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Undergraduate student participation in non-curricular research

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2-24-2022

Undergraduate Student Participation in Non-Curricular Research: Preliminary Findings

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SOURCE Citation

Osborne, Bethany; Chaze, Ferzana; George, Purnima; Medhekar, Archana; Sullivan, Kate; and Abdulrahem, Israa, "Undergraduate Student Participation in Non-Curricular Research: Preliminary Findings" (2022).

Undergraduate student participation in non-curricular research. 1.

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Preliminary Findings

BY

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Acknowledgments

We would like to thank the following people for their contributions to this research:

Israa be Abdulrahem, Research Assistant, Sheridan College SSW Program

Hafsa Alavi, BSW Placement Student, Ryerson University

Sanaya Chaze, Cover Design, Bachelor of Interior Design Program, Ryerson University

Nidhi Jose, BSW Placement Student, Ryerson University

Seraphina Serutan, Research Assistant, Paralegal Program, Sheridan College

Katie Sullivan, Research Assistant, Sheridan College SSW Program

Sydney Weitler, SSW Placement Student, Sheridan College

Cover Photo: Adobe Stock Photos

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Preamble

Over the past decade, the researchers have worked in higher education and community-based settings and worked with dozens of undergraduate students. Personal experience of working with those students fueled our curiosity. We knew that many of the students that we had worked with really benefitted from their experiences, and we also knew that it had been valuable to our own research projects. Undergraduate research is listed as a High Impact Practice (HIPS) for the undergraduate experience:

“Many colleges and universities are now providing research experiences for students in all disciplines. Undergraduate research, however, has been most prominently used in science disciplines. With strong support from the National Science Foundation and the research community, scientists are reshaping their courses to connect key concepts and questions with students’ early and active involvement in systematic investigation and research. The goal is to involve students with actively contested questions, empirical observation, cutting-edge technologies, and the sense of excitement that comes from working to answer important questions”.¹

We embarked on this research to hear from the students themselves. This report represents the highlights from our preliminary findings.

Introduction

This report presents the highlights of preliminary findings from a survey of people who had engaged in non-curricular research (i.e., research outside of coursework and practicums) in either a paid or voluntary capacity during their undergraduate studies. The survey formed part

¹ AAC&U (2022). High Impact Practices <https://www.aacu.org/trending-topics/high-impact>

of a mixed method study seeking to understand the experiences of students who were involved in non-curricular research during their undergraduate studies, and how these experiences may have contributed to gaining research related work experience and/or building their social capital. We define social capital as the benefits students gain from relationships with supervisors and other team members. The study was reviewed and received ethical approval by the Research Ethics Boards of Sheridan College and Ryerson University. Over the period from February- June 2021, 104 people participated in the survey. This report presents highlights of the preliminary survey findings.

Profile of Participants

The participants in the study represented a diverse group, in Gender, Age, Ethnicity, Family History of Post-secondary Education, Highest Degree/Level of School Completed, Citizenship Status, and Field of study of most closely related to undergraduate non-curricular research experience.

Gender

79% (n= 82) of respondents identified as women and 20% (n=21) identified as men. One respondent preferred not to specify.

Table 1: Gender of Participants

Gender of Participants	%	n
Women	79%	82
Men	20%	21
Prefer not to specify	1%	1

Age

At the time of filling in the survey, 44% (n=46) of respondents were between 18-24 years of age; 43% (n=45) were between 25-34 years of age, 7% (n=7) were between 35-44 years of age, 5% (n=5) were between 45-54 years of age and one respondent was 55 years or older.

Table 2: Age of Participants

Age of Participants	%	n
18-24 years	44%	46
25-34 years	43%	45
35-44 years	7%	7
45-54 years	5%	5
55 years or older	1%	1

Ethnicity

36% (n=37) of the respondents identified as Caucasian, 21% (n=22) as South Asian, and 14% (n=15) as East Asian. 11% (n=11) identified as having mixed ethnicity. A smaller number of respondents identified as Caribbean (5%, n=5), and Latino/Hispanic (3%, n=3). 4% (n=4) preferred not to answer.

