

Fostering New Brunswick's Talent Pipeline: Evaluating the Impact of Pathways to Professions on Foundational Skills Development Among the Future Workforce



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Project Title

Fostering New Brunswick's talent pipeline: Evaluating the impact of Pathways to Professions on foundational skills development among the future workforce

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Executive Summary

To help prepare the next generation of New Brunswick's leaders for success, the New Brunswick Institute for Research, Data and Training (NB-IRDT) has developed **Pathways to Professions**: an experiential learning program that provides post-secondary students with skills-based training and hands-on experiences in research, policy and professionalism.

To support this initiative, researchers at NB-IRDT surveyed student participants to learn about their experiences with Pathways to Professions. This report examines the development of core skills among participants, details which aspects of the program students found most beneficial and explores students' perceptions of self-growth and career goals – all to help cultivate skills and foster civic engagement among the future workforce of NB.



Background: Connecting Post-Secondary Students with Hands-On Learning

The province of New Brunswick has faced many population-based challenges in recent years. Although more people began moving to NB following the COVID-19 pandemic, the province continues to struggle with the challenges of an aging population and the out-migration of its younger residents, with skilled graduates in particular searching for career opportunities in other provinces. The out-migration of qualified graduates has far-reaching implications for the future labour market, which could lead to a lack of skilled workers to fill important roles.

Experiential learning provides an avenue to boost graduate retention by providing opportunities for students to participate in meaningful work experiences in connection with local organizations. Students learn by doing – gaining concrete skills outside the classroom setting, discovering new career opportunities and reflecting on their ability to profoundly impact their communities. Along with the goal to foster civic engagement and a sense of local connection, experiential learning aims to equip students with transferable in-demand skills for future careers.

Pathways to Professions (P2P) is a 13-week paid experiential learning program that provides post-secondary students in NB with a full curriculum of professional skill workshops and networking sessions while they complete research for NB organizations.

Students work in teams under the mentorship of academic, government and industry professionals to provide data-driven evidence that can be used to improve programs and policies in the province. NB-IRDT believes data-informed decision-making is the way of the future, and P2P empowers students to participate in this future while discovering the many ways research can be applied across a diverse range of careers.

Key Findings: Student Experiences and Skills Growth in Pathways to Professions



NB-IRDT asked students to provide feedback on P2P workshops throughout the summer program and distributed an end-of-program evaluation questionnaire when students finished Week 13.

While reflecting on their goals and experiences, students evaluated their skills growth in 5 key areas: Communication, Collaboration, Critical thinking and problem-solving, Innovation, creativity and entrepreneurship and Self-awareness and self-management.

Foundational Skills Development

Collaboration skills saw the most consistently positive levels of growth.

This may be a reflection of P2P's team-focused structure, which requires students to work together, delegate tasks and solve conflicts within their teams.

However, **Critical thinking and problem-solving skills** had some of the highest (i.e., the most "5 out of 5") growth ratings – despite the workshops in this skill category receiving some of the students' lower ratings.

This may indicate that students gained most of their critical thinking and problem-solving skills through the hands-on, experiential component of P2P – from facing real-world problems that threatened their work and coming up with their own solutions to move forward, rather than from learning about problem-solving techniques in workshop settings. In this way, students "learned by doing."

Student Reflections and Career Goals

Themes of **increased self-awareness and self-confidence** were most prominent among students' reflections on their experience with P2P.

This suggests that the opportunity to "learn by doing" not only helped students gain new skills but also empowered students to more fully recognize the skills and potential they already possessed but had not previously utilized.

Many students commented that P2P had **introduced them to new career options**.

Though some expressed interest in government and others preferred careers in research, student responses overall suggested P2P helped empower them with the experiences and self-awareness to make more informed career decisions.

Key Takeaways: What Have We Learned Through This Process?

The student evaluations and reflections presented in the full report suggest that Pathways to Professions effectively achieved its goal of boosting students' foundational skills development while impacting their career goals and interests. A closer look at student responses provides valuable insights beyond the program's overall effectiveness and allows us to draw conclusions regarding which program components may have been most impactful, and why.

The skills in which students saw the highest levels of growth appear to be those that required them to work collaboratively and address real-world problems as they arose, reinforcing the concept that the true value of experiential learning is its incorporation of hands-on experience and real-world applicability. Although students' workshop ratings remained positive overall, the most impactful method of boosting students' skills appears to have been the work experiences they had within their research teams, outside the classroom and workshop settings.

Student reflections on their career goals suggest that P2P did impact their future plans – whether through the introduction of new career pathways or by reinforcing students' interests in different fields. While some students are now considering new options, and others are even more confident in pursuing their previous goals, responses suggest that by providing the opportunity to immerse themselves in different types of work experiences, P2P has helped empower students with the skills and self-awareness necessary to make informed career decisions.

More time must pass before it is possible to see the career pathways students choose, including whether they pursue careers in New Brunswick. However, for now, P2P has empowered students to recognize their own skills and potential, providing the opportunity for them to realize their ability to contribute to their local communities as engaged citizens and the future leaders and decision makers of New Brunswick – should they so choose.

Introduction

Background: Foundational Skills for the Emerging Workforce

The province of New Brunswick (NB) invests substantially in educating its post-secondary students and encouraging them, as qualified graduates, to stay and work in the province. Although the population of NB has continued to grow in the wake of the COVID-19 pandemic (NBjobs, 2023), retaining students as valuable members of the future labour force remains a primary concern.

NB is facing labour shortages, with projections suggesting there will be 120,000 jobs available in the next 10 years, but there will not be enough active members of the labour force to fill them (Opportunities NB, 2023; Government of New Brunswick, 2019). Retaining qualified graduates is one strategy to help meet this demand – however, the goal is not only to encourage graduates to stay but also to equip them with the skills and experiences necessary to become engaged citizens and meaningful contributors to the progress and prosperity of our province.

The shift from a manufacturing to a knowledge-based economy has impacted the types of skills employers seek (Cheung et al., 2012), and research suggests that Canada is not, in fact, producing graduates with “the right skills to sustain and enhance the country's economic competitiveness and social well-being” (Munro, 2014, p. 5). Rather, it is suggested that Canada's students face a deficit in essential skills, including critical thinking, problem-solving, literacy, numeracy, communication, innovation, commercialization, and overall employability, resulting in an education-work divide (Munro, 2014). For post-secondary education systems to meet the challenges of the 21st century, there is a need to develop more foundational skills among the rising generation (Parkin, 2013).

Skills Growth in New Brunswick: Global Competencies

In 2017, the Government of New Brunswick (GNB) produced a list of “NB Global Competencies” (2019b, 2019c) as a desired outcome for every NB student. They include:

Communication	Collaboration
Critical thinking and problem-solving	Innovation, creativity and entrepreneurship
Self-awareness and self-management	Sustainability and global citizenship

These competencies encompass transferrable skills, sets of knowledge and attitudes that empower learners to reflect on and take agency in their learning and their lives (GNB, n.d.). While these are not necessarily subjects that are taught in the classroom, they are essential for living and thriving in new economies (local, global and virtual) (GNB, 2019c) and can be made accessible to students through new opportunities to learn and to do (GNB, n.d.).

Experiential Learning: Gaining Foundational Skills Through “Learning by Doing”

Experiential learning, or “learning by doing” (Bradberry & de Maio, 2019), is growing in popularity as an effective way to boost students' foundational skills – such as the NB Global Competencies – through the integration of educational and training opportunities (Cheung et al., 2012).

