

The Mitacs logo is displayed in white on a blue background. It features the word "Mitacs" in a bold, sans-serif font, with a small white dot above the letter 'i'.

Mitacs

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Inspirer l'innovation*

Mitacs Accelerate and Elevate Outcomes: Supervisors Survey

Mitacs Evaluation

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Acknowledgements

This evaluation report is the result of voluntary feedback from a sample of Mitacs' past Accelerate and Elevate supervisors. Mitacs is grateful to all the study participants. The perspective of our university professors is invaluable to understanding how experiential learning programs like Mitacs Accelerate and Mitacs Elevate help transfer knowledge from our universities and build connections between industry and academia.



Executive Summary

Report Objectives

The goal of this report is to present findings from a recent longitudinal survey of Mitacs academic supervisors. This survey allowed Mitacs to capture intermediate and long-term outcomes and impacts of its Accelerate and Elevate programs.

These results demonstrate the significant and tangible impact that our programs are having at our partner universities.

Key Results

- The majority (over 90%) of Accelerate and Elevate supervisors would recommend the programs and would use them again
- At least half of the projects conducted by Accelerate and Elevate supervisors surveyed would have not have been possible without Mitacs' support
- 70% of Accelerate supervisors and 66% of Elevate supervisors reported the programs significantly contributed to the advancement of their industrial research program
- Over 70% of Accelerate and Elevate supervisors believe the programs have prepared graduate students and postdoctoral fellows for a variety of career paths
- More than two-thirds of Accelerate and Elevate supervisors continued developing the research from the projects
- Over half of supervisors from both programs recruited new graduate students or postdoctoral fellows
- 63% of Accelerate supervisors and 60% of Elevate supervisors continued to formally collaborate with their partner organizations after completion of their Mitacs project
- As a result of their participation, 82% of Accelerate supervisors and 80% of Elevate supervisors will engage in future collaborations with the private sector

Conclusion

The Mitacs Accelerate and Mitacs Elevate programs allow university professors the opportunity to collaborate on a research project with the private sector that may not have been possible otherwise. Both Mitacs programs contribute to the success and growth of university researchers, with new graduate students recruited and significant advancements made to research programs. Mitacs fosters collaborations between academic researchers and private-sector partner organizations, and these collaborations continue to grow after the completion of the projects.



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Introduction

Context

Since 1999, Mitacs has worked to promote Canadian innovation by mobilizing researchers and building new partnerships across sectors. To date, Mitacs has enabled thousands of unique research projects in communities across the country. To ensure that these projects are having a meaningful impact on the Canadian innovation landscape while providing the best possible results for our partners' investments, we continuously monitor and measure the performance of our programs. This involves regularly reaching out to past program participants to collect data on the outcomes of the program. The results presented in this report reflect our commitment to transparent monitoring and evaluation practices as we strive to support researchers and boost innovation in Canada.

Objectives

The goal of this report is to summarize and present findings from a recent longitudinal survey of Accelerate and Elevate supervisors. The survey allows Mitacs to capture intermediate and long-term outcomes and impacts of its Accelerate and Elevate programs. The results supplement the data that is collected through participant exit surveys, which are limited to immediate program satisfaction, outputs, and short-term participant outcomes.

These results demonstrate the significant and tangible impact that our programs are having on our partner universities. The results will also be used internally to inform program improvements and identify new or changing client needs.

Report Format

Survey results are presented according to the program in which the respondents participated. The survey collected data from supervisors who participated in Accelerate, Elevate, as well as those supervisors who participated in both programs. For the majority of figures in the report, results are presented by program.

The report first presents respondent demographics, by program, followed by overall program satisfaction. Then the report explores the specific impacts and outcomes of each of the programs from the perspective of supervisors. Finally, the report examines the extent to which the programs have influenced or changed the behavior of supervisors.

Methodology

Design

The survey instrument was designed by the Mitacs Evaluation Team, and reviewed and tested by representatives from multiple Mitacs departments. The survey was created, managed, and distributed using FluidSurveys.

Distribution

The list of survey participants was created using the Accelerate and Elevate program database. All Accelerate and Elevate supervisors who participated in the program between 2003 and 2015 were targeted. The survey instrument was distributed to 2,127 supervisors by email.

The survey was active between March 31 and April 21, 2016. A first reminder targeting all supervisors who had not completed the survey was sent on April 13, and a final reminder was sent on April 20. The original email invitation and subsequent email reminders outlined survey goals and procedures.

Response Rate

A total of 656 supervisors responded to at least one question of the survey, and 528 respondents completed the questionnaire (an overall response rate of 31%, see Table 1). The sample is also representative of all supervisors who



have participated in the Mitacs programs (Table 2). Note that “Accelerate-only supervisors” refers to those who have participated only in Accelerate, “Elevate-only supervisors” refers to those who have participated only in Elevate, and “Accelerate and Elevate supervisors” refers to those who have participated in both programs.

Table 1: Response rates of Accelerate and Elevate supervisors survey

	Total	Overall number of surveys filled	Complete surveys only	Response Rate Overall	Response Rate Complete Only
Accelerate and Elevate Supervisors	2,127	656	528	31%	25%

Table 2: Comparison of the survey sample to the population

	Total	Accelerate-only supervisors	Elevate-only supervisors	Accelerate and Elevate supervisors
Population (supervisors)	2,127	89%	6%	5%
Sample (number of respondents, complete surveys)	528	77%	8%	15%

Data Analysis

This report summarizes data collected from distinct groups of Mitacs program participants. It should be noted that although Accelerate and Elevate results are presented together, individual program performance should not be assessed by directly comparing data from the two programs, as each program has unique objectives and activities. However, basic statistical analysis (Chi-squared (χ^2) test, * $p < 0.05$) was performed on the data shown in Figures 5 to 14, and 17 to 21 in order to highlight any program-specific feature or effect on academic supervisors. Unless otherwise specified, the demographic responses for those supervisors who indicated participation in both programs are divided between Accelerate and Elevate.



Results

Demographics

As mentioned in the Report Format section, Accelerate supervisors and Elevate supervisors were surveyed simultaneously, as were supervisors who had participated in both programs. Figure 1 shows the distribution of program participation of supervisors. The higher number of respondents who indicated participation in Accelerate is representative of the Mitacs supervisor population. While the Elevate program has existed since 2010 and admits only postdoctoral fellows as trainees, Accelerate has been in operation since 2003 and is open to graduate students as well as postdoctoral fellows.

