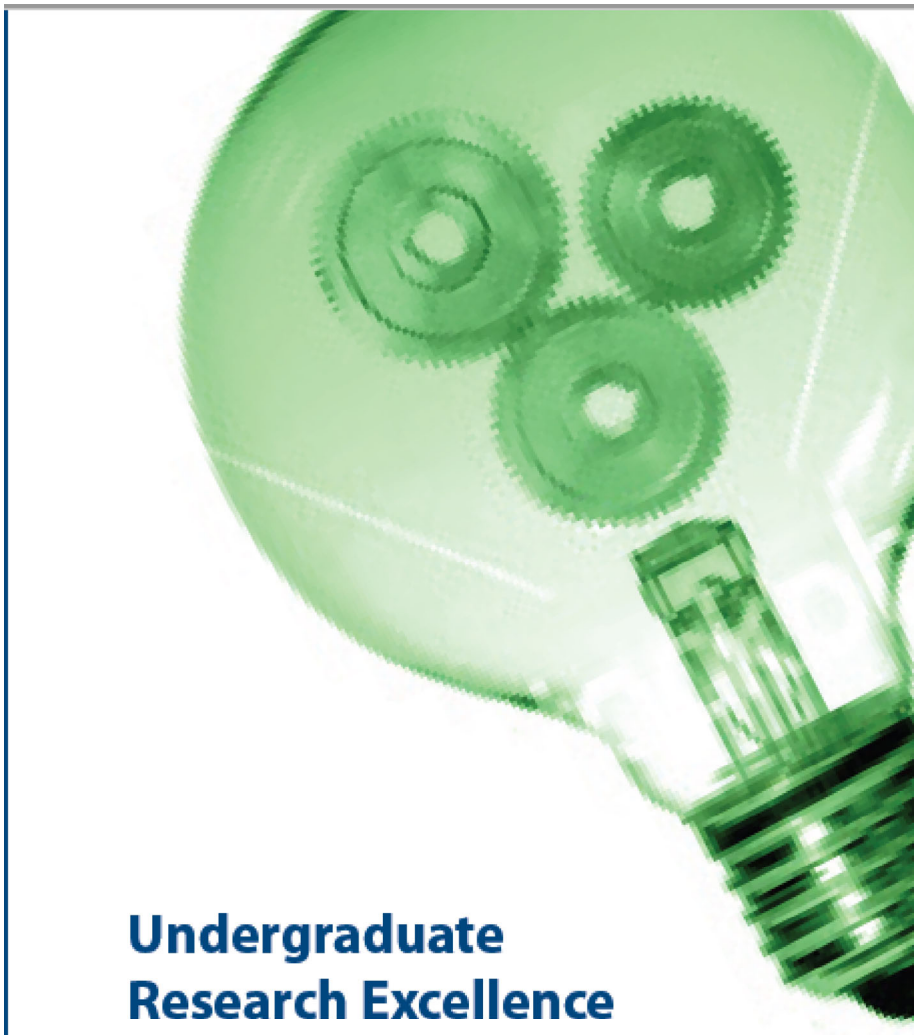

Undergraduate Research Excellence Awards 2007

UCFV
UNIVERSITY COLLEGE of the FRASER VALLEY

Undergraduate Research Excellence Awards 2007

Over $13,000 has been awarded to students who were nominated by faculty based on exceptional research work, either as part of the work study program or as research assistants, or for an outstanding research project as part of a course.

Congratulations to all the students who have worked so diligently to produce award-winning research projects.

Special thanks to the family and friends of our students who support them with funding, encouragement, and patience! Your contribution is most appreciated.