While the emerging NB workforce is well educated, students often do not receive general workplace training, as there are few opportunities to learn hands-on skills through course-based learning. To help bridge the existing skill gap, and to enhance student employability (Bradberry & de Maio, 2019; Nenzhelele, 2014), universities are looking to experiential learning opportunities as a way to provide students with more well-rounded academic experiences and facilitate the development of “real-world” on-the-job skills – with a focus on “soft” or interpersonal skills (Roberts, 2018) such as leadership, teamwork, problem-solving, work ethic and creativity (Abbasi et al., 2018; Eyster, 2009; Pang et al., 2019).

Through hands-on workplace participation, experiential learning can provide students with opportunities to gain or improve skills in foundational, in-demand areas identified as crucial for NB's future workforce. Working closely with organizations and communities through experiential learning programs has been found to develop students' sense of civic connection – and for NB, fostering students' sense of connection to their communities may make them more likely to remain in the province as they transition from post-secondary education to the labour force. Moreover, experiential learning requires reflection on transferrable skills gained, enabling students to articulate their abilities and the applicability of their skills in the workplace – thus boosting students' self-awareness, self-confidence and self-marketability.



Pathways to Professions: Research-Focused Experiential Learning at NB-IRDT

Providing students with meaningful, hands-on workplace experience, labour market training, interpersonal and technical skills development and networking opportunities with NB professionals.

At NB-IRDT, we believe that data-informed decision making is the way of the future. Yet, while data is everywhere, the skills and confidence to use data are not. To help equip students with data expertise, along with exposure to research-related and in-demand foundational skills, we developed Pathways to Professions.

Pathways to Professions (P2P) is a research-focused experiential learning program for post-secondary students across NB. For 13 weeks each summer, we provide a challenging, supportive and structured research experience with the aim of equipping students to step confidently into their careers and leadership positions of the future. Students who are accepted into the program participate as researchers on a New Brunswick-relevant project while attending

training sessions focused on empowering students as researchers and equipping them with soft skills to boost their professionalism upon entering the workforce.

P2P started with six students working on two NB-IRDT projects during the summer of 2020. At that time, the social distancing requirements of COVID-19 challenged us as program administrators to come up with a work and training experience that could be delivered remotely. As it turns out, this structure was well-suited to helping us expand our program to students across NB.

In the years that followed, we increased the number of research projects offered by NB-IRDT researchers and affiliates; and for the summer of 2022, we officially partnered with the Government of New Brunswick (GNB) to create a stream of research projects for students in the [Future GNB](#) / [Avenir GNB](#) summer program.

Through P2P, we aim to create a work environment that closely simulates a real academic/ government research setting. We like to think of P2P as a “dry run” for students to gain experience working in a professional research environment before entering “the real world” – that is, the NB labour market.

We believe that experiential education, through programs like P2P, is key for retaining talent in the province of New Brunswick, equipping students to enter the future workforce with confidence and resilience as well as improving the lives of all New Brunswickers through evidence-informed research and decision-making.

Our goal is to empower students from a variety of educational backgrounds to explore career options and learn new skills while under the protective umbrella of P2P. We facilitate and coordinate research projects with real stakeholders and deliverables in a condensed timeframe while providing supporting workshops and mentorship every step of the way. Students are challenged to work in teams, solve problems as they come up and apply their post-secondary learnings in real-world scenarios.

P2P's Vision and Mission:

- To provide students with the space to learn, develop and apply data-driven fact-based research skills to better prepare them for the application of real-world, academic and non-academic, research.
- To give students meaningful experiences through which they are accountable for their work while still having mentorship to lean on.
- To engage the best speakers to lead session workshops and tutorials for students.
- To ensure that students leave the P2P program with a better understanding of themselves and a set of new/improved skills.

The Goal of This Study: Evaluating the Impact of Pathways to Professions

The study seeks to answer two primary evaluation questions:

1. What is the impact of P2P on participating students' foundational skills development?
2. What is the impact of P2P on participating students' career goals and interests?

To help answer these questions, we distributed evaluation questionnaires to all student participants in the Summer 2023 P2P program during and following program completion.

Student responses (both Likert-scale ratings of various program elements and open entry reflections on their experiences) are used in the following sections to assess the program's impact, accompanied by a discussion on how these results may be used to inform approaches to boosting foundational skills and civic engagement in students across NB.

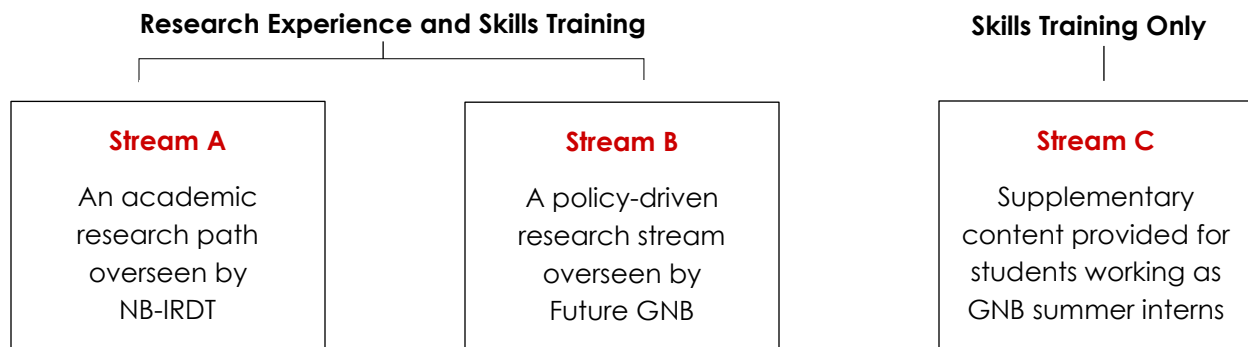
Data and Methodology

Students who participated in the 2023 P2P program were asked to fill out evaluation questionnaires at various points during the summer, including four session evaluation forms (distributed in ~3-week intervals during P2P; see [Table 2](#)) and a final program evaluation questionnaire distributed in the last week of the program.

It is important to note that in 2023, students participated in P2P in different capacities depending on their position (i.e., student researcher, student mentor) and program stream (see P2P Student Streams below). Evaluation questionnaires were tailored to reflect each student group's experiences with P2P; and as a result, some students received different questions than others. These differences are explained below and can be seen in the evaluation questionnaires provided in [Appendix B](#).

P2P Student Streams

Summer 2023 marked P2P's fourth year in operation and the first year of dividing program offerings into three different streams:



Students in Streams A and B participated in the full P2P curriculum of workshops, tutorials and networking sessions while completing a research project for NB-IRDT or an industry partner (Stream A) or for GNB (Stream B). Though Stream A and Stream B were overseen by different program leads, students in both streams attended the same required workshops, completed the same basic program deliverables and received the same evaluation questionnaires.

Students in Stream C did not complete research projects under P2P's administrative oversight but instead worked as GNB summer interns and were provided with a limited selection of P2P workshops to help boost their professional skills. Students in Stream C received shorter questionnaires (i.e., with questions pertaining to research projects removed).

P2P 2023 also welcomed back returning students from earlier program cohorts as "Student Mentors." These students were each assigned to a research team in Stream A or B to help

mentor and assist student researchers as they navigated their way through the program and completed their research projects. Student Mentors received additional training sessions in areas of leadership and were tasked with administrative responsibilities, such as hosting team meetings and "Show n Tell" sessions.

Table 1: P2P 2023 Student Participant Breakdown

Stream A	Stream B	Stream C	Student Mentor	Total
13	8	33	5	59

Session Evaluations

Students in Streams A and B received four training session evaluation questionnaires at separate time points during the program, with questions pertaining to each session attended.

Sessions consisted of workshops and Career Connect roundtables:

Workshops: Training sessions with subject matter experts in research-related, professional and intrapersonal skills meant to support the student work experience, provide collaborative learning opportunities, and enhance future employability. A full list of 2023 workshops is available online in the [2023 P2P Program in Review](#).