Table 3: Ethnicity of Participants

Ethnicity of Participants	%	n
Caucasian	36%	37
South Asian	21%	22
East Asian	14%	15
Mixed Ethnicity	11%	11
Caribbean	5%	5
Latino/Hispanic	3%	3
Preferred not to answer	4%	4

Family History of Post-secondary Education

36% (n= 37) of respondents were first in their families to attend post-secondary education in Canada. 64% (n= 67) of respondents did not identify as being first in their families to attend post-secondary education in Canada.

Table 4: Family History of Post-secondary Education

Family History of Post-secondary Education	%	n
Identified as 1 st Generation Students	36%	37
Did not Identify as 1 st Generation Students	64%	67

Highest Degree/Level of School Completed

51% (n=53) of respondents reported their highest degree to be a bachelor's education. 26% (n=27) had completed a college diploma or certificate, 14% (n=15) had a master's degree, and 2% (n= 2) had completed a professional degree. 7% (n=7) preferred not to answer. 9 respondents had a high school diploma and were currently undertaking an undergraduate diploma or degree. (n=9). One participant had an international graduate degree in medicine.

Table 5: Highest Degree/Level of School Completed

Highest Degree/Level of School Completed	%	n
Bachelors' Degree	51%	53
College Diploma or Certificate	26%	27
High School Diploma (Currently undertaking an Undergraduate Diploma or Degree)	9%	9
Masters' Degree	14%	15
Professional Degree	2%	2
International Degree in Medicine	1%	1
Prefer not to Answer	7%	7

Citizenship Status

87% (n=91) of respondents were Canadian citizens, 8% (n=8) were permanent residents and 5% (n=5) were international students at the time of filling in the survey.

Table 6: Citizenship

Citizenship Status	%	n
Canadian Citizenship	87%	91
Permanent Residents	8%	8
International Student Visa	5%	5

Field of study of most closely related to undergraduate non-curricular research experience

Over 23% of the respondents reported their research experience was in the social work or related field (n=24). The other top five reported fields of study were nursing and psychology (n=10), business and hospitality management (n=9), life science (n=8), sociology (n=7), computer science (n=6).

Table 7: Field of Study

Field of Study	%	n
Social Work or related field	23%	24
Nursing and Psychology	10%	10
Business and Hospitality	9%	9
Life Science	8%	8
Sociology	7%	7
Computer Science	6%	6

The Research Experience

Participants shared many things about their research experience through the survey. They had the opportunity to respond to the close-ended questions and could also opt to share more specific feedback through qualitative prompts. Responses to both the quantitative and qualitative responses are included in this next section.

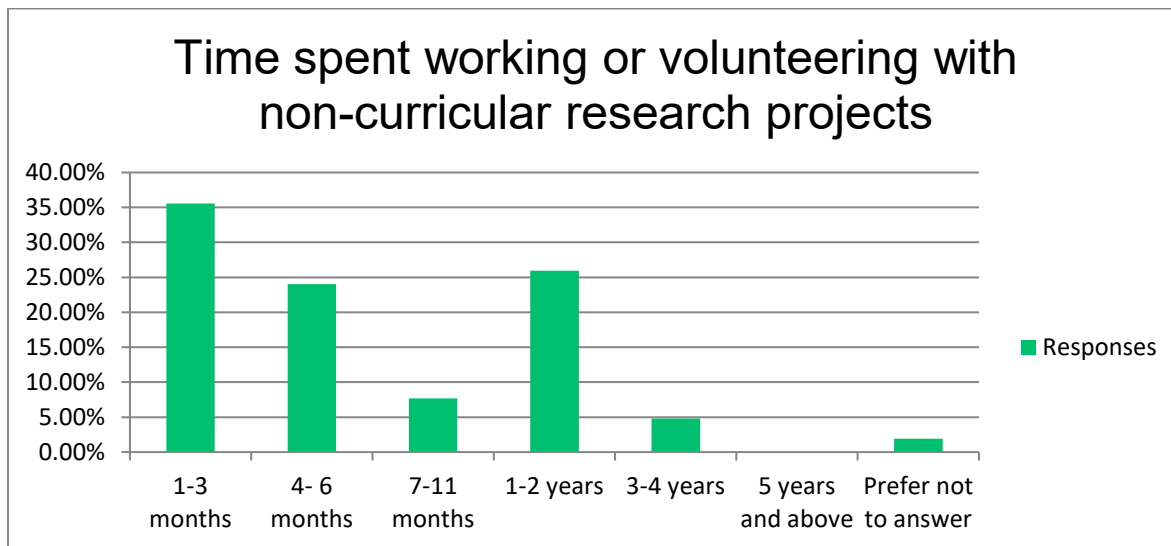
i. **Where the research experience took place**