Award Winners

Erin Borrow	*Biology*
Brayden Fishbook	*Biology*
Luis Guevara	*Business Administration*
Kimberly McGinnis	*Business Administration*
Marco Russo	*Business Administration*
David Walls	*Business Administration*
Christine McLoughlin	*Chemistry*
Essex Edwards	*Computer Information Systems*
Jordan Diplock	*Criminology*
Leifka Vissers	*Geography*
Shannon Gibson	*History*
Marlene Roseboom	*History*
Arron Docksteader	*Kinesiology*
Amanda Bottrill	*Philosophy & Political Science*
Conrad Cofre	*Philosophy & Political Science*
Tim Schouten	*Philosophy & Political Science*
Robin Kleiv	*Physics*
Daniel Mori	*Physics*
Julee Bisiker	*Psychology*
Carly Fredette	*Psychology*
Mark Jaholkowski	*Psychology*
Sara Polukoshko	*Psychology*
Colleen Smith	*Social, Cultural & Media Studies*
Susi Schecker	*Social Work*

NSERC USRA Winners

UCFV is proud to recognize students who have each been awarded a $4,500 Undergraduate Student Research Award by the Natural Sciences and Engineering Research Council of Canada.

2006 Awards

Van Dinh	Chemistry
Robin Kleiv	Physics

2007 Award Nominees

Keith Heywood	Mathematics & Statistics
Elna Deglint	Chemistry
Winter Moon	Geography
Russell Campbell	Mathematics & Statistics
Daniel Mori	Physics

Biology

Recipient: Erin Borrow

Erin is graduating from the BSc (Biology) program this spring. She is hoping to attend the Western College of Veterinary Medicine in Saskatoon this September to pursue a degree in veterinary medicine. She has always been interested in scientific research, and the Directed Studies course in Biology was a great opportunity for her to do her own undergraduate research.

Faculty Supervisor: Alida Janmaat Award: $500
Program Head: Barbara Moon

Recognized for outstanding work on

The Effect of Imidacloprid on Fecundity, Development Time and Alatae Production in Local Clones of the Green Peach Aphid (*Myzus persicae*)

This study examined the effect of a commonly used insecticide, imidacloprid, on local clones of Green Peach Aphid, *Myzus persicae*. Its effect on mortality, fecundity, development time and wing production was examined. Using ANOVA, imidacloprid concentration was determined to be significant with a sharp increase in mortality between 1µg/L and 10µg/L. At sublethal doses imidacloprid treated aphids showed significantly decreased offspring production, however development time and wing production were not affected.

Biology

Recipient: Brayden Fishbook

Brayden plans to attend graduate studies next year at UBC, studying neuropathology at Children's Hospital in hopes of one day teaching at a university. He can not thank his teachers enough for their dedication to helping him succeed.

Faculty Supervisor: Terry Starr Award: $500
Program Head: Barbara Moon

Recognized for outstanding work on

A Mutant Analysis of the Bovine CARD15 Gene

The focus of this study was to investigate a possible common genetic component between Crohn's disease and a similar bovine disorder, Johne's disease. Due to their physiological and immunological likeness, it has been suggested that Crohn's disease and Johne's disease share a similar etiology. A number of genetic mutations have been directly linked to Crohn's disease with the most common of these a mutation in the CARD15/NOD2 gene. Mutations in this gene primarily map to one of three polymorphic sites and it was these regions that we chose to investigate in cows. Our investigations found these sites were not mutated within the bovine CARD15 gene, however we did detect sites of variation between individuals. Changes in these regions may prove to play a role in the onset of Johne's disease and merit further investigation. Our goal was to determine if a strong relationship between Crohn's disease and Johne's disease could be established in order to aid in the identification and possible treatment of patients with Crohn's disease. Ultimately, having an animal model system will lead to a better understanding of these disorders which in turn would benefit both humans and cows alike.

Business Administration

Recipients: Luis Guevera, Kimberly McGinnis, Marco Russo and David Walls

Kim is a fourth year BBA student in the marketing concentration. She hopes to eventually get her MA in education so she can teach at the college level.
Luis Guevara is just completing his third year of the finance concentration and hopes to work for an investment firm as a funds manager.
Marco is in his third year of studies in the BBA at UCFV.
David is a third year BBA student in the accounting program. After obtaining his BBA, he hopes to bridge into finance and work as a mutual fund manager.

