sources of expertise which, in turn, provide a strong foundation for Indigenous youth engagement, learning and growth.

Project Rationale and Design

To address this issue, Actua developed the For-Credit Land-Based InSTEM program. It provides Indigenous youth with STEM education that takes place *on-the-land*, builds on a foundation of *Indigenous Knowledge*, and provides participants with opportunities to earn high school credit for completion. The program formally recognizes participation in land-based activities already occurring in communities that contribute to STEM learning, with a view to reducing barriers to education and careers in STEM fields for First Nations, Métis and Inuit youth. Additionally, the program provides training for educators (i.e., camp instructors and high school teachers) focused on the intersection of Indigenous Knowledge and STEM, to ensure they are prepared to support Indigenous youth learning and growth.

Land-based camps and activities examined in this evaluation occurred in three locations – Sahtu/Norman Wells (Northwest Territories), Land and Sky (Alberta), and Yukon. (*Yukon was unable to participate in the evaluation activities so we have opted to leave out further discussion of that location*).

Each location hosted many participants and camp sessions. All camps involved on-the-land components, engagement with Indigenous Elders and cultural practitioners, and hands-on STEM and land-based activities. Specific activities varied by location, timing and duration:

- Sahtu's **canoe camps** lasted between 7 and 13 days, each with 12 hours of instruction per day, focused on five or more of: Outdoor Cooking Theory and Practice, Wilderness Navigation, Leadership Fundamentals, Adventure & Ecotourism, Fostering Stewardship, First Aid, Outdoor Excursion, Outdoor Leadership, Introduction to Guiding, Leadership Fundamentals, Environmental Ethics, and Leadership in Recreation & Sport.

- Sahtu's **fishing camps** lasted 8 days, with instruction and activities focused on Angling & Fish Management Theory; Introduction to Wildlife; People, Culture, & Wildlife Heritage; Angling & Fish Management Practice; Water Management; Wildlife & Society; Wildlife Protection & Stewardship; and Community Enhancement.

- Sahtu also hosted **day camps** in partnership with Black Spruce Education in which youth between the ages of 5 and 12 completed a variety of STEM-related activities and had opportunities to hear and learn from local mentors and Elders. While the day-camps lack the more intensive focus of overnight camps and participants were younger (and therefore not eligible to earn credits), these camps provide participants with opportunities to engage in on-the-land and STEM activities with a view to spurring their interest in the more intensive InSTEM land-based camps in the future.

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degrees, Indigenous individuals are less likely (14 percent) than non-Indigenous/non-minority (19 percent) and minority populations (35 percent) to have majored in a STEM field. (A. Usher. 2022. *A First Look at 2021 Education Census Data*).

- Land and Sky (Alberta) **camps were an initiative of IndigeSTEAM and Actua collaborated with them to bring a STEM component to the program. Overall the program focused on traditional skills and knowledge**, including hunting and food preparation, trapping and survival, and fishing and traditional medicines with an emphasis throughout on understanding connections between traditional/cultural knowledge and western science. The camp also emphasized astronomy and traditional teachings about the skies – including activities related to using maps and compasses, learning about parts of the night skies (e.g., constellations, planets, waypoints, dark skies, light pollution), a site visit to the Rothney Astrophysical Observatory, and viewing stars with IndigeSTEAM telescopes.

Each camp had activities led by community-based cultural practitioners, Elders, and STEM-focused university- and college-level Actua instructors. Many camps had participants work on Community Maps, prompting them to consider what places, people, animals, and other natural and designed features can be found in the communities where they were camping and exploring. Participants had daily opportunities to reflect on what they did, learned, and how they felt in sharing circles and other group discussion.

Theory of Change

The InSTEM program has an underlying theory of change for youth participants described below. Note that the camp experience itself and the evaluation team's engagement with participants, practitioners and partners revealed some fundamental features and outcomes of the program that are not explicitly articulated in the theories of change – namely, the development of a sense of belonging and community among Indigenous youth.

The theory of change for youth participants has five main steps:

1. *Challenge/Opportunity.* First Nations, Métis and Inuit youth are underrepresented in STEM-related education and careers owing to multiple barriers to participation, including skills gaps, low self-confidence, and low interest. These are largely a function of education systems whose curricula and environments have been shaped by colonialism and the legacy of residential schools.