For over half the survey respondents (n= 57) the undergraduate research experience took place in a college, while for 42% (n= 44) the experience took place in a university setting. Three percent of the respondents (n=3) worked or volunteered in research during both their college and university studies. All respondents (n=104) reported that their undergraduate student experiences took place in Canada.

ii. **Time spent in working or volunteering with undergraduate non-curricular research experience**

Of the 102 persons who responded to this question, over one third of the participants (35.58%, n=73) spent 1-3 months engaged in the research experience, 24.04% (n=25) spent 4-6 months, 7.69% (n=8) spent 7-11 months, 25.96%(n=27) spent 1-2 years, 4.81% (n=5) spent 3-4 years, while 1.92% (n=2) preferred not to answer and other.

Figure 1: Time spent working or volunteering with non-curricular research projects



iii. Relationship with Supervisor

18 respondents used the words “Excellent” “Fantastic” or “Amazing” to describe their relationships with their supervisor, while others (n=8) described their relationship with their supervisor as “Very good” or “good”. Others (n=6) felt their relationship was “Mediocre” “Fine” or “Decent”. Some respondents (n=6) used the words “enjoyed” and “loved this relationship” to describe their relationships with their supervisors. Five others considered their supervisors to be “friendly” and “welcoming”

Some respondents (n=17) elaborated that they found the relationship to be **supportive** either while on the job or in terms of opening other opportunities.

“They checked in on me regularly, ensuring I was coping with the challenging content (sad, violent stories). As well, they offered timely feedback on the summaries and literature review. Also, expectations were set at the start, and I was aware of timelines and arrival of the briefs. Very supportive”. p.54.

“I consider my relationships with all Research Supervisors to be incredibly positive and beneficial. My supervisors were not only generous mentors but fostered in me a belief in research as a power tool to advance social change and reduce human suffering. I am grateful for the time and discussion with all my supervisors and for their ongoing support and encouragement throughout my academic journey. All supervisors have provided me references, supported university applications, referred me to future opportunities and overall, provided tremendous guidance and support”. p.53

15 respondents described the relationship with their supervisors as **engaging, sharing, informative and professional**.

“My relationship with my research supervisors was very collaborative. Even though I knew they were much more experienced and qualified than me, we had a relaxed, equal relationship. I felt very comfortable going to them to seek clarification and new opportunities”. p.46.

“Very good, I really enjoy[ed] all the research meetings because the faculty members are always sharing their research experience. They treat me as an equal part of the team and always ask for my opinion or input”. p.3

Some other respondents (n=13) describe their supervisors as their **mentors and role models**.

“My relationship with my both supervisors was good - professional and productive. I feel that they were my “bosses” but also mentors who I could learn a lot about research from (as well as countless other things). I was slightly intimidated by their professional experience but grew more comfortable and confident in my abilities the more I worked with them” p. 90

“Great relationship. She was keen on providing me with any research opportunities I was willing to take on. She was always available to provide feedback or guidance, as I was very uncertain of how to do many of the tasks she was asking me to do. Finally, she recognized my contributions to the study by having me as co-author and providing me with a reference for my graduate school application. I see her as a true mentor” p.19.

