

Entrepreneurship as a catalyst for change:

How the I-Corps programme is having a positive impact at Washington State University

At Washington State University an exciting collaboration between business and science has sprung up, building new bridges for academic research to impact the public. The National Science Foundation's I-Corps programme has been driving and supporting entrepreneurship at the university, an Economic Development Council and Economic Faculty Ambassadors are working towards a university-wide culture of creativity and innovation and successful scientific entrepreneurs are proving that commercialisation can be the feeder of ideas and scholarship the key to technological advances.

It has been noted in recent years that entrepreneurship by academic scholars and at academic institutions does not distract from or interrupt research and learning. It actually acts as a catalyst for innovation, driving introspection and improving applied research and scholarship. In a topical essay, Vice-Chancellor of Research at the University of California, Berkeley, Dr Paul Alivisatos, wrote that 'entrepreneurship has been an invaluable aid to my intellectual renewal, and it has helped me be at the forefront of new directions in my field'. A focus on entrepreneurial goals can concentrate research work and lead students and teachers to discoveries and technologies that can make real tangible differences for good in the world. It was with these possibilities in mind that Washington State University (WSU) set up its Economic Development Council (EDC), in collaboration with the National Science Foundation's (NSF) I-Corps programme, led by the Assistant Vice President for Innovation and Research Engagement, Brian Kraft. The council aims to assist researchers and students in engaging with societal problems and the marketplace as a whole, promoting a cycle

of discovery that helps steer scientists back round to impactful research and its service in real-world application.

TOOLS FOR SUCCESS

This approach of service to communities through applied science feeds into WSU's mission as a land-grant institution. Dating back to the 1860s, the land-grant system's goal was to establish public universities that provided higher education access to 'working-class' citizens, especially the children of agricultural and industrial workers. Since its establishment in 1890, WSU has conducted key research geared towards developing and advancing the agricultural economy of the state. This includes working in partnership with agricultural stakeholders to conduct applied research that benefits the growth and global competitiveness of the state's thriving agricultural sector. This culture of partnership, engagement and outreach has been enhanced and expanded by the efforts of the EDC and I-Corps programme. Most recently, WSU has focused on broadening the reach of the land-grant vision and its practical application and delivery of science to encompass the whole of the university, striving to demonstrate that the creative and scholarly discoveries of students and faculty can be translated into an array of services, products and technologies that can improve people's lives.

The EDC itself acts as a collaborative forum, not a department, bringing together colleagues from across the university with a common goal. The council has principally been working to expand the tradition of creating talent, innovation and entrepreneurship at WSU from agricultural development into other technological and economic sectors and improving the quality



Above and right: WSU is dedicated to teaching entrepreneurial and innovation skills while encouraging interdisciplinary collaboration, industry mentorship, and alumni engagement. Through an array of activities, WSU provides programmes, clubs, and team-based competitions to assist students and faculty to develop and refine their business models, discuss lessons learned, and prepare for further customer discovery.

of life in communities where WSU's system of campuses are located. Through conversational activity they have been asking how such applied and responsive research can be incentivised and discussing how such enterprise can personally benefit researchers' scholarly and professional lives. In 2016, the grassroots Economic Faculty Ambassadors (EFA) group was established at the university and is working in conjunction with the council. Advocating an atmosphere of creativity and openness, the ambassadors look to build connectivity across the academic disciplines and see above and beyond launching a business or patenting an invention. By communicating the value of cross-disciplinary interaction and public engagement they hope to actively demonstrate how scholarly activity at the university can have a community-based societal and economic impact. Since its inception, the ambassadors have sustained a support group of like-minded faculty and developed, proposed and implemented policies across WSU that induce research along with recognising the inherent value-added benefits associated with internal and external engagement and outreach.