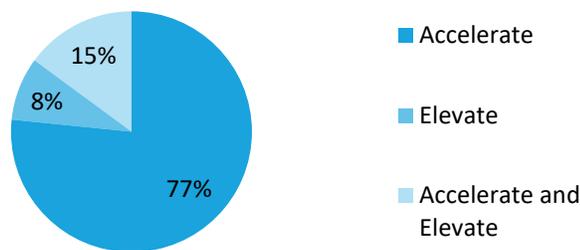


Figure 1: Participation of supervisors by program

In terms of academic area of expertise, Figure 2 presents the top five disciplines identified by respondents. As shown, 42% of respondents come from the Applied Sciences disciplines, with 18% and 13% representing other disciplines (including Business, Mathematical Sciences, Earth Sciences, and Arts & Humanities) among Accelerate and Elevate supervisors, respectively. These results are aligned with the most recent distribution of academic disciplines among Mitacs program participants, as shown in last year's annual report¹.

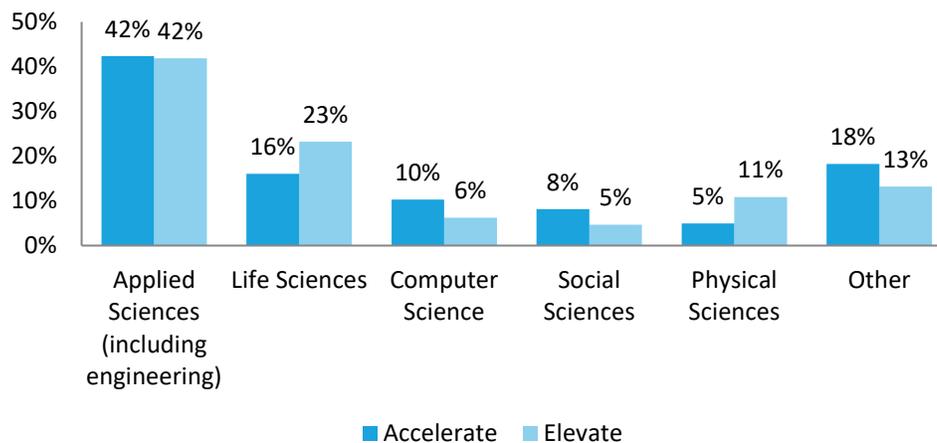


Figure 2: Academic discipline of Accelerate and Elevate supervisors

¹http://www.mitacs.ca/sites/default/files/uploads/page/mitacs_annual_report_to_innovation_science_and_economic_development_201.pdf



The majority of respondents who first supervised an Elevate fellow reported their initial participation between 2009 and 2015 (Figure 3), while Accelerate supervisors indicated that their first Accelerate project occurred as early as 2004. Both programs experienced exponential growth in terms of number of participants between 2011 and 2015, which is reflected in the data below.

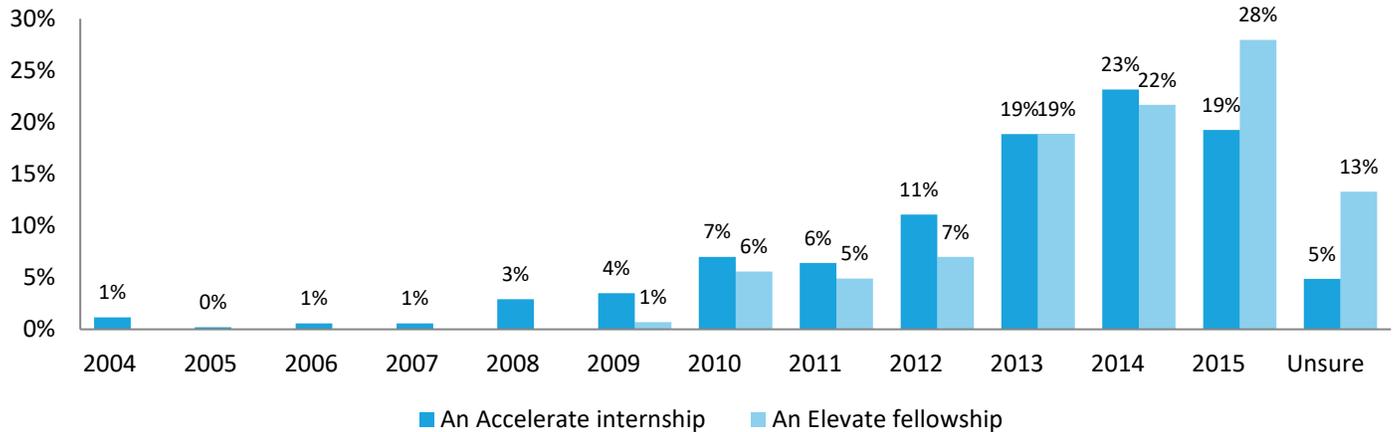


Figure 3: Year in which supervisors first participated in Accelerate/Elevate

Overall, 89% of respondents participated in Accelerate and/or Elevate in Ontario, Québec, British Columbia, or Alberta (Figure 4). The high number of respondents from these provinces is largely explained by graduate students and postdoctoral fellows' distribution across Canada, as well as the availability of program-specific provincial funding.

