Non-Curricular Undergraduate Research as a Catalyst for Skill Development and Social Capital

NON-CURRICULAR UNDERGRADUATE RESEARCH AS A CATALYST FOR SKILL DEVELOPMENT AND SOCIAL CAPITAL

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"This is like a shining star on my resume"

NON-CURRICULAR UNDERGRADUATE RESEARCH AS A CATALYST FOR SKILL DEVELOPMENT AND SOCIAL CAPITAL

Dr. Bethany Osborne, Dr. Ferzana Chaze,
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NOTE FROM THE RESEARCHERS

Over the past decade, the researchers involved in this study have worked across higher education and community-based settings, collaborating with dozens of undergraduate students. These experiences have been central to shaping our curiosity and commitment to this work. We have witnessed firsthand how undergraduate students benefit meaningfully from engaging in non-curricular research, while also recognizing the significant contributions they make to advancing our own projects.

We have had the privilege of working closely with the students acknowledged in this study, as well as many others throughout our careers. These relationships have been mutually transformative: they have shaped not only our development as researchers and mentors but also supported students in launching their own professional paths across diverse disciplines. Many of these former students have since gone on to mentor others, extending the impact of these experiences across generations.

Undergraduate research is widely recognized as a High Impact Practice (HIP) within postsecondary education. Institutions increasingly offer research opportunities across disciplines, though such experiences have historically been most prominent in the sciences. Supported by organizations such as the National Science Foundation, these initiatives aim to involve students in authentic, inquiry-driven learning experiences. This includes engaging with complex and contested questions, conducting empirical research, utilizing advanced

technologies, and experiencing the intellectual excitement of contributing to meaningful knowledge production.

It is with gratitude for those voices and those relationships that we undertook this research. Our hope was that this research would help to centre and better understand the perspectives of the undergraduate students themselves.

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Note: All contributions by Archana Medhekar to this research project were undertaken prior to her appointment to the judiciary to the Ontario Court of Justice on January 29, 2026 and in a non-judicial capacity. This publication reflects scholarly and professional work completed before assuming judicial office. Nothing in this work should be understood as expressing judicial views, influencing adjudicative decision-making, or representing the positions, policies, or authority of any court or tribunal. The authors do not intend, and no reader should infer, any institutional endorsement of the research findings in this report.

FOREWORD

Research is about more than generating knowledge; it is about nurturing curiosity, confidence, and the capacity to address complex problems facing our communities. Having spent the majority of my career focused leading community-based research and evaluation teams, and for the past five years, growing applied research within the Ontario college sector, I am encouraged by the findings presented in this study, which demonstrate the meaningful impact of research experiences for college and university students. With a deep commitment to building equity, diversity, and inclusion into our research culture at Sheridan College, this study has also confirmed what we continue to strive towards – research opportunities that remain accessible, inclusive, and supported by strong mentorship to realize the full benefit for students.

The evidence presented affirms what the post-secondary system has observed firsthand: students who participate in research develop skills that extend well beyond the research process itself. They become stronger critical thinkers, more effective collaborators, and more confident learners. These experiences help students connect theory to practice, build professional networks, and envision new possibilities for their future careers and educational pathways.

This work represents an important contribution to the literature on the importance of college and university-based research, especially for the students who participate as key members of the investigation teams, and I hope these findings inspire continued investment in this critical aspect of the post-secondary education experience and as a cornerstone of student success and innovation.

Dr. Vicki Mowat
Dean, Faculty of Applied Health and Community Studies & Dean, Research
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ABSTRACT

This study examines undergraduate students' participation in non-curricular research experiences and their impact on skill development, social capital, and future opportunities. Drawing on a mixed-methods design, the research integrates survey data from 104 participants and in-depth interviews with 19 individuals, alongside a comprehensive literature review. Findings highlight the role of non-curricular undergraduate research as a high-impact educational practice that can enhance research competencies, confidence, and employability. Participants reported substantial benefits including advanced research skills, teamwork abilities, and increased self-confidence, while also identifying challenges related to time management, complexity of tasks, and communication with supervisors. This study underscores the importance of mentorship, equitable access, and institutional support in maximizing the benefits of non-curricular undergraduate research experiences. Recommendations include expanding access, improving onboarding processes, and embedding equity, diversity, and inclusion (EDI) principles into research opportunities.

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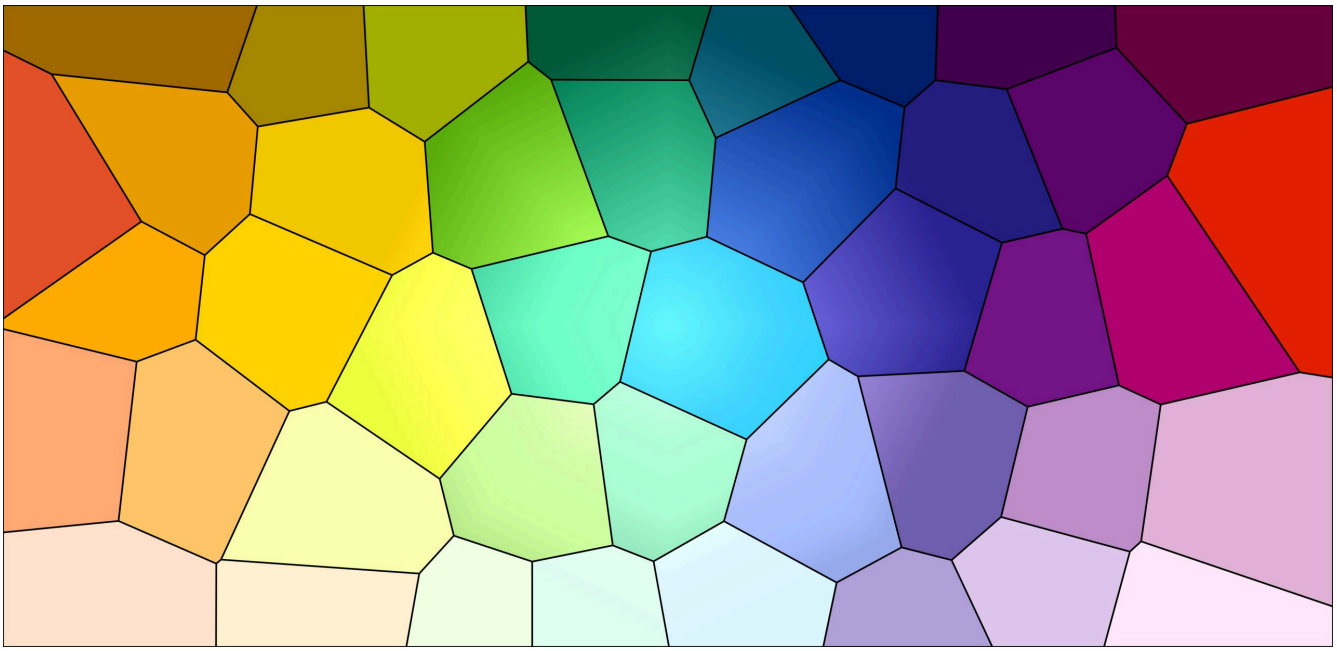
PART I

INTRODUCTION

INTRODUCTION



Undergraduate research is widely recognized as a high-impact educational practice that fosters experiential learning and skill development. However, much of the existing scholarship has focused on curricular or discipline-specific research, particularly in STEM fields, leaving a gap in understanding non-curricular research experiences in the social sciences and Canadian context. This study aims to address this gap. This report presents the findings from a mixed method research project 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.

Both the survey and follow-up interviews were of former or current students 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. Over the period from February- June 2021, 104 people participated in the survey. Included in the survey questions was an opportunity to self-select into sharing more information about their experience in a follow-up interview. Nineteen participants opted into a follow up interview. The study was reviewed and received ethical approval by the Research Ethics Boards of Sheridan College and Toronto Metropolitan University (then Ryerson University).

Central to the study is the concept of social capital—defined as the benefits derived from relationships with supervisors, faculty, and research teams—which plays a critical role in shaping students' academic and professional trajectories.

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PART II

LITERATURE REVIEW

LITERATURE REVIEW

This literature review presents a comprehensive overview of the experiences of undergraduate students participating in non-curricular research. Participating in undergraduate research can be a critical experience for students, shaping their skills, identities, and future pathways (Taraban & Logue, 2012). Undergraduate research is regarded as a 'high impact' educational practice (Parker, 2018); however, most of the literature focuses on science and engineering disciplines with less attention to social sciences and humanities (Ishiyama, 2002; Rand, 2016). Based on the review of literature, developing and implementing a structured, theory-based approach in undergraduate social sciences and humanities can provide students with a high-quality research experience and outcomes.

Currently, there remains a gap in the literature framing student experiences for non- curricular research. Most research utilizes self-reported data from student surveys to evaluate the impacts of research experiences (Lopatto, 2004). Although numerous reports discuss the benefits of undergraduate research, there is a lack of literature focused on understanding students' challenges and difficulties in research (Parker, 2018).

Benefits Gained by Undergraduate Students Participating in Research

Student participation in research enhances students' opportunities for innovation, where traditional learning and mentorship meet the immediacy of real work, providing relevant, hands-on experience (Vranic, 2014). The ability to help define a problem and work towards a solution gives students substantial, practical, real-life exposure that delivers great value (Beckman & Hensel, 2009). Students are also more likely to solve research problems, which can help them develop critical thinking and gain more confidence in their intellectual abilities (Beckman & Hensel, 2009). Students benefit from increased disciplinary knowledge and improved understanding of knowledge application (Ishiyama, 2002). Undergraduate research also helps create a wealth of pathways beyond undergraduate education, making students more competitive for graduate programs and other opportunities (Beckman & Hensel, 2009). Through research participation, students learn about the collaborative process, thereby increasing their cultural awareness (Vranic, 2014). Additionally, students gain a deeper understanding and appreciation for research and complex cognitive skills (Vranic, 2014).

Challenges Experienced by Undergraduate Students Participating in Research

The body of existing literature has been less critical in discussing how research education might contribute to social engagement. Elsen et al. (2009) indicate a need to strengthen a "research-teaching nexus" in post-secondary institutions as teaching and research are often isolated undertakings. Brown et al. (2016) identify two main components of an optimal undergraduate research experience: A content-based emphasis which focuses on written and oral presentation skills, and a process-emphasis which is designed around engagement. However, they also note that institutional pressures surrounding undergraduate research often prioritizes either the process or the products of research over learning outcomes. Furthermore, if students believe the research skills are too complicated or outside their perceived abilities, lack of self-confidence can undermine their engagement with research training and education (Morgenshtern et al., 2011), as many students who want to participate in undergraduate research but have not yet done so feel that they lack readiness (Morrison et al. 2018). Moreover, over-ambition, difficulty collecting data (location of secondary data and recruitment of participants for primary data), feeling trapped when understanding new qualitative shifts, difficulty relating concepts to research problems, and poor organizational skills all present as student challenges (Rand, 2016).

Faculty and Institutional Benefits and Challenges to Undergraduate Research

In addition to rewarding students, co-curricular research also offers many benefits to faculty and institutions.

Mentoring students is shown to be personally satisfying (Morrison et al., 2018), while helping faculty to grow professionally in their own right by renewing their enthusiasm for teaching and informing what they bring to the classroom (Osborn & Karukstis, 2009). Offering research opportunities also presents many benefits to institutions. Specifically, student presentations at conferences and publications aid in the visibility of programs and may draw new applicants (Morrison et al., 2018). However, there are also barriers which prevent institutions from further pursuing co-curricular research opportunities. Faculty have identified a lack of time, insufficient funding, and unpaid or undercompensated workload. These burdens are often relegated to marginalized staff (e.g. adjunct professors, racialized faculty, or women), who are expected to shoulder the workload without adequate recognition (O'Donnell et al. 2015; Petrella & Jung, 2008). Additionally, mentoring students rarely receives credit towards tenure or promotion and can get in the way of faculty pursuing their own research endeavours (Osborn & Karukstis, 2009). These are all barriers which should be considered when designing a co-curricular research program.

Undergraduate Research Experiences and EDI

In social sciences, the ability to engage with research, design, development, and implementation is an increasingly important skill. Consistent claims in the literature have shown that undergraduate research experiences benefit those from marginalized groups even more than the average student (Parker, 2018), yet these students are often underrepresented in STEM fields (Winslow & Davis, 2016). When included in undergraduate research, studies have shown that outcomes for students improve significantly; Latino students with research experience graduate at nearly double the rate of those without, while Black and Latino researchers report stronger employability prospects post-graduation (O'Donnell et al., 2015). Underrepresented students also bring unique perspectives and motivations to research (O'Donnell et al., 2015).