Faculty Supervisor: Mark Breedveld Award: $250 each
Program Head: Lachlan Whatley

Recognized for outstanding work on

Hope Mountain School Marketing Research Project

The students carried out an in depth market research study for Hope Mountain School (HMS), a society set up by the Hope School District to provide outdoor and environmental education to adult learners. The purpose of the research was to determine the demand for such courses and to determine which markets HMS should target with their marketing efforts. The students' research involved conducting focus groups, secondary research, and mall intercept surveys at SevenOaks and Cottonwood Malls. The students presented their research report to the HMS Board of Directors in December 2006. The research results were important in helping the Board plan its strategic directions for the years ahead.

Chemistry

Recipient: Christine McLoughlin

Christine first became involved in chemistry research in her first year at UCFV and has worked on many different projects. She will be finishing her BSc this April with a double major in chemistry and biology. She plans to take a year off and then attend UBC in 2008 to pursue a Masters in chemistry. This is the second URE award Christine has received.

Faculty Supervisor: Noham Weinberg Award: $1000
Program Head: Arthur Last

Recognized for outstanding work on

Measuring Chirality by Chiral Interactions

A molecule is called chiral if it is different from its mirror image (known as an enantiomer). If a molecule is identical to its mirror image it is called achiral. Chirality measures seek to quantify the degree of chirality of a molecule by comparing it with its enantiomer or with a similar achiral compound. Often, these measures are calculated as the distance between a compound and its reference molecule in an optimized superimposition. While there are many methods for measuring degree of chirality, these methods will often produce a result identifying a chiral molecule as achiral, a so called chiral zero. This study sought to test a new method for measuring degree of chirality, which avoids the problem of chiral zeroes by making a proper choice of the reference object. The degree of chirality was compared for a series of chiral compounds. This method of measuring the degree of chirality requires further investigation but may eventually be used for selecting the optimum chiral catalysts for a chemical reaction.

Computer Information Systems

Recipient: Essex Edwards

Essex graduates this year from the CIS degree program. He intends to continue his education in Computer Science, with the goal of working on better software to model the natural world.

Faculty Supervisors: Ora Steyn & Noham Weinberg Award: $1000
Program Head: Ian McAskill

Recognized for outstanding work on

(1) Evolving Virtual Creatures
(2) Constant Pressure Molecular Dynamics

(1) A computer program was implemented that automatically designs the structure and behavior of simple simulated robots/creatures. A creature is evaluated on a specific task (locomotion in this project) through simulation with rigid body physics. With selection based on task performance, successive generations of crossed and mutated creatures evolve to be more effective at the task. This sort of evolutionary robotics has its most serious applications in engineering, as automated design processes.

(2) Classical molecular dynamics treats molecules and atoms as classical particles and describes evolution of molecular systems in terms of Newtonian equations of motion. A molecular dynamic calculation can be performed under either constant volume or constant pressure conditions. We propose a new constant-pressure molecular dynamics algorithm where the size of the molecular dynamics box is treated as an additional variable described by Newtonian equations of motion. The new algorithm is implemented in a C-program and tested in comparison with other techniques.

Criminology

Recipient: Jordan Diplock

Jordan is a graduating student from the criminal justice degree program. Under the direction of Dr. Darryl Plecas, and for the Mission RCMP, he has been managing a pilot project to set the stage for the tracking of crime, criminality, and prolific offenders in Mission.