2. *Activities.* Actua's For-credit Land-based InSTEM program aims to remove barriers by providing Indigenous youth with opportunities to participate in STEM-related learning in positive, supportive, Indigenous-focused and -led, on-the-land environments with culturally relevant content and activities. This includes engagement with Indigenous role models, ceremonies and practices; hands-on land based activities aligning with Indigenous Knowledge withSTEM; and opportunities to earn high school credits for successful participation.

3. *Short-Term Outcomes*. The activities provide youth with exposure to Indigenous role models and STEM activities in supportive, culturally-relevant, community settings which are expected to: increase interest in Indigenous worldviews and ways of knowing; improve attitudes and interest in STEM and STEM learning; increase skills and knowledge of STEM fields; enhance critical thinking and problem-solving skills.

4. ***Interim Outcomes***. Over time, the experience is expected to provide a foundation for further learning and growth, including: improved self-confidence; improved confidence in STEM skills; integration of Indigenous cultural identity and STEM learning; achievement of high school credits.

5. ***Long-Term Outcomes.*** With increased confidence and interest in Indigenous Knowledge and STEM and completion of the land camp and in-school course components, the program expects to see over the long-term: higher enrollment in optional STEM courses in high school; increased high school graduation rates; application of STEM learning in local communities; intention to pursue further education and/or employment in STEM fields.

III.   Evaluation Approach

The evaluation aimed to capture the program's impact on participants' skills, knowledge, confidence, interest in Indigenous Knowledge and STEM, and future intentions in education and career paths. As noted, the critical importance of a sense of belonging and community as a foundation for learning and growth was revealed as the initial evaluation plan unfolded. Recognizing this essential element of the program, the evaluation was adjusted to ensure it would capture insights about how well this sense of belonging was being nurtured.

Evaluation Principles

The evaluation aimed to capture both an ***accurate*** and ***comprehensive*** picture of relevant impacts across the program. At the same time, it aimed to impose a ***minimal burden*** on participants, require participants' ***consent***, and protect participants' ***privacy***. While a focus on accuracy and comprehensiveness alone would recommend more intensive evaluation activities, tradeoffs were made to minimize the evaluation burden and respect consent and privacy.

Because the program was delivered to and largely by Indigenous individuals and communities, the evaluation was governed by the First Nations Principles of OCAP™ – Ownership, Control, Access and Possession. This meant ensuring that the communities receiving the program were involved in the design of the evaluation plan; were assured ownership over, access to, and possession of all evaluation materials; and that whenever possible, they were supported in collecting insights through methods of their own design. In practice, adhering to OCAP principles involved:

- designing an evaluation approach in consultation with Actua's Indigenous-led InSTEM team;

- consulting with Indigenous delivery partners on the overall approach and specific instruments, and inviting them to implement, reject, or redesign instruments as appropriate for their communities and participants; and

- providing Indigenous partners with access to evaluation results and reports in draft and final form.

Evaluation Instruments

We collected data and feedback using a variety of instruments allowing for multiple perspectives on the program and its impact.

- **Administrative Data**. Actua provided the evaluation team with data on the number of participants, including demographic data (e.g., age ranges, locations); and information on program completion and credits earned.

- **Participant Surveys.** Participants were invited to complete a short survey that included questions about why they attended camp, overall satisfaction, whether their understanding of Indigenous land-based knowledge and STEM improved, the importance of Elders, mentors, cultural practitioners land-based activities, and thoughts for camp improvement. Overall, 46 participants from two locations (Sahtu and Land & Sky) completed the survey. The responses have limited statistical validity, but provide rich qualitative insights.

- **Indigenous Knowledge Community Mapping**. With guidance from camp staff, participants were invited to produce community maps. Community mapping is grounded in storytelling and symbol-based analysis. It can include drawing topographical views of the land and adding images of significant people, places, animals, natural features, and/or activities that reflect Indigenous Knowledge. Mapping prompts participants to respect and celebrate Indigenous land-based knowledge, language, and cultural practices; offers opportunities to make connections between Indigenous Knowledge and STEM; and provides a way to observe participants' learning and growth. Participants at many, but not all, camps completed community maps. To interpret their meaning, the evaluation team spoke with camp instructors who witnessed the development of the maps from beginning to end.

- **Instructor Reflections and Interviews**. We asked instructors to record and share with the evaluation team their reflections on camp and participants' learning and growth on a daily basis, or as often as practically feasible. The evaluation team also conducted interviews with instructors to gather additional insights after camps were completed. The reflections and interviews offered insights about the impact of various activities and experiences on participants' sense of belonging and community, understanding of Indigenous Knowledge, and STEM skills and knowledge. They also provided insights about the impact of camp on instructors themselves.