Support programs dedicated to students such as career workshops, peer advising, group meetings, or journal clubs were influential for students in research (O'Donnell et al., 2015). Familiarity with academic and professional networks and norms allows students to recognize shared backgrounds, demystify their career paths, and build connections, particularly for underrepresented students (O'Donnell et al., 2015). Furthermore, social networks can open the door to reliable resources and support that can improve individual career success and satisfaction (Thompson et al., 2014). Societal relevance and community engagement were prevalent among underrepresented students, as they could connect their research to a deep-rooted desire to give back to families, communities, and society (O'Donnell et al., 2015). Gender differences in undergraduate research reveal inequalities resulting from interactional dynamics, cultural norms, and institutionalized policies and practices (Winslow & Davis, 2016).

Social Capital and Undergraduate Research Experiences

This study draws on Bourdieu's (1986) theory of capital, particularly the concept of social capital, to interpret patterns of access to opportunities and outcomes. Social capital refers to the resources that individuals can access through relationships and social networks (Bourdieu, 1986), The concept of 'capital' originates from Marx's analysis of social relations between labourers and capitalists (Thompson et al., 2014). Drawing on theories of capital, particularly social capital, undergraduate research can be understood not only as a site of skill development but also as a mechanism through which students gain access to academic and professional networks that influence future opportunities (Thompson et al., 2014). This is especially significant for students from underrepresented groups, for whom participation in research can significantly enhance educational attainment, employability, and a sense of belonging within academic spaces (O'Donnell et al., 2015). Social networks accessed and mobilized through social ties can benefit undergraduate research by facilitating the flow of information, group membership, and demonstrating shared identity through common goals and professional relationships (Thompson et al., 2014). Additionally, social networks can open the door to reliable resources and support that can improve individual career success and satisfaction (Thompson et al., 2014).

Undergraduate Research Experience as High Impact Educational Practice

The literature underscores the significant educational, professional, and developmental value of undergraduate participation in non-curricular research. Across disciplines, undergraduate research is consistently identified as a high-impact educational practice that promotes experiential learning, critical thinking, and student engagement (Kuh, 2008; Parker, 2018). The evidence demonstrates that such experiences enable students to bridge theory and practice, develop advanced research competencies, and cultivate greater confidence in their intellectual abilities and future academic or career pathways. These benefits are particularly compelling in the context of growing demand for experiential and applied learning opportunities within higher education.

Mentoring is a transformative way of strengthening social relationships between undergraduate students in research. Key mentor characteristics include providing project guidance, career guidance, professional socialization, and identity development (Rand, 2016). According to Kuh (2008), high-impact practices are effective because they require dedication and a substantial time commitment from students; require students to communicate with classmates and professors about meaningful topics; expose students to diverse ideas and people of different backgrounds; provide students with regular assessments of their work; enable students to apply their knowledge within and beyond the classroom walls; and possess a powerful potential to change the course of students' lives (Kilgo et al., 2015). Mentorship can open students' opportunities, such as academic gain, heightened understanding of the research process, and graduate school (Gould, 2018). The creation of 'performance accomplishments' in self-efficacy development provides authentic opportunities to calibrate knowledge

(Bandura, 1977). Sometimes students perceive themselves as 'outsiders,' therefore giving students more ownership in data collection and analysis connects them to a meaningful association within research (O'Donnell et al., 2015).

Gaps in Existing Research

Much of the existing scholarship relies heavily on self-reported survey data and tends to emphasize outcomes rather than lived experiences. As a result, there is a comparatively limited understanding of the complexities, challenges, and inequalities that shape students' engagement in non-curricular research. The literature also indicates a strong disciplinary imbalance, with a disproportionate focus on STEM fields and relatively limited attention to social sciences and humanities contexts (Ishiyama, 2002; Rand, 2016). This gap is particularly notable given the distinct pedagogical aims and social justice orientations of these disciplines.

Importantly, challenges such as lack of confidence, perceived lack of preparedness, time constraints, and institutional barriers—including insufficient funding and limited recognition of faculty mentorship—highlight that the benefits of undergraduate research are not uniformly experienced. These challenges point to a broader need to strengthen the integration between teaching and research, as well as to develop more structured and supportive program models that center learning outcomes rather than solely research outputs (Elsen et al., 2009; Brown et al., 2016).

The literature further emphasizes the critical importance of mentorship, participatory pedagogy, and social networks in shaping student experiences. However, the persistence of structural inequities—including disparities related to gender, race, and access to resources—highlights the need for intentional equity, diversity, and inclusion (EDI) approaches in the design and implementation of research opportunities.The literature points to the need for a more comprehensive, theoretically grounded, and context-sensitive understanding of undergraduate non-curricular research experiences. There is a clear opportunity to extend existing research by examining not only the benefits but also the challenges, processes, and relational dimensions of participation—particularly within social sciences and humanities contexts.

Addressing these gaps is essential for developing more equitable, impactful, and sustainable undergraduate research practices.Our research study responded directly to these gaps by adopting a mixed-methods approach to explore both the outcomes and lived experiences of students engaged in non- curricular research. The research study, as laid out in the following pages aims to contribute to a more nuanced understanding of how undergraduate research functions as a high-impact practice, while also identifying strategies to enhance its accessibility, inclusivity, and effectiveness across diverse student populations.

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PART III

METHODOLOGY

METHODOLOGY

This mixed method study was reviewed and approved by the Research Ethics Boards of Sheridan College and Toronto Metropolitan University (then Ryerson University).

To be eligible, participants needed to be:

- 18 years of age or older
- Involved in a non-curricular research project between 1 to 10 years ago as an undergraduate student
- Not currently employed or in a student relationship with individuals from their non-curricular undergraduate research project

Purposive and convenience sampling were used to reach eligible research participants. Qualitative research snowball sampling also enabled further recruitment of participants. Participants were recruited using a combination of email invitations and recruitment posters distributed across various colleges and universities. The research team encouraged their colleagues to circulate the study information and survey link within their networks. The recruitment materials included a brief description of the study and a link to the online SurveyMonkey questionnaire. This strategy allowed the researchers to reach individuals who have previously participated

in non-curricular undergraduate research. Participation in the survey was entirely voluntary, and at the end of the survey, respondents had the option to indicate interest in a follow-up interview by providing their contact information.

Data collection took place between February and June 2021, with 104 individuals participating in a survey and 19 individuals participating in in depth qualitative interviews. The online anonymous survey contained close-ended and open-ended questions that explored student benefits, and challenges in their non-curricular undergraduate research experiences. The survey was developed based on the existing research on undergraduate student experiences and supplemented by the researchers' own experiences of supervising such research. The survey was pilot tested with a small group of undergraduate students. An incentive to be entered into a raffle for one of three $100 Amazon gift cards was provided for survey participants. The semi-structured interviews that followed the survey allowed for a deeper exploration of their experiences, their supervisory relationships and impacts of their experiences.

This study adhered to ethical standards for minimal-risk research, ensuring that participants are not exposed to harm beyond everyday experiences. Informed consent was obtained for both the survey and interviews. Participation was voluntary, and individuals were informed of their right to withdraw at any time without consequence. To ensure that participants felt free to share the positive and negative aspects of their non-curricular undergraduate research experiences, the research team ensured that the researchers conducting the interviews did not have a prior supervisory relationship with the students they interviewed. The survey was anonymous, and confidentiality was ensured in the interviews through de-identification, and the use of pseudonyms. Data was securely stored in password-protected files and devices, accessible only to the principal investigators, and retained for five years before destruction.

Survey data was analyzed using descriptive statistics. Interviews were audio recorded and transcribed using otter ai. The transcriptions were reviewed for accuracy. Interview data was analyzed using grounded theory processes (Corbin & Strauss, 1990). Open coding allowed codes to emerge from the data. These were then collapsed into larger themes that captured participants' experiences with the non-curricular undergraduate research experience. To ensure trustworthiness, two members of the research team reviewed each coded transcript to ensure the quality and consistency of the way the data was coding. Together, the data from the survey and interviews allowed for the researchers to capture a better understanding of the breadth and depth of the undergraduate non-curricular research experience.

Across both the survey and interviews, participants were predominantly women aged 18–34 and represented diverse ethnic and educational backgrounds. Many were first-generation students and had research experience primarily in Canadian college settings. 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.

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PART IV

SURVEY FINDINGS

SURVEY RESPONDENT PROFILES

The following chapters present the survey overview and findings, drawing on the answers from 104 respondents.

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

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.

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.

First Generation students: 36% (n= 37) of respondents were first in their families to attend post-secondary education in Canada.

Highest Degree/Level of School Completed: 51% (n=53) of respondents reported their highest level to be a bachelor's degree. 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. One participant had an international graduate degree in medicine.

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.

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), and computer science (n=6).

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THE RESEARCH EXPERIENCE

Where the research experience took place

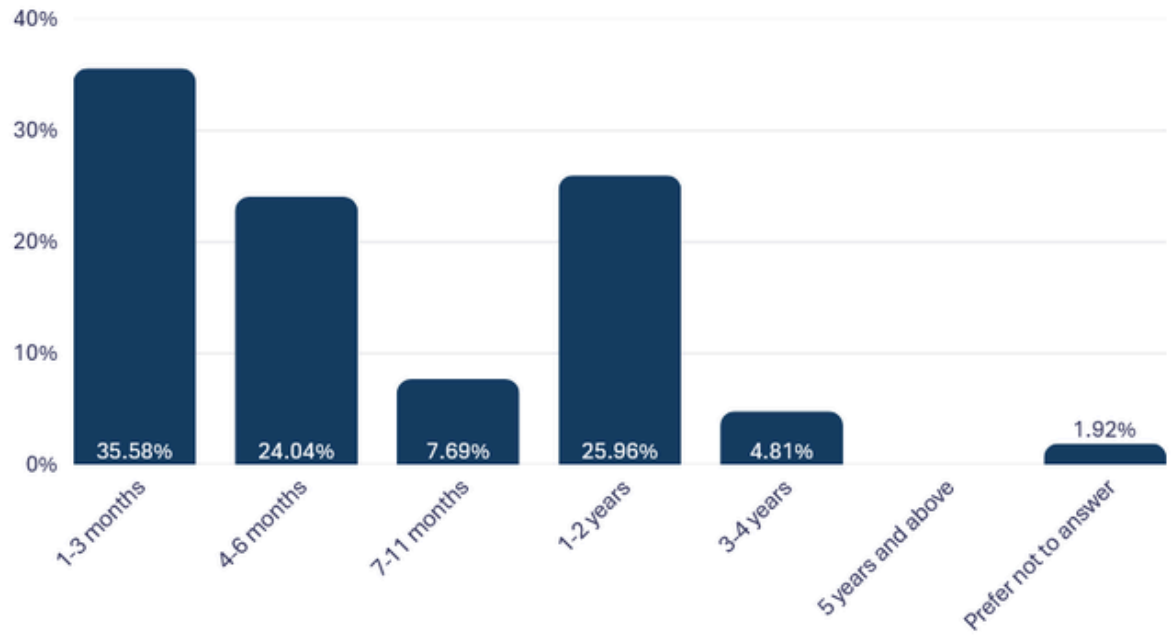
For over half the survey respondents (n= 57), the non-curricular undergraduate research experience took place in a college, while for 42% (n= 44) the experience took place in a university setting. Three percent of the respondents (n=3) worked or volunteered in research during both their college and university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

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=37) 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



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.

> *"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 describe the relationship with their supervisors as engaging, sharing, informative, and professional.

> *"I really enjoy 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 both my 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*

Yet other respondents (n=5) felt that they developed deeper personal and professional relationships with the supervisor through the experience, stating, "*My supervisor has become a reliable friend and reference since the project*" (P. 37).

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BENEFITS GAINED

Overall Benefits

Table 1 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 1: Benefits of the research experience

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

Most significant learning from the non-curricular undergraduate tesearch experience

The respondents elaborated on the most important learning from their research experiences:

Enhanced research performance and writing skills (n=24)

Respondents felt that they gained greater understanding of the steps in research and skills in writing. On research skills gained, Participant 20 said they came away having learned, *"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."*

Soft skill development (n=24)

The development of soft skills was an important learning for some participants. Participant 50 stated of the experience, *"I learned the importance of collaboration, and teamwork. I learnt that everyone on a team has their own unique skills and abilities."*

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. One participant said, *"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).