Faculty Supervisor: Darryl Plecas Award: $1000
Program Head: Martin Silverstein

Recognized for outstanding work on

Mission RCMP SPSS Feasibility Study: Crime and Criminals Tracking Project

This pilot project involves establishing a database system intended to provide Mission RCMP with a practical way to manage information on crimes and criminals to aid in their crime reduction efforts, with specific attention on identifying and targeting prolific offenders. However, the goals of the pilot project go beyond the implementation of the database system in Mission. The broad purpose of the pilot project is three-fold:

1) To design a crime analysis database that can be used by police managers and crime analysts to provide timely and detailed reports on the nature and extent of crime and criminality with a policing jurisdiction.
2) To assess the practicality and effectiveness of using SPSS software as an alternative to iBase intelligence software for the development and maintenance of a strategic crime analysis database.
3) To design and assess the practicality of an offender profile sheet that can be used to assist police in identifying high priority offenders, tracking co-offending, and in better describing the background of offenders coming before the courts, to Crown.

Geography

Recipient: Leifka Vissers

Initially interested in UCFV due to the small class sizes, Leifka was motivated by the high level of faculty involvement in and support of her education and career goals. Leifka is graduating this year and plans to continue her studies in a graduate program in the coming years.

Faculty Supervisors: Cherie Enns & Claire Beaney Award: $1000
Program Head: Ken Brealey

Recognized for outstanding work on

(1) Social and Non-Market Housing Strategies in BC Municipalities
(2) Theories of Human Entry Migration to the Americas: A Review

(1) The provision of low-income and social housing is a challenge faced by municipalities, regional districts and provincial governments. This project, based on interviews with housing program developers and administrators, provides an overview of housing strategies. The benefits and drawbacks associated with strategy were analyzed in order to develop best practice models. These models were then combined to form recommendations for social and affordable housing development at the municipal level.

(2) There is considerable debate as to when the new world was peopled, how, and by whom. The two dominant theories of human migration to the New World include the coastal migration route along the Pacific Coast of North America, and the ice-free corridor theory where people migrated along a corridor between the Laurentide and Cordilleran Ice Sheets. This project compiles and evaluates the arguments of glaciologists, climatologists, archeologists, linguists, biologists and others to produce a comprehensive overview of these arguments.

History

Recipient: Shannon Gibson

Shannon has been attending UCFV since 2001 and will graduate in 2008. She hopes to enter the teaching profession, although she would eventually like to resume her education and pursue a Masters degree. She has long had an interest in World War II and was excited to be able to combine this interest with a study of that time period in Latin American history.

Faculty Supervisor: Geoffrey Spurling Award: $500
Program Head: Sylvie Murray

Recognized for outstanding work on

Perception and Policy: The United States and Nazi Fascism in Latin America During World War II

This research examined the tension that was created between the stated objectives of the U.S.'s Good Neighbour Policy and long-held perceptions of Latin America, as the United States began to fear the growing influence of Nazi fascism there. U.S. newspaper accounts and political cartoons of the time revealed both the direct action that U.S. officials undertook and the subtle perceptions of Latin Americans that shaped and justified those actions.

History

Recipient: Marlene Roseboom

Marlene is entering her fourth year as a BA student and plans to continue her education at UCFV in the new Teacher Education Program, with the goal to become an elementary school teacher. Marlene appreciates the relaxed and friendly atmosphere at UCFV, as well as the personal interest that many instructors take in their students' academic success.

Faculty Supervisors: Alisa Webb Award: $500
Program Head: Sylvie Murray

Recognized for outstanding work on

Madame de Staël: Power and Paradox in Life and Writing

Madame Germaine de Staël, an early French feminist and an accomplished writer and salonière, advocated rights for women during the French Revolution and Napoleon's reign. Critics since the turn of the 18th century have praised her political and social skill. In talk and text, she managed to walk the fine line between overtly challenging prevailing views toward women and submitting to them just enough so that she did not alienate both her social contemporaries and her reading audience. Although Staël does not entirely escape the prevalent ideology of her era that women must be relegated to the private sphere, she does offer a strong challenge to contemporary assumptions of women's intellectual inferiority, paving the way for later feminists. This paper examines the disapproval of a woman's public role and the denigration of her intellect that was so prevalent in 18th century society through the lens of Jean Jacques Rousseau, Staël's father Jacques Necker, and Napoleon. It then contrasts Stael's actual intellectual prowess in her salons and writing with those commonly-held views.