- **Interviews With Coordinators and Practitioners**. We invited camp coordinators and practitioners to have conversations with us about the importance and impact of the land camps to gain additional insights about participants' learning and growth. It was mainly through these interviews that the evaluation team began to see the critical importance of the sense of belonging and community that camps try to foster among Indigenous youth.

Evaluation Experience and Limitations

The evaluation encountered some challenges. Notably, the original evaluation organization was unable to continue with and complete the evaluation initially proposed. The current evaluation approach was prepared at a later stage in the process, drawing some insights from that organization's work, but with limited opportunities for pre-delivery engagement with program stakeholders and coordinators. Thus, while the final evaluation draws from a variety of evaluation activities and offers an account of the experience and impacts, a more robust evaluation could have been generated had a switch in evaluation teams not been necessary.

We encountered some challenges which affect the comprehensiveness of the results. Program locations made different choices about which evaluation instruments they felt were appropriate and feasible in their context and circumstances. One location felt that a participant survey was inappropriate and chose not to administer that part of the evaluation. Other locations found it difficult to have participants complete the community maps on a regular schedule given the physically and mentally demanding nature of all-day canoe trips and the need to let participants rest. Finally, camp staff at some locations could not be reached for post-program interviews with the evaluation team. As a result, the evaluation plan was not applied consistently across the locations and leaves some gaps in understanding. Nevertheless, sufficient feedback was gathered through multiple channels to allow for meaningful observations about the program.

IV.   Evaluation Results

The data and feedback collected reveals that the program is engaging Indigenous youth in STEM activities, improving awareness and understanding of Indigenous Knowledge, enhancing a sense of belonging and community, and having a positive impact on attitudes towards STEM education and careers.

Participation and Motivation

The program engaged many participants who had mixed and multiple motives for attending.

- Overall, **63 youth enrolled and participated** in the FSC-funded camps at Sahtu/Norman Wells, and Land and Sky Summit.[2] This included:
    - **14** youth who enrolled in and completed the **Sahtu canoe and fishing camps**;
    - **16** youth who enrolled in and completed the **Sahtu day camps**;
    - **33** youth who enrolled in, and 30 of whom completed, the **Land and Sky camp**.

In terms of **motivation for attending**, the survey completed by 46 campers showed that:

- one-third said that *earning a credit* was a key reason for attending;

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[2] Enrollment and participation data for Yukon were not available.

- over one-half said that they came to *learn and/or expand their knowledge* (of STEM, Indigenous Knowledge and culture, or both);

- a few said they came to *spend time outdoors and/or with their friends*.[3]

Interviews with camp instructors, delivery partners, and Elders revealed an awareness of the various motives and attitudes that campers bring to the first day of camp. In many cases, an initial sharing circle or camp fire discussion allowed instructors and leaders to understand campers' motivations and general dispositions to being at camp which provided them with a baseline for how to engage with each participant and adapt activities and messaging. Indeed, one of the strengths of the program is the instructors' and leaders' readiness to understand and engage with participants as individuals and adapt the program to their needs in real-time, rather than as interchangeable participants in a program with a fixed curriculum and schedule.

Credit Attainment

- Overall, **72 high school credits were earned** by 44 eligible participants at the Sahtu/Norman Wells and Land and Sky Summit camps.[4] This included:
  - **42 credits** collectively earned by the 14 participants who enrolled in and completed the **Sahtu canoe and fishing camps**;
  - **30 credits** collectively earned by the 30 participants who completed the **Land and Sky Summit** camp.

Participants at the Sahtu day camps were not yet high-school age and therefore not eligible to earn high school credits.

The credits earned by Indigenous youth are a critical achievement of the program. Formally credentialing land-based education and attainment of Indigenous Knowledge helps to emphasize and recognize the value of these forms of education and knowledge and improves' participants' confidence in their ability to succeed. For those participants who earned multiple credits – namely, those at the Sahtu canoe and fishing camps – the boost to confidence and progress towards completing their high school education is likely significant.

Participant Satisfaction

Participants indicated a high level of satisfaction with the program and their experience.

