

UNDERGRADUATE RESEARCH INITIATIVE

MARCH 2016 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](#). 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. A collaborative approach including forming a "Community-of-Action" faculty group
5. Undergraduate Student Research Assistantships

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, social sciences and the humanities. Participation among students engaging in a first-year research experience has increased from 1500 in 2014/15 to over 1800 students in 2015/16. Program evaluation results from the pilot have indicated that faculty are highly satisfied collaborators and students report an increased ability, "to think like a researcher".

In fact, the Undergraduate Research Initiative is poised to reach the 20%, Integrated "Promise and Potential" goal covering both course-based undergraduate research and a robust number of mentored, summer research assistantships in each College. All of this ensures more and better opportunities for students' to do and disseminate research, scholarly and artistic work and serving as an example to other institutes interested in similar outcomes.

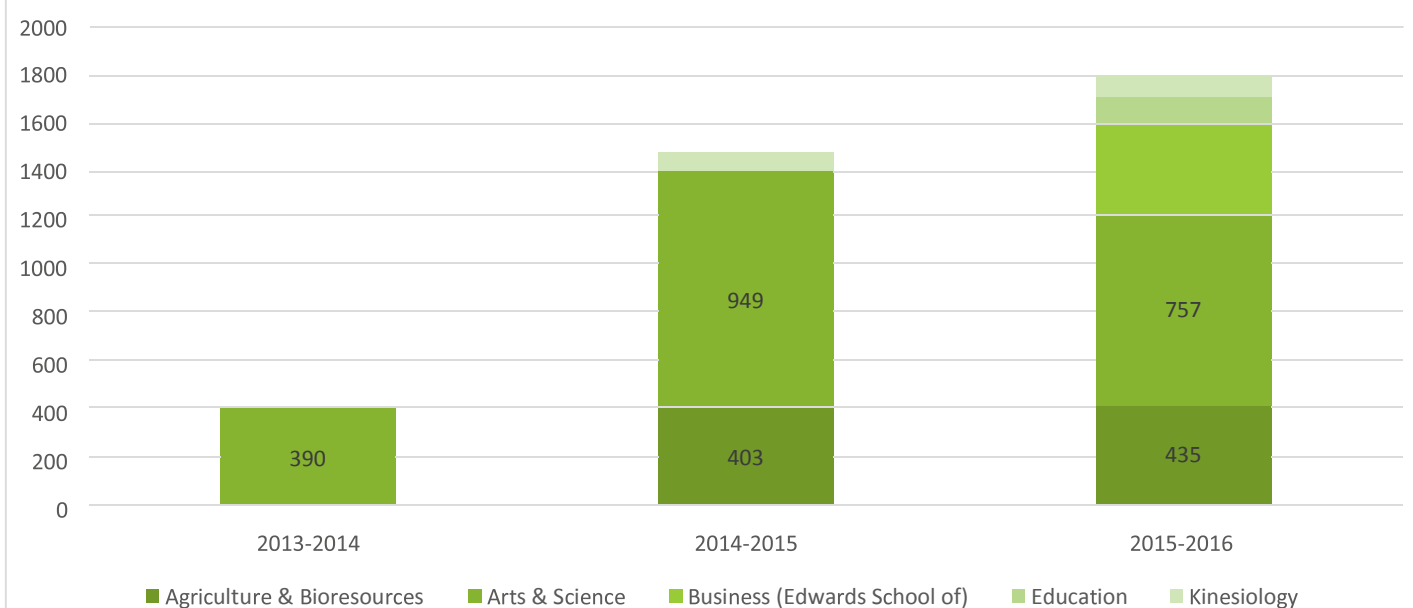
Curriculum-Based Experiences

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 research experiences in first-year courses. Throughout 2015-2016 academic year, five colleges offer over 1800 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 for early research experiences, our institution is building students' scholarship and skill sets and increasing faculty interest in and activities in the **Scholarship of Teaching and Learning**.



Faculty get involved by embedding a 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 simulates the professional research cycle and provides individual students, or those working in groups, a valuable introduction to the important tenets of research.

Number of students in entry-level classes with an undergraduate research experience per college at the UofS since 2013



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 offer more diverse disciplinary research experience and is prepared to see a 10% increase in the total number of student participants across both terms.

2015-2016 Participating Colleges, Professors, Course Sections, and Student Numbers

Program offerings include specific Aboriginal programming such as the Arts & Science Aboriginal Student Achievement Program (ASAP) and Transition Program, along with the Saskatchewan Urban Native Teacher Education Program (SUNTEP) in the College of Education.

PARTICIPATING COLLEGES FOR 2015-2016

The **Undergraduate Research Initiative** started with a pre-pilot in one college, expanded into three colleges for the pilot year and has now expanded into two, additional colleges for 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 found success with offering research experiences in first-year **Business Statistics** course. Students have responded enthusiastically to applying the skills and course learnings to a project and topic of their choosing to support the statistical skills they acquire.