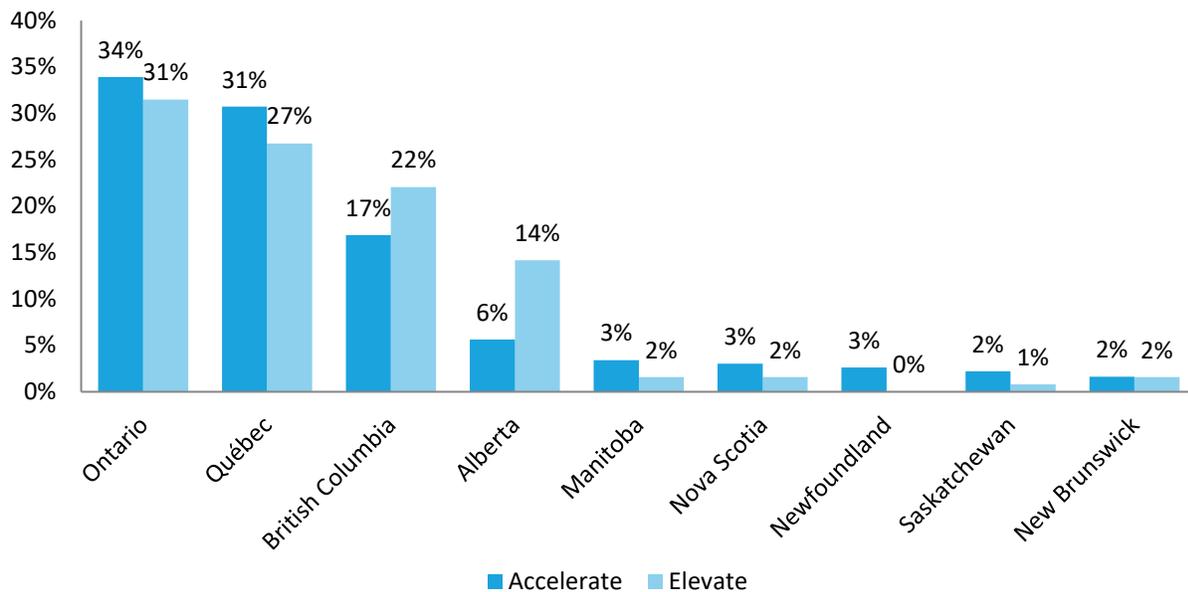


Figure 4: Province in which supervisors participated in Accelerate and/or Elevate



Overall Program Satisfaction

The willingness of academic supervisors to recommend the program or use the program again can serve as proxies to assess their satisfaction with the programs. Based on both criteria, the vast majority of supervisors are satisfied with the Accelerate and Elevate programs (Figure 5).

However, there is a significant difference in Accelerate and Elevate supervisors' willingness to participate in the program again. The two most common reasons provided by Elevate supervisors for not wanting to use the program again relate to supervisors' upcoming retirement and the higher financial contribution required by the partner organization. This discrepancy may also be explained in part by differences in flexibility of the two programs; Elevate requirements are more rigid than those of Accelerate in terms of project length and education level of the intern. Among respondents, 59% Accelerate supervisors and 21% Elevate supervisors indicated that they had participated in more than one research project for either program (data not shown).

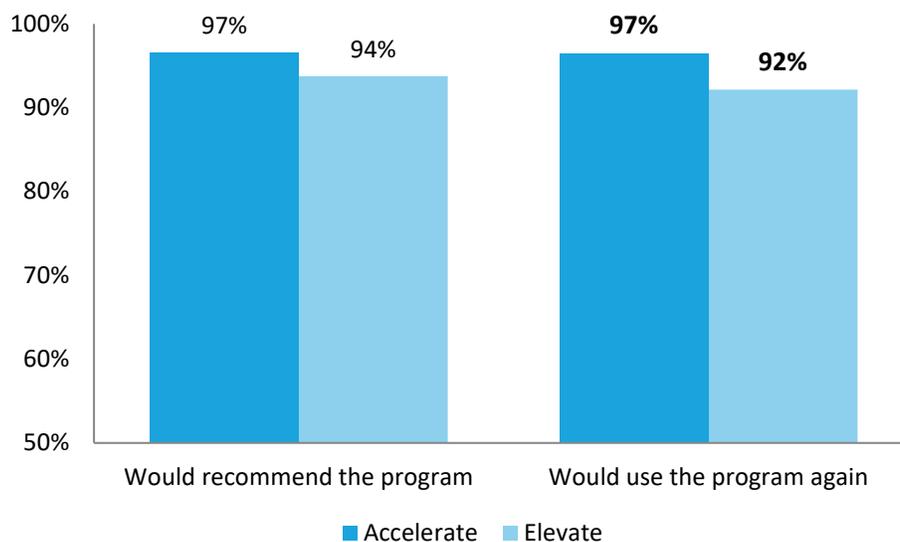


Figure 5: Academic supervisors who would recommend and use Accelerate/Elevate again (percentages in bold are $p < 0.05$)

Outcomes

The intended outcomes of Accelerate and Elevate are similar. In general, both programs aim to increase collaboration and knowledge transfer between academia and industry, enhance the skills of interns and postdoctoral fellows, increase the nature and extent of research linkages, improve the employability of the intern or fellow, and facilitate the discovery of innovative solutions to industry research challenges.

In this report, many of the findings relate to these intended outcomes. In addition, some unintended or additional outcomes are presented. This subsection outlines research outcomes, business outcomes, and training opportunities for graduate students and postdoctoral fellows.



Research outcomes

The Accelerate and Elevate programs are built around a central research project of mutual interest for the academic researcher and the partner organization. As such, one of the first questions we asked Accelerate and Elevate supervisors was about the extent to which the program(s) played a role in the realization of the project. As shown in Figure 7, in the absence of Accelerate and Elevate, only 5% and 3% of projects, respectively, would have occurred with a similar scope. For both programs, at least half of the projects would not have been possible (either not started or canceled) without the support offered by Mitacs.

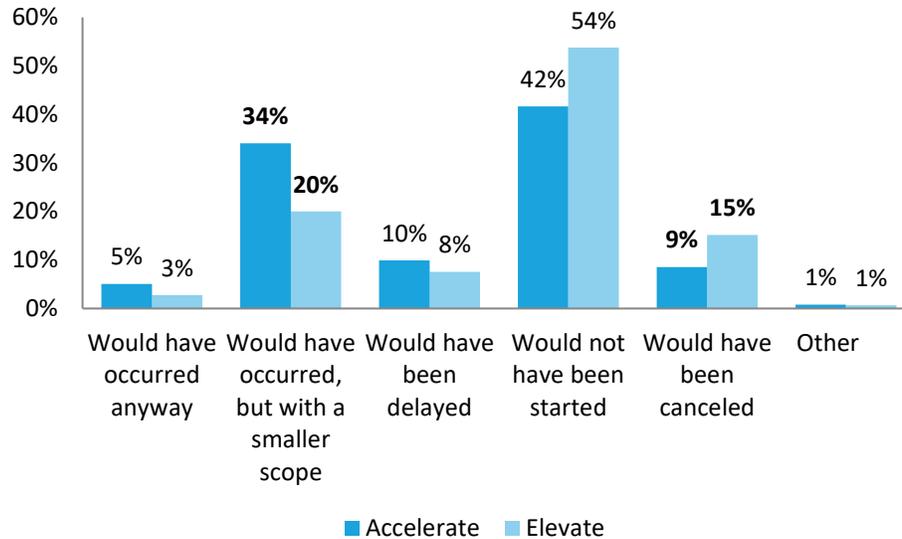


Figure 6: Extent to which research projects would have been possible in the absence of Accelerate and Elevate (percentages in bold are $p < 0.05$)

Not only would it seem that the programs help facilitate the proposed research projects, but in many cases, results from that initial Mitacs project inspire or inform subsequent research led by the Accelerate and Elevate supervisors. Almost two-thirds of supervisors reported the results from the first project inspired/informed subsequent research projects, to a fairly great extent or more (Figure 8).