- All 46 participants who completed a survey said that, overall, they **enjoyed the land camp.**

- In open-ended responses about *what they liked best*, many participants referenced:
  - being outdoors and on-the-land;

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[3] Some participants listed multiple motivations and a few did not answer the question at all.
[4] Credits earned data for Yukon were not available.

- o   spending time with other Indigenous youth and Elders (especially in sharing circles and camp fires); and

- o   participating in a range of STEM and on-the-land activities (with astronomy and star-gazing mentioned especially frequently).

All of this indicates that the program was engaging for the participants, and viewed as an opportunity to advance their learning, growth and education.

Belonging and Community

Developing a sense of belonging and community among Indigenous youth participants was a priority for camp staff and instructors. As some staff and Elders shared in conversations with the evaluation team, developing an interest in Indigenous Knowledge, practices, and STEM is bound to fail unless Indigenous youth feel that the places and communities where the activities occur are *their* places and communities. Mainstream education settings have been hostile environments for many Indigenous youth – places where Indigenous culture and knowledge are often dismissed as less valuable, and where Indigenous youth have faced individual and structural racism. To succeed, land-camps need to ensure that Indigenous youth feel welcome, valued, and that they belong to the group and community.

Numerous camp staff, instructors and Elders indicated that they try to gauge campers' level of engagement and sense of belonging during the first circle at camp and build from that baseline to a richer sense of belonging. Staff, instructors and Elders try to nurture belonging through conversation, shared activities, and positive reinforcement, including emphasizing ideals of peace, respect, reciprocity and "all my relations." Group activities, prompts to compliment others, and the need to work as a team (such as when canoeing) contribute to that sense of belonging and worth in the community.

There is qualitative evidence that the program succeeds in nurturing a sense of belonging and community among many Indigenous campers.

- ●   While acknowledging that a few campers are "too hard to reach" over a span of just one or two weeks, **Indigenous leaders note** that, for most, the sense of belonging "really develops over the course of the camp" as seen through campers' increasing interest and engagement in shared activities and sharing circles, and in their efforts to "give back to the community" which they come to regard as "their own." Staff and instructors also note that, by the end of the camp, many campers indicate a desire to come back so that they can reconnect with the friends, relations and community they now regard as *their* friends, relations and community and which accept and value them.

- ●   ***Comments from campers*** reinforce the conclusion that belonging and community improve over the duration of camp. When asked about their favourite parts of camp, many indicated that spending time with others, reconnecting with their culture and communities, and sharing during circles were highlights – all of which can be interpreted as valuing and nurturing a sense of belonging and community. When asked about the impact of Elders, language speakers, and cultural practitioners at camp, one camper said

"it was interesting at first" and "as more came along I realized I'm a part of it" – which suggests a transformation from observer to member.

> ***Observations from Campers About Belonging and Community***
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> When asked what were their favourite parts of camp, participants said:
>
> - *"My favorite part of this trip was becoming closer with everyone who also attended."*
> - *"Spending time with people and experiencing new people."*
> - *"My favourite parts were laughing together, everyone getting along."*
> - *"Meeting relatives I never knew I had."*
> - *"Hearing stories about the land from the Elders made me want to reconnect with my culture."*
> - *"It was interesting at first. As more came along I realized I'm a part of it."*

Indigenous Knowledge – Interest, Skills and Confidence

Observations from campers, instructors and Elders suggest that participants' Indigenous Knowledge and sense of the land improved during camp. While impossible to quantify the improvement, insights from multiple perspectives confirm that learning and growth did occur.

Campers indicated improvements in their survey responses:

- **Nearly all participants** who completed a survey (43/46) said that ***the program increased their understanding of Indigenous land-based knowledge***.
- When asked what specifically they might have learned, many pointed to topic areas relating to ***food and harvesting***, ***medicine and healing***, and ***land and the environment***. ***Navigation*** using landmarks and stars was frequently cited by participants as something they learned and used.

Instructor observations confirm that participants' Indigenous Knowledge and sense of land improved during camp:

- Most instructors said it was clear that ***campers were interested and appeared to be acquiring Indigenous land-based knowledge*** during camp activities. Some instructors noted that they are not sure how much the knowledge will "stay with campers" once camp is done and that learning seemed to vary by camper, but nevertheless thought that learning and growth had occurred.
- Instructors observed that campers' interest and engagement was ***especially noticeable during land-based activities*** and ***presentations by Elders***.

- o According to one instructor, campers' Indigenous land-based knowledge "improved best when lots of people (e.g., Elders) came in to share knowledge, including gardening, fishing, astronomy, traditional teachings and medicines."