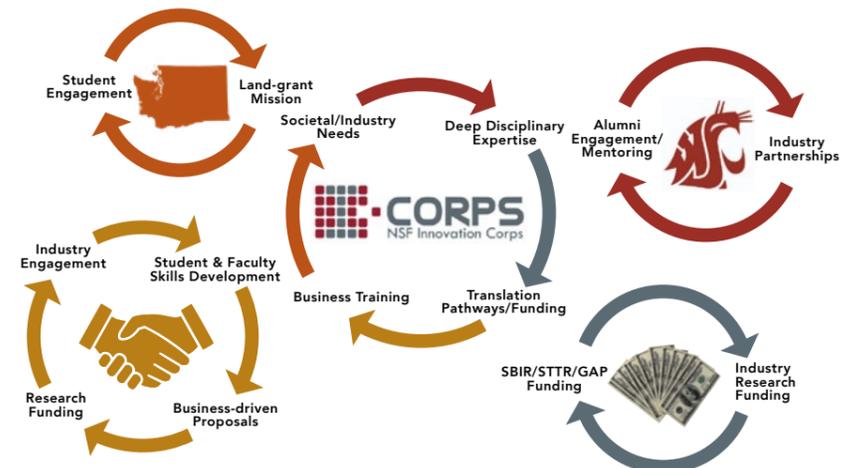
Integral to the council and ambassadors' success is their partnership with the NSF's I-Corps programme. Acting as a non-academic point of contact between the colleges, the programme ensures that people who would have little likelihood of meeting and working together get the chance to pool ideas, resources and expertise. Funded by

...research and commercialisation can work in tandem as drivers to induce productivity and creativity in scholarship...

the NSF, I-Corps was set up to ensure that NSF-funded projects had more of an economic development-based impact. The programme helps faculty apply their basic research to new inventions and technologies in areas such as the life and physical sciences, biotechnology, information technology and engineering. At WSU that means not just bringing like minds together, but also providing training on customer discovery. Core to the programme is the focus on developing a testable value

proposition associated with an underlying research effort. This value proposition then serves as a basis for conversation with a proposed customer. Over many conversations, the value proposition gets refined and the research becomes informed. It builds a business case in the framework of hypothesis driven research. In the words of one participant, Craig Owen (entrepreneurial lead for SOC Energy Materials): 'I-Corps gave me the tools to find and meet professionals in industry that work in my field of batteries'.

I-CORPS CREATES OPPORTUNITY, ENGAGEMENT, CONNECTION, SUPPORT



I-Corps is an extra-curricular, experiential, immersive entrepreneurship programme for faculty, students and staff. It teaches participants to think in terms of business and assists in developing skills to explain the impact of research from the perspective of industry. It also provides collaboration across colleges and among faculty, students and staff.



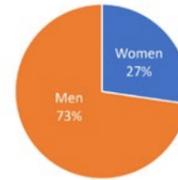
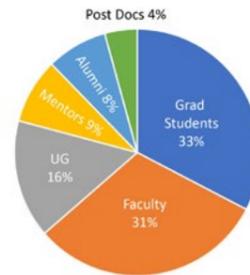
TALES OF SUCCESS

With such a well-established network of people and resources, it is little wonder that WSU has so many innovative and successful entrepreneurial efforts to speak of. One such start-up, Rewire Neuroscience, founded by WSU post-doctoral research fellow John Harkness, particularly embodies the spirit of fresh innovation and ideas purported by the EDC and I-Corps. Rewire Neuroscience empowers the future of neuroscience by providing products for researchers that are affordable and custom-designed. After receiving the Commercialization Gap Fund from WSU, the company has developed a range of intelligent research tools, including sleep fragmentation chambers, vivarium data loggers and freezer temperature and power monitoring devices. Founder Harkness says, 'The NSF I-Corps programme at WSU transformed my novel technology from a lab project into an investable business plan. Being an academic neuroscientist, I lacked experience researching the market potential, identifying customer need, and assessing the commercial viability of a product. WSU's training and support are helping my Vancouver spinout, Rewire Neuroscience, develop artificial intelligence tools for biomedical research that could one day improve healthcare-related treatments and save lives. I believe that most scientists could benefit from I-Corps' approach to project planning, whether it's for a commercial product or a research direction in the lab.'

Another start-up aiming to reach out and assist other scholars is Klar Scientific. Led by Rick Lytel, Matt McCluskey and Slade Jokela, the company has patented confocal optical profile technology, a spectroscopic microscope that has the unique ability to provide a topographic map of sample surfaces. As well as receiving the Commercialization Gap Fund from WSU, in December 2016 they won the NSF Small Business Innovation Research (SBIR) grant for \$210,370 in December 2017. Jokela noted how integral the input from I-Corps has been to their success: 'Being

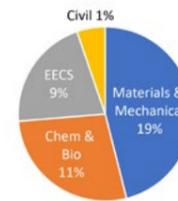
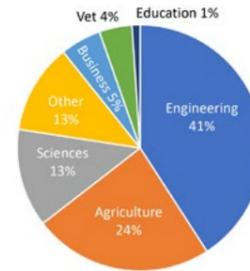
...WSU entrepreneurs have won a total of \$1.7 million in funding – almost an 11:1 return on the funds invested...