The **College of Education** is participating with an entry-level class offered once in each term. In fall, 2015, students in the **Saskatchewan Urban Native Teachers Education Program** (SUNTEP) had 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 student taking a first-year class in the college will participate in an in-class research experience culminating in a college-wide poster competition at the end of term.

CURRICULUM-BASED INNOVATION

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

Arts & Science

INTS 102.3	GEOG 130.3	WGST 112.3
<i>Studying in Science: Essential Skills and Strategies</i> Dr. Sandra Bonny 42 students A.S.A.P.	<i>Space Place and Society: An Introduction to Human Geography</i> Dr. Paul Hackett 130 students	<i>Introduction to Women's and Gender Studies</i> Dr. Mirela David & Ms. Allyson Stevenson 66 and 61 students
ASTR 104.3	ENG 114.3	SOC 112.3
<i>Astronomy of Planets (online)</i> Dr. Daryl Janzen 79 students	<i>Literature and Composition: Reading Culture</i> Dr. Wendy Roy 28 students U.TRAN.	<i>Foundations in Sociology: Social Construction of Everyday Life</i> Dr. Victoria Mowat 122 students
GEOG 109.3	GEOG 120.3	HIST 155.3
<i>The Earth and Life Through Time</i> Dr. M Gabriela Mangano 24 students A.S.A.P.	<i>Introduction to Global Environmental Systems</i> Dr. Xulin Guo 133 students	<i>Magic, Superstition, Rationality and the West</i> Dr. Frank Klaassen 76 students

Agriculture and Bioresources

AGRC 111.3	ANBI 110.3	EVSN 110.3
<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	Kinesiology
COMM 104.3 &	ECUR 309.3	KIN 122.3
<i>Business Statistics I</i> Dr. Mahshid Atapour 406 students	<i>Applied Literacies of Knowing ELA Elementary</i> Dr. Beverly Brenna 16 students S.U.N.T.E.P. <i>& Relational Curriculum Making Elementary</i> 100 students	<i>Social Behavioural Foundations of Physical Activity</i> Dr. Leah Ferguson 109 students

COMMUNITY-OF-ACTION

Since February 2013, current and potentially interested faculty collaborators are invited to in-person term-events, and to become members of an online group offering resources and links to exchange ideas, experiences, and thoughts on the research arc and its implementation in classes, as well as the chance to get involved in the **Scholarship of Teaching and Learning**.

Topics have included:

- Research ethics: questions and considerations
- Program Evaluation
- Disseminating Students' Research
- Working in Instructional teams; research coaches and more
- Assessment solutions for in-class research, scholarly and artistic work
- Publishing in the field of Scholarship of Teaching and Learning

Program Evaluation

During our full academic year pilot phase in 2014-2015, the **Undergraduate Research Initiative** designed and implemented a strategy to evaluate the initiative. Starting with a **Program Logic Model**, survey tools were then developed. The investigation of course-based research included a student questionnaire and instructor and research coach interviews and focus groups. In-class student surveys resulted in a 65% response rate, and 100% response rate from research coaches and faculty collaborators.

Faculty results have indicated that the pilot was successful with collaborators reporting genuine satisfaction with their experience, improved interconnectedness of pedagogies, 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 of Kinesiology

Moreover, 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 seeing and hearing 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 benefit was that **research coaches** spoke of their role as having provided them a unique skill building experience they can apply to their Curriculum Vitae.

"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 based on undergraduate enrolment numbers and were made available to each college or school in the following amounts in 2014 & 2015. Amounts listed below are indicative of the combined OVPR contribution and guaranteed, matched amount.

Academic Unit	2014	2015
Agriculture and Bioresources	6 students	2 students
Arts & Science	35 students	37 students
Dentistry	1 student	3 students
Education	8 students	6 students
Edwards School of Business	5 students	9 students
Engineering	11 students	10 students
Johnson Shoyama School of Public Policy	1 student	1 student
Kinesiology	4 students	4 students
Law	2 students	2 students
Medicine	1 student	3 students
Nursing	7 students	6 students
Pharmacy and Nutrition	2 students	2 students
Environment and Sustainability	2 students	2 students
Public Health	2 students	1 student
Veterinary Medicine	1 student	2 students
Total	88 students	90 students

Highly Valued:

"Funding through the USRA program was crucial for me in starting my research laboratory. My summer student was highly capable and able to act as my second pair of hands."

*Dr. Corey Tomczak,
Professor in the College
of Kinesiology*

Showcasing Student Research

SUMMER SOCIAL FOR ASSISTANTSHIP RECIPIENTS AND THEIR SUPERVISORS

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** combined efforts to host a **Poster Competition** involving 40 submissions resulting in three awards, the creation of [14 student video blogs](#) (vlogs), a select few of which are posted to the [Usask YouTube channel](#), a compelling reception with university leaders' speeches, and the opportunity to network, feel appreciated, 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; and*
- *high student-interest and involvement in editing roles which develop valuable co-curricular skills in academic publishing.*

Goals for the future may include mitigating challenges including student hours, and clarifying disciplinary focus. The next issue is currently in progress.