The research experience helped shape a few respondents' perceptions about their future careers and reinforced or made them consider new opportunities. Participant 100 stated, *"Through my research experience, I learned what career I want to go into (policy), the areas of research I'm most interested in."* How 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 enhanced opportunities to upgrade their education (n=12):** *"Added to the experience on my CV and it helped me to get accepted to a master's program."* – P.41
- **Providing increased job or volunteering opportunities (n=21):** *"Directly led to three employment*

opportunities working in academic research post-graduation." – P.45

- **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
- **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

Benefits Gained through an EDI Lens

Benefits Gained and Gender

The results indicate that participants of all genders identified positive benefits in terms of their Research Skill Development (Men=95%, Women=91%, Prefer not to say=100%) and personal growth development (Men=90%, Women=90%, Prefer not to say=100%). Differences were found with advanced writing skill, where only 48% of the men surveyed reported an increase, whereas 60% of women reported this being a benefit from

their research experience. Further, 83% of women reported an increase in future opportunities and networking compared to 62% of men.

Table 2: Benefits gained by gender

Benefit Gained	Man (n=21)	Woman (n=82)	Prefer not to say (n=1)
Research skills development	95%	91%	100%
Advanced writing skill	48%	60%	0%
Personal growth development	90%	90%	100%
Increased future opportunities and networking	62%	83%	0%

Benefits Gained and Ethnicity

Overall, Caucasian participants reported slightly more benefits as well as challenges. Generally, over 70% of both groups reported benefits in all areas other than increased writing skills. Notable differences were that 53% of Black, Indigenous, Persons of Colour (BIPOC) respondents reported an increase in writing skill compared to 70% of Caucasian respondents.

Table 3: Benefits gained by ethnicity

Benefit Gained	Caucasian (n=37)	BIPOC (n=64)	Prefer Not to Say (n=3)
Research skills development	95%	91%	100%
Advanced writing skill	70%	52%	0%
Personal growth development	97%	89%	33%
Increased future opportunities and networking	86%	73%	67%

Benefits Gained and Citizenship Status

Though there were a very small number of international student respondents, they reported slightly more benefits than Canadian citizens and permanent residents in relation to development of research skills, personal growth and increased future opportunities and networking. Most notably only 56% of Canadian citizens or permanent residents reported advances in their writing skills in comparison to 80% of international student participants.

Table 4: Benefits gained by citizenship status

Benefit Gained	Canadian Citizen/ Permanent Resident (n=99)	International Student (n=5)
Research skills development	92%	100%
Advanced writing skill	56%	80%
Personal growth development	90%	100%
Increased future opportunities and networking	78%	80%

Benefits Gained and Generation of Learners

The reported benefits were quite similar across groups, with 90-93% of respondents from both categories experiencing research skills development and personal growth development. 76% of first-generation students reported increased future opportunities next to 79% of non-first-generation respondents. Lastly, the lowest reported benefit was advanced writing skills, with 62% of first-generation respondents reporting the benefit next to 54% of non-first-generation students.

Table 5: Benefits gained by generation of learner

Benefit Gained	1st Generation (n=37)	Not 1st Generation (n=67)
Research skills development	92%	93%
Advanced writing skill	62%	54%
Personal growth development	92%	90%
Increased future opportunities and networking	76%	79%

Benefits Gained and Location of Research Experience

While both college and university students reported positive benefits from the research experiences, university research student respondents reported more advances to writing skills (13% more than college respondents) as well as responded more favourably to future opportunities and networking (7% more than college respondents). College respondents reported slightly higher in terms of personal growth development and increased research skills.

Table 6: Benefits gained by location of experience

Benefit Gained	Research Experience in College (n=57)	Research Experience in University (n=44)	Both (n=3)
Research skills development	93%	91%	33%
Advanced writing skill	53%	66%	0%
Personal growth development	91%	89%	33%
Increased future opportunities and networking	75%	82%	67%

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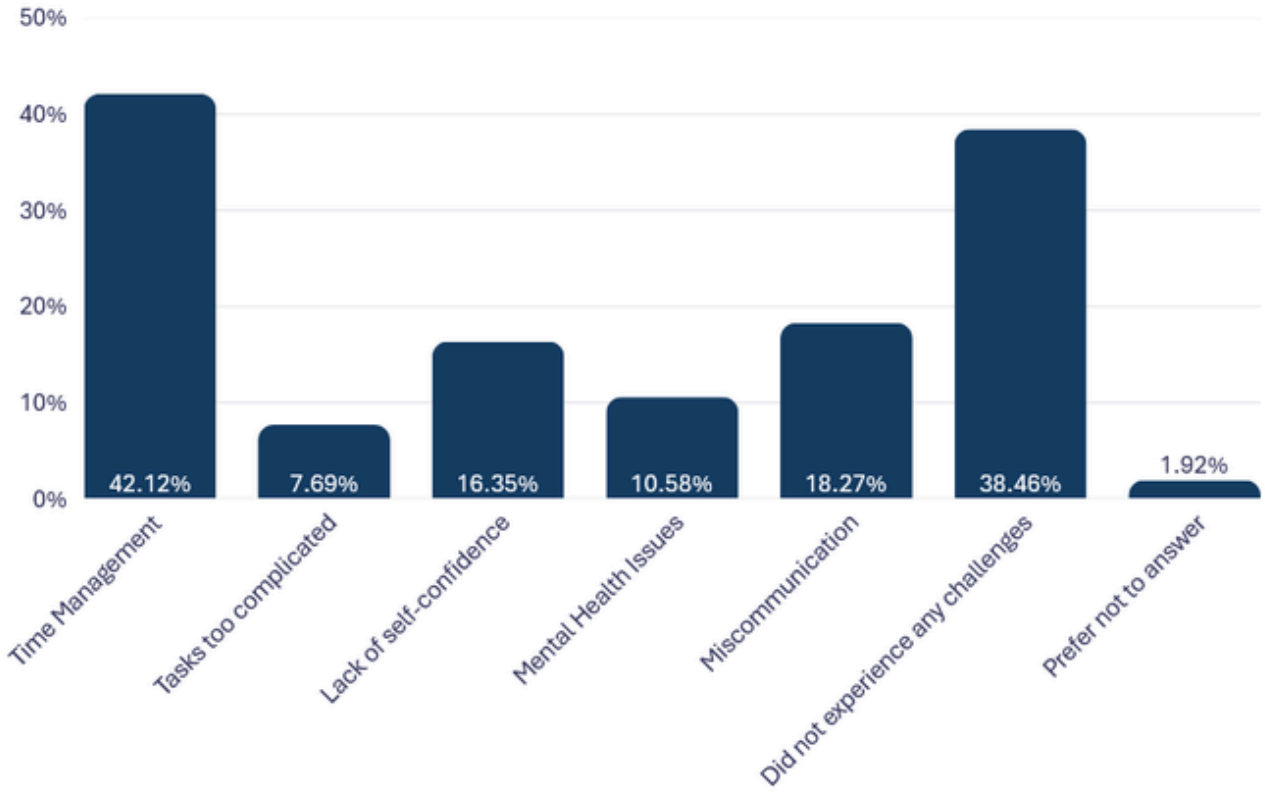
CHALLENGES

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

Figure 2: Challenges experienced during non-curricular research experiences



Open-ended responses by respondents to other questions provided insights into a few of these challenges. One participant claimed their mentors were, *"Supportive and helpful, involved and passionate, but [there were] miscommunications in regard to expectations and roles"* (P.4), while another elaborated on the relationship:

> *"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*

Challenges and Gender

The greatest challenge reported by both men (52%) and women (46%) was time management. Men reported to have more challenges overall with 24% reporting tasks being too complicated (Women=4%), 29% reported miscommunication with faculty/supervisor (Women=15%), 29% lacked self-confidence (Women=12%), and 14% reported mental health challenges (Women=9%). 40% of women and 33% of men reported to have had no challenges at all in relation to their research experiences .

Table 7: Challenges experienced by gender

Challenge Presented	Men (n=21)	Women (n=82)	Prefer not to say (n=1)
Time Management	52%	46%	0%
Tasks required of me were too complicated	24%	4%	0%
Lack of self-confidence	29%	12%	100%
Mental Health Issues	14%	9%	100%
Miscommunication with research supervisor/faculty member	29%	15%	100%
I did not experience any challenges	33%	40%	0%

Challenges and Ethnicity

Overall, BIPOC participants reported more challenges than the Caucasian participants. An exception was in miscommunications with their faculty/supervisor where 27% of Caucasian participants had this challenge compared to only 13% of BIPOC participants. The greatest challenge reported by both groups was time management, with 48% of BIPOC participants and 43% of Caucasian participants. 14% BIPOC participants reported mental health was a challenge compared to only 5% of Caucasian participants. 17% of BIPOC participants reported a lack of self-confidence in comparison to 11% of Caucasian participants. Both groups experienced similar challenges in relation to tasks being complicated (8%). Slightly more Caucasian participants (43%) reported no challenges at all compared to the BIPOC participants (38%).

Table 8: Challenges experienced by ethnicity

Challenge Presented	Caucasian (n=37)	BIPOC (n=64)	Prefer Not to Say (n=3)
Time Management	43%	48%	67%
Tasks required of me were too complicated	8%	8%	0%
Lack of self-confidence	11%	17%	67%
Mental Health Issues	5%	14%	0%
Miscommunication with research supervisor/faculty member	27%	13%	100%
I did not experience any challenges	43%	38%	0%

Challenges and Citizenship Status

46% of Canadian citizen/PR participants and 60% of international student participants reported time management as the greatest challenge. 20% of international students reported tasks being too complicated compared to only 7% of Canadian citizens/PR participants. International students did not report any miscommunications with faculty/supervisor or having a lack of self-confidence whereas 19% of Canadian citizens/PR participants reported miscommunications with faculty/supervisor and 17% reported lack of self-confidence. 20% of international students reported mental health challenges compared to only 10% of Canadian citizens/PR participants. More Canadian citizens/PR participants reported having no challenges at all compared to only 20% of international student participants.

Table 9: Challenges experienced by citizenship status

Challenge Presented	Canadian Citizen/PR (n=99)	International Student (n=5)
Time Management	46%	60%
Tasks required of me were too complicated	7%	20%
Lack of self-confidence	17%	0%
Mental Health Issues	10%	20%
Miscommunication with research supervisor/faculty member	19%	0%
I did not experience any challenges	39%	20%

Challenges and Generations of Learners

The greatest challenge reported by both first-generation and non-first-generation students was time management, with 46% of the former and 48% of the latter identifying it as something they struggled with. Interestingly, non-first-generation students reported higher rates of miscommunication with their research supervisor (22%) compared to only 11% of non-first-generation students. Similarly, lack of self-confidence was more commonly reported by non-first-generation students (19%) than by their first-generation peers (11%). The rate of students who reported experiencing no challenges at all was nearly identical across both groups.

Table 10: Challenges experienced by generation of learner

Challenge Presented	1st Generation (n=37)	Not 1st Generation (n=67)
Time Management	46%	48%
Tasks required of me were too complicated	5%	9%
Lack of self-confidence	11%	19%
Mental Health Issues	14%	9%
Miscommunication with research supervisor/faculty member	11%	22%
I did not experience any challenges	38%	39%

Challenges and Location of Research Experience

In all groups, time management was the greatest challenge with 42% of college participants, 55% of university students, and 100% of those with both college and university experience. The biggest difference between groups was tasks being too complicated, with 9% of college students reporting this compared to only 5% of university participants. Slightly more college students also reported mental health being a challenge with 11% of respondents compared to only 9% of university respondents reporting mental health being a challenge. 16-18% of both groups experienced miscommunication with faculty/supervisor and lack of self-confidence. More college students, 47% of respondents, reported having no challenges at all, whereas only 30% of university students reported having no challenges, and none of the students who had both reported having no challenges.

Table 11: Challenges experienced by location of experience

Challenge Presented	Research experience in College (n=57)	Research experience in University (n=44)	Both (n=3)
Time Management	42%	55%	100%
Tasks required of me were too complicated	9%	5%	67%
Lack of self-confidence	16%	18%	0%
Mental Health Issues	11%	9%	33%
Miscommunication with research supervisor/faculty member	16%	18%	67%
I did not experience any challenges	47%	30%	0%

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EVALUATING THE OVERALL UNDERGRADUATE NON-CURRICULAR EXPERIENCE

Respondents were asked to rate their non-curricular 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 40.4% (n=42) rating their experience a 10. Over 14% of respondents rated their experience a 9, 8, and 7 respectively (n=16; n=15; n=16); and 7.7% (n=8) of the respondents rated their experience a 6. Only 6.7% (n=7) of respondents provided their non-curricular undergraduate research experience with a rating of 5 or lower.

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. 61.5% (n=64) ranked the likelihood a 10, while 24.5% (n=25) ranked it a 7, 8, or 9, indicating that they were either likely or very 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).