Career Connect: A professional development opportunity consisting of a series of meet and greet sessions with industry and government leaders, presented in the form of a roundtable, or interview. During these sessions, leaders in the NB workforce discuss their personal career journeys and what they learned along the way. Sessions are interactive, casual, and demonstrate how students can apply their research skills in a variety of workplace settings.¹

Evaluation Questionnaires

Students in Streams A and B (excluding Student Mentors) were asked to complete a total of 35 session evaluations over four evaluations. These were delivered to students via Microsoft Forms, with the following response breakdown:

¹ While student reflections on Career Connect sessions are presented in this study when applicable, full session evaluations are only presented for training workshops, given the focus on foundational skills development.

Table 2: Session Evaluation Questionnaire Schedule

Questionnaire:	Weeks covered	Sessions included	Responses received
Evaluation 1	Weeks 1 - 3	13 sessions	21/21
Evaluation 2	Weeks 4 - 7	8 sessions	17/21
Evaluation 3	Weeks 8 - 10	7 sessions	19/21
Evaluation 4	Weeks 11 - 13	6 sessions	11/21

Table 3 in [Appendix B](#) presents the questions and ranking system used in all student evaluations for the workshops and Career Connect sessions they attended.

Overall Program Evaluation

In the last week of P2P, students received a final P2P evaluation questionnaire via Microsoft Forms containing four separate sections of questions:

- Self-Evaluation of Skills Growth
- Program Rating
- “I-Statement” Reflections
- Open Entry Questions

Close-ended questions (i.e., rating scales) were analyzed quantitatively, and thematic analysis was used to analyze students’ responses to open-ended questions.

Self-Evaluation of Skills Growth

To better understand the impact of P2P on fostering foundational skills in students, and to promote student reflection on their own growth, we asked students to rate their skills growth on a Likert scale from 0-5, with 0 being no growth and 5 reflecting a significant amount of improvement in a particular skill.

The skills students were asked to self-evaluate were based on the NB Global Competencies, with only slight variations:

- Communication
- Critical thinking and problem-solving
- Self-awareness and self-management
- Collaboration
- Professionalism, innovation and creativity

It should be noted that instead of rating their innovation, creativity and entrepreneurship (GNB, 2019b), students were asked to rate their professionalism, innovation and creativity – this change was made to better reflect P2P’s focus on professional conduct and the program’s lack of emphasis on entrepreneurship. Further, we did not ask students to evaluate their growth in sustainability and global citizenship (GNB, 2019b), as this was beyond the scope of the program.

The self-evaluation questionnaire (available in [Table 4](#) in [Appendix B](#)) was distributed to students in Streams A and B and Student Mentors (n = 26), with 22 responses (85% response rate).

“I-Statement” Reflections

Using a Likert Scale ranking of Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree, Student Mentors and students in Streams A, B and C were asked to rate different aspects of their summer experience through levels of agreement with I-statements, such as,

“I enjoyed working on research projects that had specific ties to NB.”

Stream C students received a tailored set of questions to better reflect their experience and level of participation in P2P (see [Table 5](#) in [Appendix B](#)).

Program Rating

Students and Student Mentors were asked to rate their personal experience with elements of P2P using a 5-point Likert scale of Poor, Fine, Good, Great, and Amazing. Students in Streams A and B received all questions asking them to rate various parts of P2P, whereas students in Stream C received a selection of the questions – only those that were relevant to their P2P experience (see [Table 6](#) in [Appendix B](#)). For example, because many Stream C students worked from a GNB office, they were not asked to rate their “virtual work environment.”

Open Entry Questions

Finally, Student Mentors and students in Streams A, B and C were asked open entry questions regarding their perceptions and experiences with P2P to give them time and space to reflect on anything they liked, within the parameters of the prompt, so as not to limit student feedback. Once again, students in Stream C received a tailored set of prompts to better reflect their unique experience with P2P programming. All open entry questions and anonymous responses are available in [Tables 7](#) and [8](#) in [Appendix B](#).

Limitations

It should be noted that a firewall issue prevented many Stream C students from completing the program evaluation online through Microsoft Forms. Therefore, they were given the option to complete their evaluations using a Microsoft Word document and email their responses back to NB-IRDT, with the assurance that steps would be taken to ensure participant anonymity (i.e., removing student email addresses and other identifying features from the responses, which were combined and saved in a separate document).

In practical terms, this issue greatly affected student response rates, and only 5 Stream C students emailed their responses to NB-IRDT as a Microsoft Word document. Because such a

small sample size is unlikely to be representative of the Stream C group, and in accordance with disclosure guidelines for small counts, Stream C responses are not presented in this report.

Other study limitations to note include the possibility that student responses may be subject to self-report bias. In particular, because the end-of-program evaluation asked students to self-evaluate their skills growth over a preceding period of time, students may have under- or over-reported their skills growth based on the quality of their memories from before the program began. In future, asking students to self-rate the level of their skills by distributing questionnaires at the beginning and at the end of the program (i.e., using a pre-test and post-test) may address this issue.

Finally, this study only reports on student responses for the 2023 P2P program and as such is only representative of the fourth iteration of P2P. While student responses and reflections may align with those of students from preceding cohorts, it is important to note that many program features of P2P change every summer, and students' experiences may differ from year to year.

The following section presents results from students' workshop evaluations, self-evaluation of skills growth and open entry questions.

Results: Foundational Skills

Development of Communication Skills

“Communication involves receiving and expressing meaning in different contexts with different audiences and purposes. Effective communication involves understanding local and global perspectives and societal and cultural contexts.” (GNB, 2019b)

This section presents findings regarding the development of students' communication skills during P2P and their satisfaction with the program's communication-focused workshops and activities.

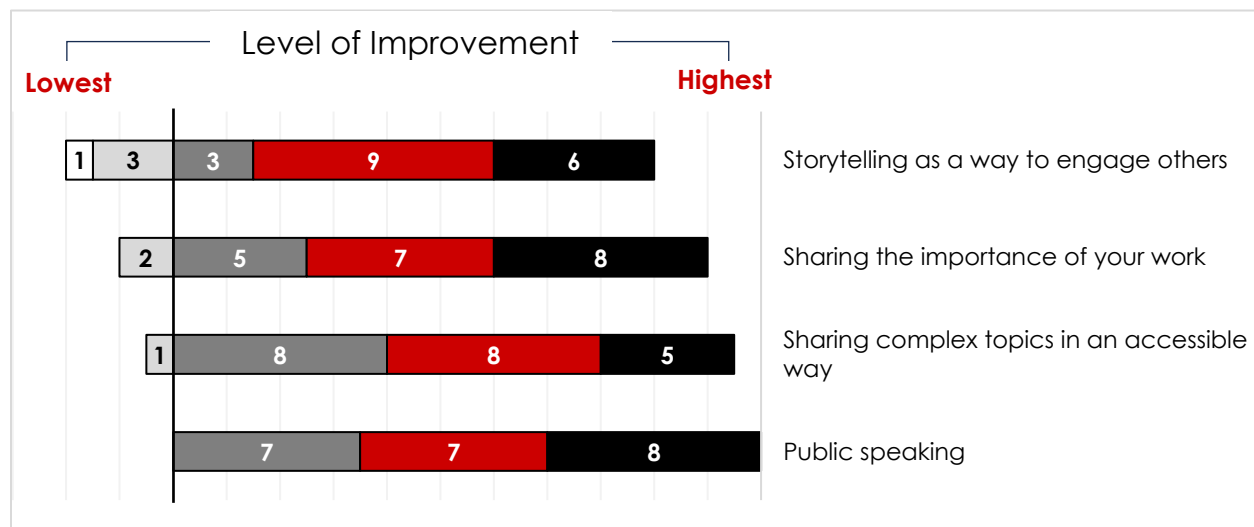


Student Evaluation of Communication Skills Growth

At the end of P2P, students were asked to evaluate how they felt their professional skills had grown during their time in the program. On a scale of 0-5 (with 0 indicating no growth and 5 indicating high levels of growth), they rated their growth in 4 areas of communication:

- Storytelling as a way to engage others
- Sharing the importance of their work
- Sharing complex topics in an accessible way
- Public speaking

Figure 1: Communication Skills Growth (n = 22)



We see that the overwhelming majority of students saw positive levels of growth across all the communication skills they were asked to evaluate. However, the highest levels of growth were in the area of **public speaking**.