Who Participates in I-Corps - Individuals?



The I-Corps Programme was launched by the National Science Foundation in 2012 to ensure broader socio-economic impact of research-related funding. WSU's I-Corps programme has wide participation across academic disciplines, but is particularly attractive to students and faculty engaged in science, technology, engineering and maths – STEM – programmes.

Who Participates in I-Corps - Colleges/Depts?



part of I-Corps enabled us to get specific feedback from our customers about what our prototype should be – that was essential information to apply for the SBIR grant we received to develop our first product.'

In 2017, the IntelliBra, a sensor for measuring infant intake of breast milk and preventing mastitis, a painful inflammation of the mammary gland in the breast that can impact breast feeding, was developed at the university. With licensees identified by the I-Corps process, WSU are currently pursuing licenses for the creation of an industrial consortium, with funding for further women's research and product development likely. One IntelliBra team member commented on the positive impact I-Corps events had on their idea: 'Our team was convinced that forming a startup company was needed to get our product to market, and we were determined to do so to make sure our product had a chance to make an impact on nursing mothers worldwide. During I-Corps we were able to get in touch with major industry players, and we are now planning a major research partnership

that will not only help commercialise our technology but will invest in future research! With industry mentors engaging the scientific team behind the product, there is already a drive to create prototypes. It is certain that IntelliBra technology will be improving the health of mothers and babies, nationally and perhaps internationally, in the near future.

CYCLES OF SUCCESS

Once considered, it is obvious to see how research, engagement, and commercialisation can work together as drivers to induce productivity and creativity in scholarship, each one acting and integrating as catalysts. The I-Corps programme and the development of institutional groups like the EDC and EFA have had a tangible and quantifiable impact on the output of faculty at WSU. To date, WSU entrepreneurs have won a total of \$1.7 million in funding – almost an 11:1 return on the funds invested in the I-Corps programme. Their ideas are already making an impression on the 'outside world'. The outcomes and deliverables of such investments are two-fold; not only is research energised, developed, and made tangible, but important societal problems can be solved. The idea to engage the country's brightest minds with the world's biggest problems isn't rocket science, and the benefits of the I-Corps programme at WSU are palpable.



Behind the Research Washington State University

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Research Objectives

The Economic Development Council at WSU aims to increase outreach and translational activities at the university. The I-Corps programme is an important part of this.

Detail

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Bio

Washington State University is actively working to build a stronger entrepreneurial culture. This has led to a blossoming of new programmes and activities that aim to help faculty engage both within the university and with the public. This effort is a key component of a university initiative to grow the impacts of and diversify funding for research.

Funding

NSF

Collaborators

- Brian Kraft
- Marie Mayes
- Howard Davis
- Chris Coppin
- Travis Woodland
- Scott Steiger
- Francis Benjamin
- Aziz Makhani
- Ann Goos



References

Paul Alivistasos (2018) Reflections on a Scholar's Journey in the World of Entrepreneurship. <http://www.cchem.berkeley.edu/pagrp/entrepreneurship.html> (accessed 18 April 2018).

External Review of Innovation and Entrepreneurship at WSU, ERIE Team, Feb 2017

Washington State University Economic Reach and Impact, Community attributes inc. and Washington State University, Mar 2015

Personal Response from Dr Kraft

What you are most excited about for the future of economic development at WSU?

“ The programmes we have running today have the potential to dramatically alter the landscape at WSU. The spirit of collaboration and connectivity is building a broad community of entrepreneurially minded faculty, staff and students who are mutually supportive in the efforts to connect to the public. This network is serving to facilitate outreach efforts and inform practice on campus. I-Corps is where the rubber meets the road in these activities; rolling up the sleeves and coaching teams on how to define their work in testable ways serves to refine the products of research to best fit the needs of the end users. This represents a fundamental pivot in how we do basic research in the university. If we can sustain these activities, our work can have a long standing impact at WSU and to our public funders. ”

Are there any standout projects in the pipeline?

“ We are in the early stages of building a network of capstone instructors across campus. The aim of this project is to develop student collaborations in association with their respective capstone projects. The intended outcome is to add value to the projects by diversifying the expertise engaged and, with some luck, yield project outcomes that can be carried forward into a business or public benefit. ”