

# **REVIEW OF FEDERAL SUPPORT TO RESEARCH AND DEVELOPMENT: EXPERT PANEL CONSULTATION PAPER**

## **ALGONQUIN COLLEGE'S RESPONSE TO THE CONSULTATION QUESTIONS**

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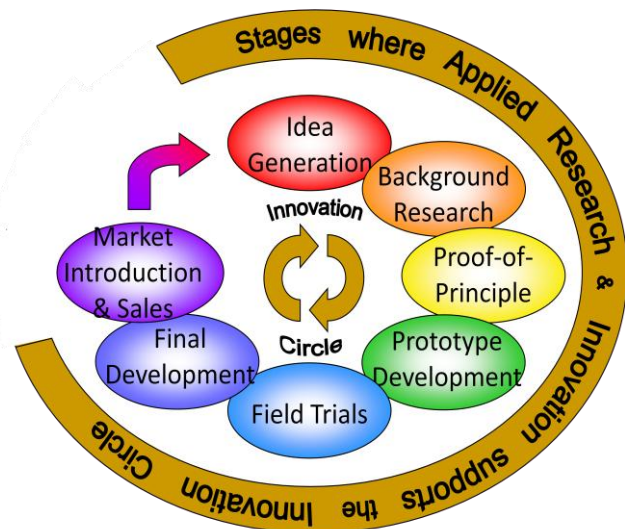
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**1. In addition to the R&D activity defined by the OECD, should government be funding other business activities related to the commercialization of R&D? If so, what and why?**

Yes. Business Innovation encompasses more than technical development and includes activities such as market research, business planning, first adopter engagement and development of marketing and sales processes and products. The full continuum from Idea Generation to Market Introduction & Sales, Figure 1, requires a keen understanding of business dynamics. In addition, each of the steps identified requires research in order to develop the best product, process or service.

Algonquin has undertaken a number of marketing studies and developed a business plan for clients that provided great insight and direction for the clients. Funding for a portion of these activities would be a good investment for the government as it would enable industry to more effectively screen ideas and nascent technologies, thus considerably improving the probability of success in the marketplace. Well developed market understanding and business plans would also make business opportunities more attractive to potential private sector investors.



**Figure 1. The Innovation Circle for developing products, processes or services**

**2. Does Figure 2, the model of business innovation presented above, capture the key structural factors and inputs to innovation? If not, what is missing?**

If Canada is serious about getting more businesses to do applied research and become more innovative, the question that needs to be asked is “What is hindering current companies from participating in business innovation?”. Some of these hindrances include inadequate human, financial and equipment resources; poorly defined market demands; insufficient government support (direct or indirect); a low “Entrepreneurial Quotient”; and lack of first adopters.

Although some of the factors guiding companies to practice business innovation are highlighted, the model is too traditional and conservative and does not reflect the entrepreneurial requirements of risk-taking, innovation, resource limitations, and market trends, demands and needs. It is recommended that the model be enhanced in the factors area to include “Business Resources” (financing, human resources, equipment ...), “Market Understanding and Dynamics” (demands, trends, needs ...), and Entrepreneurial Quotient.

**3. Regarding capital, is there an adequate supply of risk capital for Canadian firms at each stage of their growth (start-up, small, medium, large)? If not, why not? Where returns on investments are low, what are the reasons and potential solutions?**

There is not an adequate supply of the right kind of risk capital – capital that is invested with a long time horizon; rewards the investments of entrepreneurs’ blood, sweat and tears; is not driven by greed; and seeks a reasonable return that allows all to be adequately compensated for their contributions. The right kind of risk capital would also focus on retaining Canadian technologies in Canada and not selling them to foreign interests in order to get a quick return. Every technology sold to a foreign interest dilutes the expected return on investment for government support of the R&D.

The remedy, however, is not that the federal government provide risk capital to firms, but that it implements policies, programs and processes that encourage investment in Canada, make it attractive to keep Canadian technologies in Canada, and that help develop a culture of Canadian entrepreneurship.

In addition, it should be noted that the “valley of death” is an artificial construct that is focused on lack of money, rather than the real cause, a lack of adequate resources in all areas. Government programs that encourage businesses to source low-cost resources at Post-Secondary Educational Institutions (PSEI) will enable many more companies to participate in business innovation.

Algonquin assisted HousAll, a local Ottawa start-up, with the development of its temporary housing solution using students who participated through an in-class project (ICP). The company reported that Algonquin’s support saved \$100,000 in development cost, halved the development time which enabled HousAll to go to market sooner and capture a \$2,000,000 opportunity they would otherwise have missed. Total government support? \$3,500! This illustrates the power of PSEI!

**4. Regarding ideas and knowledge, do you believe it is important for Canadian firms to perform their own R&D and, if so, what do you believe are the key factors that have been limiting business R&D activity in Canada?**

Absolutely – most true innovation happens in companies with a mandate to produce wealth for owners and shareholders.