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. One respondent stated that, *"more students should be encouraged and involved in research projects, and it may be included in their curriculum"* (P. 93), while another said they, *"really wish that more opportunities for undergrad students would exist to get more exposure, learn about research projects, etc"* (P. 29).

PART V

QUALITATIVE INTERVIEW FINDINGS

PARTICIPANT PROFILES

The following chapters present the findings from the qualitative interviews conducted, drawing from in-depth conversations with 19 different participants.

Table 12 provides an overview of the qualitative interview participants. The participants were diverse in terms of age, gender, ethnicity, and educational background. The majority were women, with a significant number holding college diplomas or certificates. Participants ranged from 18 years old to over 55. The majority of participants were between 25-34 years. Ethnic backgrounds included Caucasian, South Asian, Caribbean, East Asian, and Mixed. Educational qualifications varied from college diplomas to a master's degree, with over half the participants holding college diplomas. Most participants had received their non-curricular undergraduate research experience in college, while a smaller number had done so at universities.

Table 12: Overview of Participants

	Participant (Pseudonym)	Highest level of Education Completed	Location of experience	Age	Gender	Ethnicity	First Generation Student
1	Chris	College Diploma or Certificate	College	25-34 years	Man	Caucasian	No
2	Liana	Bachelor's Degree	College	18-24 years	Woman	Caucasian	Yes
3	Larissa	Bachelor's Degree	College	25-34 years	Woman	Caribbean	No
4	Albert	College Diploma or Certificate	College	18-24 years	Man	Mixed	No
5	Alex	Bachelor's Degree	University	25-34 years	Man	Mixed	No
6	Barb	College Diploma or Certificate	College	35-44 years	Woman	Caucasian	No
7	Meredith	Master's Degree	University	25-34 years	Woman	Caucasian	No
8	Rajni	College Diploma or Certificate	College	18-24 years	Woman	South Asian	Yes
9	Olivia	College Diploma or Certificate	University	25-34 years	Woman	Caucasian	No
10	Karolina	Bachelor's Degree	College	25-34 years	Woman	Caucasian	No
11	Erika	College Diploma or Certificate	College	35-44 years	Woman	Caucasian	Yes
12	Diane	Prefer not to Answer	College	18-24 years	Woman	East Asian	No
13	Nakita	Master's Degree	College	45-54 years	Woman	South Asian	Yes
14	Dominique	College Diploma or Certificate	College	25-34 years	Woman	Caucasian	No
15	Resma	Professional Degree	College	55 or older	Woman	South Asian	No

16	Janice	College Diploma or Certificate	College	18-24 years	Woman	Caribbean	Yes
17	Imaran	College Diploma or Certificate	College	25-34 years	Man	South Asian	No
18	Jacob	College Diploma or Certificate	College	25-34 years	Man	Mixed	No
19	Samia	Bachelor's Degree	College	25-34 years	Woman	South Asian	No

THE RESEARCH EXPERIENCE

Learning about the research opportunity

The majority of participants (n=11) learned about their work opportunities through recommendations from professors and supervisors. Professors sent job postings to students who had reached out for advice or applied for other jobs. For the most part, however, Professors seem to have informed students of opportunities when they were impressed by the students' academic performance or enthusiasm and passion.

> *"I guess made a good impression on the teacher of [the introduction to research] class and she took me aside one day after class, towards the end of second term, and she suggested I apply for this position with a couple of her colleagues."*
> *– Jacob*

Some other ways in which students got to know of the research opportunities were through peer recommendations (Chris), applications through job boards (Dominique), and an informal encounter with a professor at a conference (Meredith).

Considerations while applying

Jacob and Liana highlighted the importance of financial benefits and flexibility in considering the research job.

> *"I'm doing work from home, it's 10 hours a week max, I can do it whenever I want. And it was extra money, so like that was a factor 100%... It made more sense it was flexible hours, so I was like 'This is a great opportunity'. It's money and it's also flexible."* – *Liana*

For Janice, having the job requirements match her skills in Tumblr and Pressbooks and her past experience made her feel more confident in the application process.

The selection process

Of the participants that spoke of the selection process, all of them had to go through a formal interview process. Participants such as Janice also had to submit a resume prior to receiving an interview.

Types of research projects

Participants in our study had been engaged in research projects in diverse fields such as psychology, mental health, gerontology, behavioural and educational research, health, technology and innovation and social and community development focused projects. Chris said his project was *"focused on youth and mental health"*, while Nakita's study was a *"housing project that works for underprivileged people."*

Team Composition

Team sizes and compositions varied widely, from small teams of two to larger groups of up to 15 people, with different roles and responsibilities. Apart from the Principal Investigator(s) and undergraduate students, teams were sometimes comprised of master's and PhD students, professionals from the field, and faculty/staff from other departments and/or universities and colleges.

> *"There were three or four research students as well, who are social studies students... but the team was about eight of us at the biggest that I remember: three designers and four to five students of different disciplines."* – *Chris*

Tasks

Participants were engaged in a diverse range of tasks in their non-curricular undergraduate research ranging from developing fundraising campaigns, to helping in all aspects of the research project:

- Creating literature reviews (Barb, Rajni, Liana, Erika, Meredith, Alex, Samia)
- Creating an annotated bibliography (Larissa)

- Writing the methodology section of papers for publication (Larissa)
- Writing and editing research reports (Karolina, Resma)
- Fundraising and grant allocation (Diane),
- Seeking consent from participants (Alex),
- Organizing workshops (Alex)
- Developing the survey (Alex, Erika)
- Administering a survey (Alex)
- Data entry (Alex)
- Survey analysis (Erika)
- Conducting focus groups (Jacob, Dominique)
- Transcribing audio recordings (Alex, Barb, Rajni, Dominique, Meredith, Jacob)
- Administrative tasks related to the research project (Barb)
- Help in the creation of an Open access Publication including adding visual components and ensuring accessibility (Rajni, Janice)
- Presenting findings to funders and stakeholders (Jacob, Dominique)
- UX and UI design for website (Chris)
- Data analysis (Larissa)
- Virtual service directory development (Olivia)
- User testing support (Albert)
- Taking pictures on site visits (Nakita)

While some students worked on very specific tasks related to the research projects, others like Jacob had the opportunity to participate in a range of research related activities, from the data collection to knowledge dissemination.

> *"A lot of transcribing interviews. They were conducting a lot of focus group interviews and sending the audio files to me, and I go home and just transcribe them as best as I could and so that was a lot of my work at the start. Eventually I did get opportunities to conduct research interviews and focus groups." – Jacob*

Preparedness for work

Some of the participants felt like they were a bit unprepared before undertaking research work. For example, Alex mentioned that he was unsure what to expect going into the project, stating, *"It was kind of new to me since it was the first sort of step into research and done so [I did not know] physically know what to expect."* Karolina mentioned that she felt that she had to take the reins on her own and that she did not receive much guidance or support.

> *"I think coming out of [Name of University], they're very much like here it is. You're on your own type of thing. And so that's the role that I came from, you know, yes, having extensive experience in writing research papers but really just, you know, taking the reins on my own, aren't really getting much guidance or support." – Karolina*

Other participants were able to easily adapt to the new tasks required of them. Janice stated, *"They asked me about pressbooks, which I hadn't worked with before, but I did do a couple Google searches on it and I was like 'wow, this is a pretty interesting platform'."*

Impact of the onset of the COVID pandemic

The pandemic affected the work that participants were doing. Many participants such as Samia, Liana, Erika, and Albert found themselves suddenly needing to make the change from working in-person to a completely online environment. For some participants, not being able to meet their supervisors in person was a confusing experience. For Liana, it also involved taking on additional responsibilities as roles were shifted due to the disruption caused by the pandemic.

> *"But then things got crazy with COVID and everything yes, so [student peer who joined the project at the same time as Liana] felt overwhelmed, she kind of was like, I'm so sorry guys, I got other things going on, and I ended up taking most of the responsibility on myself, which was a little bit stressful. Yeah, for sure, good opportunity honestly, like it showed that I could do it myself. If I had originally gone into it knowing it was only myself, I don't know that I would have felt super confident, but because it kind of ended up working out that way, I was like I have to do it now." – Liana*

A positive aspect that came out of the pandemic that a few participants such as Olivia and Liana mentioned

that the online shift provided them with opportunities to develop skills that they may not have otherwise had the chance to develop such as the use of programs like Zoom and Canva.

> *"I learned a lot about Zoom and I didn't know a lot about that beforehand. And that was a good learning experience as well as starting to compile the infographics and stuff through Canva and different pieces of technology, I did learn quite a bit about that." – Olivia*

The time saved in commuting due to the online work environment was also noted as a positive outcome of the pandemic.

> *"Because once COVID came around and everything was from home, and I wasn't commuting like an hour... I found I enjoyed it. Like, I had a lot more time, I wasn't so stressed about the position itself because I wasn't trying to do five things at once. That was good." – Liana*

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BENEFITS GAINED

Deepened understanding of Research

The participants shared how their research experiences contributed to a deepened understanding of the research process. Olivia mentioned how the practical skills she gained through the experience were particularly beneficial in her field of Social Work, enhancing her ability to perform literature searches and apply research findings to her work.

> *"Things like recording meeting minutes and summarizing information, as well as how to conduct a proper literature review was quite helpful. Just being in the business of Social Work learning how to apply those great literature searches as well as do our main job like our (inaudible) system or whatnot and just kind of refining those skills about research, finding articles and things like that, as well as I think just overall just being a part of that research team could, like it might have opened other opportunities as well for my future." – Olivia*

Diane appreciated the opportunity to learn new skills and the chance to work with subject matter experts,

which allowed her to gain knowledge and skills that she hopes to apply in future roles. Dominique found that the experience helped improve their Excel skills and understanding equity, diversity, and inclusion in research. She also gained a deeper appreciation for the research process, including the importance of strategic recruitment and the time required for thorough research.

Enhanced knowledge and skills of specific aspects or tools related to research

Participants gained skills in specific aspects of research. Resma shared that she learned how to search library databases and cite articles. Other participants (Alex, Chris, Erika, Larissa, Janice) appreciated that they were able to gain knowledge and familiarity working with research tools and data collection and visualization tools.

> *"I liked working with Qualtrics and found that to be interesting, and I find it useful to be kind of fun to play around with how it sort of it looks and how it's used. It's a pretty easy to grasp program, so I kind of picked it up quickly and started looking at how we can improve it." – Alex*

Larissa felt she developed skills in interviewing, creating surveys, and conducting focus groups through her work on a research project. She attributed that project with the development of analytical skills which she was able to use on the second project she was employed on.

Jacob, Janice, and Dominique spoke of skills they developed in transcription and data analysis using research platforms like Survey Monkey or NVIVO. Though this work would be challenging at times, participants like Janice and Jacob found it to be very rewarding work.

> *"I do remember getting into transcription, where there were times where you'd get an audio file over, you know, close to an hour and a half long and several people talking and if it's a focus group, right? And you have to make what everyone's saying–and cross conversation, it was challenge, challenging, it was, but it was rewarding work because you start to learn quickly and, yeah, it wasn't anything I couldn't handle." – Jacob*

Albert found it interesting to observe how project managers organize and manage research projects, stating, *"It was good to see how the project manager thinks during the project. How they organize and manage the project was interesting to see."*

Enhanced writing skills

Many participants had conducted literature reviews as part of their work experience. Participants (Rajni, Samia) mentioned how their experience taught them how to conduct literature reviews more effectively and how this was beneficial not just for the project they were employed on but also transferred over to their academic work as it helped improve their literature review skills and writing.

"Just in general, finding resources or proper resources is a challenge, you know, at times, so I've learned different ways of finding new information, valid information, and now I could differentiate between which ones are professional work, and which is an article that's out there which is good but it's not peer reviewed." – Samia

Opportunities for growth through overcoming obstacles and fears

Participants spoke of challenges they encountered during the experience. Rajni, who was working on data related to legal case studies of women who had experienced domestic violence often found the subject matter difficult to read. She took the help of her supervisor and with their help was able to devise strategies for self-care that helped her work through the challenges she was experiencing. She used these skills to deal with similarly tough content in her academic work.

"It was very triggering as I already mentioned, I know somebody who has gone through this. And when I went, I remember, like I just got, you know, that triggered that how this might have happened with her and what issues she might have faced and so that was one of the thing. And I already talked with my supervisors about that, and they told me that I can take breaks and ground myself and everything. They helped a lot, but after a while when we get used to it and in my course, too, I know how to take to self-care." – Rajni

For some other participants (Larissa, Albert, Diane and Dominique) the tasks required of them were sometimes intimidating and overwhelming. They managed to work through their fears and in the end, felt more confident and that it had been a good experience.