Communication Workshop Evaluations

Four workshops offered during 2023 focused specifically on fostering skills to help students identify and engage with an audience when sharing the results of their summer research:

- Before You Start Writing
- Effective Writing
- Presentation Skills
- Telling a Story with Data

Over 90% of respondents agreed each session would be useful to their work, research and/or educational plans, and over 80% indicated they would like to learn more about each topic.

According to students, **Effective Writing** was the “most useful” communication workshop, while **Telling a Story with Data** was the “most interesting.”

- **100%** (n = 17) agreed or strongly agreed the information shared in Effective Writing would be useful in their endeavours.
- **95%** (n = 21) agreed or strongly agreed they would like to learn more about Telling a Story with Data.

Student Reflections

When asked to reflect on their experiences with P2P, many students described improvements in their ability to communicate effectively:

~ I learned I am a strong public speaker and I have the ability to share complex findings with diverse audiences.

~ In university, I also got in my head and felt like I couldn't speak publicly – this summer, the kindness shared across the P2P team really helped me come out of my shell.

~ I have more confidence in what I can bring to the table and I'd say I feel much less nervous speaking about what I'm passionate about.

~ Being able to contribute and discuss each other's work on show and tell days especially was my favourite.

A Snapshot of Communication at P2P

P2P promotes a culture of open, professional communication and provides weekly opportunities for students to practice presentations skills. Every Friday, students participate in a “Show and Tell” meeting, during which they give a quick presentation to update their peers on their progress, the events of the past week and changes to their plans.

Students also participate in two formal presentations to stakeholders, with high levels of preparation. Students practice their presentation skills in rehearsals, receiving feedback from P2P peers and leaders. These sessions give them time to practice public speaking and encourage reflection on how they can share their key messages in an effective, engaging way.

Development of Collaboration Skills



“Collaboration involves the interplay of the cognitive, interpersonal, and intrapersonal competencies necessary to participate effectively and ethically in teams, [including] the ability to foster social well-being and inclusivity for oneself and others to establish positive and respectful relationships.” (GNB, 2019b)

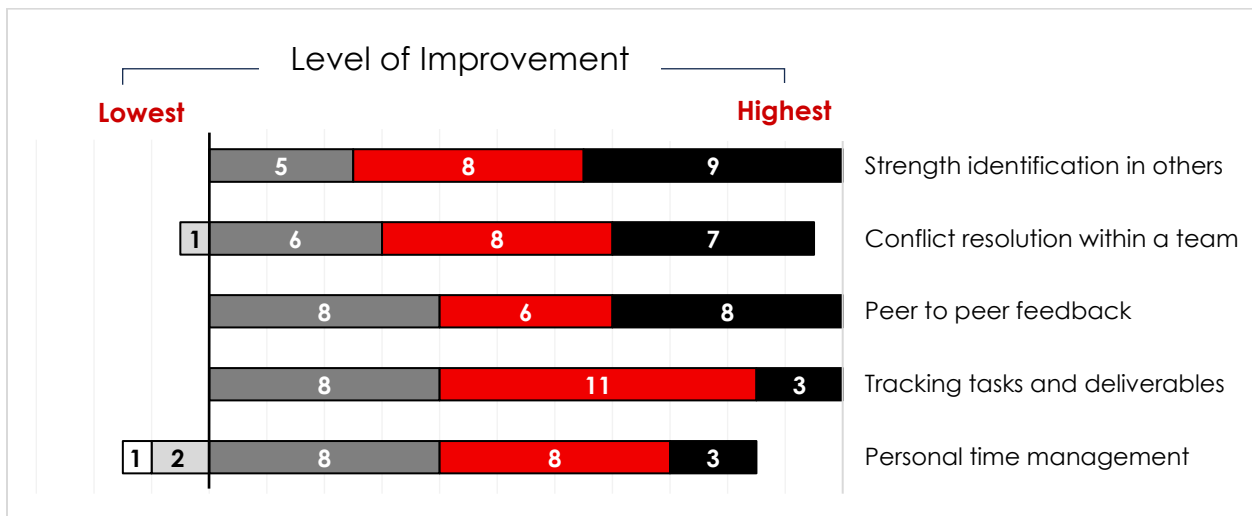
This section presents findings on the development of students’ collaboration skills during P2P and their satisfaction with the program’s collaboration-focused workshops and activities.

Student Evaluation of Collaboration Skills Growth

The second area of growth that students were asked to evaluate at the end of P2P centred around the foundational skill of collaboration. On a scale of 0-5 (with 0 indicating no growth and 5 indicating high levels of growth), they rated their growth in 5 areas of collaboration:

- Personal time management
- Peer to peer feedback
- Strength identification in others
- Tracking tasks and deliverables
- Conflict resolution within a team

Figure 2: Collaboration Skills Growth (n = 22)



Students indicated the highest levels of improvement in strength identification in others, peer to peer feedback, and tracking tasks and deliverables, with the overall highest ranking (albeit only marginally) being **strength identification in others**.

Collaboration Workshop Evaluations

Students in Steams A and B were asked to evaluate two P2P workshops focused on collaborative skills building offered during 2023:

- Project Planning and Task Management
- Empathetic Leadership

Of the two sessions, students responded more positively toward **Empathetic Leadership**, which could indicate a preference for sessions focused on interpersonal skills.

- **95%** of respondents (n = 19) agreed or strongly agreed the information shared in Empathetic Leadership was useful, and they wanted to learn more about the topic.

Student Reflections

~ I thoroughly felt like I was a valuable part of the team and appreciated that my team trusted me with the tasks that I was given.

~ Towards the middle of the summer my team really started to connect, and I feel like we created amazing bonds with one another. I didn't expect this to happen in a remote work environment. so I was pleasantly surprised!

~ I found it interesting to learn about myself as a leader. I have previously kept a professional boundary between my work and personality. But I found my team worked harder for me when I was able to share my 'authentic self'.

~ I better understood my work ethic as a team member versus as a solo researcher and how to adjust accordingly to these situations.

~ I learned to trust my instincts related to project deliverables, to give peer to peer constructive criticism, to lead with confidence, to build team dynamics and assess the environment/"vibe" of a meeting.

~ One of the most valuable aspects is working in teams with different backgrounds. It has been valuable for me to understand that everyone has a different way of analyzing and understanding topics and that everyone has a perspective that is so important for a team and project.

A Snapshot of Collaboration at P2P

Although P2P research teams receive professional guidance and mentorship from their research leads, the projects themselves are "student-led."

In teams of 3-4, students are tasked with working together to create a project timeline and plan out their deliverables for the 13 weeks of the program. With such a tight timeline, it is important for students to find ways to collaborate and support each other within their groups.

The P2P administration team provides communication resources, but students are responsible for problem-solving and handling team issues as they arise. To achieve the best outcomes, they must communicate openly, identify valuable skills in themselves and their teammates, delegate tasks within the team and collectively track their progress toward meeting deadlines.



