



SFU FUSION PROJECT SUMMARY

SUMMER 2021 – SPRING 2022

Helena Fehr | SFU FUSION Implementation | March 31, 2022

This report was produced as part of a project funded by the Future Skills Centre (FSC), with financial support from the Government of Canada's Future Skills Program.

FSC is a forward-thinking centre for research and collaboration dedicated to preparing Canadians for employment success. We believe Canadians should feel confident about the skills they have to succeed in a changing workforce. As a pan-Canadian community, we are collaborating to rigorously identify, test, measure, and share innovative approaches to assessing and developing the skills Canadians need to thrive in the days and years ahead. The Future Skills Centre was founded by a consortium whose members are Toronto Metropolitan University, Blueprint ADE, and The Conference Board of Canada

The opinions and interpretations in this publication are those of the author(s) and do not necessarily reflect those of the Future Skills Centre or the Government of Canada.



Contents

Executive Summary	2
<i>Key Findings</i>	2
Acknowledgements	3
Overview of the FUSION Skills Development Program	4
<i>FUSION Curriculum Implementation</i>	4
FUSION AT SFU	6
<i>Project Timelines</i>	6
<i>Recruitment</i>	6
<i>Key Findings</i>	7
Student Demographics	7
Overview of the student experience	11
<i>Optional Supplementary Workshops</i>	13
<i>FUSION Program Implementation Schedule</i>	13
<i>Key Findings</i>	14
PROGRAM FEEDBACK AND ASSESSMENTS	15
PROGRAM Evaluation	15
<i>Key Findings</i>	20
Impact AssessmentS	20
Feedback Jams (group debrief session)	21
<i>Key Findings</i>	22
RECOMMENDATIONS AND NEXT STEPS	22
Appendix 1: FUSION Skill Development Program Impact Assessment	24
Appendix 2: FUSION Skill Development Program Impact Assessment – Survey Analysis	26
Appendix 3: FUSON Curriculum Feedback Jam Padlet responses	33

Executive Summary

This report summarizes the implementation of the FUSION Skill Development Program at Simon Fraser University during three terms in 2021/2022: Summer 2021 (May-August); Fall 2021 (September-December); and Spring 2022 (January – March). A total of 181 students registered across all three terms.

Students enrolled as part of a co-curricular experience: a summer research project, a work-study experience, or as a member of an undergraduate scholarship community of scholars. All participating students were undergraduates; participation in the program was voluntary. Of the 203 students who enrolled, 130 students completed the program (a 64% completion rate). Students rated their skill development improvement very positively as reflected in their own assessment of the program's impact on their growth and learning.

The first section of this report briefly describes the FUSION curriculum and its implementation at the six FUSION partner universities. The rest of the report considers the specific details of SFU's implementation. The FUSION Skills Development Program implementation was delayed from initial implementation plans for summer 2020 and instead implementation began starting in Fall 2020; SFU implemented its first pilot program in Summer 2021 as our target audience (USRA students) was only available in summer. The research data and information presented in this report are collected from student FUSION curriculum workbooks, demographic data, program evaluations, impact assessments and verbal feedback collected from group interviews with students. The program's impact is assessed through an analysis of student engagement in workshops and with the workbooks; completion data; program evaluation responses; and students' reflections of their learning captured in an impact assessment.

The final section explores lessons learned and ideas for future implementation and program sustainability at SFU.

Key Findings

- Students perceived an increased ability to identify, articulate, and transfer their metacognition, communication, and problem-solving skills to their future work-related experiences. Many students also indicated that they were able to improve their academic performance through the application of the FUSION skills.
- Students commented that the reflection questions in the modules and the workbook assessments encouraged them to reflect on what they were learning.
- Most students would recommend the curriculum to others citing that it was a unique opportunity to experience something different.
- Overall, the program was seen as successful and of value to students.

Acknowledgements

I would like to acknowledge the guidance of Dr. Elizabeth Elle, Vice-Provost and Associate Vice-President, Learning & Teaching (AVPLT) in the design and implementation of the FUSION program at SFU. Special thanks is also extended to the AVPLT team for their assistance.

I would also like to thank the staff from the Centre for Educational Excellence – Olga Belikov, George Trad, Amanda Wallace, John Born, Shantala Singh, Devan Huber, Duane Woods, and Masayuki Iwase – for their technical assistance and contributions.