"It was nerve wracking, but there was a lot of people there and I was really intimidated but once you're in it and once it happens, then you become so much more comfortable because we know that work right we we've dedicated a lot of our time to, you know, understanding what we do and so when you're in the moment, it can be scary, but once you start talking, then you start to feel a little bit more comfortable and so you're like 'yeah, I got this'." – Larissa

"The task was for me to also to kind of figure it out by myself, which at first I find a bit overwhelming... But once I went through everything, I felt very confident, actually. Once I got to the coding was nice to see all the codes start reducing. But yeah, I would say it was mainly through my own initiative, but they definitely did provide me resources." – Dominique

Teamwork

The participants enjoyed the opportunity to work with teams. Alex mentioned enjoying the social aspect of working with others, collaborating on projects.

"I remember enjoying it quite a bit. I like the contact with, with students and people that participated in the study, and that one actually had a team involved so I can actually meet with other students talk with them and work on projects, work on the testing together." – Alex

Dominique felt that working in a team on the research project had helped her understand how to navigate and manage team dynamics effectively. Diane enjoyed the process of writing and sharing drafts with her team. The team provided feedback and comments, which helped her improve her work. This collaborative effort also helped her make friends and feel more connected.

> *"Throughout that process, we would just send drafts each other, so I think within the team of time, probably half of us decided to write something, and then we would send each other our draft, comments, and they actually ended up polished." – Diane*

Larissa valued the opportunity to collaborate with faculty members, which she found empowering. This collaboration allowed her to learn about different opportunities and gain insights from experienced professionals. For Olivia, the research experience provided insights into work outside of her field of nursing and she appreciated the opportunity to see teamwork and collaboration firsthand.

> *"I was able to step out from nursing a little bit and be a part of that research team and just got to see the teamwork and collaboration firsthand was just different than what I've been used to." – Olivia*

Enhanced communication skills

Participants felt that they had enhanced their writing and oral presentation skills through the research. Barb and Karolina emphasized the importance of enhancing writing skills and felt that the work on the research had helped them develop the same. Karolina focused on becoming a clearer and simpler writer through the editing process. She appreciated the feedback from her supervisor, which helped her convey her ideas more effectively.

> *"Once I wrote everything, to get those edits back and be like, 'Wow, it's really helpful', because it's like they're saying the exact same thing just in a simpler fashion." – Karolina*

Participants shared that the research had helped them with their oral presentation and public speaking skills. Jacob and Larissa were both initially uncomfortable with public speaking but acknowledged that research opportunities helped them gain confidence. They appreciate the chance to practice and become more comfortable speaking in front of crowds.

> *"Public speaking has always been something that, you know, I will do it, but it's not something that I'm ever gonna feel 100% comfortable with... it gave me confidence to, you know, I had next to no public speaking experience prior to joining the program." – Jacob*

Janice highlighted the improvement in her presentation skills while working on a project. She felt that her passion for the project enhanced her ability to present effectively.

> *"While I was working with [Conference Name] I think my presentation skills really went above and beyond. Even in my my paralegal diploma, you need a lot of presentation and advocacy skills, and I think being so passionate*

about the project, I was really able to put that passion and presentation skills into [Conference Name], and really speak from the heart." – Janice

Increased self confidence, pride and recognition

Participants (Alex Imaran, Erika, Jacob, Liana, Karolina) spoke of the confidence they gained through the skills they learned on the project.

This confidence carried over to other settings. Jacob now felt capable of taking on new challenges, while Janice felt more confident I professional environments. Samia talked of how her confidence in her communication skills greatly increased through her work experience. She identified a noticeable growth in herself as a result of this experience.

"It's a confidence booster because we have to find it, then we have to communicate what we thought and why we thought it's important, so somewhere, I had to explain why I thought the article was important, and then read it if based on what I've explained them... I actually, I saw growth in me, and my friends also said that, I've got a lot of self-confidence so it was a confidence booster for me before. I used to think twice when I had to present, I wouldn't be able to I got really nervous. Now I'm able to speak what I thought and able to, you know, explain what I think that's all due to, you know, the study and I would give credits to my supervisor X, and my coworker." – Samia

Knowing that he had acquired the necessary experience, and that his supervisors were ready to vouch for him based on their interactions over the project gave Jacob the confidence to apply for other work opportunities.

"I had the confidence knowing, you know, if I didn't have that experience, no way I would have even attempted it. For the most part, they wouldn't probably accept someone you know just any, any student with no experience, but the fact that I had, you know, six months working with two professors that they know on a personal level and who could vouch for me I think really gave me the confidence to try that for sure." – Jacob

Liana, who was a first-generation student, had experienced the absence of an adult who could support her educational journey. The confidence and pride she gained in being recognized by her professors for her work made her feel good.

"My parents didn't help me pick a university, didn't help me pick a college like, I don't have that support because they don't have that prior experience with that knowledge. So, I think just, it was really happy to be thought of positively by a professor." – Liana

Karolina shared that the confidence she gained in the research project transferred over to other parts of her work. She felt she had become a more confident problem solver and felt more confident of applying for full-time research opportunities in the future.

"It's very transferable, it's something that you're engaging in pretty much every day without consciously realizing that you're doing it right. Yeah, so in that regard. I feel like it's made me a much more confident problem solver... and so I'm forever grateful for getting experience with the research projects because I know that one experience in my

own field in my own right, I will definitely be more and more confident to then feel like I can apply for those like full time research roles in the future, and be able to go, you know, back to those." – Karolina

Janice, Dominique, and Liana also spoke of the pride they felt in their accomplishments over the research projects. Liana described her feelings about seeing the research she had contributed to being published.

"Getting that email was really exciting and it just makes you feel so good about yourself because you've done all this work and there's something to show for it in the end. And also the fact that it's so cool that this has been published." – Liana

Soft skill development

Apart from learning research skills, the projects also enhanced the soft skills for many participants. Participants spoke of how their work experiences enhanced their skills in communication (Liana), time management (Alex, Dominique), leadership (Alex), problem-solving (Karolina), receiving feedback (Liana, Karolina), creativity (Janice), and teamwork/collaboration (Diane, Janice). Liana stated, "*I feel like my experience in receiving feedback and like taking it and actually reading it has grown a lot."*

Insights into future career choices/professional life

The experience allowed many participants (Diane, Alex, Samia, Meredith, Imaran, Erika, Albert) to develop an appreciation for writing and research and to consider future career options that provided opportunities to engage in aspects of the same. Samia spoke of how her research experience made her realize how much she liked reading and learning from the same and influenced her decision to go in for a Masters' degree. For Albert, participating in extracurricular research helped him realize that although he still needs more experience, doing research in the future outside of a collegiate setting is a possibility he would like to pursue. For Erika, participating in non-curricular research gave her more confidence to pursue a path of inspiring macro level change in social work, which she would not have considered before participating in research.

"It added to my confidence in terms of my skills, in terms of career direction, and kind of academic journey, it just opened doors to me to learn, and kind of guide me towards directions my career could take, that I didn't ever even really think of... it's just kind of solidified my understanding that I kind of want to be a part of a positive change in social justice and things like that on a larger scale." – Erika

Meredith's narrative below describes how not only did her experience shape her interest and point her to a career direction she felt she wanted to pursue but also gave her the skills she needed to become successful.

"When I started my undergrad, I was super young, I didn't really know what sociology was, I had no idea what I was going to do afterwards. But I was very involved with my school, on top of the research project I was doing, and the research project really kind of pointed me towards policy, because policy is what really kind of creates those bridges

between the gaps of social policy, which is like what I ended up being interested in, which is kind of what pushed me to apply to doing a masters of policy. So in that sense, like on a personal note, it kind of helped shape that interest. And on more of a professional level, it helped kind of hone my different types of skills that are really important for my type of work, which is that writing and critical thinking and so on." – Meredith

The research experience allowed participants like Janice and Barb to gain skills of working in the professional setting. Barb appreciated the opportunity to gain experience with working in the field in a safe environment even before she completed her studies.

"It's like having real world experience, you're, you know, not only are you getting paid for, but you're also having an opportunity to see what it's like to work in the field without even working in the field as of yet, right. So these are kinds of the types of things that, you know, freshly graduated students will have an opportunity to do so to be able to try it on for size in a safe space with people that were really dedicated to my own learning, is a really incredible opportunity. And just to be able to put some of that together and see what see what the research project itself looked like from beginning to end. Like that's a big deal, right. So very beneficial." – Barb

For participants like Rajni, her learning about domestic violence on the research project helped create a foundation or a base on which she could build on her career aspirations to become a social worker.

"My ultimate goal is to work with Children's Aid [Societies], yes and we know that when we deal with those cases, we have like families Children and Families which are, which might be suffering from domestic violence. So it this experience helped me to, you know, to create a very strong foundation to understand so many. Things that may come across during this career. I think this experience has helped me to understand various impacts about domestic violence about social justice and social location of a person and that which will ultimately help me to make better decisions." – Rajni

Support and mentorship from faculty

Some of the participants (Jacob, Erika, Janice, Meredith) were deeply appreciative of the role faculty supervisors played as mentors, providing opportunities, emotional support, confidence, and inspiration.

"I just I got really lucky and, and, and made quick connections with people who happened to bring opportunities, my way and, yeah, I sought out all these opportunities for example at [University Name] that was actually a position that was suggested or brought to my attention by [Supervisor 1], yeah. She is an amazing mentor and role model, and she's always brought opportunities to my attention and it's been amazing." – Jacob

Janice spoke of how her supervisors were role models for her and the kind of mentor she wanted to be in her own career.

"There were some supervisors who didn't want to take on students, and like have that mentoring role for them and I'm like oh my gosh, I won't be that person because I had the opportunity with [Supervisor 1] and [Supervisor 2] to have great mentors, and I want to be a great mentor for them to like students and like just people who like have the

passion and willingness to learn, so I think that's, I think, like, obviously. I'm going to like, carry on in my career." – Janice

Some faculty mentors continued to support the participants long after students had completed their work experience. Meredith shared how her faculty mentor was instrumental in helping her decide which masters program she wanted to choose and helped her connect with additional research assistant jobs in other universities.

"Like they were an amazing mentor, both during the work....But then also helpful in me deciding which master's program I wanted to choose, I had a really great conversation with her about which program I wanted to get into what school I wanted to get into. And she was very helpful in providing advice that way. And then she also connected me with a professor at [Name of University 2], who I was able to do a bit of research assistant work for as well. So she was very supportive and creating kind of a network for me on top of giving me an amazing experience working on the project. So really excellent, excellent relationship, I think." – Meredith

Building personal and professional networks and increased opportunities

Many participants (Diane, Alex, Larissa, Karolina, Olivia, Erika, Janice) mentioned the benefits in relation to building personal and professional networks not just with the faculty that supervised them, but also with other professionals who were part of the team and with other students. Participants emphasized that they formed lasting friendships, connected with key faculty members and professionals, and even established lifelong mentorship relationships. Erika noted how this created a network for her that she would not otherwise have access to.

"It created this really amazing network that I otherwise would never have had the experience to have in terms of like, introducing me to and allowing me to foster relationships with amazing faculty and staff, and which again, I think, as I explained, led each one, so that my network opened the doors to each new research experience, that opened doors to the colleges in the student, Canada, (inaudible) committee." – Erika

Janice noted that as students they often had to work with a variety of people, and she particularly appreciated the opportunity the project provided her to work with like-minded students which helped her develop as a person and build self-confidence.

"Working with [Student Colleague 1] as well it was a lot like collaborative and you know, being a student, you got to work with a variety of people. And sometimes, that's, like, the relationship is like, okay, we have different kind of mindsets and we have different goals so sometimes that relationship doesn't work out where I think in positions like this, you meet people who are at the same level of like independence, responsibility, and professionalism. And so it's easy to work with and easy to like blossom into a better person and build self-confidence." – Janice

Alex and Diane appreciated the opportunity to meet students from different faculties and even make new friends.

> *"I applied for the position because in [Name of School] it's not very close to community, and you don't really get a chance to like, socialize with other people and other faculties, unless you join like clubs and so, but this was like really awesome and, honestly, like, I made a bunch close friends I still keep in touch with even after it's been a year since the project ended and we still keep in touch." – Diane*

For some participants (Jacob, Larissa. Rajni, Janice and Imaran), the research experience led to future work opportunities. Jacob, who was able to secure a practicum shortly after this work opportunity, mentioned that the experience had led to *"countless employment opportunities, personal and professional relationships."*

Opportunity to be a published author

The non-curricular undergraduate research experience provided many participants (Barb, Jacob, Karolina, Liana, Erika, Meredith, Resma) exposure to the processes of academic publications and an opportunity to be a published author. Many were included as co-authors or primary authors which boosted their confidence and prepared them for future academic or professional roles where such accomplishments are highly regarded. Karolina was able to leverage these in future work opportunities.