Development of Critical Thinking and Problem-Solving Skills

“Critical thinking and problem-solving involve addressing complex issues and problems by acquiring, processing, analyzing and interpreting information to make informed judgments and decisions. The capacity to engage in cognitive processes to understand and resolve problems includes the willingness to achieve one’s potential as a constructive and reflective citizen. (GNB, 2019b)

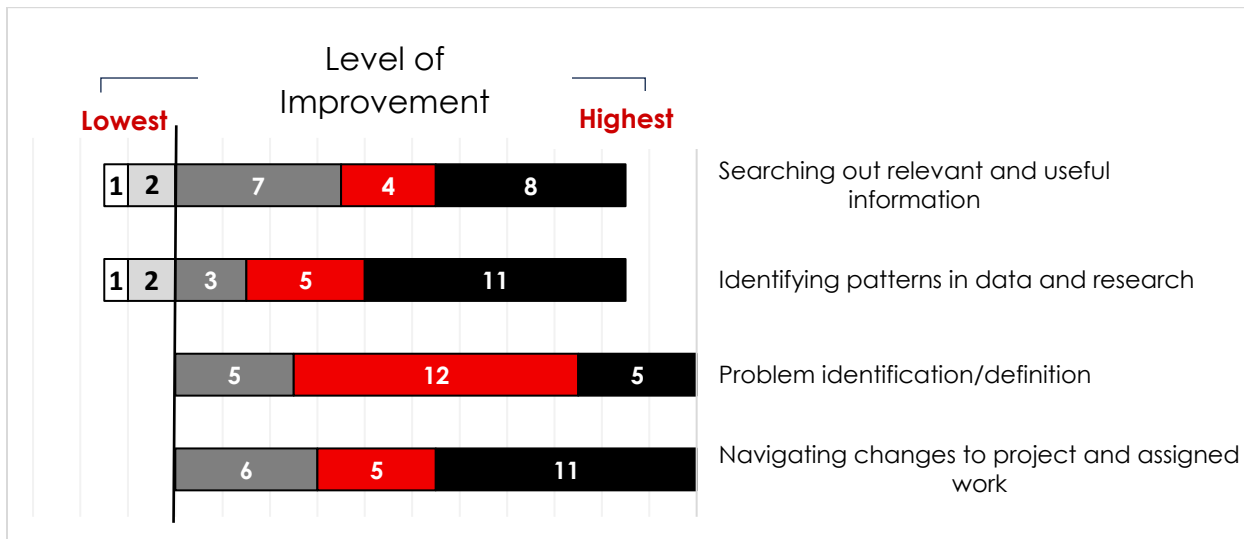
This section presents findings on the development of students’ collaboration skills during P2P and their satisfaction with workshops and activities devoted to critical thinking and problem-solving.

Student Evaluation of Critical Thinking and Problem-Solving Skills Growth

The third area of growth that students were asked to evaluate at the end of P2P centred around skills in critical thinking and problem solving. On a scale of 0-5 (with 0 indicating no growth and 5 indicating high levels of growth), they rated their growth in 4 areas of collaboration:

- Navigating changes to assigned work
- Identifying patterns in data and research
- Project identification/definition
- Searching out relevant/useful information

Figure 3: Critical Thinking and Problem-Solving Skills Growth (n = 22)



Students rated their skills growth highly in the areas of **navigating changes to project and assigned work** and **problem identification / definition**. While not every student felt they had improved their ability to **identify patterns in data and research**, half of the respondents selected “5” (the highest level of growth) for this skill.

Workshop Evaluations

Students in Streams A and B were asked to evaluate four P2P workshops focused specifically on helping them employ critical thinking and problem skills when working on their projects:

- Privacy and Ethics
- Accessing and Using Open Source Data
- Introduction to Cost-Benefit Analysis
- Research Bias + Trans/LGBTQ+ Issues in Research

According to students, **Accessing and Using Open Source Data** was the “most useful” workshop of the four, while **Introduction to Cost-Benefit Analysis** was the “most interesting.”

- **86%** (n = 21) agreed or strongly agreed the information in Accessing and Using Open Source Data would be useful in their endeavours.
- **83%** (n = 21) agreed or strongly agreed they would like to learn more about Cost-Benefit Analysis.

Student Reflections

~ I gained valuable skills this summer in terms of working with open-source data and excel which is something I have never done in the past. I learned that I am able to pick up new skills quickly and efficiently. Change has always been something that I struggled with but over the summer I believe my adaptability significantly improved. I always was able to learn to not take feedback personal and not feel defeated if the data simply does not exist. I will remember to always do the best with what I have.

~ Early in the summer, tasked with learning a new statistical software in the lab, I had such an amazing opportunity to learn self-directedly with my coworkers. We had to be resourceful with how we made use of our resources and having access to high quality mentors meant there was always someone who could help us find our way when needed. I will surely think of that experience going forward as I face daunting situations where I might not always know the right path forwards.

A Snapshot of Critical Thinking and Problem-Solving at P2P

P2P provides students the opportunity to conduct real-world research within a real-world research setting – and therefore students are faced with navigating real-world problems as part of their summer experience.

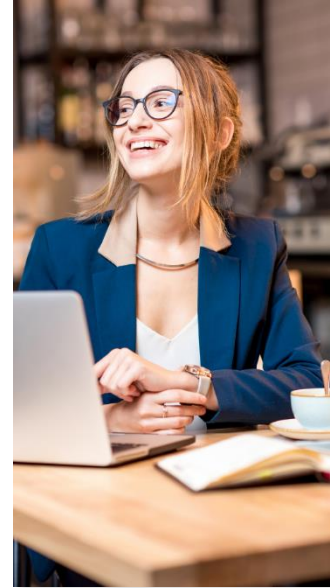
Although each team is assigned a research topic, they are ultimately responsible for choosing how they will complete their projects and manage their timelines.

When students discover that certain data they wanted are actually unavailable, they must think critically about how to finish their project in a different way. Or, when a stakeholder asks them to investigate something outside their original plan, they must reassess their research priorities and decide as a team whether they have the capacity to take on something new.

Development of Skills in Professionalism, Innovation and Creativity

“Innovation [and] creativity... involve the ability to turn ideas into action to meet the needs of a community. The capacity to enhance concepts, ideas, or products to contribute new-to-the-world solutions to complex social, ecological, and economic problems involves leadership, taking risks, independent thinking, soliciting and incorporating feedback, and experimenting with new strategies, techniques, or perspectives through inquiry research.” (GNB, 2019b)

This section presents findings on the development of students’ professionalism, innovation and creativity during P2P and their satisfaction with workshops and activities devoted to these skills.



Student Evaluation of Professional, Innovative and Creative Skills Growth

The next area of growth that students were asked to evaluate at the end of P2P centred around skills in critical thinking and problem solving. On a scale of 0-5 (with 0 indicating no growth and 5 indicating high levels of growth), they rated their growth in 4 areas of collaboration:

- Growth of professional network
- Professional appearance
- Creating visuals and graphics
- Problem evaluation

Figure 4: Professional, Innovative and Creative Skills Growth (n = 22)



Of the various professional, innovative and creative skills students were asked to evaluate, we see that the highest level of self-rated growth was in **problem evaluation**.

Workshop Evaluations

Four of the P2P workshops offered during 2023 focused specifically on helping students boost their levels of professionalism, innovation and creativity in the workplace. These include:

- Self-Marketing Strategies (Parts 1 & 2)
- Visuals in Excel
- Getting Your Dream Job

According to students, **Self-Marketing Strategies Part 2 (Resumés and Cover Letters)** and **Visuals in Excel** were the “most useful” workshops, while **Self-Marketing Strategies Part 2** was the “most interesting.”

- **100%** (n = 17) agreed or strongly agreed the information in the Resumés and Cover Letters session and Visuals in Excel would be useful in their endeavours.
- **100%** (n = 17) agreed or strongly agreed they would like to learn more about Self-Marketing through Resumés and Cover Letters.