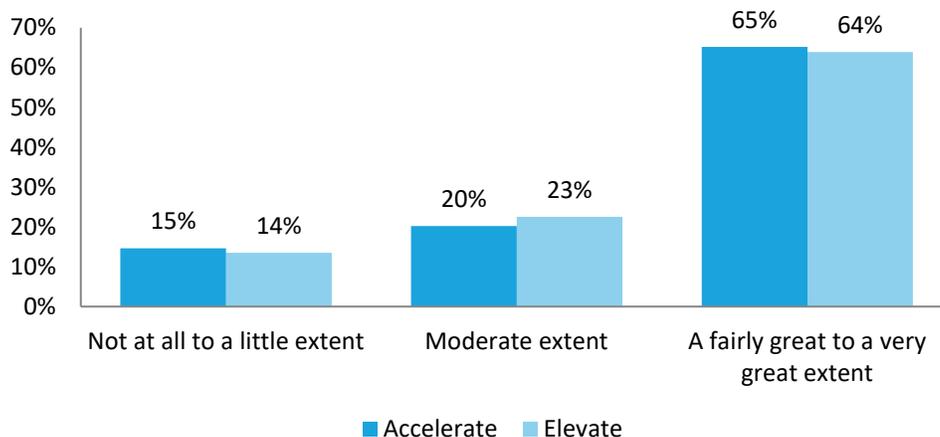


Figure 7: Extent to which results from the project inspire or inform subsequent research projects



Both programs build connections with organizations outside academia and allow professors to make progress on their research and apply it to industrially relevant problems. Figures 9 and 10 show the extent to which each program contributed to the advancement of supervisors' academic and industrial research programs, respectively. To a moderate extent or more, at least 84% of supervisors said the programs contributed to the advancement of their academic research programs (Figure 9), while at least 89% of respondents said the programs contributed to the advancement of their industrial research program, to a moderate extent or more (Figure 10).

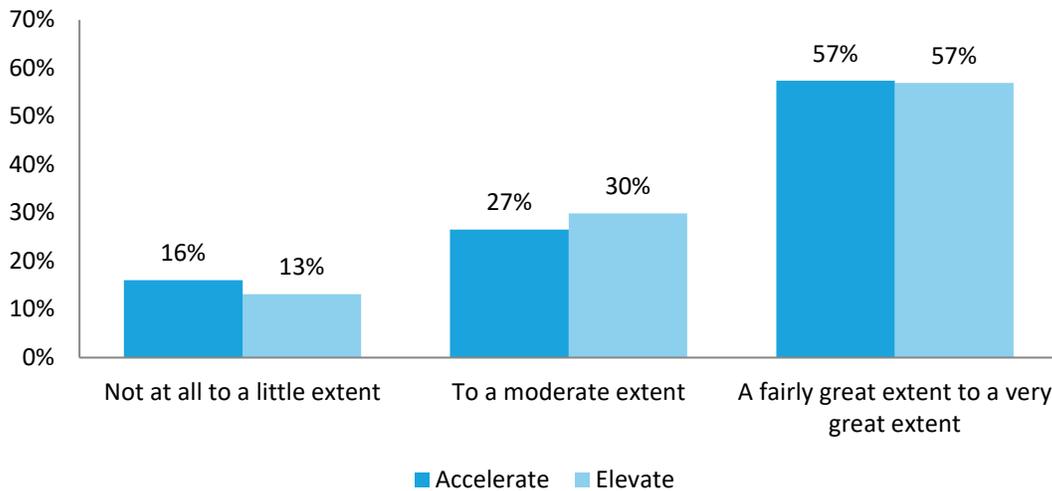


Figure 8: Extent to which Accelerate/Elevate contributed to the advancement of supervisors' *academic* research program

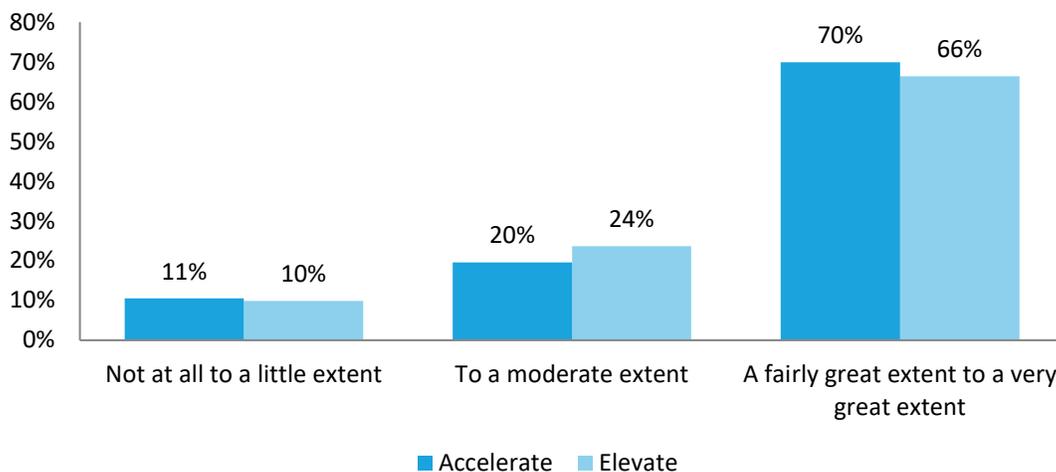


Figure 9: Extent to which Accelerate/Elevate contributed to the advancement of supervisors' *industrial* research program

In order to find out more about the advances made to supervisors' research programs, we asked about the types of research outcomes that occurred as a result of their participation. As seen in Figure 11, 71% of supervisors who participated in Accelerate indicated significant progress was made on a research problem, compared to 81% of Elevate supervisors. This is the only area within the reported research outcomes where a statistically significant difference is

observed between the Accelerate and Elevate programs. This may be explained by the difference in length of the projects and/or by the extent to which a postdoctoral fellow can contribute to a project compared to a graduate student. More than half of the supervisors in both programs reported new research directions, publications, and opportunities to present their research as a result of their Accelerate or Elevate project.