Assistance provided by Mr. Eric Tseung, Manager, Financial & Award Systems, Office of Graduate and Postdoctoral Studies and Ms. Robyn Hiew, Financial Assistant, with recruiting the USRA students and arranging the disbursement of their honorariums was greatly appreciated.

Technical assistance provided by Dr. Andrea Sator, Program Manager, Work Integrated Learning Curriculum and Ms. Jennifer Sator, Curriculum and Research Support in the development of the Impact Assessment and the interpretation of the data was greatly valued.

Overview of the FUSION Skills Development Program

The Future Skills Innovation Network (FUSION) is a national network of Canadian universities focused on exploring innovative approaches to skill development for the future economy. Launched as part of the federally-funded Future Skills Centre (FSC), FUSION works to speed experimentation and scale effective approaches to skill acquisition at universities, while contributing research results, data, and methodologies to the larger network of FSC collaborators. The members of FUSION are Simon Fraser University, University of Calgary, University of Saskatchewan, Carleton University, Concordia University, and Memorial University. Aiming to help universities prepare students for the future economy, FUSION focused on achieving three main goals:

- Developing students' work-related skills through curricular and co-curricular activities
- Creating more flexible formats for accessing learning
- Improving post-secondary outcomes for students from under-represented groups.

FUSION Curriculum Implementation

The FUSION Skills Development Program implementation was delayed from initial implementation plans for summer 2020 and instead implementation began starting in Fall 2020; SFU implemented its first pilot program in Summer 2021 as our target audience (USRA students) was only available in summer. The curriculum was designed to “wrap around” experiential learning activities to enhance students' skill development in their experiential activities. This curriculum consists of video and text instructional content, guided self-assessments, exercises, reflections, case studies and other activities, providing students with the targeted instruction and guided practice they need to meaningfully improve important employment-related skills. The FUSION Skill Development Curriculum focuses on helping students enhance their skills across three critical 21st century skill domains:

- Metacognition—the ability of the mind to plan, monitor and assess its own learning and performance
- Communication—the ability to construct and convey a message through an appropriate medium
- Problem-solving—the ability to connect various analytical strategies to come up with creative solutions to manage difficult situations.

The selection of these three skill domains was based on their repeated prioritization in surveys of employers and their perceived centrality to ‘next-generation’ employment opportunities for university graduates.

Using their experiential learning opportunity to apply their learning in real-time, students taking the FUSION curriculum learn to:

- Identify and articulate personal learning strategies and strengths in learning and processing information: creating academic and/or professional goals and plan for how the experience might contribute to those goals
- Identify how to adjust communication based on context, audience, purpose and medium: comparing and contrasting effective and ineffective communication patterns and identifying what you can change your communication with others
- Analyze and deconstruct a simulated work problem using the stages of the problem-solving cycle: classifying types of program given complexity, context, and types of solutions and devising a problem-solving strategy based on a complex problem that is occurring in the students' context.

In the Fall 2021 term, 693 students enrolled in the curriculum across five of the partner institutions in experiential co-curricular or curricular offerings. Information was collected from students to initially assess the success of this launch. Data collected from the five institutions concluded that the FUSION curriculum provided tangible benefits to students who participated.

The initial success metric was student completion. Of the 693 enrollees, 72.3% completed the curriculum: completing all six modules and submitting a completed workbook as a learning artifact. This completion rate surpassed initial expectations, which were tempered by the documented low rates of completion for other non-credit/co-curricular online courses.

An important network priority was providing access to experiential-learning and skill-development for equity-seeking participants. These participants identify with one or more groups which may be traditionally underrepresented in experiential learning and skill development. Across the network, students optionally reported on their membership in these equity seeking groups, as outlined by the Future Skills Centre: gender; international vs domestic student; identifying as a racialized student; student of Indigenous heritage; student with a disability; first generation student.

Women = 349

Indigenous persons = 7

International Students = 57

Racialized persons = 160

Persons with disabilities and Deaf persons = 47

FUSION AT SFU

Project Timelines

SFU launched its pilot program in Spring 2021, welcoming its first cohort of students in the Summer term. Two subsequent cohorts participated in the Fall 2021 and Spring 2022 terms.

