

UNDERGRADUATE RESEARCH INITIATIVE

NOVEMBER 2015 REPORT

RESEARCH/USASK.CA/UNDERGRADUATE



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Introduction

In 2013, the University of Saskatchewan set a target to raise the number of undergraduate students engaging in a research experience by 10%. This was part of a larger goal to increase experiential learning by 20% within four years across the institution as set out in the **Promise and Potential Integrated Plan 2012-2016**. Through collaboration with faculty in Agriculture, Kinesiology, and the Social Sciences, two administrative units empower faculty to integrate research into their curriculum and align their teaching and research. Investments have been made by the Offices of the Vice-President Research (OVPR) and Vice-Provost Teaching and Learning (VPTL) and have included four essential elements which facilitated the pilot's success:

1. Curriculum innovation expertise
2. Funding and administrative backing
3. Program evaluation
4. The "community-of-action" faculty group

Faculty access expertise from the Gwenna Moss Center of Teaching Effectiveness to innovate their pedagogical practices to include curriculum-based research experiences for students. Explicit funding and administrative support from the Office of the Undergraduate Research Initiative, part of the Strategic Research Initiatives unit within the OVPR, allows faculty to hire experienced students as "research coaches" to guide and facilitate first-year students as they carry out a class-based research project; and co-organize events wherein students share their findings. An integrated program evaluation strategy allows faculty and administrators to track and guide progress, ensure the potential to look at long-term outcomes, and provision data for faculty interested in the Scholarship of Teaching and Learning. The "Community-of-Action", through events and an online presence, enables interdisciplinary collaboration as new and experienced faculty share practices, exchange ideas, and facilitate knowledge mobilization.

Central to operationalizing research experiences in diverse fields of study was determining a common definition that both offices, with distinct mandates, could endorse. The "research arc", a common, simple, yet flexible definition of the three steps involved in the research process, refers to students' forming a question, investigating, and dissemination findings. Involved faculty have overwhelmingly embraced the "research arc" and the initiative overall with creative and meaningful curricular approaches which reflect their courses' learning outcomes. Meanwhile, students increasingly recognize that they are developing an understanding of the research process, what it means to think and act like a researcher, and the potential research holds.

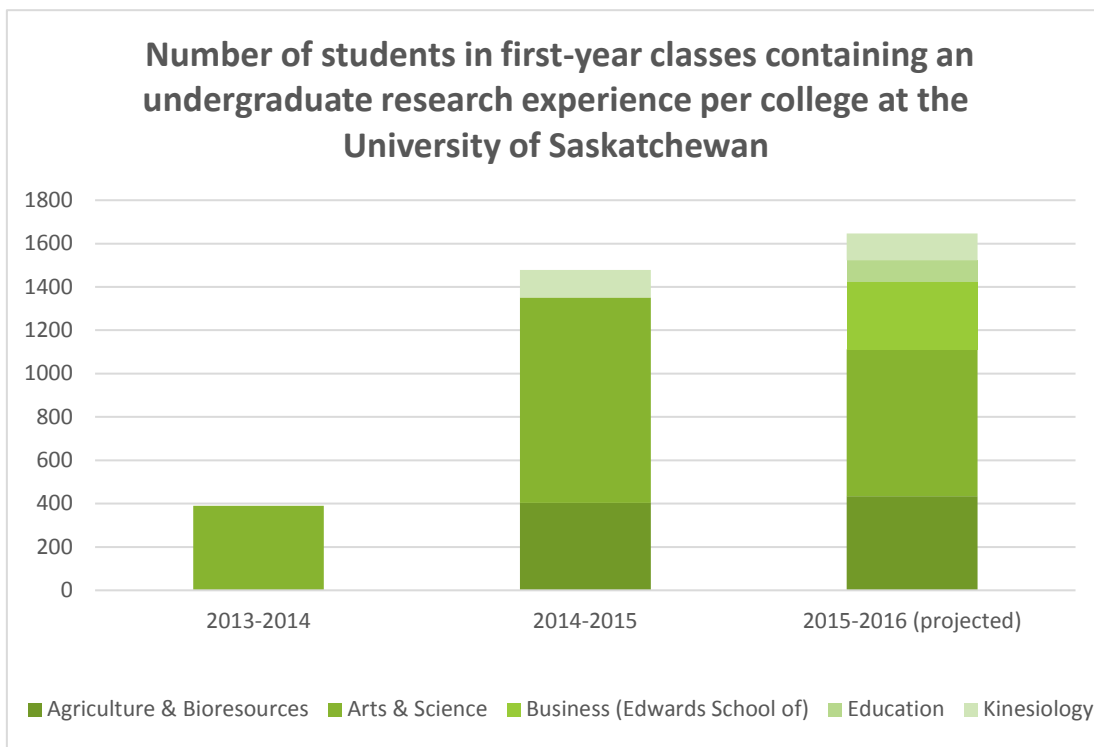
Now in its second year, momentum for the first-year, course-based undergraduate research is building, gaining involvement from faculty and administrators in Business, Natural Sciences, and the Humanities. The Undergraduate Research Initiative is poised to reach the 20%, Integrated "Promise and Potential" goal with course-based undergraduate research, ensuring more and better opportunities for students' to do and disseminate research and serving as an example to other institutes interested in similar outcomes.