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. Last January, there were 58 applicants and 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 took place as well in January 2016 with prizes awarded in science & engineering, social sciences and humanities, a People's Choice award, and a prize specific to a project reflective of a U of S Signature Research Area. Increased efforts resulted in awards going to a greater range of disciplines and a streamlined judging process.

"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

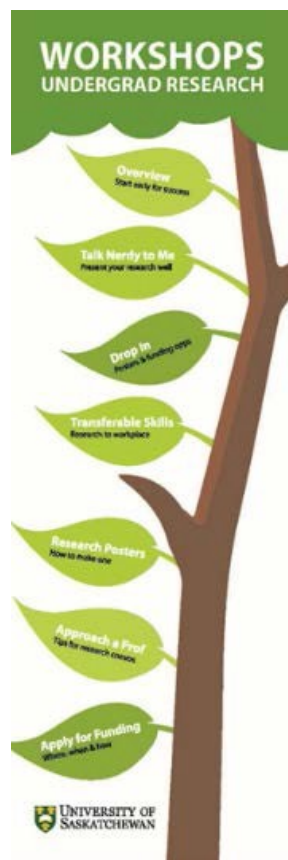
Raising Awareness

RESEARCH/USASK.CA/UNDERGRADUATE

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

Since the website launch, the **Undergraduate Research Office** has been tracking website data-use 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 **Summer Social** event celebrating assistantships with most users visiting the **vlogs** from 2014. Typical viewers spend three minutes on the site each visit looing over four pages. This is encouraging as it means viewers are reading (or watching) features and finding what they are looking for along with discovering new content of interest.

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), the workshop series aims to have students helping students in academic endeavours related to capacity building of research related skills and knowledge with an interdisciplinary approach. Uptake is steady with nearly 90 students taking in a workshop so far over this academic year.

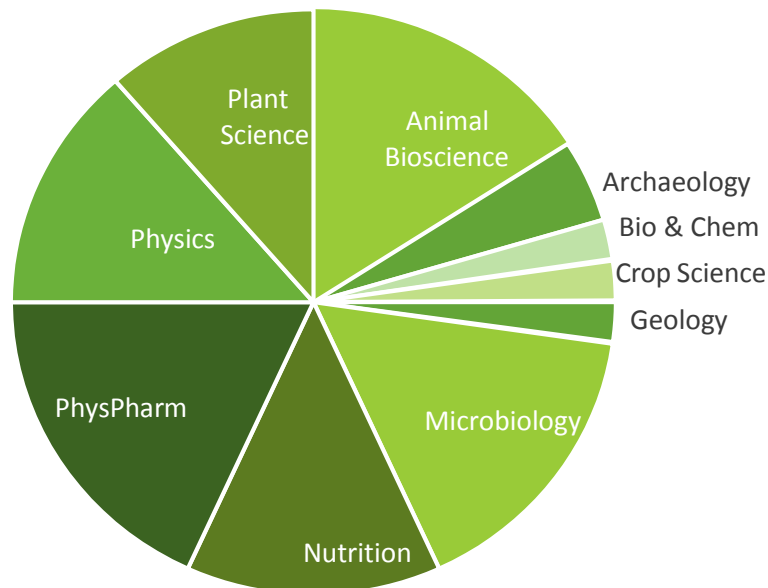
Topics include:

- 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' Areas of Study/Major



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 along with promoting student stories and research experiences, all of which consequently direct viewers to the **Undergraduate Research website**. Furthermore, we now have a student photographer to capture images at events, workshops, and to create more impact in visual media.

- Facebook—<https://www.facebook.com/U-of-S-Undergraduate-Research-Initiative-1606229909607787/?fref=ts>
- Twitter—<https://twitter.com/usaskUGResearch>
- Website—<http://research.usask.ca/undergraduate/>

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 multi-term partner who has been involved across more than one iteration.*

FACULTY INSTRUCTORS

Dr. Alec Aitken	Dr. Xulin Guo	Dr. Gabriela Mangano
Dr. Mahshid Atapour*	Dr. Paul Hackett	Ms. Victoria Mowat*
Dr. Sandra Bonny*	Dr. Daryl Janzen	Dr. Wendy Roy
Dr. Beverly Brenna*	Dr. Frank Klaassen*	Ms. Allyson Stevenson
Dr. Mirela David*	Dr. Colin Laroque	Dr. Ulrich Teucher
Dr. Murray Drew*	Dr. Marie Lovrod	Dr. Fran Walley*
Dr. Leah Ferguson*	Dr. Michael MacGregor	Ms. Krista Wilde*
Dr. Joseph Garcea	Dr. Steven Mamet	

RESEARCH COACHES

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Nicole Cameron	Bridget Larocque	Jing Xie
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Kara Loy	Dr. Nancy Turner	

Conclusion

The **University of Saskatchewan** is a community of scholars and to ensure every member of that community, from first-year student to faculty member, has the opportunity to contribute to our research mission, the **Offices 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 faculty to support students in asking interesting and meaningful research questions, investigating, and presenting their discoveries in ways which build confidence, contribute to a rich academic experience, develop and diversify scholarship, and ultimately result in **Research with Impact** for our institution.