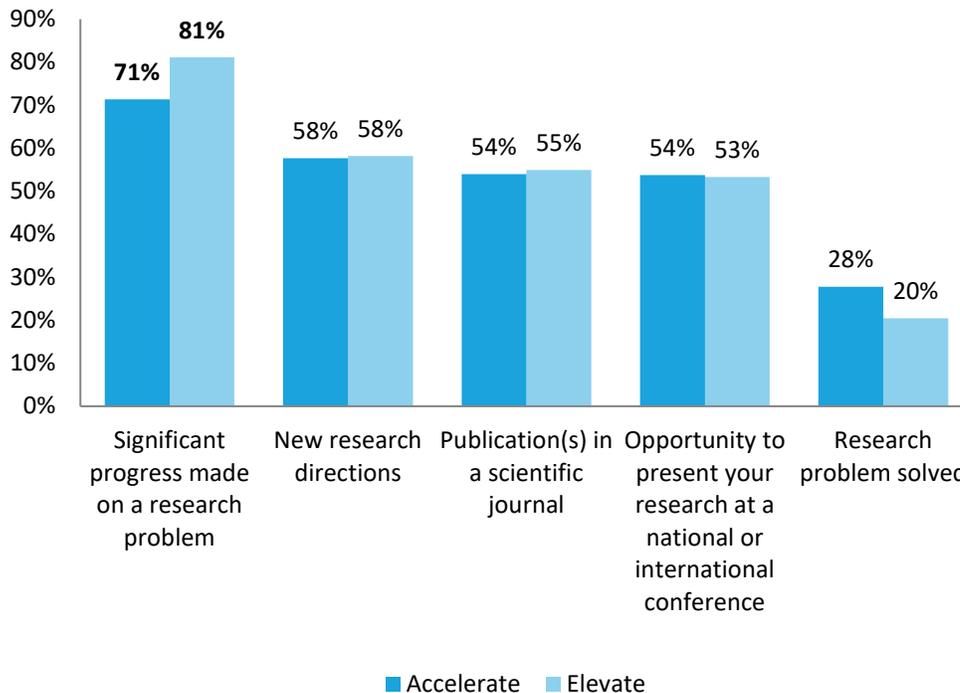


Figure 10: Research outcomes as a result of the Accelerate and Elevate programs, according to supervisors (percentages in bold are $p < 0.05$)

Business outcomes

The Accelerate and Elevate projects resulted in other benefits outside the realm of academia. Significant, tangible outcomes such as commercialization are a goal of both the Accelerate and Elevate programs. Figure 12 shows that approximately a third of Accelerate and Elevate supervisors surveyed have commercialized, or are in the process of commercializing, the results of the project, while another third anticipate that the results will be commercialized. These findings are strongly comparable to the views expressed by Accelerate industry partners on the same question².

² <http://www.mitacs.ca/en/newsroom/publication/mitacs-accelerate-industry-survey>



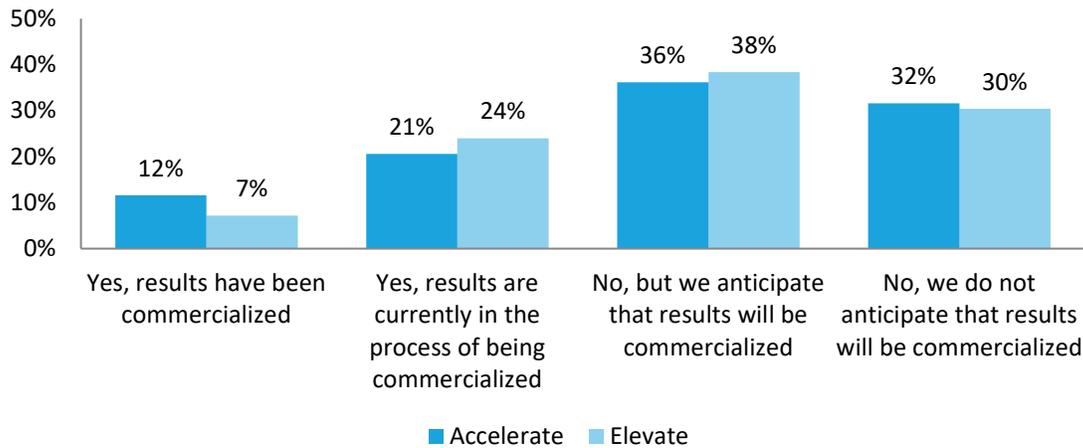


Figure 11: Commercialization outcomes of the Accelerate/Elevate program

Over 50% of respondents from both programs reported that new or enhanced processes were developed, over 40% developed a new or enhanced product, and nearly a third developed a new or enhanced service (Figure 13). Other business outcomes included patent (13%) and license applications (4% and 8%).

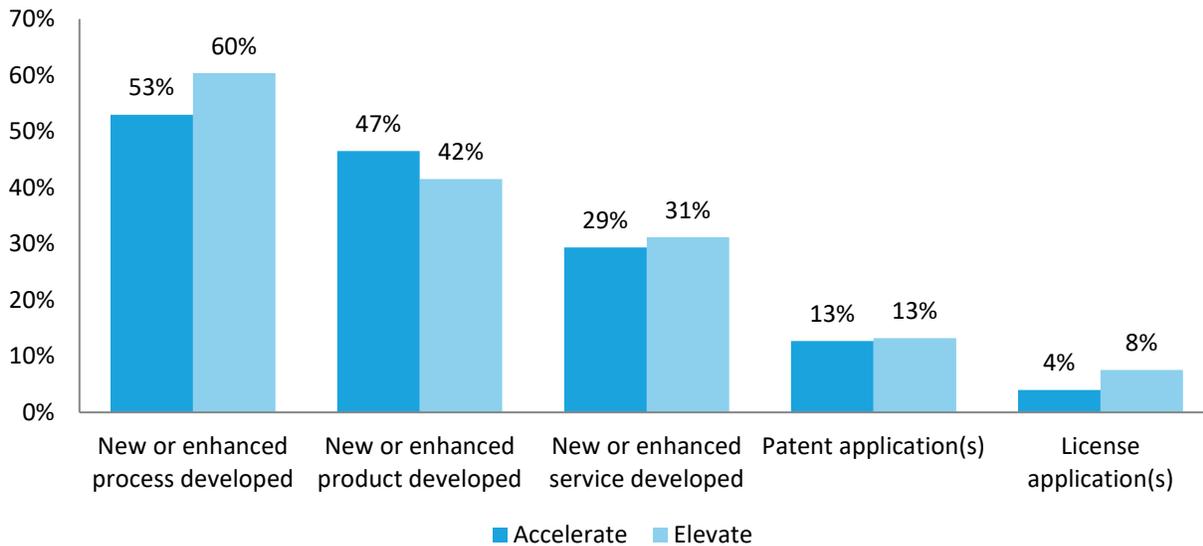


Figure 12: Commercialization outcomes as a result of the Accelerate and Elevate programs, according to supervisors

To summarize, Accelerate and Elevate supervisors reported multiple beneficial outcomes as a result of the projects, from both a business perspective and a research perspective. In the next section, we examine some of the intangible benefits of the programs, in particular those specific to the Elevate training program.