Curriculum-Based Experiences

The Undergraduate Research Initiative has increased the number of students' engaging earlier and more often in the UofS research culture through explicit resources for faculty to implement meaningful research experiences in 100-level courses. This fall, five colleges are offering approximately 1200 entry-level students an introduction to research through a course-based project. To accomplish these gains, faculty are directly supported to align research experiences and learning outcomes with the help of expertise in curriculum and instructional design, and through the provision of research coaches who facilitate students' research activities. Through targeting resources to support first-year research experiences, we are building students' scholarship and skill sets and increasing faculty interest in and activities in the Scholarship of Teaching and Learning.



To formalize a collaboration, a faculty instructor embeds an introductory research experience that covers the three stages of **the research arc**, including: a) having students involved in creating a research question; b) investigating the question; and c) sharing the results. This process simulates the professional research cycle and provides individual students, or those working together in groups, a valuable introduction to some important tenets of research.



CURRENT COLLABORATING CLASSES AND COLLEGES

In the 2014-2015 academic year, nearly 1500 students from the three inaugural participating colleges experienced curriculum-based undergraduate research. Advancing on the success of the two previous years, the 2015-2016 year sees an additional two participating colleges: the College of Education and Edwards School of Business. As a result of these new collaborations, the initiative has been able to attain a greater reach and more diverse offerings and is expecting to see a 10% increase in the total number of student participants across both terms.

Fall 2015 Participating Colleges, Professors, Course Sections, and Student Numbers

Arts & Science			
INTS 102.3 (91)	GEOG 130.3 (01)	WGST 112.3 (03) & (05)	SOC 112.3 (01)
<i>Studying in Science: Essential Skills and Strategies</i> Dr. Sandra Bonny 42 students	<i>Space Place and Society: An Introduction to Human Geography</i> Dr. Paul Hackett 130 students	<i>Intro to Women's and Gender Studies</i> Dr. Mirela David & Ms. Allyson Stevenson 66 and 61 students	<i>Foundations in Sociology: Social Construction of Everyday Life</i> Dr. Victoria Mowat 122 students
Agriculture and Bioresources			
AGRC 111.3 (01A)	ANBI 110.3	EVSN 110.3 (01)	
<i>Sustainable Plant and Soil Management</i> Dr. Francis Walley & Ms. Krista Wilde 255 students	<i>Introductory Animal Bioscience</i> Dr. Murray Drew 90 students	<i>Renewable Resources and Environment</i> Dr. Steven Mamet 42 students	
Edwards School of Business		Education	
COMM 104.3 (01) & (03)		ECUR 309.3	
<i>Business Statistics I</i> Dr. Mahshid Atapour 199 students		<i>Applied Literacies of Knowing ELA Elementary</i> Dr. Beverly Brenna 16 students	