Yet other respondents (n=5) felt that they developed **deeper personal and professional relationships** with the supervisor through the experience.

“Absolutely great. My supervisor has become a reliable friend and reference since the project” p.37.

“For the most part, being involved in a non-curricular research project had a very positive effect on my relationships with my research supervisors/professors. It gave me the confidence to ask for and foster mentorship relationships and grow my network and skill set” p.14.

iv. Benefits gained from the research experience

Table 8 details the benefits of the research experience according to respondents. The top five benefits from the research experience were Advanced knowledge in research skills (n=85), Learning to work independently and with a team (n=77), Increased self-confidence (n=71), Ability to analyze data (n=62), and Access to mentorship (n=59).

Table 8: Benefits of the research experience

Benefits	%	n= 104
Advanced knowledge in research skills	81.73%	85
Experience in participant recruitment	25.96%	27
Experience in writing literature reviews and an ethics protocol submission	36.54%	38
Experience in conducting data analysis	52.88%	55
Understanding secondary literature	41.35%	43
Ability to analyze data	59.62%	62
Understanding ethical conduct	50.00%	52
Experience in transcription and coding	34.62%	36
Increased understanding of how to overcome obstacles	51.92%	54
Learning to work independently and with a team	74.04%	77
Ability to integrate theory into practice	48.08%	50
Access to mentorship	56.73%	59
Co-authorship on publications	28.85%	30
Experience with organizing research dissemination	16.35%	17
Graduate school opportunities	19.23%	20
Improved access to academic references	47.12%	49
Increased self-confidence in oral presentation and writing	53.85%	56
Increased self-confidence	68.27%	71
Prefer not to answer	0.96%	1
Other (please specify)	2.9%	3

v. Most important learning from the undergraduate non-curricular research experience

Enhanced Research Performance and writing skills (n=24)

Respondents felt that they gained greater understanding of the steps in research and skills in writing.

“I acknowledge that I have learnt a myriad of research skills that I will be always grateful for. But one of the most pivotal things that I have learnt from my non-curricular research experience was writing literature reviews while understanding the main idea of the scholarly article and addressing any gaps” p.44.

“The ability to read, comprehend, and analyze statistical data in articles, a skill gained by participating in this research project” p.93.

“The value of being thorough when conducting experiments - considering all factors to prevent bias in sample selection, authentic control versus experimental group, how a direct correlation can be measured, and eliminating external factors that may skew results” p.20.

Soft skill development (n=24)

Respondents felt the research opportunity provided them with opportunities to develop soft skills including organization, time management, project management, communication, patience, collaboration, and the ability to work independently were some soft skills respondents felt they developed through their research experience.

“I learned to be detail-oriented and organized” p.13.

“Project management. Being involved in supporting and executing challenging projects was a fantastic lesson in time and project management that gave me the skills I needed to be a competent entry level professional” p.14.

“I learned the importance of collaboration, and teamwork. I learnt that everyone on a team has their own unique skills and abilities” p.50

Increased understanding of Research (n=13) and what it entails

The respondents shared that they developed an increased understanding and appreciation of the complexity of research and its various components. They developed a more nuanced understanding of research methodologies and of the value of research for furthering knowledge in a field and for social change.

“Research is much more complex than I had initially assumed. There are a lot of moving parts” p.25.

“I learned the importance of not only finding research that supported your inquiry but it is also important to find where the gaps are as well” p.67.

Enhanced professional knowledge of the respondent’s field of study (n=5)

A few respondents expressed that they had increased their understanding of content related to their specific field of studies.

“I learned a lot about the work that goes into developing a fundraising campaign, especially the importance of market research when developing ideas” p.78.

Increased Self Confidence (n=8)

Respondents indicated they developed a greater sense of self confidence through the research experience.

“I am capable enough to do things professors do - there are others out there who are sources of inspiration - I learn most from doing and being thrown into intimidating roles” p.22.