Training opportunities for graduate students and postdoctoral fellows

One major difference between the two programs is the training courses developed for postdoctoral fellows participating in Elevate. Although Accelerate interns have opportunities to attend several free Mitacs professional development



workshops, Elevate fellows follow a specific research management training program that is a mandatory component of their fellowship.

Regardless, both programs offer interns and fellows the opportunity to work on industry and community-relevant research problems through interaction with partner organizations. Research shows that university students believe work-integrated learning opportunities positively impact their career opportunities as they transition to the workforce³, whether to a role in academia or a position in the private, public, or not-for-profit sectors.

One of the additional outcomes of both programs is an increased awareness amongst interns and fellows of alternative career options and the skills required to pursue these options. When asked if the programs have prepared interns and fellows for a variety of career paths, over 70% of supervisors from both programs indicated that this experience definitely prepared their interns and fellows for a variety of career paths (Figure 14).

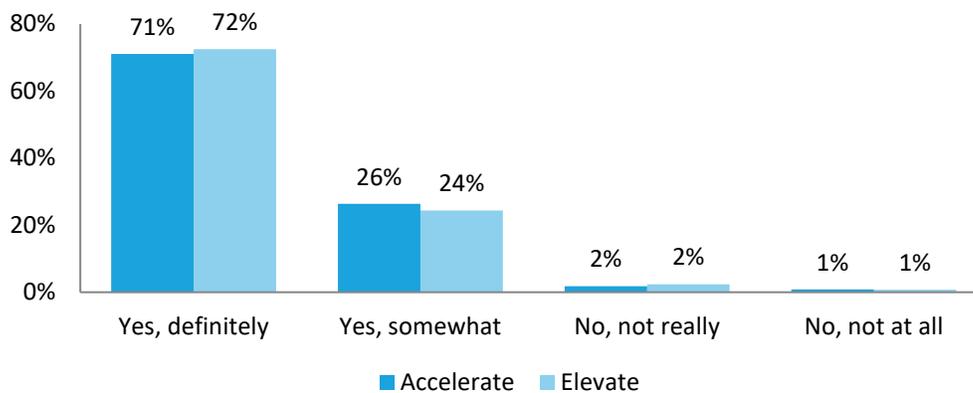


Figure 13: Supervisors who believe Accelerate and Elevate have prepared the graduate students and postdoctoral fellows for a variety of career paths

Data from a recent survey of Elevate fellows supports the responses from Elevate supervisors. Almost half (43%) of Elevate fellows surveyed indicated that their career goals have changed since beginning their fellowship. Of those Elevate fellows whose career goals have changed, 66% cited industry/private-sector research as a new career goal.⁴

Taking into account the tailored Elevate research management training curriculum, we asked respondents who supervised an Elevate fellow to rate the extent to which they observed an increase in certain proficiencies and attributes of the fellows. At least 75% of Elevate supervisors surveyed observed an increase in all of the key competencies outlined in the research management training courses (Figure 15). Supervisors noted that the top three skills developed by Elevate fellows as a result of program participation are the ability to conduct research to address private-sector problems, communication skills, and creative and critical thinking (Figure 15).

³https://forum.academica.ca/forum/the-ideal-wil-experience?utm_source=Academica+Top+Ten&utm_campaign=bd6a667a10-EMAIL_CAMPAIGN_2017_01_13&utm_medium=email&utm_term=0_b4928536cf-bd6a667a10-51914365

⁴<http://www.mitacs.ca/en/newsroom/publication/mitacs-elevate-outcomes-fellows-survey>



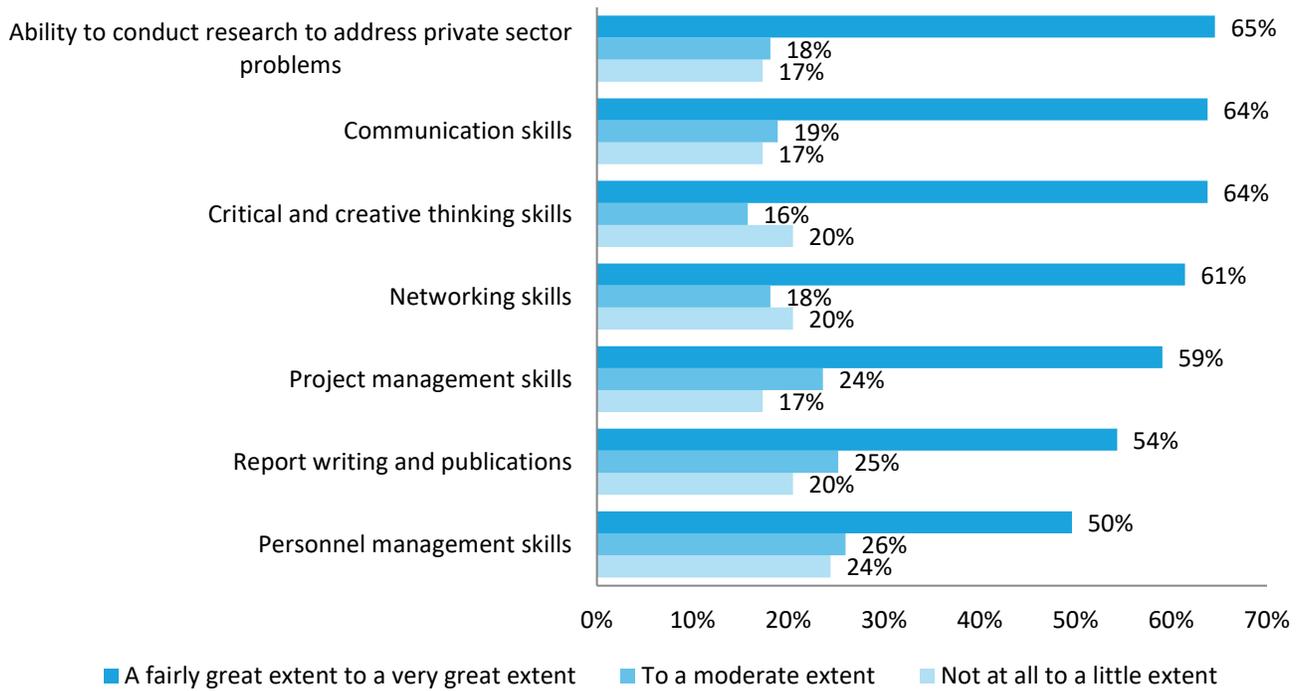


Figure 14: Extent to which Elevate supervisors observed an increased proficiency in skills and attributes

When Elevate supervisors were asked whether they consider the research management training to be a valuable component of the Elevate program, 88% agreed that it was valuable, to a moderate extent or more (Figure 16).