Recruitment

Key decisions that influenced student recruitment efforts and enrolment for the Spring 2021 term were: (1) partner with the Vice President, Research and International and Dean, Graduate and Postdoctoral Studies and focus recruitment efforts on students who had been offered an Undergraduate Student Research Award (USRA) and their academic supervisors; and (2) establish the program as a voluntary, non-credit, optional activity for students. Students who successfully completed the curriculum would also receive credit on their co-curricular record (CCR). A \$150 honorarium was also offered, in line with the FUSION project guidelines. The USRA program provides opportunities for undergraduate students to be part of a major research project, supervised by a university professor. The USRA program was identified as the SFU target early in the development of FUSION because it is a highly experiential activity, but does not explicitly include skills development. Students join a research lab and their learning tends to be focused on their research project only, with any additional enrichment highly variable and dependent on the level of interest (and available time) of the professor they are working with. We believed that FUSION would elevate the USRA experience at SFU.

The majority of the students who participate in the USRA program are from the Faculties of Science (Biology, Physics, and Chemistry); Health Sciences; and Applied Sciences. Additional awards made available by the VP-Research and International encourage students from other Faculties to also engage through VPR USRAs. Because the program is administered by the Dean of Graduate and postdoctoral studies, an email invitation was sent from DGS staff. Additional information was made available on the AVPLT's website, and the AVPLT additionally contacted USRA supervisors to let them know about the program and to ask that they encourage students to enroll.

Based on the success of the first cohort, students enrolled in the Work-Study program were identified for the Fall 2021 implementation. The program provides an opportunity for undergraduate students to participate in research-based projects and earn a supplemental income. Participation is based on financial need. Although work-study students are involved in research-based projects, they do not design the project themselves and the level of engagement with the research life of the lab is variable. . An email invitation was sent by the Financial Aid and Awards office, who oversee the Work-Study program.

To increase the number of participants, and to test the curriculum's applicability to a broader student population, students from the general undergraduate population were invited to participate in the Fall 2021 implementation. Information on the program was included in the

weekly online student bulletin “What’s Happening”, sent out by Student Services to all undergraduate students, staff and faculty.

For the Spring 2022 term, students who received an Undergraduate Scholars Entrance Scholarship (USES) were invited to participate. Students who receive an undergraduate scholarship to SFU automatically become part of a community of scholars. Supplementary co-curricular programming is offered to USES students throughout their academic career at SFU. SFU’s undergraduate scholarship program recognizes high school students who demonstrate potential to enrich the university community through ongoing academic and community contributions. Information on the FUSION curriculum was sent to all USES recipients by the USES Program Manager in Student Engagement and Retention. Although USES students typically receive supplemental co-curricular programming, they are not necessarily engaged in an experiential learning opportunity at the same time as they are completing the FUSION curriculum.

Participation in the program was voluntary for all students.

For the Summer and Fall 2021 implementation, an honorarium of \$150 was offered to students who completed all six modules within the designated timeline. No honorarium was offered in the Spring 2022 implementation as the funding was ending prior to completion of the curriculum.