“As a student with accommodations, that I too have the ability and capability of developing high-quality research skills!” p.63.

“To trust my skills and learnings, even as an international student I could be successful at my job”. p.96.

Shaping their career perception and future interest (n=5)

The research experience helped shape a few respondents' perceptions about their future careers and reinforced or made them consider new opportunities.

“One important thing I learned from my non-curricular research experience as an undergraduate student is that research is something I now want to continue in my post graduate studies. By given this opportunity, I was able to enhance my research skills and apply it for the future” p.91.

“How important it is to attain real world experience while in school. Through my research experience, I learned what career I want to go into (policy), the areas of research I'm most interested in” p.100.

vi. **Ways in which research experience contributed to future opportunities**

63.46% (n=66) respondents expressed that the research experience contributed to future opportunities. We asked the survey respondents to describe ways in which the research experience contributed to future opportunities. Respondents felt that the research experience contributed to their future opportunities by:

Providing enhance opportunities to upgrade their education (n=12)

“Added to the experience on my CV and helped me to get accepted to a master’s program” p.41

“I was able to apply the knowledge I learned from the research project within my undergraduate degree and placement. The research project was directly related to the line of work I hope to continue working with (geriatrics). I was able to include my research experience within my Masters' application to further my education” p.87

“1. It made me look more attractive to graduate school because I had publications and other practical experience on my CV. 2. I was rewarded a SHRCC likely in part because of my research experiences. 3. I was offered excellent job opportunities post-grad school based on my previous work experience” p.100

Providing increased job or volunteering opportunities (n=21)

“Directly led to three employment opportunities working in academic research post-graduation” p.45

“From my contract with the first project, I was able to secure another contract with the second project” p.46

Providing networking and referral opportunities (n=11)

“Both my supervisors provided academic letters of reference which were mandatory for a dream job I secured collaboration with other professors in their field, access to their academic networks” p.22

“Each research experience opened the door to/led to being referred to/recommended for the subsequent research experience. They also opened the door to my practicum position as a Research Associate with the [Name of the organization]. Additionally, I was fortunate to one of my Research Supervisors nominating me to sit on a national committee (Name of the committee), which I was selected for and am grateful to be a part of. I also believe that all of these experiences are instrumental in University applications and will lead to increased employability afterwards” p.53

Enhancing their resumes (n=3)

“I've cited it on my resume and talked about in one job interview” p.54

Broadening /Reinforced participants' perception about their potential and the fields they could work in (n=4)

“As a 4th Year Social Work Student, it has reaffirmed my interest of working with the child welfare system in Ontario to address systemic injustices” p.33

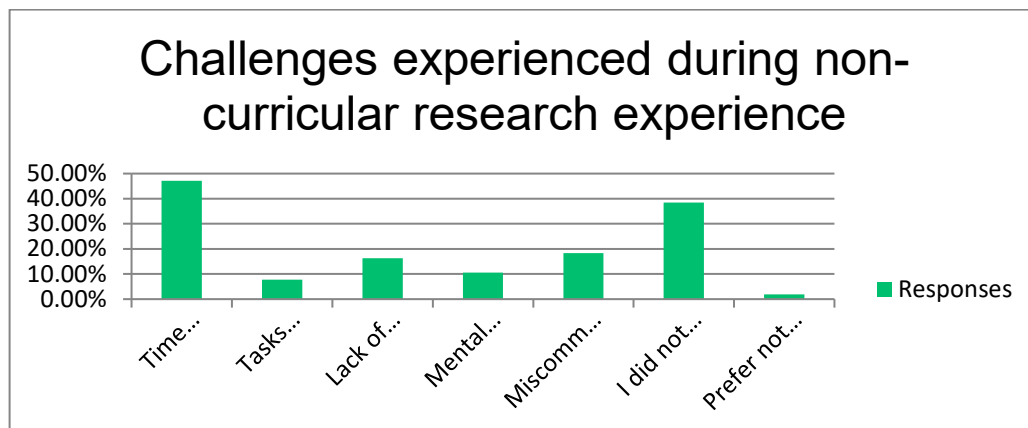
“Changed my perspective and direction of graduate studies” p.65.

vii. Challenges during non-curricular research experiences

Figure 2 depicts the challenges experienced by respondents during the research. The main challenge was found to be Time Management (n=49). Other challenges included tasks required being too complicated (7.7%, n=8), lack of self-confidence (16.4%, n=17), mental health issues (10.6%, n=11), miscommunication with research supervisor or faculty member (18.3%, n=19). Interestingly, 38.46%(n=40) of respondents reported that they did not experience any challenges during their research experiences.