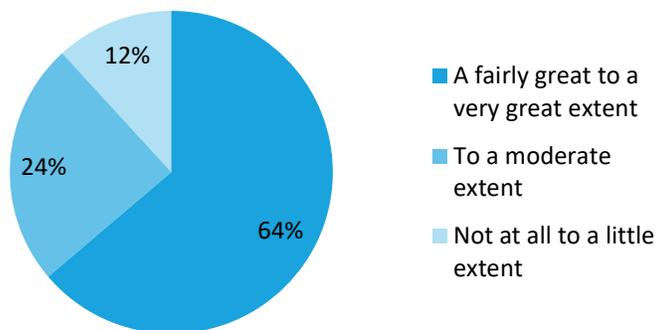


Figure 15: Extent to which Elevate supervisors consider the research management training to be a valuable component of Elevate

Behavioral Changes

Along with tangible outcomes such as patent applications and skills development, Accelerate and Elevate aim to change the behavior of all program participants, including academic supervisors and industry partners. Both university-based



programs seek to increase and strengthen the relationships between universities and industry through cooperative innovation. Supervisors surveyed report to have made changes to the way they conduct research and plan to make more changes in the near future. Over two-thirds of Accelerate and Elevate supervisors continue to develop research from the project, and more than half have increased the amount of interactions with industry and private organizations (Figure 17). When asked about their intentions, at least 57% of Accelerate and Elevate supervisors plan to continue developing research from the project, acquire more or new sources of funding, and increase the amount of interactions with industry and private organizations (Figure 18).

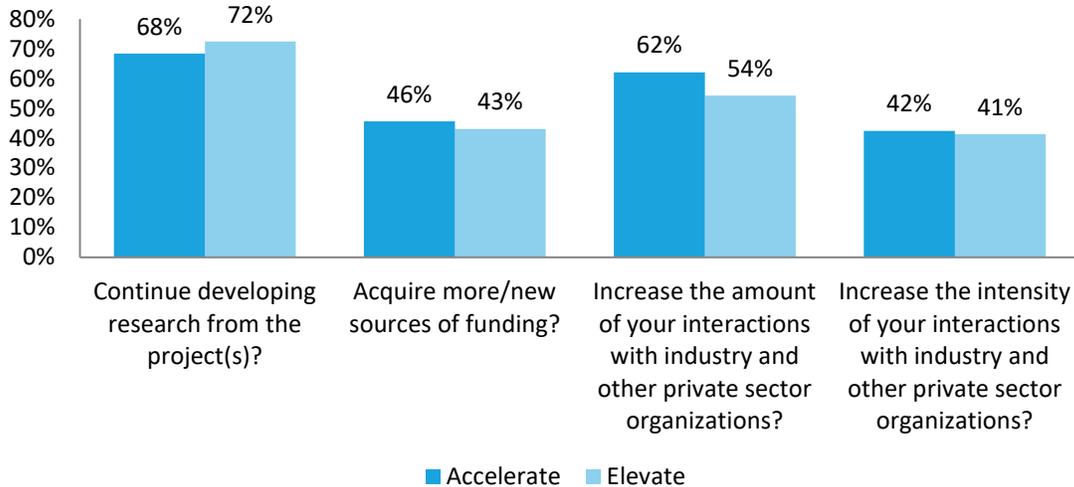


Figure 16: As an academic supervisor, did you...

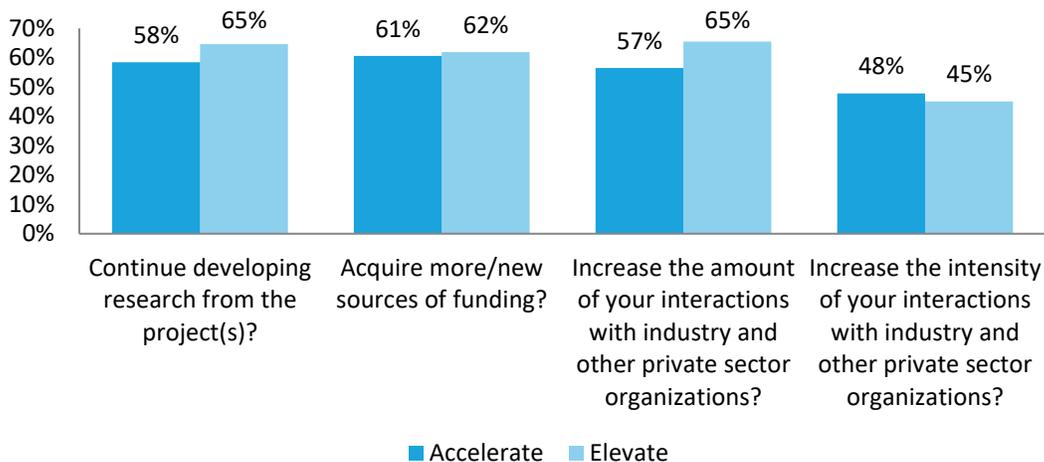


Figure 17: As an academic supervisor, do you intend to...

With continued and expanded research, the question arose about whether supervisors were making any changes to the way they worked with graduate students and postdoctoral fellows, given that expanded research often requires more qualified researchers. Nearly 60% of supervisors said they have recruited new graduate students or postdocs, and more than 70% reported having retained graduate students and postdocs (Figure 19).