> *"The publication is the biggest piece I would say, without them I would not have a publication. So that is, that is the biggest piece, specifically in terms of the fact that I do want to do my masters. And so, again, just another fact with that that it's very much, you know, something that they look for on a CV, when you're applying." – Karolina*

Advantage when applying for jobs

The opportunity to engage in non-curricular undergraduate research significantly enhanced participants' (Diane, Rajni, Liana, Albert, Resma) resumes and job applications making them stand out among other candidates.

> *"This is like a shining star on my resume, because I really love talking about it because I have such an amazing experience, and I also feel like it stands out because when you when you apply for like business jobs, most people are like consulting club, or like finance. I feel like it's very different. Also, it has applied to really any role, so I feel like it can give me a leg up in terms of job." – Diane*

These experiences not only highlighted their unique skills but also demonstrated their ability to work on substantial, real-world projects.

Participants consistently noted that having research projects on their resumes drew attention from hiring managers, often becoming a focal point during interviews. Karonlina, Liana, Rajni and Albert mentioned that

the skills and achievements gained through these research roles gave them a competitive edge in the job search process.

> *"So yes, it was my resume. Whenever I met for an interview, it was there on my resume. It was always a question in the interview. And in fact, the first job I got, my manager brought it up." – Resma*

> *"The professor pointed out to me that my research experience was something that made me stick out via all the candidates, so clearly it demonstrates skills and whatnot that some students might not have had the opportunity to demonstrate outside of the classroom. And I think that that's noticeable on resume, and it will definitely help me in the future." – Liana*

Some participants (Diane, Alex, Rajni, Jacob, Erika) also mentioned that the references provided by the research supervisors were helpful in future job applications. For others (Erika, Karolina, Rajni, Olivia) the references were invaluable at the time of applying for future educational opportunities.

> *"In terms of references and recommendations, you know, I was super fortunate that all of my university applications were supported by reference letters from [Head of Department] and from [Supervisor 1 and 2]." – Erika*

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CHALLENGES

Time management

For many participants (Alex, Barb, Larissa, Liana, Janice, Imaran, Nakita, Dominique) managing time and competing priorities proved to be the biggest challenge. Balancing multiple responsibilities, including research projects, academics, and personal commitments posed significant challenges for participants, such as long hours and high stress levels.

> *"Originally, I can say that I was quite overwhelmed with doing that, working part time, going to school, and trying to get my work done commuting. So, any stresses I had related to the position I feel like came from being too, like over committed myself in a sense." – Liana*

Some participants developed strategies to manage their workload, such as using calendars, prioritizing tasks, and setting boundaries to prevent burnout. Imaran, who was returning to school as a mature learner, felt that

he had to spend much more time than the "average student" to maintain a high grade-point average. This, combined with the pressure of the research, felt exhausting. He shared that without "*having a calendar that I had in front of my face every day, I don't think I would be able to.*" He also found putting boundaries around personal time became important as a strategy.

Feeling overwhelmed with task at hand

Some participants (Diane, Barb, Chris, Karolina, Janice, Imaran, Dominique) shared experiences of feeling overwhelmed by the demands of their research projects, balancing multiple responsibilities, and navigating complex tasks. Challenges included time constraints, heavy workloads, conflicting views on topics, and managing personal struggles. Barb shares the stress she encountered on account of time pressure and based on her sense that others including her supervisors and communities impacted by the research were relying on her work, *"it's not just the professors that are relying on you there are individuals that are relying on you because they are going to reap the benefits of the work that you're doing."*

Other participants mentioned feeling overwhelmed with the skill level required by the job (Chris), or by a scope of work (Janice), or nature of task (Imaran, Dominique). Chris remarked that, as design students, they sometimes felt that they were *"a bit out of our head, or out of our water out of our depth" and that they "probably bit off more than we could chew".*

Janice, who was tasked with a literature review on the topic of social capital, found the vastness of literature on the topic overwhelming.

> *"No, wasn't easy. I didn't know there's so many conflicting views on what social capital means. Like you either just need to find like a solid definition, because at one point I kind of thought I was kind of getting consumed by this literature, because it was very extensive." – Janice*

Difficulty working with others on the team

Working in teams presented challenges for a few participants due to lack of clear role hierarchies among student researchers (Chris), unclear division of tasks (Alex), or different styles of work (Dominique).

> *"Another challenge which always comes with working with another system or group work is everyone has different ways on how they worked. I think I'm detail oriented and they take more time and I like to break down tasks and other people might want to do all their hours in one day, and work faster, so I felt sometimes the difficulty working with this other individual just- not as a bad way, they just had a different approach and sometimes I felt it difficult to kind of coordinate." – Dominique*

Lack of confidence/intimidation

Intimidation or fear of the task at hand was a barrier for some participants (Albert, Liana, Karolina, Larissa, Meredith, Dominique). Alex felt scared going into his first shift. Meredith shared she felt some intimidation with the task at hand while Karolina described the publishing experience as "daunting." Such fear was typically felt at the start of the project/task but often went away over time.

For Liana, the intimidation was less about the task and more about interacting with her supervisors. She felt intimidated by her supervisors and was unsure of how to balance personal and professional communications with them based on their unequal relationship.

> *"Starting out, I was quite intimidated by the both of them, and finding the level of being professional, but also trying to be friendly with a with a boss. I think has also always kind of been hard for me." – Liana*

Liana's work involved writing and improving on drafts based on feedback from her supervisors. She felt anxious while receiving this feedback and stated about her work that *"it was a low self-confidence piece."* This anxiety reduced over time.

> *"The more writing I did, the more they gave me feedback, the more I felt comfortable with it. But at first, I really struggled, and it's not that I didn't think what I was writing was good but I was scared of rejection and failure." – Liana*

For Alex and Liana, it was interacting with their supervisors who were accomplished and experienced researchers that was intimidating as they had not had such interactions outside of the classroom before.

> *"I remember being pretty nervous having to talk with my professor one on one, since it was just us meeting at lunchtime. I definitely remember being quite anxious at the time, but I think that was a good experience for me as well to get that kind of exposure." – Alex*

> *"I wanted to point out that it's cool now, but they are predominantly very intimidating women. They're both so intelligent and so friendly and so welcoming, but it doesn't change the fact that they've done a lot, and they have a lot of experience and I sat across the table from both of them and I was like, wow, the, the awestruckness didn't really go away." – Liana*

This intimidation proved a challenge for Liana as she did not feel comfortable taking up time in meetings to ask the questions she wanted to.

> *"I was in a room with very smart people just, I felt it I was sitting there in a room with women who knew a lot. And it wasn't necessarily a negative, but it was a bit of a challenge too. I don't want to ask too many questions. I know you can never ask enough questions, but for things that seem so silly or trivial. When you're on in a kind of time crunch like we have an hour meeting, we got to go through this and this. I'm interrupting my supervisor for every little thing that I don't understand." – Liana*

While Jacob did not feel intimidated by his supervisors, he mentioned feeling reluctant to speak up as a student on the project. He sometimes felt that things could have been done more efficiently on the project he did not speak up as *"you don't want to overstep your bounds."* Jacob felt that working for a research supervisor who was also a faculty member had its own challenges as there was the added pressure of wanting to make a good impression.

> *"But I think it was challenging because you really want to make the best impression possible, right? So, I think you will want to, it is intimidating right when you're working for your professors, it's not like going into any other job right? Because these are people that you're going to work with for the next year at least, right? And you don't want to go in there and disappoint so I would definitely say that there is a bit of pressure that comes with doing student research work." – Jacob*

Unmet expectations

Sometimes challenges emerged when the participants did not feel the job met with their expectations either because they wanted to do more than what the job they had been hired to do entailed (Alex), or because they felt their skills were not as well aligned to the task as they would have liked (Diane).

Dominique felt less engaged with the project on account of the lack of guidance and supervision she expected from her supervisor. She feels that she did not perform to her potential and this was partly due to the lack of support from her supervisor.

> *"One thing I do wish is that she would check with me more, you know deadlines are very set tasks. I found that her tasks were often open ended. And I didn't necessarily understand the purpose of what I'm doing. I think that's what kind of drew the gap between me engaging myself because there was no- I was told to transcribe and then I wasn't necessarily given a process to analyze it was just okay that process for social interactions because I think that would be interesting, and which I did. But at that point I had no idea that there was actually a process when they're analyzing transcripts late, like the grounded theories, and all that so I think I just felt confused for most of the parts. And I think that's where the lack of engagement came from. I think I didn't perform to what I knew my potential was and I wish, and I'm not sure what exactly could have been done but I do wish, some sort of additional support, or maybe a different management style would have worked better for me." – Dominique*

Thinking back on what could have been helpful Dominique felt that additional support, regularly scheduled meetings and opportunities to clarify doubts over a platform that allowed for a conversation style interaction like Microsoft Teams instead of email would have helped.

Fear of negative references

Chris spoke of being scared that the negative experience they had in the project would translate into a bad referral from supervisors which would in turn jeopardize their internship opportunity in the program they were in.

> *"I was really upset with the way things ended, and I was concerned that you know it would be a bad referral, that I wouldn't get an internship. The reason I avoided my resume, and it's still not on my LinkedIn and all of these things is, is plainly just, I don't know what would happen if someone asked [Supervisor 1] and [Supervisor 2] for a referral, and, and I just didn't feel comfortable with that situation." – Chris*

Challenges created by COVID/virtual environment

The shift to remote work during the pandemic posed several challenges for participants including having to take on additional work due to team members quitting (Liana), feeling of isolation (Olivia), reduced opportunities to connect and collaborate (Liana, Olivia), and difficulties working virtually (Dominique).

> *"As far as kind of feeling isolated yourself like 'oh I'm working on this all by myself here'. I'm at home or whatnot, it would be so nice if we could have went to [Name of University] and maybe all came together but with COVID restrictions we weren't allowed to do things like that." – Olivia*

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SUPERVISOR QUALITIES AND RELATIONSHIPS

Supervisor qualities that Enhanced the non-curricular undergraduate research experience

Participants appreciated the relationship they developed with their supervisors who they regarded highly on account of their expertise, style of communication, mentorship, or because they felt the supervisors had participants' interest in mind.

Participants appreciated when their supervisors were friendly or supportive (Albert, Rajni, Meredith, Karolina), cordial (Nakita), responsive (Imaraan, Rajni), and did not micromanage the participants' work (Barb).

"Our relationship was very positive and a very strong relationship with the supervisors, both of them, X and Y are

> *amazing, they're the one of the best supervisors I've had. They're very friendly and they're very supportive. And whenever we were stuck on something, they were always there to help us, to reply our emails. Yes, even in the night as well whenever you're stuck, we just send them email, they reply right away and with the solution, and it was very, very helpful." – Rajni*

Supervisors who created work environments where student researchers felt comfortable asking questions (Jacob, Liana) provide input and ideas (Albert), shared all aspects of the research with participants (Albert), provided flexibility in work times (Rajni, Barb, Samia), and cared for their well-being (Diane, Janice) were greatly appreciated.

Supervisors as Mentors

Supervisors played an important mentorship role for a majority of participants (Larissa, Erika, Diane, Janice, Alex, Barb, Rajni, Jacob, Samia, Olivia, Karolina, Resma, Dominique). As mentors, supervisors encouraged participants, provided guidance and training, provided flexible work opportunities, prioritized the student research assistants' goals and aspirations and provided long term mentorship even after the work relationship had ended.

Encouragement and Support

Participants spoke of the encouragement and support they received from supervisors that gave them the confidence to continue or to explore new ways of doing things. Janice spoke on how the feedback helped her to improve, "She would read what I had written and like, give me pointers on where to go next, which I thought was really helpful." Erika also found the support to be encouraging.

> *"A lot of my research supervisors really believed in me and gave me the confidence to kind of navigate and figure things out on my own and sort of provide my own lens and my own kind of attack to things." – Erika*

Olivia spoke on how her supervisors provided her with much needed support at a time when she was navigating a personal crisis.

> *"I received a lot of support during the research project, I had a death in the family, and I couldn't even imagine the support that they- that they provided me and the strength of they gave me and they gave me some time off to spend time with my family because they understand the importance of that, and it was a strong line of communication between us all." – Olivia*

Guidance and Training

Participants were very appreciative of the guidance and training supervisors provided them (Diane, Larissa,

Albert, Rajni, Samia, Karolina, Resma). Larissa particularly appreciated that she was provided with the tools she needed to be able to work and then space to work on her own along with constructive feedback when needed.

Albert also appreciated his supervisor for her guidance in research, willingness to give feedback and provide clarifications. He felt comfortable and confident in his work as he felt safe to make mistakes.