PARTICIPATING COLLEGES FOR 2015-2016

The Undergraduate Research Initiative has expanded into two new colleges in the 2015-2016 academic year. Collaborators now include:

- College of Agriculture and Bioresources
- College of Arts and Science
- College of Education [NEW]
- Edwards School of Business [NEW]
- Kinesiology

Edwards School of Business has forged ahead with an innovative inclusion of undergraduate research in the first-year Business Statistics course. Students have responded enthusiastically to applying the skills and tenets to a project and topic of their choosing.

College of Education is participating with an entry-level class offered once in each term. This fall, students in the **Indian Teachers Education Program (ITEP)** have the chance to research through an inquiry project as part of the participating class.

The **College of Kinesiology** has implemented an in-class undergraduate research experience for all first-year student intending to complete a kinesiology degree. This year the course is offered in Term 2.

In the **College of Agriculture and Bioresources**, every first year student in the college will participate in an in-class research experience culminating in a college-wide poster competition at the end of term. With one or more instructors in every first-year class participating, a professional community of faculty within the College is formed.

CURRICULUM-BASED INNOVATION

As a joint venture with the Undergraduate Research Initiative, the Gwenna Moss Centre for Teaching Effectiveness (GMCTE) provides collaborative and targeted curriculum and instructional design assistance for faculty who are implementing research into courses. Experts support faculty from any discipline to balance undergraduate research within course learning outcomes, to maintain feasibility, and maximize known benefits for students and faculty alike. Key staff include Dr. Sheryl Mills, Curriculum-Design Specialist, Mr. Ryan Banow, Instructional Design Specialist, and Dr. Carolyn Hoessler, with expertise in the Scholarship of Teaching and Learning.

The **Experiential Learning Fund** <http://www.usask.ca/gmcte/awards/experiential>, administered through GMCTE, makes \$250,000 available annually to support innovative academic projects. This type of resource can be put toward supporting student groups' disseminating their research findings such as through the Agriculture and Bioresources First-Year Research Experience (FYRE) Poster Fair.

COMMUNITY-OF-ACTION

Since February 2013, faculty collaborators and those interested in getting involved with entry-level undergraduate research are invited to events offered each term, and an online component with resources and links to exchange ideas, experiences and thoughts on the research arc and its implementation in classes, as well as getting involved in the Scholarship of Teaching and Learning.

Program Evaluation

During our full academic year pilot phase in 2014-2015, the Undergraduate Research Initiative invited a doctoral candidate from the Social Psychology unit to design and implement a program evaluation strategy. This student provided guidance in developing a Program Logic Model from which she could develop and administer survey tools. The investigation of our course-based activities and participants included a student questionnaire and questions for research coach and instructor interviews and focus groups. Every research coach and faculty collaborator participated in Term 1, and student surveys in participating classes across both terms allowed for a 65% response rate. In fall 2015, we are also surveying the majority of participating classes.

Faculty results indicated that the pilot was a success with collaborators reporting genuine satisfaction with their experience, improved interconnectedness of pedagogies and enhanced reach to multiple learning styles and diverse students, improved knowledge mobilization, more opportunities to differentiate oneself for the purposes of tenure and merit promotion, and overall optimism about the impact on students and research coaches.

Now our first year students, the very first year they come in, they are hearing about research or learning about different techniques, they're talking about research questions. They're talking about research data, analysis and different ways that we can be doing that."