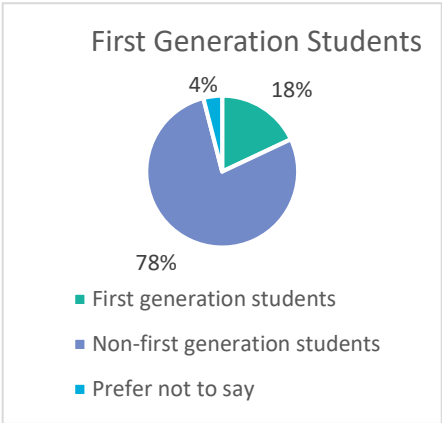
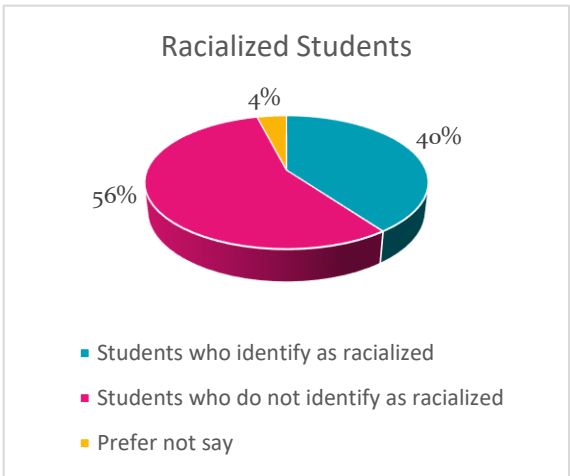
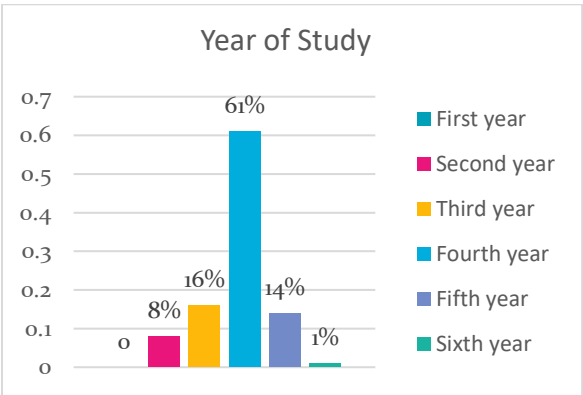
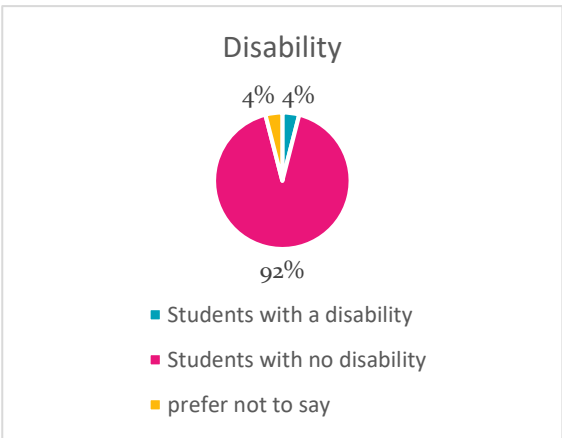
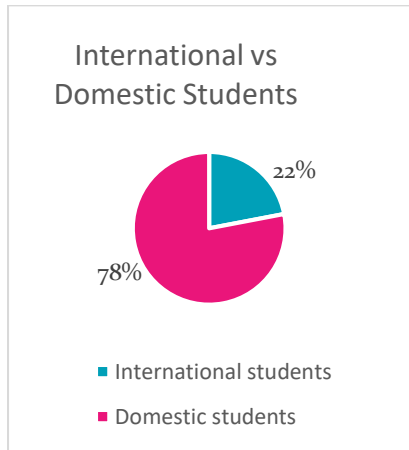
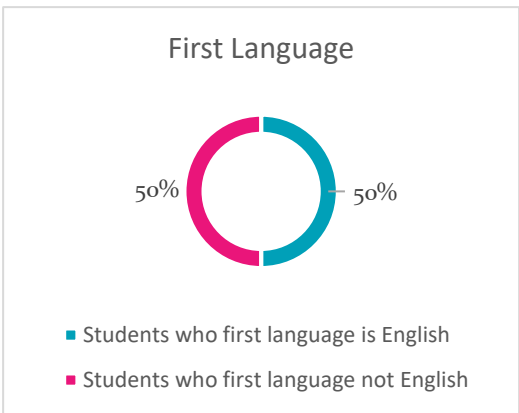
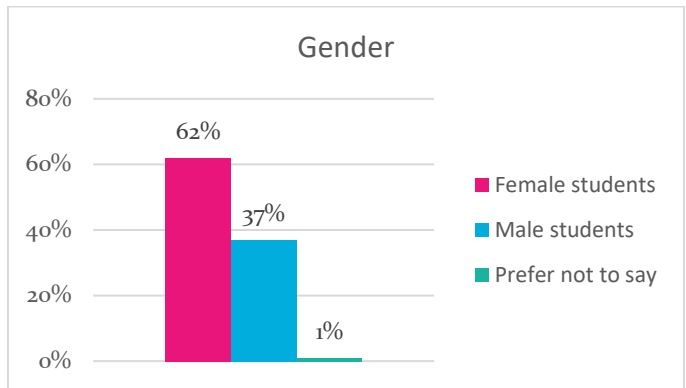
Key Findings

- Feedback from USRA students indicated that supervisors encouraged their students to register; honorariums were an added bonus – not always driving force for registration
- Fall 2021 and Spring 2022 registrations were lower than anticipated; speculation is that students were tired of online training but it may also be that these students were earlier in their programs, and less engaged or high-functioning than students who had applied for the USRA funding from NSERC or the VPR.