- o Another instructor noted that campers "got a lot from the concept of 'land as teacher' and 'learning from the land' by the end of the trip. The land challenged them and they learned from it."

- o One instructor felt that improvements in campers' Indigenous Knowledge occurred *only* when Elders or cultural practitioners were involved – which suggests that who is sharing and how knowledge is being shared may be critical elements of the program.

The **community maps** provide additional, albeit less obvious, indications of increased Indigenous land-based knowledge among campers:

- While instructors noted that campers required significant prompting and guidance in adding Indigenous Knowledge to their community maps, they felt that the maps revealed improvements in Indigenous land-based knowledge over the duration of camp.

- According to one instructor, they had "to really prompt [campers] to make connections" but "the end-of-week community maps were better" with campers pointing out sites for fishing and hunting, naming animals and places, and recognizing the connections among places and activities, on the one hand, and STEM and Indigenous Knowledge, on the other.

- According to instructors, some camp groups were "really into the community maps" and "had fun adding stuff to their maps" while others were less engaged. "Learning was age and community dependent. Sometimes we had to lead them, sometimes it was more organic." As engagement with community mapping varied, instructors adapted their approach to ensure that all participants had some awareness of the role of Indigenous Knowledge and STEM in their communities.

STEM – Interest, Skills and Confidence

Observations from campers and instructors indicate that campers' STEM skills and knowledge likely increased during camp, though campers themselves did not always recognize that what they were doing or learning could be labelled STEM.

- **Two thirds** of campers who completed surveys said that they ***learned something new about STEM***. About half offered one or more examples of what they had learned in STEM *without prompting* – including astronomy, water testing and chemistry, navigation/GPS, plants/botany. The survey question from which these results are drawn formally asked more specifically about STEM *opportunities and careers*, but most participants appeared to read the question as asking about their STEM learning *broadly understood*.

- **Instructor reflections and interviews** confirm that campers learned about STEM and that the camps contributed to STEM skills and confidence. Instructors would often

prompt campers to consider whether some activity (e.g., navigation, fishing, water testing) was a "STEM activity" which helped campers to make the connections. Nearly all instructors believe that campers' STEM skills and knowledge improved to some extent over the course of camp.

- The addition of certain places, activities and other STEM-related markers on campers' **community maps** – albeit with instructor prompting – also suggests improved STEM awareness and knowledge among participants.

As camps last only between one to two weeks, STEM skills development was often more a matter of reinforcing existing skills and knowledge, and/or introducing new skills and knowledge and achieving basic, but not advanced, mastery. Nevertheless, campers appear to come away with some hands-on skills, improved STEM awareness, a recognition of the role of STEM in daily life, and an appreciation for the kinds of STEM skills and knowledge that they could develop in future learning.

Indigenous Knowledge and STEM Connections

One of the aims of the program is to encourage Indigenous youth to recognize the connections between Indigenous Knowledge and STEM – to see that Indigenous Knowledge *is* STEM knowledge. While the evaluation instruments are not suited for robust assessment of whether this connection was made, observations from instructors indicate that many campers were able to make this connection, whether explicitly or implicitly.

- One instructor noted that many campers "learned Indigenous Knowledge and learned that this constituted science" and this was achieved in large part by "learning from the environment" and "learning from the land."

- Another instructor reported that "I tried to tie Indigenous Knowledge and activities to our STEM programming. Sometimes they had 'aha' moments with the connection and really did get a sense that this was tied together."

- Yet another instructor observed that "we often made those connections for them… usually during circles/sharing. So we had to prompt them, but they made those connections when prompted."

V.   Discussion and Implications

Actua's For-credit Land-based InSTEM program for Indigenous youth is having a positive impact on participants. Participants are happy with their experience, many earn credits for learning new skills and knowledge, and many finish the program with a stronger sense of community, belonging and understanding of Indigenous land-based knowledge.

It is difficult to fully capture and quantify improvements in confidence, belonging, skills and knowledge – in part because some concepts are hard to operationalize (e.g., sense of belonging) and in part because respecting participants' privacy and community wishes prevents certain kinds of evaluation activities from being deployed. What is clear is that the Indigenous

participants, leaders, and guests recognize learning and growth among campers in the context of a STEM-oriented, land-based, Indigenous-led program.

Areas of Strength

The success of the program owes much to a variety of factors, but a few key ones stand out.