L. Ferguson, Professor in Kinesiology

Specifically according to faculty and research coaches, **undergraduate students** who experienced **course-based research** benefited in three main areas: **thinking skills, group skills, and understanding of research**. Thinking skills involve problem solving and flexibility and adaptability as well as the ability to follow instructions. Group skills refer to peer accountability, the ability to work with and interact with others including those with differing diverse opinions and experiences, and giving and responding to constructive feedback. First-year students also developed an understanding of research as a process and the relationship between knowledge and research through ore chances to see and hear about research in person from local experts, exploration of career interests leading to more informed decision making, and a sense of the connectedness between students and academic community. Another reported benefit was that **research coaches** spoke of their role as having provided them a unique skill building experience for their CVs.

"I have to say that this was one of the best teaching experiences I have ever had. Usually when I try new teaching methods, it never works out quite right the first time. This program has just astounded me with how well it worked and with such a positive response from the students. I can't wait to do it again next year!" M. Drew, Professor in Agriculture and Bioresources

Research Assistantships

OVPR MATCHING GRANTS

This past summer, 90 Undergraduate Student Research Assistantships were awarded to undergraduates hired to work on faculty-led research. Funds are typically provided as \$2,000 or \$4,000 awards that are **matched or superseded** by the faculty supervisor or college. Annual allocations are determined based on undergraduate enrolment numbers and are made available to each college or school in the following amounts. Amounts below indicate the combined OVPR contribution and guaranteed matched amount.

Academic Unit	2014	2015
Agriculture and Bioresources	\$24,000 6 students	\$20,000 2 students
Arts & Science	\$224,000 35 students	\$288,000 37 students
Dentistry	\$8,000 1 student	\$12,000 3 students
Education	\$40,000 8 students	\$44,000 6 students
Edwards School of Business	\$36,000 5 students	\$52,000 9 students
Engineering	\$48,000 11 students	\$44,000 10 students
Johnson Shoyama School of Public Policy	\$8,000 1 student	\$8,000 1 student
Kinesiology	\$16,000 4 students	\$16,000 4 students
Law	\$8,000 2 students	\$8,000 2 students
Medicine	\$8,000 1 student	\$12,000 3 students
Nursing	\$32,000 7 students	\$24,000 6 students
Pharmacy and Nutrition	\$12,000 2 students	\$12,000 2 students
Environment and Sustainability	\$8,000 2 students	\$8,000 2 students
Public Health	\$8,000 2 students	\$8,000 1 student
Veterinary Medicine	\$8,000 1 student	\$8,000 2 students
Total	\$488,000 88 students	\$564,000 90 students

***Ratio of # of Students/Award**
more students can benefit when the awards are well allocated.*

***Quality vs. Quantity**
research assistantship funding aims to achieve a balance between quality and quantity.*

Showcasing Student Research

SUMMER ASSISTANTSHIP SOCIAL

Students' contributions to research over the course of the summer are celebrated and showcased in an event in mid-August attended by faculty supervisors and student recipients of both Undergraduate Student Research Assistantships awarded by the Natural Sciences and Engineering Council (NSERC) and the Undergraduate Research Initiative through the OVPR. Staff from the Undergraduate Research Initiative and the College of Graduate Studies and Research office combined efforts to host a poster competition involving 40 submissions resulting in three awards, the creation of 14 student videos, a select few of which are posted the Usask YouTube channel, a compelling reception with university leader' speeches, and the opportunity to network and socialize.

UNIVERSITY OF SASKATCHEWAN UNDERGRADUATE RESEARCH JOURNAL (USURJ)

The Undergraduate Research Initiative committed to providing support to **USURJ** for a three-year pilot from 2013-2016. The introductory years have resulted in high student involvement in editing and publishing and two, published issues of the on-line journal. Since the journal's launch, 27 students have had the opportunity to publish their peer-reviewed research and art. Notable highlights include:

- *A viewership of approximately 5700 from October 30th 2014 to October 30th 2015*
- *On-going opportunities for undergraduates to publish their work;*
- *High student interest and involvement in editing roles which develop valuable co-curricular skills in academic publishing.*

Goals for the future may include mitigating peer-review fatigue and student hours, and clarifying disciplinary focus. The first issue of the second volume is currently underway.