STUDENT DEMOGRAPHICS

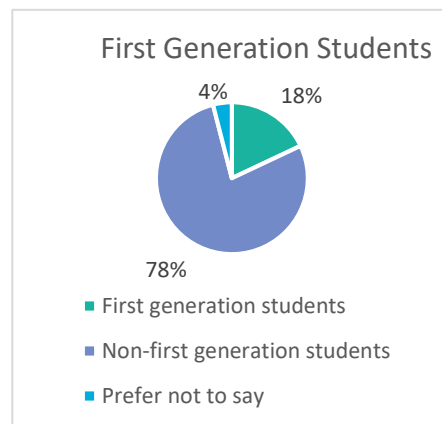
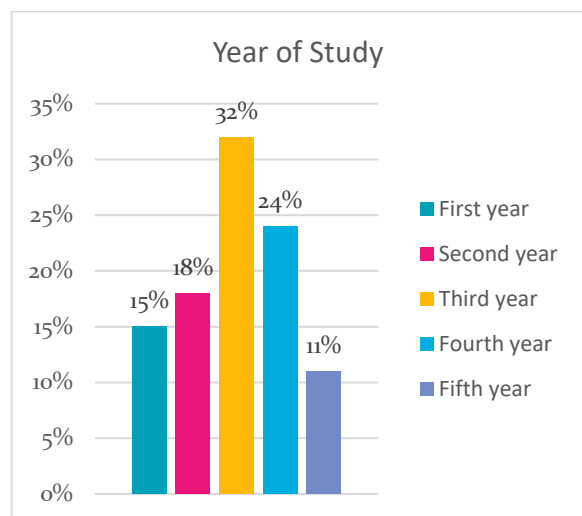
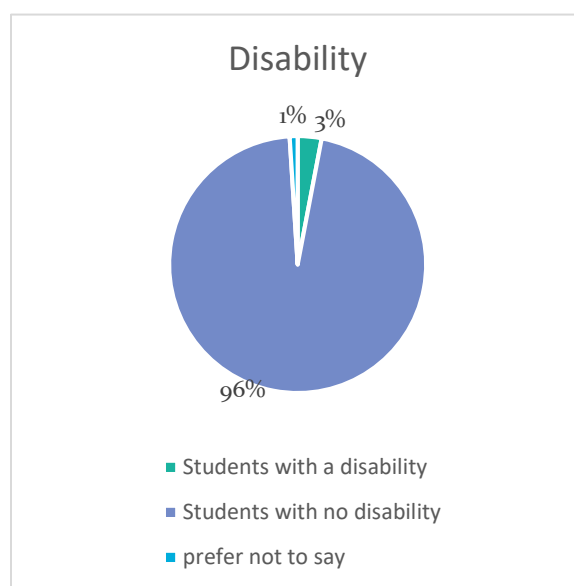
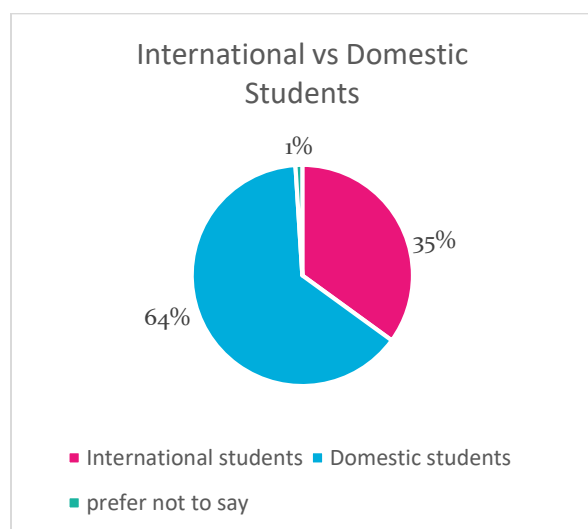
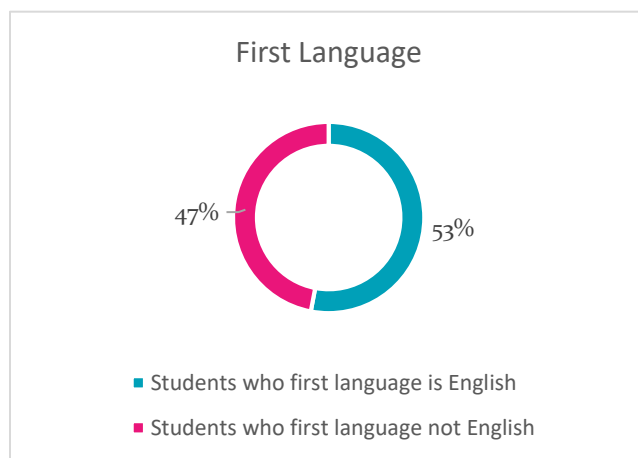
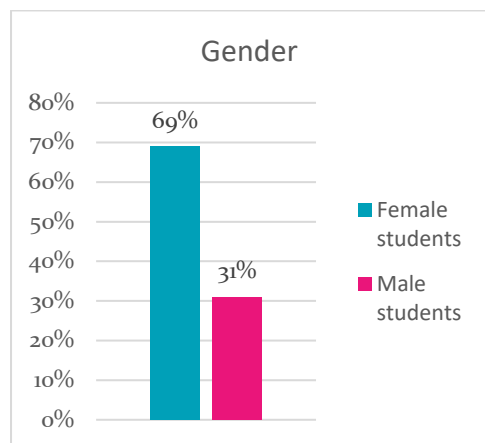
Demographic information was collected in each term to better understand the students participating in the program.