Student Reflections

~ The P2P program offers great networking opportunities, which I really appreciate.

~ I did not realize there were going to be so many opportunities to showcase our abilities, and to connect with other professionals.

~ I didn't expect the interaction with experts in academia and business to be so personable and for all the people that met us to have been so invested in our professional development. They were all open to setting up meetings outside of their time with our group to chat about my interests. I got a huge chance to make connections over this summer and I'm very grateful to get to stay in touch with these passionate people.

~ One of my goals for the summer was to expand on my networking. I think I did a really good job with this goal, as entering into the program I had not even had a LinkedIn account.

A Snapshot of Professionalism, Innovation and Creativity at P2P

P2P encourages students to exhibit a professional appearance and behaviour by following a business casual dress code and remaining engaged in meetings. More importantly, however, it provides the opportunity for students to expand their professional network through 'Career Connects': Meet and greet sessions with industry and government leaders presented in the form of a roundtable, or interview.

Within their own work, students are encouraged to practice innovation and creativity by taking ownership of their knowledge transfer products. They must decide, as a team, how to portray their results, including which visual tools to employ, how to design each product so it remains authentic to their work, and what overall research story to tell.

Development of Self-Awareness and Self-Management Skills



“Self-awareness and self-management involve... the ability to identify opportunities, set goals, establish and monitor plans while adapting to change and adverse conditions... Learners who are self-aware and self-manage effectively are better situated to be lifelong learners, personally fulfilled, and a contributing citizen.” (GNB, 2019b)

This section presents findings on the development of students' self-awareness and self-management during P2P and their satisfaction with the workshops and activities focused on enhancing these skills.

Student Evaluation of Self-Awareness and Self-Management Skills Growth

The final area of growth that students were asked to evaluate at the end of P2P centred around skills in self-awareness and self-management. On a scale of 0-5 (with 0 indicating no growth and 5 indicating high levels of growth), they rated their growth in 7 related areas:

- Self-confidence
- Self-motivation
- Not internalizing feedback as failure
- Organizational skills
- Self-marketing
- Goal-setting
- Personal reflection

Figure 5: Self-Awareness and Self-Management Skills Growth (n = 22)



The skill with the highest self-rated growth was **self-confidence**. However, while not every student felt they had greatly improved their ability to **not internalize feedback as failure**, a greater number of respondents selected “5” (the highest level of growth) for this skill.

Workshop Evaluations

Three of the P2P workshops offered during 2023 focused specifically on helping students boost their self-awareness and self-management in their personal and professional lives. These include:

- Workplace Mental Health Strategies
- Goal-Setting
- Experiential Learning Reflection

According to students, **Goal-Setting** was the “most useful” workshops, while the **Experiential Learning Reflection** was the “most interesting.”

- **95%** (n = 21) agreed or strongly agreed the information in Goal-Setting would be useful in their endeavours.
- **91%** (n = 21) agreed or strongly agreed they would like to learn more about the topic of reflecting on their experiences.

Student Reflections

~ I have learned that I am capable of more things than I thought and have gained the confidence to be more outspoken and be able to share the research we have conducted.

~ I learnt that I have skills to bring to the table and good tips for executing group projects I just need to speak up more!

~ I learned that I am better than I thought at time management. When the summer started, I doubted my ability to keep myself to a schedule, but as the summer went on, I felt more confident in making my own schedule.

~ I now know that failure, or doing something wrong, can always be used as feedback for a pathway to growth.

~ I learned that I can work under pressure and with little direction.

~ The most valuable part of my experience was learning about myself and my confidence with certain tasks. I learned how to better accept feedback and how to face any fears that I had.

A Snapshot of Self-Awareness and Self-Management at P2P

Reflection is a core component of experiential learning and a primary focus at P2P. Students are encouraged throughout the summer to reflect on what they are learning and experiencing, and how the skills and opportunities they gain can benefit them outside the program as well.

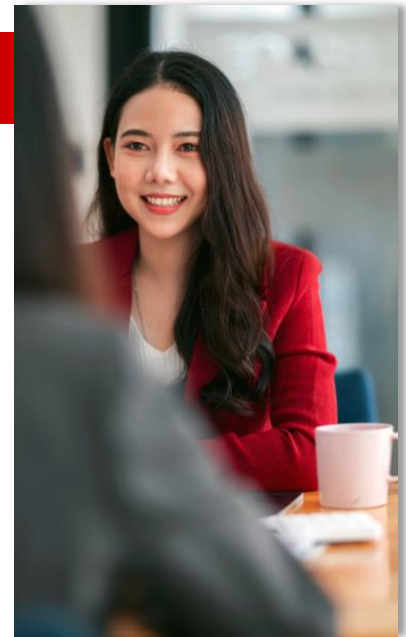
In guided discussion questions during weekly Show n Tell sessions, students are asked to speak about their evolving goals and plans for their projects, including how they are finding the experience of managing their own time.

With a focus on self-evaluation – including the questionnaires on which this study is based – P2P asks students to consider not only what they have learned about new professional opportunities but, above all, what they have learned about themselves.

Results: Career Pathways

One of P2P's primary goals is to empower more post-secondary students to pursue careers in research and/or policy in New Brunswick – to not only stay and contribute to the local economy but, even more importantly, to become leaders who can use evidence to inform the best possible decisions for the province. By providing hands-on work and training in areas of policy and research, we aim to help NB students realize their potential while introducing them to a wide range of careers that could be open to them, including careers across government.

At the end of the program, students were asked if their P2P experiences impacted their career goals. This section presents their reflections.



Student Reflections

At the end of P2P, students were asked to answer open entry questions about their perceptions and personal experiences during the program. [Table 7](#) in [Appendix B](#) presents the questions sent to students in Streams A and B, and [Table 8](#) shows the questions sent to students in Stream C.

While many student responses to these questions have been shared in the preceding section on foundational skills development, one question in particular touches on P2P's primary goal of empowering more students to stay and work in New Brunswick.

In what way(s) have your work experiences this summer changed or reinforced your future career plans?

Their responses (n = 22), shared below, show that while a number of students indicated a change in their career plans, an equal number felt their summer experiences had reinforced their interests in areas of research and academia and had supported previous career plans.

A common theme among responses is the introduction of new career pathways that students had not previously considered – and in many cases, the possibility of working in government. Overall, student responses to the impact of P2P on their career plans were positive, and even when students discovered that they might not want to pursue a certain career pathway, comments show that they found new interests and passions to take its place.

Student responses, though diverse, suggest that P2P 2023 effectively achieved its goal of introducing students to a wide range of possible career options within New Brunswick, while helping them realize their potential as valuable members of the future workforce.

It should be noted that any responses containing information that could potentially be used to identify a student have been excluded.

P2P Students' Career Interests in Government

~ I can tell with confidence that I'm on the right track. I enjoy the research process as well as the communication part. P2P also gave me something I'd never thought of: the possibility of working in the public sector.

~ Can see myself working in government now.

~ I have always envisioned myself to work for government and the public services so I hope I can fulfill those goals.

~ It opened a lot of doors for me to work in government.

~ It has shown me more opportunity to work in GNB which has swayed my initial career plan of going into the music industry. The flexibility, remote work option, the teams and projects being done at GNB are something I am interested in and am considering more seriously.

~ I now know in what capacity/position I do and do not want to work in for government.

P2P Students' Career Interests in Research

~ For one, they have shown that the research process is something I'm deeply interested in. Working with administrative data has changed the way I think about data and has led me to think about ways I can use my own background to undertake population-level research with available data. I will continue pursuing research opportunities in my studies and beyond.

~ It has definitely helped me reassure myself about my goal of becoming an academic and doing further research on things that matter, specifically in Political Science.

~ They have not really, Maybe a little more reaffirmation that I want to do research.

