

MAKE A START TOGETHER

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Recently, I found myself with a group of colleagues, all of us talking about research projects that we had either just started, just completed, or were just in the middle of and coming up against some challenging results in need of a new direction. Those who were just starting out discussed the impetus for the research project, what industry problem was being addressed and in what way their team was tackling the task. Those who were just completing their work discussed the surprises encountered either in the design or implementation of their work, focusing on the lessons they learned along the way. Those in the middle were the least forthcoming, perhaps because like many of us they were unaccustomed to sharing work in progress, something that was normally kept within the team and only revealed once the hurdles had been overcome and the challenges had been met and matched.

Through all this there was a theme, a common thread that was the bane of applied research in general and applied research in vocational education in particular: the lack of communication and collaboration between centers, projects, schools, and technicians. For no matter where we were coming from, what we were doing, and why we were facing the challenges we were facing, all of us agreed that there was no venue for conversation, no place to share research results such that we could help each other succeed in the applied research realm. We were all representatives of stand-alone shops, working in isolation, collaborating with colleagues at the school but rarely going beyond the safety of our home institutions. Wouldn't it be great, we mused, if there were a vehicle for sharing research results with like-minded practitioners so that the work we do and the successes (or failures) we experience could be communicated collaboratively so we were all learning from our similar experiences. This was the kind of thought process that led the World Federation of Colleges and Polytechnics (WFCP) and its Applied

Research and Innovation Affinity Group (ARIAG) to create a new international magazine titled *Applied Research Results in Vocational Education and Training* (ARRIVET).

The Applied Research and Innovation Affinity Group is an established international community of practice within the WFCP; members share the results and outcomes of applied research projects undertaken by their institutions, as well as exemplary practices related to applied research and innovation, through regular meetings and presentations, webinars and conference attendance, dedicated projects and collaborative initiatives. Their newest resource, *Applied Research Results in Vocational Education and Training* was created to fill the gap discussed above and with this its inaugural issue ARRIVET offers a new voice for applied research practitioners, collaborators, and fellow travelers. Why an applied research magazine? Why not a blog or a wiki, a podcast or even a journal? Our reasoning focused on the realities of applied research and its unique role in vocational education and training contexts. In other words, we started with the question of what would be most accessible, most useful to our sector and our work. Hence a magazine for sharing results and practices.



Consider the researcher at Camosun College in Victoria BC Canada who has been working on the challenge posed by Keltsmaht Kelp, an Indigenous owned and operated kelp and seafood company that produces a probiotic, an organic bio-stimulant made from freshly harvested macro-kelp. This bio-stimulant increases available nutrients, building healthy soil to protect plants from abiotic stresses, therefore, boosting plant growth and quality. It can also be used as a substitute for chemical-based fertilizers reducing the negative effects on the environment. Our first engagement with Keltsmaht Kelp was through a Mechanical Engineering capstone project

exploring ways to automate the chopping and pressing process. While working on this project Keltsmaht was having difficulty with the consistency of fermentation; some batches spent more than two weeks in their drums, without fermenting. We needed to learn more about the fermentation process. To assist, we engaged with faculty and students from our biochemistry department to optimize fermentation and production of kelp-based biostimulants, understand the nutrient impacts of brown sugar vs unsulphured molasses on the fermentation process, and compare various cuts of kelp and amounts of culture to find the best overall fermentation recipe. We learned that for the best outcomes, the optimal recipe involves fresh kelp, reduced to fine particle sizes, and fermented at high temperatures with the addition of brown sugar. With this success Keltsmaht is looking to scale up production by implementing fully automated systems for rinsing, chopping, blending, fermenting, and screening out the probiotic. They have outgrown their facility in Tofino BC and have signed a lease on a new space in Port Alberni BC where they will be creating a production facility capable of processing up to 200 tons of kelp per year, harvested from their newly licensed kelp farm. We learned a great deal during this research project, and established a strong partnership that will continue as Keltsmaht develops their processes and automates their production. Because this was an applied research project, our focus was on delivering the best outcome for the partner. But there are lessons learned from this project that might benefit other colleges, other partners. Where could we go to share these **research results** with a wider audience?

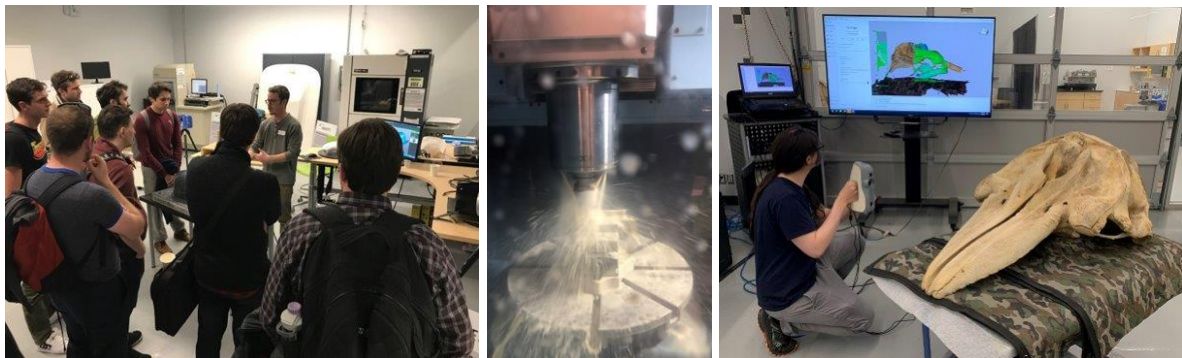


Oceanus Reinforced Plastics is a North Saanich BC company that provides materials integration services to the marine industry – a composite shop focused on hulls for different types of boats and boat makers. They are currently in partnership with Zodiac Milpro to prototype new designs