USSU PROJECT SYMPOSIUM

The University of Saskatchewan Student Union's Project Symposium started as a means of bridging gaps in the cycle of research on campus by offering an additional, pan-disciplinary opportunity for undergraduate students to showcase their research, scholarly and artistic works in a public forum. This past January, there were 58 applicants with 21 displays, illustrating a growing interest in showcasing undergraduate research over last year's number of submissions and displays. The Project Symposium is an adjudicated event that welcomes faculty and staff to judge students' submissions and the most remarkable projects are awarded monetary prizes.

This event will repeat again this coming January with increased efforts to reflect a greater range of disciplines and a streamlined judging process. Building on its success, redoubled efforts are likely to increase the visibility, accessibility, and number and quality of student submissions and enhance audience interest.

"USURJ paved a path for me to be part of a journey towards celebrating and fostering passion for academia."

- So Ri Lee, volunteer associate editor

Raising Awareness

RESEARCH/USASK.CA/UNDERGRADUATE

In October 2014 the **Undergraduate Research website** was launched. It offers resources, service-descriptions and lists of opportunities for faculty, undergraduates and graduate students. Specifically, lists of participating classes, external funding opportunities for assistantships and travel to present on research, as well as stories about student research experiences are available.

Since the website launch, the Undergraduate Research Office has been tracking the website data in order to infer about the website's usability, outreach, and accessibility. The most recent analytics show a high amount of traffic coming from the Student Stories page and video blogs index as well as to the Assistantships page, with the third most popular page being the one listing undergraduate research courses. Of note, an increase in views led up to the August 13th Social event celebrating assistantships with most users visiting the vlogs from 2014. Typical viewers spend three minutes on the site each visit looking over four pages. This is encouraging as it means viewers are reading (or watching) feature and finding what they are looking for along with discovering new content of interest.

SOCIAL MEDIA

In addition to the website, other ways of reaching and communicating with an audience consisting of students, faculty, campus colleagues, and our national and international counterparts has increasingly involved social media. In 2014, the Undergraduate Research Initiative's summer student created a **Twitter** account and tweeted to involve and communicate with interested students, faculty and campus services and departments. The 2015 summer student created a **Facebook** account that has also proven to be successful in connecting with student communities on campus, promoting student stories and research experiences, all of which consequently direct viewers to the Undergraduate Research website.

Another developing contribution to the social media presence for Undergraduate Research will come from a newly created student position: **event and communications photographer**. To maintain and build relevance and interest through social media and the website, attention to our visual messaging is important. Images of our events and activities, as well as those of our collaborators and partners, will strengthen and promote the initiative.

STUDENT ENGAGEMENT THROUGH PAL: UNDERGRADUATE RESEARCH WORKSHOPS



Facilitated by mentors from the Peer Assisted Learning (PAL) program, and in conjunction with the Library, Student Learning Services (SLS) and lead by the Undergraduate Research Initiative Coordinator, the workshop series aims to have students helping students in the development and capacity building of research related skills and knowledge with an interdisciplinary approach.

Topics for workshops during regular term include:

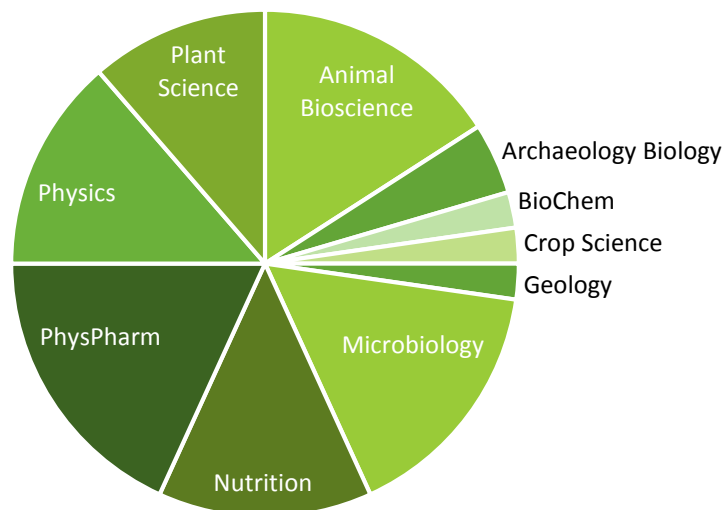
- How to Approach a Research Supervisor
- How to Create a Research Poster
- How to Apply for and Where to Find Funding
- Transferable Skills: from research to the workplace and vice versa