> *"She was honest, gave me good feedback and she gave me clarifications and I never felt intimated by her. I always felt like, if I had to report something to her, I felt confident. Like, this happened that's happened to her like, and I was not a scary thing like I needed to do the perfect job. Or she will get mad at me or find something wrong. She was a very open person, and I felt like she was a good mentor because she taught me a lot of good research practices." – Albert*

When supervisors were very clear and open in their communication and expectations, it helped participants feel more prepared for the work.

> *"So that was super important, you know, I never, I never went into it, you know feeling totally blindsided or confused right? And they always made sure that that they did their part in letting us know how to succeed and what they were expecting, so it wasn't a matter of questioning your work, you knew what the expectations were and how to communicate. Communication was huge and they were great at it." – Jacob*

Flexible work

Some supervisors provided flexible work timings and spaces that encouraged students to work at their own pace (Alex, Barb, Dominique, Janice). This flexibility gave students an opportunity to develop confidence in their own abilities while maintaining accountability.

> *"I was very fortunate with the team I was on that they would basically allow me to fit in where I could. So if I had 10 hours a week that I was dedicated to them, they didn't care when I did the 10 hours per week, so long as I got the work done, right. So there was a lot of flexibility there." – Barb*

Prioritizing participants' goals and aspirations

Some supervisors placed participants' goals and aspirations at the forefront of the research opportunity. Karolina's supervisor often asked about her goals and how the supervisor could help her achieve the same. Olivia shared that her supervisor made her identify her goals for working in the project early on and that her supervisor made sure to provide opportunities to allow her to meet those goals.

> *"We kind of identified some goals early on, I wanted to work on my speaking points and presentation type skills, and my supervisor recognized that and wanted to provide me with opportunities to be able to do that so taking a lead on facilitating a meeting with community partners for." – Olivia*

Long term mentorship

The mentorship provided by some supervisors continued long after the participants had stopped working for them (Karolina, Jacob, Olivia, Larissa, Janice), with Jacob stating, *"We still communicate to this day, it's a long-lasting thing."*

However, not all relationships with supervisors were positive. Challenges arose when supervisors were too busy to provide mentorship and supervision to participants (Alex) or when supervisors did not provide the guidance that participants wanted or needed (Dominique).

Challenges also arose when the supervisors did not communicate effectively have the subject matter expertise to guide students on the aspects of research they had been hired to work on. This can be seen in the experience shared by Chris.

> *"Even the professors. I mean, they could have communicated a bit better but at the same time, they're not designers. They weren't designers in any way, shape, or form, so we drove our own requirements. They had no idea what was going on, from a design perspective, right? Like we showed them something and they, they either liked it and gave us the green light or they told us to go back and make some tweaks, but they had no idea who was doing all the work, they had no idea who was driving the project, they just assumed that everything was running smoothly." – Chris*

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RECOMMENDATIONS FROM PARTICIPANTS

Detailed overview of the work at the time of hiring or orientation

Though all participants received some orientation to the work they were hired for, a few participants (Albert, Imaran) felt unprepared for the work ahead of them and wished they had a more detailed explanation of the work the onset. Albert explained that he gradually learned about the project over the course of his experience, but it would have helped him to have received a detailed overview at the beginning.

Imaran suggested that it would be helpful to get details about the project at the time of hiring as it would help anxiety as well as allow students to make informed decisions as to whether the opportunity is one that they would find interesting. Liana suggested that an onboarding manual or booklet may be helpful to orient students joining research project. This booklet could have less to do with the subject matter of the project and more to do with the overview and background of the project.

> *"I feel like maybe a short booklet with background information so that I can refer back to it. We personally talked a lot about what the study was who it was for, this, that, like the overall, they gave it to me many times verbally, but to have something maybe physically written would be helpful when you're first starting out, just to refer back to so that I'm not constantly asking." – Liana*

Recruiting students with accommodations

Dominique, who has academic accommodations, felt that research opportunities are not explicit in welcoming students with accommodations to apply for such positions. She recommended a more mindful recruitment process that is explicitly welcoming to students with academic accommodations.

> *"One thing I thought was a bit odd is I don't feel like the research projects at [Name of College] make a point to ask if you have accommodations to also help you out.... I will just worry about the wording [of the job description] comes off as making the assumption that we think that they don't have the opportunities but I think it would just- making it clear that it's open to all students and not just having at the bottom of applications, I think it should be integrated somewhere like at the beginning, or in the job description somewhere because if you think it comes as an afterthought. So I think just looking it's open to any student all students have these abilities to develop, and we're here to make this an enjoyable process and to help support you." – Dominque*

She felt that there had been limited opportunities for her to explain her accommodation or to understand how these would translate into the work she was applying for, Suggesting that it would be helpful for students with accommodations to have the college apply accommodation related information from school to work opportunities.

Increased opportunities for informal socialization

A few participants (Diane, Alex, Liana) expressed a desire for more opportunities for informal in person socialization during their work as undergraduate students. This need for more informal ways to get to know and build relationships with teammates was particularly noticeable when the work was done remotely. Liana describes monthly staff socials she has heard about in other workplaces and felt that even an hour of such informal socialization time could greatly help to make students feel more comfortable.

> *"And it's just an hour of non-work-related talk. I think that it does a lot, because in my placement, I've been working mostly remotely on. I just started in office last week and I'm working with people I've never met face to face until last week so it's very hard to develop those working relationships, if I'm not seeing these people, other than just in interviews and whatnot. But that hour kind of gives me a look into their personality and kind of what they think is funny or what they enjoy. So I'm not saying that you have to dedicate an hour in four weeks specifically but maybe reading or doing an activity, even if it's 15 minutes where it's not necessarily work related in context." – Liana*

More structure and clarity on tasks

Participants (Alex, Chris, Dominique) appreciated work that had defined structure and processes.

> *"I'd like to build more structure, since we are kind of taken week by week...I don't think I would want handholding,*

but I think in some experiences I think it would be nice to have like a very clear understanding of what the future of the project would be, getting more getting more of an idea that I think would be helpful." – Alex.

Dominique felt that there needed to be clarity in terms of process to be followed in the work opportunity as well as in terms of timelines and information about the purpose of the project. Chris added that not having clear expectations about the job roles and processes could also lead to challenges.

"My takeaway is just make sure that the communication, and that the expectations are clear, from everywhere, from the professor down to the assistant, right? Because if you don't have that clarity, then, then it could just breed some, some, ill situation." – Chris

Reinforce that non-curricular undergraduate research experience is a learning opportunity

Liana suggested that supervisors need to emphasize that the undergraduate work experience is a learning opportunity for students. This would help take some of the pressure off the work and help them feel more supported and confident in the work they were being made to do.

"Stuff like that is a learning opportunity and I feel like maybe reinforcing that it's a learning opportunity would be helpful, because it was a research assistant position, it was paid. Because it was paid, because there was the interview process and it was not formal, but formal enough. I always thought that I had to do things right in the right way or I had to produce work at a certain quality. Sure, I do obviously have to do that. But again, reminding myself it was a learning opportunity was something I had to do a lot so maybe reinforcing that with research students who go into research shows that at the end of the day, I was there to support them but they were also there for me to learn from them." – Liana

Debriefing after the research experience

Chris, who had experienced some challenges in relation to teamwork in his non-curricular undergraduate research experience, felt the need for a debrief at the end of the research experience to allow him to understand where he stood in relation to his supervisors.

"I think a debrief would have been helpful for everyone in a situation, it would allow me to kind of learn where I stood with [Supervisor 1] and [Supervisor 2]. I still don't know where I stand with them. So that would have been, I think good for me, I think. For them it would have been helpful to kind of learn that, you know, they needed to improve how they communicated with their research team because they have many students on board right?" – Chris

Increase opportunities and awareness of non-curricular undergraduate research experiences

Non-curricular undergraduate research experiences offered the participants many benefits and many participants felt that there needed to be more opportunities for non-curricular undergraduate research and that these needed to be publicized more so that students are aware of the same and the benefits of being involved in such opportunities (Barb, Rajni, Jacob, Samia, Olivia, Liana, Albert, Nakita). Barb and Jacob suggested that this could be done by increasing grant funding for such research, *"I think the more and more funding and the more studies we can get students involved in the better, because you could potentially be carving out a new career path for a student"* (Jacob).

Opportunity for longer engagements with the same project

Three participants recommended that the research opportunities should allow for longer term engagement from students. Opportunities were often grant-funded and lasted a semester for a student to allow diverse students to gain from the same funding pocket. These participants felt that the time was not enough, either because they wished to continue working on the project (Alex, Rajni) or because they felt that the limited time did not allow them to develop authentic engagement with the work.

> *"I understand they're trying to give opportunities to various students because I do understand there's contracts, and they'll hire a different student for usually a different term as- the only thing I didn't like about that is that it's kind of like I'm just giving a bit and then that pulled off the project it's- how am I supposed to build an authentic engagement with the product if I only get three months, which is really quickly within the research world, and then I'm pulled off and then someone else holds on...If you were giving the opportunity to stay on for two contracts per se, the quality of the work with the students would be higher." – Dominique*

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IMPLICATIONS FOR PRACTICE

The findings of this study have important implications for students, faculty, and post-secondary institutions seeking to enhance the effectiveness, accessibility, and equity of non-curricular undergraduate research experiences. Situating these implications within the frameworks of high-impact practices (Kuh, 2008), experiential learning (Kolb, 1984), and theories of capital (Bourdieu, 1986), the results highlight the need for intentional design and equitable access to maximize the transformative potential of non-curricular undergraduate research. These implications must also be understood in relation to questions of institutional value, return on investment, and resource prioritization.

The Value Proposition of Non-Curricular Undergraduate Research in Contexts of Fiscal Constraint

At a time when higher education institutions and funding bodies face increasing financial pressures, non-cur-

ricular undergraduate research are often viewed as an optional or supplementary investment. However, the findings of this study suggest that such a characterization underestimates its broader institutional and societal value. Rather, it represents a cost-effective, high-impact intervention that delivers substantial returns across multiple domains.

First, non-curricular undergraduate research aligns with Kuh's (2008) definition of high-impact practices, offering intensive, engaged learning experiences that promote deep understanding and retention. Importantly, these benefits are achieved without requiring large-scale structural reforms. Instead, non-curricular undergraduate research often operates within existing institutional ecosystems, leveraging faculty expertise and modest funding, making it a relatively low-cost, high-yield educational strategy.

Second, from an experiential learning perspective (Kolb, 1984), non-curricular undergraduate research can provide forms of applied, practice-based learning that are difficult to replicate in traditional classroom contexts. The findings demonstrate that students acquire both technical competencies and transferable skills, such as critical thinking, teamwork, and communication, that are directly relevant to labour market demands. In that sense, research experiences contribute to workforce readiness, enhancing the employability of graduates while reducing the need for additional institutional investments in career-readiness programming.

Third, non-curricular undergraduate research can serve as a key mechanism for the development of social capital (Bourdieu, 1986). By connecting students with faculty mentors, other student researchers, professional networks, and future opportunities, research participation facilitates pathways into graduate education and employment. These relational benefits not only enhance individual student outcomes but also contribute to institutional goals related to graduate success, program reputation, and alumni engagement.

Importantly, the study also demonstrates that non-curricular undergraduate research can function as a vehicle for equity and social mobility, particularly for first-generation and underrepresented students. When access is supported and structured appropriately, research opportunities can reduce disparities in exposure to academic and professional networks, thereby addressing structural inequalities in higher education.

Taken together, these findings suggest that investments in non-curricular undergraduate research should not be viewed as discretionary expenditures, but rather as strategic investments in student success and institutional impact. In contexts of fiscal austerity, such investments may, in fact, represent more efficient uses of resources compared to less targeted or lower-impact initiatives.

Implications for Faculty

Faculty members play a critical role in shaping non-curricular undergraduate research experiences, particularly in relation to access, mentorship, and learning outcomes. To address inequities in access, faculty should adopt more transparent and inclusive recruitment practices, moving beyond informal selection mechanisms that privilege students with existing social capital (Bourdieu, 1986).

The findings further highlight the importance of structured mentorship. Faculty should explicitly commu-

nicate expectations, provide scaffolding for research tasks, and reinforce the developmental nature of non-curricular undergraduate research. This approach can reduce student anxiety and support skill acquisition.

Implementing structured onboarding processes and adopting tiered mentorship models may also enhance the quality and scalability of research experiences. Additionally, faculty should engage in reflexive mentorship practices that consider the diverse needs and backgrounds of students, thereby promoting more inclusive learning environments.