~ It made me become more interested in public health research.

~ It has helped me to have an idea in what ways I can use my academic knowledge of economics into the workplace and for research.

~ I'm very passionate about the current state of the healthcare system in our province. This reinforced my career plans as I'd like to continue in the research field.

P2P Students' Reflections on New Skills and Interests Impacting Future Careers

~ I realized that I want to work at a place the priorities social responsibility and equity.

~ This experience made me consider other professional pathways I had not previously known about or considered.

~ I appreciate that I am able to consider new career paths. Its also valuable to learn about companies hiring based on transferable 'soft' skills.

~ I've been able to learn more about KT and the ways in which I can make an impact. Receiving feedback has especially been valuable in the creation of my outreach materials.

~ I worked in a field completely different (when you look at it from the surface) from what i studied in school. i thoroughly enjoyed studying it and am now trying to see if it's possible to merge the 2 topics together, so i have a lot of researching and decision making ahead of me.

~ My career plans have remained the same but I think my work experience this summer has allowed me to expand my skills and gain valuable experiences that will help me succeed in my future career plans.

~ I now know that I do not want to work in data analysis in a lab setting, complete an honors at school, and apply for graduate school. On the flip side, I know that I love interpreting numbers and results of a study, writing reports, and finding evidence for policy changes.

~ I learned how much of a difference learning the skills to do a job and making strong connections can land you great jobs and it's not always just about what degree you got or what school you went to. I had a fear of "making the wrong decision" which was holding me back. Taking time off to figure things out or choosing to go to school again once I graduate wasn't a decision I had to make right now or everything else ends. There's no closing window. I have my whole life ahead of me to experiment and experience anything I want but those decisions shouldn't come out of a place of fear.

Discussion: Interpreting These Findings



While it is encouraging to see that students reported overall positive skills growth across each identified Global Competency, and responded favourably in their workshop ratings and reflections on their summer experiences, it is important to consider what we can learn from variations in their responses.

When we compare students' self-rated skills growth across each of the five competencies we investigated, we see that Collaboration skills had the most positive levels of growth across the board.

This is not a surprising outcome, as P2P is structured on a foundation of collaboration – with the success of each research project fully dependent on the ability of teams of student researchers to work together toward their goals, delegate tasks, and handle any disputes that may arise.

That being said, more students selected the absolute highest level of growth (i.e., a rating of “5”) for individual skills in other areas – specifically for Identifying patterns in data and research and Navigating changes to projects and assigned work, both classified as Critical Thinking and Problem-Solving skills.

This, on the other hand, is an interesting outcome: Workshop ratings indicate that students found the critical thinking and problem-solving workshops less useful and less interesting than workshops across other skill categories. However, students also indicated the highest levels of skills growth in this area.

A likely explanation for this is that students gained most of their critical thinking and problem-solving skills not from participating in workshops but through the hands-on, experiential component of P2P – from facing real-world problems that threatened their work and being required to come up with their own solutions to move forward. In this case, students' growth in critical thinking and problem-solving skills perfectly exemplifies the value of experiential learning as “learning through doing,” compared to students' lower levels of interest in “learning by learning.”

When we look at students' workshop preferences, we see that Self-Marketing Strategies Part 2 (Resumés and Cover Letters) received the most positive overall response – with 100% of students (n = 22) expressing that the content in this workshop was useful to their endeavours, and they wanted to learn more about the topic.

It is possible that the popularity of this workshop is due to its individual, real-world applicability. This session focused on helping students effectively portray their summer work experiences and skills growth in resumés and cover letters. Intending to help students successfully market themselves to future employers, it included breakout-room activities and required students to work together to identify their skills and explain the different types of tasks they had

accomplished – and why each was both impressive and valuable. In this case, we see the same themes of real-world applicability and skills growth through hands-on experience that appeared in the findings from students' skills evaluations above.

Finally, although student reflections touch on diverse themes and topics related to different skills, experiences and career goals, one particular theme stands out across each open entry question and response category: the theme of growth in self-awareness and self-confidence.

It quickly became apparent that while some student responses incorporated learning-focused remarks, like, "*I learned how to...*," students were more frequently using phrasing of self-discovery, such as, "*I learned I **am** good at public speaking.*" Across each skill category, samples of student responses include the realization of skills and characteristics they already possessed but had not previously had the chance to explore:

- ~ I have learned that I am capable of more things than I thought...*
- ~ I learned that I am better than I thought at time management...*
- ~ I learned that I can work under pressure and with little direction...*
- ~ I learned to trust my instincts...*
- ~ I found it interesting to learn about myself as a leader...*
- ~ I thoroughly felt like I was a valuable part of the team...*
- ~ I have more confidence in what I can bring to the table...*

Although P2P's curriculum of workshops and networking sessions can support student growth by introducing them to new forms of knowledge and strategies for completing projects, no teaching session can give students this type of introspective self-knowledge. Instead, the self-awareness students exhibit in the reflections above indicates levels of personal growth that come from the experience of taking on new tasks and challenges and discovering what they are capable of along the way. Through "doing," they not only learn about the processes of conducting research and informing policy – they also learn about their own strengths and weaknesses and begin to see potential where previously it may have been hidden.

Conclusions

The findings from the 2023 P2P student evaluation questionnaires presented in this report suggest that P2P has successfully provided students with opportunities to gain or improve skills in foundational, in-demand areas identified as crucial for the future workforce of NB – described in the Introduction as 'Global Competencies' (GNB, 2019b):

Communication	Collaboration
Critical thinking and problem-solving	Innovation, creativity and entrepreneurship
Self-awareness and self-management	Sustainability and global citizenship

The skills in which students saw the highest levels of growth appear to be those that required them to work collaboratively and address real-world problems as they arose, reinforcing the concept that the true value of experiential learning is its incorporation of experience and real-world applicability.

Student reflections on their career goals suggest that P2P has had an impact on their future plans – whether through the introduction of new career pathways or by reinforcing students' interests in different fields. While some students are now considering new pathways, and others are even more confident in pursuing their previous goals, responses suggest that by providing the opportunity to immerse themselves in different types of work experience, P2P has helped empower students with the skills and self-awareness necessary to make informed career decisions.

Above all, however, student reflections suggest that P2P has empowered them to recognize their own skills, value and potential to accomplish more than they had previously thought themselves capable of – and it is our goal that students will draw on their growing levels of self-confidence to see their ability to contribute to their local communities as the future leaders and decision makers of New Brunswick.