Students from nearly all disciplines attend the workshops with a majority studying in the sciences. This year we have seen a significant increase in the number of Physics and Physics Engineering and Animal Bioscience students as well as consistent attendance from students majoring in typically “pre-medicine” areas of study including: Physiology and Pharmacology, Microbiology, , and Pharmacy and Nutrition. Attendance at these workshops has increased this term over last and is consistent over the weeks meaning that student interest in research, often stemming from installations of course-based research experiences, and promotion by undergraduate chairs within

departments is growing.

Bookmarks created this term promote future Undergrad Research Workshops through the libraries

Chart of Workshop Participants' Area of Study/Major



Acknowledgements

The Undergraduate Research Initiative has evolved since the release of the October 2014 report through the efforts and enthusiasm of faculty collaborators, research coaches and peer mentors, as well as staff across multiple departments. Any and every progress and credit of successes within the Initiative are owed to these individuals.

An asterisk denotes a term partner who has been involved across more than one iteration.

FACULTY INSTRUCTORS

Dr. Alec Aitken
Dr. Mashid Atapour
Dr. Sandra Bonny*
Dr. Beverly Brenna
Dr. Mirela David*
Dr. Murray Drew*

Dr. Leah Ferguson
Dr. Joseph Garcea
Dr. Paul Hackett
Dr. Frank Klaassen
Dr. Colin Laroque
Dr. Marie Lovrod

Dr. Michael MacGregor
Ms. Victoria Mowat*
Ms. Allyson Stevenson
Dr. Ulrich Teucher
Dr. Fran Walley*
Ms. Krista Wilde*

RESEARCH COACHES

Kathleen Aikens
Gurcharn Brar
Nicole Cameron
Ashleigh Cummer
Dilshan De Silva Benaragam*
Terri Favel
Christina Fowlie-Neufeld
Yuchen (Nina) Gao

James Hawkes
Leanne Jaeb*
Kim Kargut*
Bridget Larocque
YuanYuan (Sunny) Li
John-Etienne Myburgh*
Gurbir Singh Dhillon
Nicole Spencer*

Kelsi Toews
Linzi Williamson
Jing Xie
Dandan (Stella) Xu
Zihan (Hester) Ye
Chuyuan Zhan

PEER MENTORS

Yasamin Bahman
Dilshan de Silva Benaragama
Russell Green

Jillian Gushulak
Yangyang Liu
Stephen Patrick*

Alexandra Staley
Ramy Tannous*

UNDERGRADUATE RESEARCH INITIATIVE STAFF

Ryan Banow
Aimee Ferré
Kara Loy

Dr. Sheryl Mills
Thomas Onion
Dr. Nancy Turner

Laura Zink

Conclusion

The University of Saskatchewan is a community of scholars. To ensure every member of that community, from student to faculty, has the opportunity to contribute to our research mission, the Office of the Vice President Research and the Vice Provost Teaching and Learning are supporting faculty interested in implementing a course-based undergraduate research experience across multiple departments and colleges. The Undergraduate Research Initiative is expanding and the number and quality of opportunities for students and faculty to ask research questions, investigate, and present their discoveries in ways which build confidence, contribute to a rich academic experience, develop and diversify scholarship, and result in research with impact for our institution.