The findings suggest that students benefit most when they approach non-curricular undergraduate research as both a developmental learning experience and a strategic opportunity for building academic and professional capital. Students should be supported in actively cultivating relationships with faculty and engaging in early academic interactions that can facilitate access to research opportunities.

Additionally, students should be encouraged to frame research participation as a learning process rather than a performance-oriented task. Many participants reported initial uncertainty and self-doubt, which diminished over time as they gained experience. This reframing aligns with experiential learning theory (Kolb, 1984) and can support persistence and engagement.

Students should also be guided to leverage their research experiences more intentionally by seeking feedback, maintaining professional relationships, and translating their experiences into articulated skills for future academic and employment opportunities.

Implications for Institutions

At the institutional level, the findings underscore the need to formalize and expand non-curricular undergraduate research opportunities in ways that promote both access and sustainability. Developing centralized systems for advertising research opportunities can reduce reliance on informal networks and enhance equity.

Given the relatively low cost and high impact of non-curricular undergraduate research, institutions should consider prioritizing funding for such programs, even with limited available funding. Investing in multi-term or scaffolded research opportunities may further enhance learning outcomes and deepen student engagement.

Institutions should also recognize and support mentorship as a central component of non-curricular undergraduate research. Providing professional development for faculty supervisors and formally recognizing mentorship contributions can improve the consistency and quality of student experiences.

Embedding equity, diversity, and inclusion (EDI) principles into research program design is essential for addressing disparities identified in this study. This includes inclusive recruitment practices, financial support for students with competing obligations, and mechanisms to support students with accommodations.

Finally, integrating non-curricular undergraduate research into the broader curriculum and building community through research networks and informal engagement opportunities can strengthen both participation and student outcomes.

Conclusion

One central implication of this study is how non-curricular undergraduate research functions both as a pedagogical tool and as a relational, structural mechanism that shapes access to opportunity. While the benefits of research participation are substantial, they are unevenly distributed without intentional intervention.

In an era of fiscal restraint, the challenge for institutions is how to design investments in non-curricular undergraduate research investments to maximize impact, equity, and sustainability. By aligning non-curricular undergraduate research initiatives with high-impact practice principles (Kuh, 2008), experiential learning models (Kolb, 1984), and a critical understanding of capital (Bourdieu, 1986), institutions can ensure that these programs contribute meaningfully to student success and broader institutional goals.

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DISCUSSION

This study provides a comprehensive examination of undergraduate students' participation in non-curricular research by integrating quantitative survey data and qualitative interview findings. The results reinforce the characterization of non-curricular undergraduate research as a high-impact experiential learning practice while also illuminating the mechanisms through which such experiences contribute to skill development, social capital, and career trajectories.

Non-Curricular Undergraduate Research as a High-Impact Educational Practice

The findings strongly support Kuh's (2008) conceptualization of non-curricular undergraduate research as a high-impact practice (HIP) characterized by sustained engagement, meaningful interactions with faculty and peers, exposure to diverse perspectives, and opportunities to apply knowledge in real-world contexts . The present study demonstrates that non-curricular research aligns closely with these elements.

Participants reported working collaboratively on authentic research problems, engaging deeply with complex material, and communicating their findings through various dissemination activities. Even short-term experiences often required intensive engagement, confirming that duration alone does not determine impact. Rather, the depth of involvement is critical, through participation in multiple stages of the research process, appears critical. These findings extend Kuh's (2008) framework by demonstrating that non-curricular research, even when informal or short-term, can function as an effective high-impact educational practice.

Experiential Learning and Skill Development

The results are also strongly aligned with Kolb's (1984) experiential learning theory, which conceptualizes learning as an iterative cycle involving concrete experience, reflective observation, abstract conceptualization, and active experimentation (Kolb, 1984).

Participants' narratives reflect each stage of this cycle. Students engaged in concrete experiences such as conducting interviews, transcription, analyzing data, and writing literature reviews. These activities were followed by reflection, often facilitated by feedback from supervisors and peers. Through this reflection, participants developed more refined understandings of research processes (abstract conceptualization) and applied these insights in subsequent tasks (active experimentation).

The findings further suggest that experiential learning in non-curricular undergraduate research extends beyond skill acquisition to include deeper epistemological development. Students not only learned how to conduct research but also developed an appreciation of research complexity, ethics, and rigor. Consistent with Kolb's theory, challenges such as uncertainty and initial lack of preparedness appear to be integral to the learning process, contributing to growth when appropriate support structures are in place.

Social Capital, Access, and Inequality

The findings of this study indicate that access to non-curricular undergraduate research opportunities is often mediated by pre-existing relationships with faculty or institutional networks. Students frequently entered research roles through faculty recommendations or informal connections, suggesting that participation is influenced by the distribution of social capital prior to engagement.

At the same time, participation in research significantly enhanced students' social capital. Through mentorship, collaborative work, and exposure to academic networks, participants gained access to new resources and opportunities, including employment, graduate study, and professional connections. This dual role of social capital—both as a condition for access and an outcome of participation—illustrates how non-curricular undergraduate research can function as a mechanism for both reproduction and transformation of advantage, consistent with Bourdieu's (1986) framework.

Mentorship and the Transmission of Capital

Mentorship emerges as a key mechanism for the transmission of both social and cultural capital. Supervisors guided students through research tasks and introduced them to academic norms, professional expectations, and networks that facilitated future opportunities.

Effective mentorship was characterized by a balance between structure and autonomy, clear communication, and sustained support. These relationships often extended beyond the research experience, contributing to long-term academic and professional trajectories. In contrast, inconsistent supervision limited students' ability to fully benefit from the experience, suggesting that access to mentorship represents a critical point of inequality.

Identity Formation and Professional Development

The study also contributes to understanding how non-curricular undergraduate research supports identity formation, particularly through the combined effects of experiential learning and access to capital. As students engaged in authentic research and received validation from supervisors, they developed a sense of themselves as capable researchers and professionals.

This transformation aligns with experiential learning theory, as repeated cycles of action and reflection enabled students to build confidence and internalize their developing competencies (Kolb, 1984).

For first-generation students and others with limited prior exposure to academic research, this identity shift was particularly significant, highlighting the role of non-curricular undergraduate research as a potential site of social mobility and empowerment.

Challenges as Structural and Learning Constraints

Despite the substantial benefits identified, participants also reported a range of challenges that can be understood through both experiential and structural lenses. Time management, workload pressures, and mental health concerns reflect broader institutional and social constraints that shape students' capacity to engage fully in research experiences.

From an experiential learning perspective, challenges such as task complexity and initial lack of preparedness represent important—but potentially disorienting—stages in the learning process (Kolb, 1984). However, without adequate support, these challenges may limit learning outcomes. Similarly, inconsistent mentorship and unclear expectations reflect gaps in program design that can exacerbate inequalities in access to social and cultural capital.

The additional disruptions caused by the COVID-19 pandemic further highlighted the role of structural

contexts in shaping students' experiences, particularly through reduced opportunities for interaction and collaboration.

Limitations

While this book provides valuable insights into the benefits and challenges of undergraduate non-curricular research, some limitations should be noted. The sampling strategy comprising of purposive, convenience, and snowball sampling, may have resulted in a sample that is not fully representative of all undergraduate researchers. Additionally, some groups of undergraduate students, such as international students, made up a very small sample of student participants limits the strength of comparisons across groups.

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CONCLUSION

In summary, the findings demonstrate that undergraduate non-curricular research experiences provide meaningful and often transformative opportunities for students, particularly when supported by strong mentorship and accessible entry pathways. Despite variations in duration, background, and initial preparedness, participants consistently reported significant gains in research competencies, transferable skills, confidence, and professional direction. At the same time, the importance of equitable access, clear communication, and inclusive support structures emerged as critical factors shaping these experiences. Overall, the results underscore the value of expanding and institutionalizing such opportunities to enhance student development, foster social capital, and support more equitable participation in research.

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STUDENT BIOGRAPHIES AND REFLECTIONS

The following reflections were written by student researchers who worked on this project over the years. They offer further perspectives into the impact of non-curricular undergraduate research, bringing the material full-circle and mirroring many of the findings represented in this book.

Carley-Rose Hayward

Carley-Rose is a graduate from Sheridan College's Social Service Work in Gerontology and Honours Bachelor of Social and Community development programs. She has dedicated her life to working with older adults, in retirement communities, long term care, and in adult day programs, which she has done for the last six years. Beyond that, she has a range of other experiences, from sewing clothes to working retail to connecting community members to healthcare supports, but through it all, person-centred care has remained a priority for her. Carley hopes that her research work will help to leave a positive impact on the various communities studied – students, crafters, educators, and older adults.

Carley-Rose Reflection

I've been lucky enough to have participated in three separate research projects over the course of my time at Sheridan College, including my capstone research project and two non-curricular research projects. When Bethany presented me with the opportunity to work on this study, I was very excited as I felt that I had already lived the non-curricular research experience and understood the topic personally.

It should come as no surprise that I found many of the reported benefits to be relatable, particularly the increase in self-confidence. I feel that between Fall 2024 and now, my academic writing skills and ability to disseminate and analyze research findings have vastly improved. The Carley of two years ago would not have believed that I would be working on a research project that would soon be published, and would have found

the prospect daunting. But now, I feel very capable, and in fact, confident in my ability to properly edit and bring this research out into the world.

Additionally, I related deeply to the reported benefits of positive mentorship. Working alongside Bethany, Ferzana, and Karen (who was a mentor for a prior study), as well as my fellow student researchers has shown me how motivating and empowering encouraging mentorship can be. My supervisors guided me through the process while still allowing me to work to my strengths – for example, my skills in graphic design, my interest in literature reviews, and my eye for detail with editing – which in turn helped me to develop a real passion for the work I was doing.

As a hopeful applicant to grad school, this opportunity has provided me with extremely valuable resume line-items, but beyond that, it's given me insight into what research looks like outside of the classroom. I've learned that research is so much more than conducting the actual study, and that it is a highly collaborative process that requires quite a bit of adaptability and teamwork, and most critically, time management skills. The irony is not lost on me that, in editing the report itself, I've come to have an even deeper understanding and appreciation for the participants and respondents in this study.

I'm beyond grateful to have been a part of a project that centres those voices and affirms the value of non-curricular undergraduate research experiences. I hope this work encourages more students to seek out similar opportunities and for institutions to invest in making them more readily available and accessible.

Akansha Hansji

Akansha is a Community and Social Services Worker with seven years of experience working with diverse populations, primarily youth. She is passionate about research and knowledge mobilization and looks to deepen the understanding of marginalized communities and their lived experiences. She aims to bridge research and practice by contributing to approaches that promote inclusion, equity, and social change. This project was greatly impactful as she was a mature student in post-secondary education while being part of this research.

Akansha Reflection

It was quite insightful to discover the benefits of non-curricular undergraduate research experiences while taking part in it as I was able to learn and draw comparisons with my own experiences. Being involved in this work allowed me to engage more deeply with the material and recognize how my own journey aligned with many of

the ideas discussed. This made the experience more meaningful, as I was not only learning about research, but also seeing myself within it.

The word 'research' is often daunting to those who are outside of the circle. I never imagined that I would be able to be part of a research team and contribute to meaningful research was also not something I had considered pursuing when I first started the Social and Community Development program.

This research meant a lot to me, especially as we focused on the subject of social capital. As a first-generation immigrant who has chosen a field that no one in my circle is in, I have faced obstacles in finding opportunities which reflects in the importance of access to networks related to social capital. This research allowed me to build many skills that will benefit me as I pursue further education and future employment. I no longer feel lout of place and instead, I feel a sense of ownership in this work.

Through this research opportunity, I was able to build valuable skills and confidence which is something that was also reflected in the research itself. Students can often feel like outsiders and may lack confidence, but with strong mentors, we are able to persevere and accomplish more than we expect. I found myself relating to this idea throughout my experience.

This opportunity also allowed me to balance my schoolwork and research effectively, which helped me improve my time management skills. I was trusted to be more independent in my learning, which pushed me to work harder and produce meaningful work.

As I finish my research term, I reflect on what I learned. When I first started, I expressed my desire to do my best and become the research assistant my professor saw in me. I can now confidently say that I have achieved that. This research experience has opened new opportunities for me and given me the confidence to pursue paths that may seem complex or intimidating. I feel more capable of entering spaces I once believed I was not good enough for.

This research term gave a different meaning to research: one that is attainable and enjoyable. I hope to continue pursuing opportunities that involve research so I can keep learning and sharing knowledge with others. I especially enjoyed reading literature reviews and helping analyze and organize date which are skills that will no doubt support me in the future.

This process allowed me to give research an opportunity, and will no doubt become a part of my professional journey. This research project has the potential to expand opportunities for undergraduate students, and I am honoured to have been part of this process.

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