- That the program is **designed and delivered largely by Indigenous leaders and Cultural practitioners** is critical. Participants and instructors exhibited greater interest and reported higher levels of learning when content and activities were delivered or presented by Indigenous staff and guests. This also contributed to the sense of belonging and community – a critical foundation for further learning and growth – and to a recognition of the value of Indigenous Knowledge.

- The **land-based approach** is also a critical component. Getting out of conventional classroom settings and engaging in land-based, hands-on activities engaged many participants in ways that the traditional education system does not. Using nature and technology together to navigate hikes and canoe trips, for example, revealed in a practical way the importance of and connections between Indigenous Knowledge and STEM to participants.

- Finally, many participants, instructors and leaders indicated the importance to learning and growth of camps with a **long duration and intensity**. Engaging with campers for 7 to 14 days in activities that lasted from sunrise to nightfall and after helped to develop the critical sense of belonging and teamwork needed to complete challenges, and a genuine connection to and appreciation for land-as-a-teacher. While the day camps obviously lacked this duration and intensity, the hope is that they spur participants' interest in attending the more intensive camps in the future.

Ideas for Improvement

While participants, instructors, organizers and guests all felt the programs have been successful, a few ideas for improvement emerged from feedback and analysis.

- **Instructor recruitment and training**. Based on direct and indirect feedback from participants and instructors, there appears to be room to improve instructor recruitment and training.

    o First, Actua should **ramp up efforts to recruit Indigenous instructors** for the camps. Both Indigenous and non-Indigenous instructors felt that Indigenous instructors were better prepared to make connections between Indigenous and STEM knowledge, and that participants seemed to respond more to activities and lessons led by Indigenous instructors.

    o Second, and recognizing that it may be impossible to recruit Indigenous instructors into all positions, Actua should consider much **more intensive training for instructors in Indigenous Knowledge, the connections with STEM, and especially the context from which many Indigenous participants are**

coming to camp (e.g., legacies of colonialism, residential schools and other considerations). If Indigenous campers are to develop the critical sense of belonging and community, they must be able to trust that instructors understand the colonial background and legacies within which they live and learn, and genuinely value Indigenous land-based knowledge.

- *Improvements to curricula*. While participants improved their Indigenous land-based knowledge and developed a stronger sense of belonging and community, the curriculum could be improved in a few ways.

  o First, the *importance of belonging and community should be more central as a motive and goal in lesson plans, activities and instructor training*. Indigenous leaders and guests were clearly attuned to the importance of belonging and community and nurturing these among campers, but it was less obvious to the STEM instructors. Thus, although the camps tended to contribute to belonging and community, for STEM instructors this was seen as more incidental than intentional. Ensuring all instructors and leaders recognize the importance of nurturing belonging and community could generate more success.

  o Second, some *additional thought should be given to how to make the connections between Indigenous Knowledge and STEM clearer* in camp activities and discussions – including helping campers see that Indigenous Knowledge *is* STEM knowledge and that there are interesting career paths for those interested in land-based knowledge and STEM. Some instructors struggled to make those connections and highlighting those paths and could use additional guidance to achieve that aim of the program.

- *Embedded, Indigenous-led evaluation.* The current evaluation captured some insights about the extent to which the program is achieving some of its key aims – and insights about aims that should have a more central place. At the same time, the evaluation experience revealed the need for different, more culturally appropriate and Indigenous-centered ways of measuring impact. Just as the program itself is involved in continuous improvement, the approach to evaluation also has room and opportunity for improvement. In practice, a better understanding of the program's impact could likely be achieved by working over a long time-frame with an Indigenous-led team with ideas and experience for more appropriate and effective evaluation approaches, and who could be trusted participants in on-site, embedded observation.

Expansion

Is there a need to expand the program or project to reach new population groups or different geographies?

Actua's program has demonstrated success in supporting learning and growth among Indigenous youth. While hard to quantify, the importance and impact is clear to first-hand

observers. Given that there are many Indigenous youth who could benefit from the program, there is a good case to support expansion.

That said, the program is resource and expertise-intensive. Setting up sites and activities takes time, and developing relationships with Elders, and cultural practitioners that are willing to share their time and expertise cannot be rushed. Actua and its program partners would know best whether, to what extent, and on what timelines expansion could occur. If capacity is available, however, insights gathered from this evaluation indicate that the rationale for expanding the program to more Indigenous youth is strong.