Factors limiting business R&D include a low entrepreneurial quotient comprising an endemic Canadian culture that is risk averse, complacent with the status quo, and having a low awareness and understanding of domestic or international competition.

A secondary dampener is a poor understanding of R&D incentives programs that provide either direct funding or indirect tax relief. This latter is especially true for start-ups and small enterprises which have insufficient resources to meet the administrative requirements of programs such as the SR&ED program, which are complex and provide rebates long after the firm has made the expenditure. A system where tax relief could be applied for prior to the commencement of the work could incent more firms to engage in R&D by freeing up cash when it is needed.

**5. Regarding networks, collaborations and linkages, what are the main impediments to successful business-university or business-college partnerships? Does the postsecondary education system have the right capacity, approaches, and policies for effective partnerships with business?**

Rather than focus on impediments, the main ingredients for successful collaboration are as follows. The absence of these ingredients impedes business-PSEI linkages.

- a. Entrepreneurial faculty and students who can move at the speed of business rather than the speed of academia. The “publish or perish” culture at many universities is generally antithetical to entrepreneurship.
- b. Industrial Liaison offices that understand business cycles, dynamics and drivers and inculcate a culture within the PSEI that aligns with business culture.
- c. Recognition by PSEIs of the best organizations with which they can collaborate. Generally universities collaborate best with Large Enterprises (LE) and colleges are particularly effective with Small and Medium Enterprises (SME), while also having a role with LE.
- d. A greater desire to contribute to the well-being of Canada and its citizens (who fund most of the academic research through taxes) than to enhance the international reputations of individuals or institutions.
- e. Sufficient administrative/management supports to enable PSEIs to ensure all legal, contractual, relational and financial responsibilities and obligations are fully satisfied. For colleges, project management support is well below that required to meet the demand of our clients. At Algonquin we are currently involved in ~ 70 collaborative projects, but have another ~20 potential clients in the pipeline that we do not have the resources to support.

**6. Regarding the creation of demand for business innovation, what role, if any, do you believe that government should play in being a “first customer” for R&D investments in Canada?**

Preference should be given to Canadian companies for new technologies that are market-tested. The federal government could be a first adopter for technologies that are well-defined and have met a defined “state-of-development”, but have not been fully market-tested. Alternatively, given the size of the bureaucracy and the risk aversion of government, it could develop a funding program that provides subsidies for non-governmental organizations to be early adopters, thus enabling the supplier to scale the technology to a size and robustness more amenable to deployment in large organizations and de-risking adoption by the government.

Extension of the SR&ED program to, or creation of a similar one for, commercialization should be considered. More incentives for service industries to innovate should also be examined.

**7. Regarding talent, is Canada producing sufficient numbers of graduates with the right skills to drive business innovation and productivity growth? If not, what changes are needed? Where demand for advanced skills is low, what are the reasons and what changes, if any, are needed?**

No – too many programs focus on business or technology with no melding of the two. Federal and provincial governments need to work together to encourage the development of programming that addresses this gap.

Too much education is too theoretical and graduates often are unprepared for the real-world. One way to redress this is provide greater applied learning opportunities by developing greater linkages between industry/community organizations/non-profits and post-secondary educational institutions, especially colleges. Collaborative projects that are executed by students as part of the program (*i.e.* ICP) need to be encouraged and funded. Algonquin has had tremendous success with this model and has assisted numerous clients with product, process and service development in a cost-effective, timely manner.

**8. Can you describe whether and how your firm employs students currently enrolled in community colleges, polytechnics and universities, and what government measures could make it easier to work with students during their academic programs and to recruit them after their graduation?**

Algonquin College hires many students for applied research projects done in collaboration with industry partners. Providing higher stipends from research grants would make it easier to attract good students. For example, the NSERC CCI only allows \$5500 per student per semester, which is reasonable when students are in school, but total unreasonable when employing students of the summer or on coop where the cost is closer to \$10,000.

Allocation of funds to support “First Job” types of programs (where 50%-80% of the salary of a recent graduate’s first year in industry is paid through a government program) would be beneficial to assisting SMEs hire entrepreneurial employees who could help with research and innovation.

A marketing program by HRSDC or Industry Canada promoting the innovative and entrepreneurial skills of college graduates would open the eyes of many employers to an unrecognized source of business innovation.

Lastly, re-directing some of the business-focused research funding to support more ICPs would enable many more students to participate in applied research activities with industry. This would get students working in their chosen fields prior to graduation and help them develop their entrepreneurial and innovation skills.

**9. With which federal programs supporting business or commercially oriented R&D in Canada do you have direct experience and knowledge? In your view:**

Some very good programs have been developed in the last few years. From a college perspective some of the biggest concerns relate to mismatches between government funding cycles (and the dreaded March 31 deadline) and academic and business cycles.