Kinesiology

Recipient: Arron Docksteader

Arron's plans for the future are to obtain a MA and hopefully a PhD in the field of sports science; his area of interest is biomechanics. Arron has made many great friends at UCFV and would not have traded the hands-on experience he received for any other school opportunity.

Faculty Supervisor: Graham Fletcher Award: $1000
Program Head: Gregory Anderson

Recognized for outstanding work on

Comparing the Pose® method of rowing vs. the Traditional method of rowing: Muscle activity during steady state rowing and 250 m time trial differences using novice rowers

This study compared two rowing techniques: the Traditional method (TM) and Pose® method (PM) in order to determine changes in rowing kinematics and muscle activation measured with electromyography. The rowing community continues to analyze the current TM however, little progress has been made toward identifying a new technique that may elicit a better performance or decrease the stress on rowers that may cause injury. Results of this study indicate the TM technique contains a larger distance per stroke, which may result in a slower stroke rate. The TM technique also showed more muscle activation than the PM, which produced a lower power output. Conversely, results show the PM technique contains a shorter stroke length resulting in a smaller distance per stroke than the TM. However, the PM technique allows for a higher power output and a faster stroke rate, with less muscle activation. The findings from this study suggest that the new PM rowing technique may result in having a greater rowing efficiency and better performance outcomes.

Philosophy/Political Science

Recipient: Amanda Bottrill

Amanda has just completed her third year in the BA program. After she graduates next year, she is plans to apply to law school, with the goal of becoming a family lawyer.

Faculty Supervisor: Hamish Telford Award: $350
Program Head: Glen Baier

Recognized for outstanding work on

Recommendations to Improve Territorial Formula Financing: Helping the Yukon Move Forward

This paper was a briefing on the fiscal situation in the Yukon, demonstrating the ways in which the Yukon has long been ignored by the federal government. Being a territory that depends on the federal government for 61% of its revenue, one would think that the federal government would be eager to hear any suggestions the Yukon government could offer to improve its situation. However, this does not seem to be the case. The federal government focuses on the provinces, as this is where the majority of the population, and therefore the majority of votes, is located. The unique challenges of governing a population that is 25% Aboriginal peoples, not being allowed access to the revenues from their own natural resources, and striving for self-reliance are all significant issues that are addressed in this paper. Several recommendations are put forth in order to address these problems. These issues are currently holding the Yukon back from reaching its full potential. In order for the Yukon to move forward and produce a lively economy, these issues need to be resolved.

Philosophy/Political Science

Recipient: Conrad Cofre

Conrad has been a student at UCFV since 2003 and has a particular interest in Political Science.

Faculty Supervisor: Hamish Telford Award: $350
Program Head: Glen Baier

Recognized for outstanding work on

Equalization Report: The Province of Newfoundland & Labrador

This project was an investigation into the Equalization Process outlining its purposes and principles. It was concluded that Newfoundland & Labrador's demand for higher than average fiscal capacity is consistent with the principles of equalization due to Newfoundland & Labrador's high tax rates and debt levels.

Philosophy/Political Science

Recipient: Tim Schouten

Tim plans on graduating next year with a BA in History. He hopes to study at the theological college of the Canadian Reformed Churches, in Ontario. Tim would like to thank Hamish for a class well taught. In Tim's words, "Dr. Telford is a world-class professor, and made something which I might have previously considered mundane into something very exciting. That excitement, in turn, was reflected in my research paper, and the result was better than I could have hoped for."