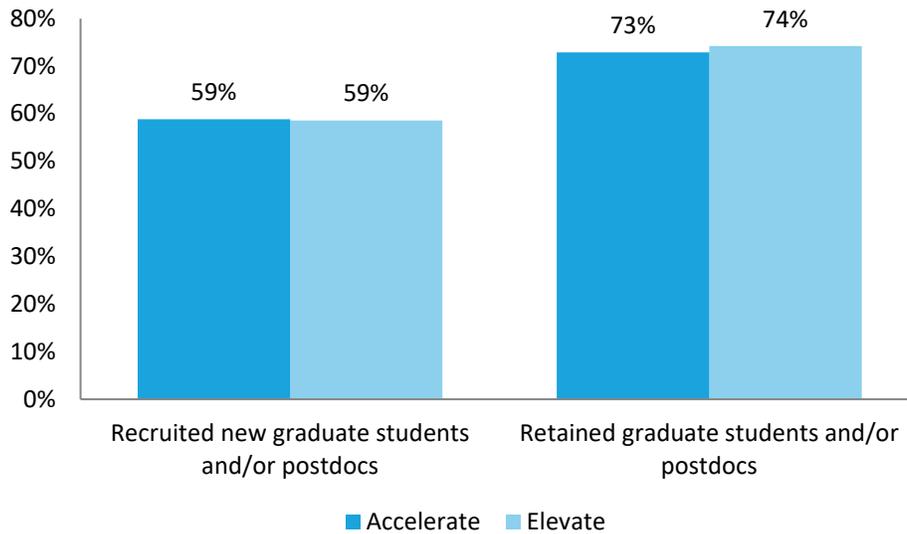


Figure 18: Supervisors who recruited new/retained graduate students/postdocs as a result of program participation

With regards to their interactions with partner organizations, supervisors were asked if they have continued collaborating and interacting with their partner organization, and whether they have engaged in new collaborations with other organizations. Sixty percent of Accelerate and Elevate supervisors surveyed continue to collaborate formally with the partner organization, and more than a third of supervisors from both programs have engaged in new collaborations with other private-sector organizations (Figure 20).

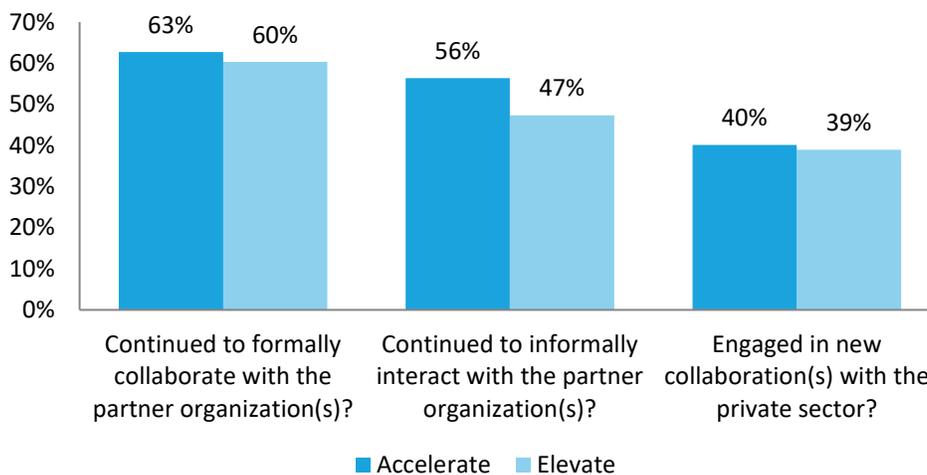


Figure 19: Supervisors' collaboration practices as a result of program participation

The majority of supervisors from both programs indicated that it is likely or very likely that they will engage in future collaborations with the private sector (Figure 21). This type of behavior is an intended long-term outcome of both programs.



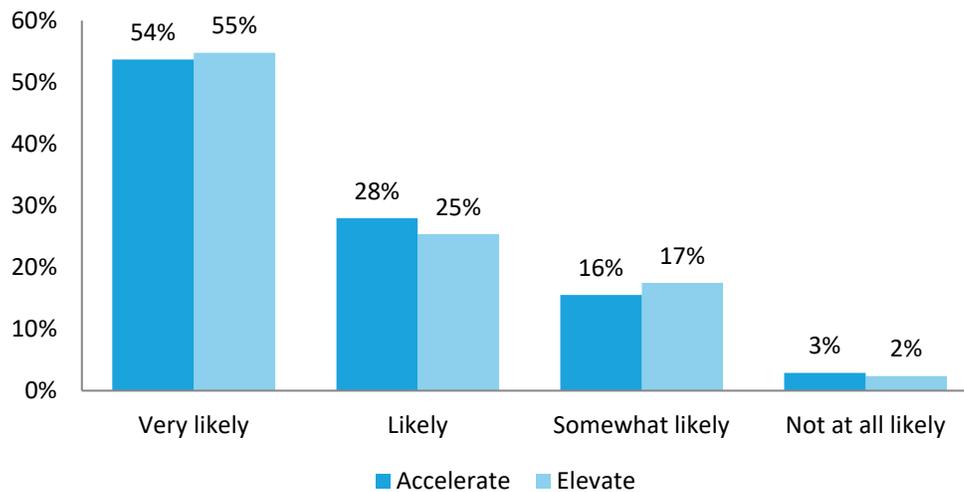


Figure 20: Likelihood that supervisors will engage in future collaboration activities with the private sector as a result of Accelerate/Elevate program participation

Finally, the survey instrument asked about the opinions held by Accelerate and Elevate supervisors on collaborations with the private sector prior to their participation in the program(s), and how their participation in the program(s) affected their initial perceptions. The majority of supervisors surveyed held a positive opinion about collaborations with the private sector prior to program participation, with 78% of respondents viewing this type of collaboration as either fairly valuable or very valuable (data not shown).

When asked if their perceptions about this have changed since participating in Accelerate or Elevate, 79% of supervisors now see more value in collaborations with the private sector, regardless of their initial opinions prior to a Mitacs project. Those who did not view this type of collaboration as valuable initially now see it as more valuable, as do those who already viewed private-sector collaborations as valuable opportunities for university researchers.



Conclusion

Supervisors from both programs have reported benefits to their research programs and new connections with the private sector. Accelerate and Elevate allow university researchers to collaborate on mutually beneficial projects with the private sector, which may not have been possible otherwise. Both Mitacs programs contribute to the success and growth of university researchers, with new graduate students recruited and significant advancements made to research programs. Mitacs fosters collaboration between academic researchers and private-sector partner organizations, and these collaborations continue to grow after the completion of the project.