- a. Which of these programs are working, and why?
  - i. The NSERC CCI is generally a very good program in that it provides resources at the institution level that can be utilized on applied research projects with industry. The recent addition of Technology Access Centres, the Applied Research Tools and Instruments Program, and the Applied Research and Development Program are welcomed adjuncts to the Innovation Enhancement Program.
  - ii. The FedDev Applied Research & Commercialization (ARC) Program is good in that it allows support for a broad range of research and commercialization activities, beyond that of other industry engagement programs. The ability to allocate funding to projects at the college level is especially helpful, as we know our clients best and can pick those best suited to the program better than an external committee.
- b. Which programs are not working, and why not?
  - i. Two aspects of the NSERC CCI Innovation Enhancement Program restrict its efficacy: first, the restrictive rules around engaging professors that do not recognize provisions in collective agreements for compensating professors; and second, the low stipend levels for hiring student researchers.
  - ii. The FedDev ARC Program is administratively burdensome and does not provide sufficient remuneration to cover the administrative and operational costs of institutions delivering the program. Best practices in other organizations (*e.g.* NSERC) should be implemented to improve delivery and impacts.

**10. If you have direct experience and knowledge of the SR&ED tax credit, what are your views in relation to the following: Does the current structure of the SR&ED tax credit encourage incremental investment in R&D?**

The overall complexity and paperwork is overwhelming for start-ups and SMEs. It is recommended that a SR&ED Lite program be developed that would be tailored to the needs/resources of start-ups and SMEs. One change would be to allow start-ups and SMEs to apply for the credit prior to initiation of during execution of a project to enable the SME to receive the cash during the project, when it will be most useful.

**11. How could the Government of Canada lighten the administration requirements of its programs on recipients and improve outreach to business?**

The first improvement would be to have greater trust in post-secondary institutions which have many years of experience in delivering government programs; the level of oversight is disproportionate to that experience for some of the programs.

A second improvement would be to provide more funding for administration and support for colleges in the various funding programs. Colleges do not have the administrative infrastructure of other institutions. At Algonquin the biggest impediment to more industry engagement is a lack of support in the industry liaison office.

Streamlining reporting requirements and developing a common set of metrics with the provinces would also lighten the administrative requirements.

**12. How could the Government of Canada be more innovative and responsive to meet new needs or opportunities, and try alternative service delivery-approaches in its programs?**

- c. Recent evidence (Conference Board of Canada report for Colleges Ontario) indicates that colleges work well with industry, especially SMEs. The government could build on the momentum being generated by colleges by providing larger grants to colleges to disburse on projects with industry chosen by the college. This could be done by redirecting funding resources from currently going to commercialization activities with poor returns.

Colleges can improve delivery and impacts because we know our clients much better than a bureaucrat will and can “vet on the ground”.

More niche programs targeted to specific sectors, such as digital media, would provide focused efforts to improve Canada’s competitiveness.

**13. Are there any gaps in the Government of Canada’s support to business and commercially-oriented R&D? Do firms performing R&D in other countries have an advantage over Canadian firms because of access to programs that are not available in Canada? What would be the principal features of new programming to fill these gaps?**

There are gaps – most current programs focus on funding research and technical development. Business innovation encompasses marketing and business development activities and funding programs should be modified to include funding of business development activities.

**14. What lessons and best practices can be taken from provincial business and commercially oriented R&D programs, and how should the two orders of government align their programming?**

The Colleges Ontario Network for Industry Innovation (CONII) is excellent model for developing networks. The funding model is also good: funds for operational costs are evenly distributed across all participating colleges, encouraging capacity building, while the colleges decide where project funds are spent. The administrative requirements could be lessened.

The Ontario Centres of Excellence (OCE) Connections program is great for stimulating industry:academic collaborations through in-class projects. However, the paperwork is somewhat onerous.

At Algonquin we are already aligning programs by co-funding projects from both FedDev and OCE and finding it an effective mechanism for stimulating business innovation. Formal linking of programs between the two levels would be useful for lowering administrative burdens, e.g. permitting only one application to be developed that would be good for both programs.

**15. Is there a difference between R&D and innovation? If yes, how are they different? Should government focus on R&D or Innovation? What should the balance be?**

Innovation is output and impacts focused while R&D is results oriented. Until a product, process or services has been implemented or commercialized, innovation has not occurred. R&D is a necessary component of innovation, but R&D that is left in the lab or on the bookshelf has not resulted in innovation.

To increase business participation in the development and introduction of new or improved products, processes or services to the market the government has to redirect more funding to innovation – that is R&D with a stated goal of making an impact in the lives of Canadians in a reasonable timeline. Basic research will always be needed to fill the idea pipeline, but inadequate funding of the downstream activities will continue to result in poor returns. In addition, there are many market-driven issues that need to be resolved or opportunities to be exploited that require *applied* research and experimental development and would benefit from targeted government largesse.