Faculty Supervisor: Hamish Telford Award: $350
Program Head: Glen Baier

Recognized for outstanding work on

Ontario and Equalization – a Report Prepared for the Premier of Ontario

The aim of this research project is to brief the Premier of Ontario (theoretically) about Canada's equalization scheme, Ontario's interest in this national program, as well as Ontario's positions regarding its future. Equalization was introduced in 1957 by the federal government to deal with the problem of a horizontal fiscal imbalance. Some Canadian provinces with limited fiscal capacity didn't have the means to offer social programs at a level comparable to that of the richer provinces. There was a system of conditional grants already in place, but these did not bring the poorer provinces up to a sufficient level. Equalization was designed to bring up the fiscal capacities of these provinces to such a point that they could offer comparable social programs. It used federal tax-dollars, collected from all Canadians. Ontario, however, provides a very substantial amount (43%) of federal government revenues. This means, in turn, that 43% of equalization is funded by Ontario. In 2006-07, then, Ontario contributed 43% of $11.28 billion to equalization, that is, $4.85 billion. Ontario's position, therefore, is one of opposition to any increases to the total cost of equalization.

Physics

Recipient: Robin Kleiv

Robin is a graduating student this year with a BSc in Physics. He chose UCFV for its proximity to his home and for its excellent learning atmosphere due to small class sizes. He has been accepted into the graduate program at the University of Saskatchewan, where he plans to begin studying theoretical particle physics this September. Robin is a second time recipient of the URE award and was awarded an NSERC USRA in 2006.

Faculty Supervisors: Noham Weinberg Award: $500
Program Head: Norm Taylor

Recognized for outstanding work on

Non-equilibrium Dynamics of Reaction Systems in Viscous Media

As a research assistant, Robin's research involved model development and molecular dynamics simulations of reactions in viscous media, and utilized the WestGrid high performance computing infrastructure. The first of two projects that he worked on involved investigating how the reaction rate of a triatomic system is affected by the solvent cage effect. This research project required the development of a suitable potential function for the reaction and a procedure to generate properly distributed random initial conditions. Once this work was completed, simulations were performed. While performing these simulations he came up with the idea of using mass scaling as a technique for controlling solvent viscosity. The second project involved analytical work to demonstrate the validity of the idea. Once this was established, simulations were performed to test the technique. These tests were successful. This technique constitutes a useful alternative method to varying viscosity through pressure, temperature or the chemical identity of the solvent, and is easily implemented in simulations.

Physics

Recipient: Daniel Mori

Daniel Mori has worked on several projects with Rob Woodside and is a second time recipient of an Undergraduate Research Excellence Award. He also has been awarded an NSERC USRA for 2007. Daniel is graduating from UCFV with a Bachelor of Science degree.

Faculty Supervisor: Rob Woodside Award: $500
Program Head: Norm Taylor

Recognized for outstanding work on

Reimann Curvature Tensor

In Einstein's General Theory of Relativity, gravity is described geometrically as the curvature of space-time, determined by mechanical properties such as energy, momentum and pressure. The study of fluids is of particular interest as they are good representations of stars. The material fluid with the simplest mechanical properties is a "Perfect Fluid", which has isotropic pressure density and an energy density. This research involved solving the Einstein field equations (EFE) to get the metric for a static spherically-symmetric perfect fluid. Using this solution, Daniel was able to calculate the Riemann curvature tensor and the pieces of the Riemann tensor that arise from Ricci decomposition, such as the Weyl conformal tensor. When he analysed the Weyl tensor and its divergence, he split it into two pieces, expecting one to be a local gravitational field and the other to be nonlocal. Instead, Dan found that neither piece was divergence-free in general. The local divergence vanishes if and only if the energy density is constant inside the fluid.

Psychology

Recipients: Julee Bisiker, Carly Fredette, Mark Jaholkowksi and Sara Polokushko

Julee aspires to become a Behavioural Consultant for autistic children.
Carly plans to apply to the Masters in Occupational Therapy program at UBC for fall 2008.
Mark is doing a major in psychology; his research interests include memory, visual processing, and the effects of stress on health.
Sara graduated with a BA in Psychology and she plans to attend graduate school in Counseling Psychology.