Respondents were asked to rate their undergraduate non-curricular experience on a scale from 1-10 with 1 being 'not great'- and 10 being 'excellent'. An overwhelming majority reported a positive experience, with 45.19% (n=74) rating their experience a 10. Over 14% of respondents rated their experience a 9,8 and 7 respectively; 7.7% of the respondents rated their experience 7; and 9% of the respondents rated their experience a 6. Only 5% of respondents provided their undergraduate research experience a rating of 5 or lower.

Figure 2: Challenges experienced during non-curricular research experiences



Open-ended responses by respondents to other questions provided insights into some of these challenges

“Supportive and helpful, involved and passionate, but miscommunications in regard to expectations and roles” p.4

“My relationship with my supervisor was/is good. I still work on one of the projects part-time as an assistant for other student researchers. There were some instances where I was unhappy with communication or transparency when it came to the job and my tasks - a lot of the time I was uncertain of what I needed to do, or how I would even do it. I felt under qualified for the work I had to do, but over time I became a bit more comfortable. I have tried to step away from the project for personal/school-related reasons, though I was a bit pressured into staying on part-time. I reluctantly accepted, as I felt obligated to share my knowledge with newer students on the team, but ultimately it has been a bit taxing on me” p.73

viii. Rating their Research Experience

Respondents were asked to rate their undergraduate non-curricular experience on a scale from 1-10 with 1 being 'not great'- and 10 being 'excellent'. An overwhelming majority reported a positive experience, with 45.19% (n=74) rating their experience a 10. Over 14% of respondents rated their experience a 9,8 and 7 respectively; 7.7% of the respondents rated their experience 7; and 9% of the respondents rated their experience a 6. Only 5% of respondents provided their undergraduate research experience a rating of 5 or lower.

ix. Likelihood of recommending working or volunteering with a non-curricular research project to other undergraduates

Respondents were asked to rate the likelihood of them recommending working or volunteering with a non-curricular research project to other undergraduates. 64% (n=67) ranked the likelihood a 10, while 43% (n=33) ranked it a 9 indicating that they were either very likely or likely to recommend this experience to other undergraduates. A small number (1%, n=1) ranked the likelihood a 4 (unlikely) while 3% (n=3) ranked it a 1 (very unlikely).

x. Other comments

In their final comments, a few students shared what a positive experience the research experiences had been for them and wished that more such opportunities existed for undergraduate students and students be encouraged to engage in such activities.

“More students should be encouraged and involved in research projects, and it may be included in their curriculum” p.93

“Really wish that more opportunities for undergrad students would exist to get more exposure, learn about research projects, etc.” p.29

“Personally, having such a good experience in a research project, I hope more new students can have the same amazing experience that I had” p. 72

Conclusion/Recommendations

The preliminary findings from this survey highlight the importance and value of undergraduate students engaging in non-curricular research. It also provides evidence that the high impact that experiential learning can provide. The role of the faculty mentor within the research experience was significant to the survey participants- and added significantly to their learning. In section X, students expressed that they wished there were more opportunities for gaining experience through undergraduate research. This speaks to the responsibility of faculty and of post-secondary institutions to both cultivate and provide these kinds of opportunities for students as part of their undergraduate learning experience.

As we continue to analyze the data from our qualitative interviews, we will explore these themes further, learning from the students and their experiences and have a clearer picture of how we can create opportunities and improve undergraduate research experiences.