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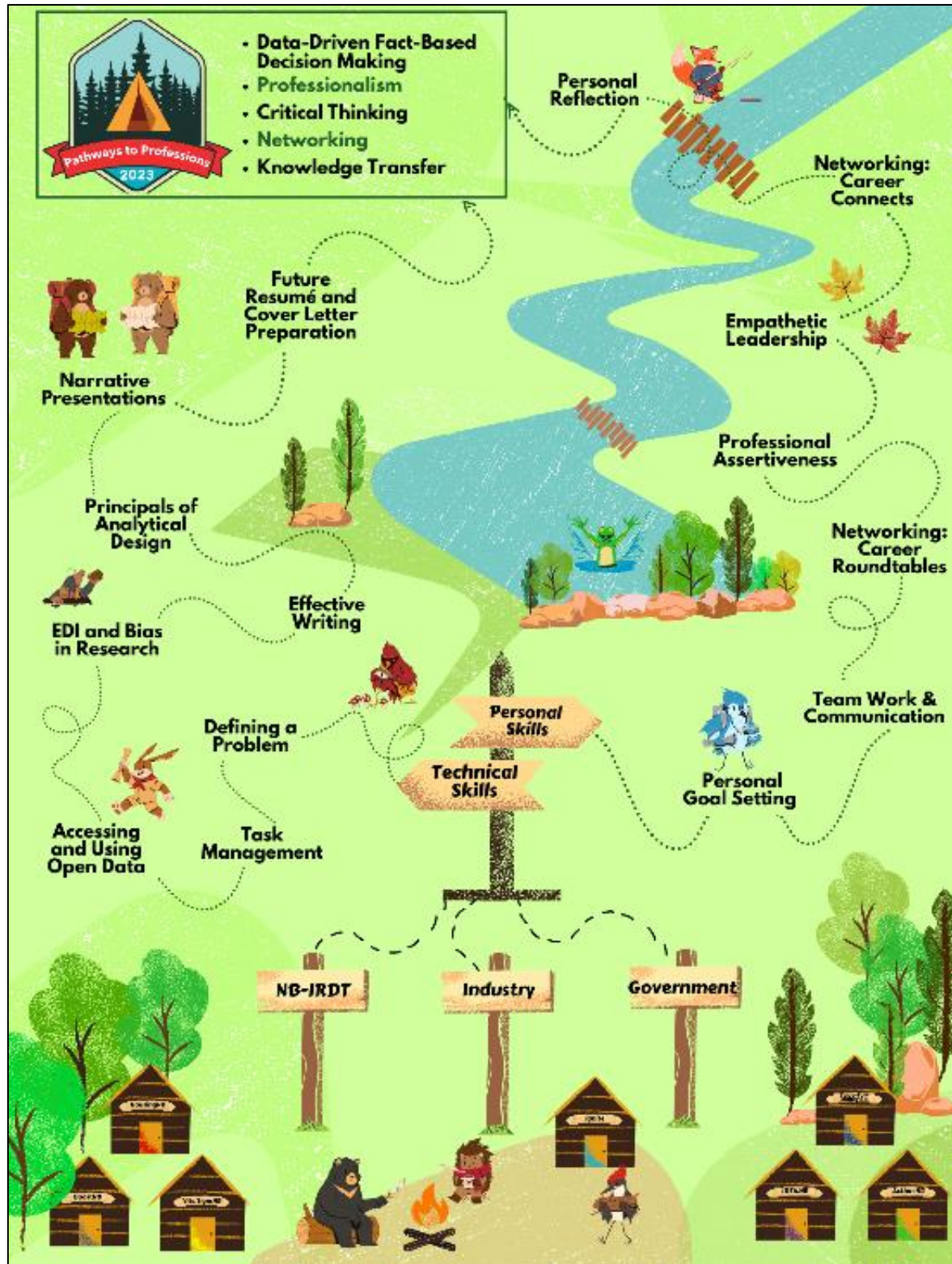
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Appendix A: Student Pathways

Figure 6: 2023 Visualization of P2P Student 'Pathways'



Appendix B: Evaluation Questionnaires

Table 3: Session Evaluation Questionnaire

Workshops	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Overall, I enjoyed this session.					
I believe that the presenter was knowledgeable on the topic.					
I believe the presentation was well-organized.					
The information will be useful to my work, research, and/or educational plans.					
If this session was offered to the public – I would recommend it to others.					
I would like to learn more about this topic.					
I feel this workshop was an overall benefit to me.					
This session was scheduled for a time during the summer where I felt it benefited myself and my team's progression through our research tasks and deliverables.					

Career Connects	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Overall, I enjoyed this session.					
The conversation gave me a new insight into my own educational plans.					
I would be interested in working in *career area*.					
I have reached out to *presenter* (via email or LinkedIn)					

In your opinion – should this session be included in the 2024 P2P plan?	No	Yes
Open Ended (optional) – Please let us know what you thought of this session, the presenter, and content. You can use this space to elaborate on any of your above responses.		

Table 4: Questionnaire for Student Self-Evaluation of Professional Skills Development Due to Participation in P2P 2023

	Levels of Improvement					
	None					High
	0	1	2	3	4	5
Overall Communication						
Public Speaking						
Sharing complex topics in an accessible way						
Sharing the importance of your work						
Storytelling as a way to engage others						
Overall Collaboration						
Personal Time Management						
Tracking tasks and deliverables						
Peer to Peer Feedback						
Conflict resolution within a team						
Strength identification in others						
Overall Critical Thinking / Problem Solving						
Navigating changes to project and assigned work						
Problem Identification / Definition						
Identify patterns in data and research						
Searching out relevant and useful information						
Overall Self-Awareness / Self-Management						
Personal Reflection						
Self-Marketing						
Not internalize feedback as failure (accept feedback as a pathway to growth)						
Self Motivation						
Goal Setting						
Organizational Skills						

Self-Confidence						
Overall Innovation, Creativity, and Entrepreneurship						
Growth of professional network						
Professional Appearance						
Creating visuals and graphics						
Problem Evaluation						

Table 5: "I-statement" Questions Distributed for Student Evaluation of P2P

Questions Distributed to Streams A, B, and C	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I reached out to P2P presenters and career connect interviews.					
This summer has made me reconsider my current career pathway in a positive way.					
This summer has reinforced my current career pathway in a positive way.					
Overall, I had a positive working experience.					
I fully understood why the P2P program was created.					
I made valuable connections during the program.					

Questions Distributed to Streams A and B only	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
My research team met regularly outside scheduled meetings.					
My research team all supported each other.					
I felt that the work I was completing over the summer was valuable to my Project Lead.					
Overall, I enjoyed my experience working as part of the Pathways to Professions program.					
I enjoyed working on a research project that had specific ties to NB.					
I felt connected to the other students in the program who were not on my research team.					
I felt supported by my Mentor and the P2P Admin Team.					
I knew what I was supposed to be working on each week and was never confused about the tasks laid out for me.					
I fully understood what role was going to be when I was hired for the Program.					

Table 6: Questions Distributed for Students' Program Ratings

Questions Distributed to Streams A, B, and C					
Please rate the following parts of the P2P program based on your personal experience overall.	Poor	Fine	Good	Great	Amazing
The P2P Program overall					
P2P skill building workshops					
P2P Networking opportunities (Career Connects)					
Overall, my experience in P2P was...					

Questions Distributed to Streams A and B Only					
Please rate the following parts of the P2P program based on your personal experience overall.	Poor	Fine	Good	Great	Amazing
Virtual Work Environment					
Communication of Tasks and Deliverables					
Would you recommend Pathways to Professions to other students you know?	Yes		No		

Table 7: Open Entry P2P Evaluation Questions Distributed to Streams A and B

(Streams A + B) Open Entry Questions (students can provide as much or as little information as they would like)	
1.	Was the experience what you were expecting? In what ways did it align and/or differ?
2.	Reflecting on your summer, including your personal goals, what did you learn about yourself? What would you do differently if you could do it again?
3.	For you, what was the most valuable aspect of your time in the Pathways to Professions program going into your career journey?
4.	What are your top three and lowest three sessions from the summer? (These can be ranked based on personal interest in the content, engagement in the topic, and/or overall impact the session had on you)
5.	In what way(s) have your work experiences this summer changed or reinforced your future career plans?
6.	In what ways do you believe the Pathways to Professions program could be improved?
7.	Open area to elaborate on anything from above, anything you wanted to express that we didn't leave room for, and/or any extra comments you would like to leave.

Table 8: Open Entry P2P Evaluation Questions Distributed to Stream C

(Stream C) Open Entry Questions (students can provide as much or as little information as they would like)	
1.	What were your top 3 and bottom 3 P2P workshops of ALL the content you
2.	Stream C curriculum included goal-setting, identifying core values, assertiveness, and reflection – are there any other stream C specific sessions that you would have liked to have included?
3.	What did you enjoy about your P2P experience this summer? Please list everything that comes to mind.
4.	What could we do to improve your P2P experience? Please list everything that comes to mind.