Faculty Supervisor: Ron Laye Award: $250 each
Program Head: Wayne Podrouzek

Recognized for outstanding work on

Improving Academic Performance: Managing Stress through Biofeedback and Relaxation Training

The goal of this study was to assist post-secondary students in improving their academic success by reducing stress and promoting relaxation. Two versions of a stress reduction program were tested. Participants in both conditions were taught effective stress reduction techniques, including diaphragmatic breathing and progressive muscle relaxation. One group received heart rate variability biofeedback training while the other group received more reflective listening along with the cognitive-behavioural training (CBT). Results obtained indicate there were no significant differences between the two groups on any of the dependent variables. However, there was significant improvement on all three visual analog scales (VAS) that measured perceived stress and its effect on academic performance and daily life. A significant positive correlation was also obtained between positive affect and all measures on the VAS. It was concluded that, while a greater number of participants might yield better results, a brief intervention of CBT can reduce stress and negative affect and increase positive affect.

Social, Cultural, and Media Studies

Recipient: Colleen Smith

Colleen came to UCFV in 2002 after working for many years in the field of childcare. Committed to enhancing the experience of youth in the Fraser Valley, she has been involved with several community projects to raise youth awareness of racism, sexism and homophobia. From her political work she became interested in the media effects of "girl power" on the upcoming generation of young women. Colleen plans to continue her research in the areas of social justice, media and gender studies.

Faculty Supervisor: Katherine Watson Award: $1000
Program Head: Elizabeth Dennis

Recognized for outstanding work on

Girl Power Comes of Age: An Exploration in Young Women's Gender Identity Formation

This qualitative study was conducted using a purposive sample of middle-class young women in order to explore the effects of girl-positive media on young women's gender identity formation. The results reveal that both positive and negative effects occur. As children the young women used such media to create community. Today they employ creative forms of resistance to the negative aspects of the media. Yet, despite the support and high expectations of their well educated parents, the young women are unable to wholly resist the negative impact of girl- positive media, particularly that which is perpetuated by large corporations.

Social Work and Human Services

Recipient: Susi Schecker

Susi is currently completing her final year in the Bachelor of Social Work program. While she plans to work in the field after graduation, she is considering further education in the future. Her interest in this research stems from her belief that all individuals and all groups in a society deserve an equal opportunity to live and learn to their fullest potential.

Faculty Supervisor: Adrienne Chan
Program Head: Gloria Wolfson

Award: $1000

Recognized for outstanding work on

Research on Social Justice in Universities

This research examines how social justice is conceptualized and experienced in universities. As part of a comparative study, the research begins by documenting polices that relate to social justice in 20 Canadian universities. This will be followed by the development of case studies in three to four universities. The methods used will include policy analysis, documentary analysis and in-depth interviews. Policy and documentary analysis will rely on discourse analysis, textual analysis, and analysis of power relations. The results of this study will have implications for higher education governance, university policy, practices for inclusion, and may influence the re-assessment of social goals of the university. This research will contribute to knowledge generation by increasing an understanding of the university's role as a vehicle to build citizenship and social justice, in a time of competing demands and priorities.

The University College of the Fraser Valley (UCFV) is a comprehensive, regional post-secondary institution that enrolls over 10,000 students per year and is larger than half the universities in Canada. Nestled in the beautiful Fraser Valley just east of Vancouver, British Columbia, UCFV has campuses in Abbotsford, Chilliwack, and Mission, and regional centres in Hope and Agassiz.

UCFV focuses on teaching excellence, with the highest priorities for research being to support teaching and to address local issues and regional needs. Faculty, staff, and students are engaged in a significant number of research projects that both enrich the environment of the university and contribute to the development of the Fraser Valley region. This publication is intended to create awareness of this activity and to serve as a reference to those seeking access to specific expertise at the institution.

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