for different types of vessels for the Canadian Coast Guard. Due to tight deadlines and labour shortages on Vancouver Island, Oceanus was in need of a partner that could complete iterative designs and multiple prototypes as quickly as possible, with a high level of accuracy and innovation. With a state-of-the-art composites shop, that same Canadian college was able to provide the knowledge and expertise to address their needs, fabricating moulds for composite manufacturing using different methods and diverse materials. We provided multiple iterations, prototypes, and final products. The most significant outcome of our collaboration has been the innovative ways we have come up with to create inserts and plugs and therefore help Oceanus be more efficient and be able to take on more work. In return, Camosun has greatly benefitted from the partnership, learning and building greater expertise in composites manufacturing, sharing experience with a trusted partner, working together to build our own skillsets as well as capacity for the local industry. We are proud of the fact that during this time we have significantly reduced the amount of waste generated during the composite process, passing these lessons on to multiple industry partners and having a positive environmental impact. But how might we go about sharing our innovations more widely? Where could we find an interested audience committed to improving composites manufacturing **research practices**?

Camosun College is a member of a larger organization, Tech Access Canada [<https://tech-access.ca/>], a national, not-for-profit passionate about expanding the reach of its sixty Technology Access Centres (TACs) to make their R&D support services accessible to entrepreneurs and innovators across Canada and contributing to the development of a more inclusive innovation economy. Our TAC members are the foremost leaders in college applied research and assisting Canadian entrepreneurs in developing new innovative products and solutions using technology. Collectively, the TAC network provides Canadian firms with access to: almost 4 million square feet of dedicated innovation and applied research space, \$477 million worth of state-of-the-art equipment and research facilities, and over 2,000 experts in business innovation and applied R&D with in-depth industry experience. Tech-Access Canada supports the growth, competitiveness, and success of its members by:

- Advocating to government officials and agency heads about priorities to advance the applied research and ensure Canadian innovators can access their R&D services.
- Championing the TACs as major players in Canada’s innovation ecosystem and excellent incubators for top talent and future serial innovators.
- Connecting innovators and entrepreneurs to the network members with expertise to advance the development and commercialization of their product or solve their innovation challenge.
- Delivering programs that provide opportunities for TAC members to engage in R&D projects with industry partners.
- Facilitating the sharing of best practices to help TAC members achieve operational excellence.
- Fostering collaborative partnerships with industry, government, universities, associations, and other innovation stakeholders to advance applied research in Canada.



A TAC is a state-of-the-art applied research and innovation center, affiliated with a Canadian college or cégep, that provides companies with access to cutting-edge technology and equipment, as well as a multi-disciplinary team with the expertise to turn brilliant ideas into market-ready products. TACs offer value-added R&D and innovation services to Canadian businesses—particularly small and medium-sized enterprises (SMEs)—to develop new prototypes, scale-up processes and solve unique business challenges. They also provide customized training for industry to upgrade technical skills, and de-risk the financial investment of implementing new equipment and adopting emerging technologies. They aim to generate

innovation and productivity results, while enhancing the competitiveness of their industry partners. Companies that work with the TACs benefit from flexible intellectual property (IP) policies and have the right to commercialize the research results and IP. TACs also help de-risk the financial investment required when taking on applied research projects by helping businesses to access and leverage government funding programs. TACs are a uniquely Canadian phenomenon, but how would a college or innovator learn about this **research in context** without direct experience?



Regardless of the project or the partner, the content or the context, every applied research activity at Camosun includes the training of students, from developing the inquiry question through design and prototyping to delivery and post-project assessment. This includes the preparation of students to engage in applied research, ongoing mentoring of students while they work on projects, and assisting students as they transition from college inquiry to full-time employment. Like all VET institutions, we are first and foremost a center for training, and our applied research activities serve the needs of our students as much as the needs of our community. One key feature of this is the orientation of students to the rigors and realities of applied research, from the tracking of time and task to the promise of deliver on time and on budget. We require students to understand and work within the boundaries of business and industry, training for research before they enter the world of work. We also operate at the applied research/training for vocations nexus, trying to better understand the pedagogical aspects of our eminently practical endeavors, supporting the work and the development of teachers who are likewise committed to the training of students, while building student capacity through innovative practice and intentional learning. But where can we share our insights into

training for research or **training for vocations** within the larger and specific context of applied research?

It is within these five categories that ARRIVET has chosen to focus its attention, and it is from these five categories that we look to draw future articles and issues. We welcome articles in:

- Research Results – applied research findings from projects undertaken by VETs.
- Research Practices – applied research approaches leading to results and principles.
- Research in Context – geographies of applied research and their results.
- Training for Research – activities in preparation for applied research and its results.
- Training for Vocations – the “applied research/training for vocation nexus” including applied research in pedagogy, building teacher capacity, learning development, and building student capacity.

We look to generate collaborative conversations that center on the challenges and successes of applied research within the vocational education and training universe. With this first issue, we are starting a conversation that we hope will generate more good work, more insight and innovation, more conversation and collaboration and cooperation within our global community. It is a small beginning, but it has the potential to change the way applied research is conducted at VET institutions, and the way teaching and training is conducted around the world. Let us make a start... together.