COHORT 1: Summer 2021 (Undergraduate Student Research Assistant (USRA) program students)



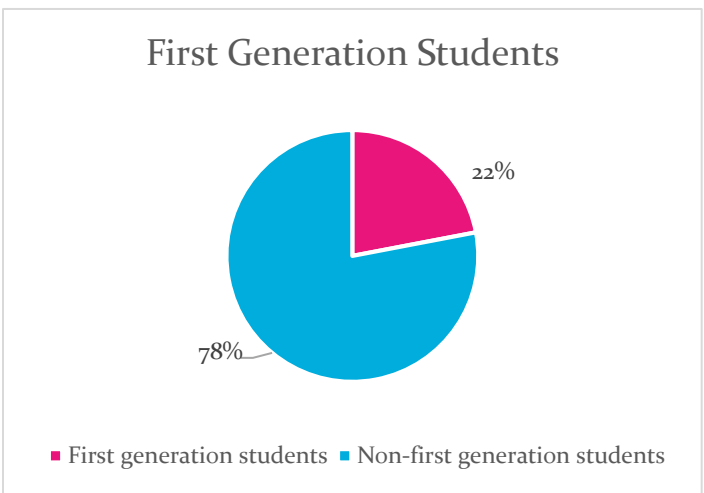
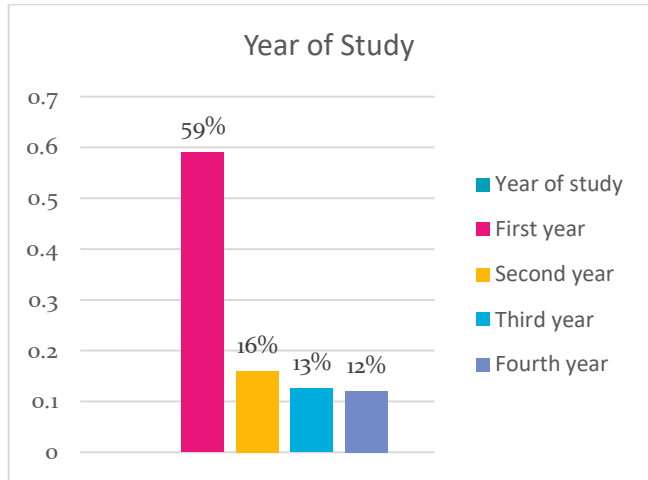
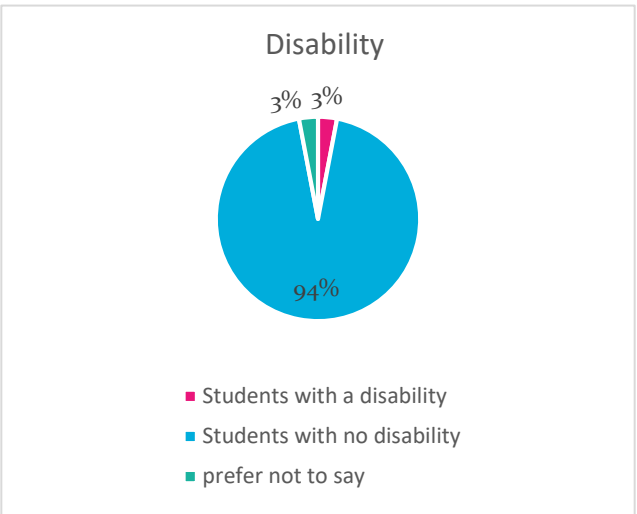
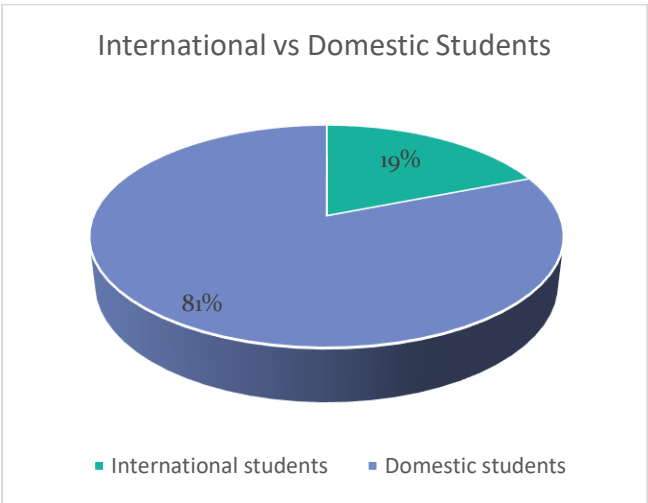
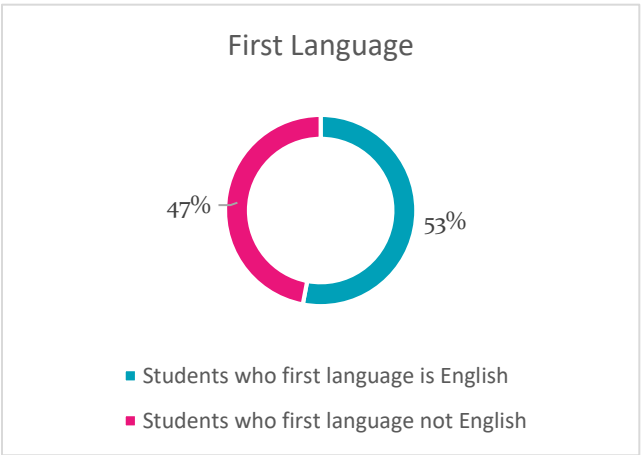
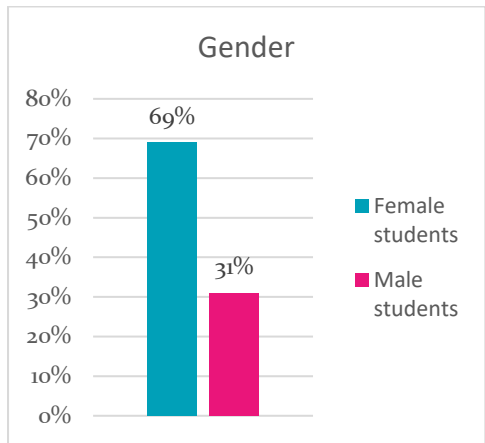
Indigenous students (First Nations, Metis, Inuit) 1%

COHORT 2: Fall 2021 (Work-Study students and General Population)



Indigenous students n/a
(First Nations, Metis, Inuit)

COHORT 3: Spring 2022 (Undergraduate Student Entrance Scholarship (USES) program students)



Indigenous students n/a
(First Nations, Metis, Inuit)

Overview of the student experience

To facilitate students' access to the FUSION curriculum, the modules were embedded into Canvas, SFU's learning management system (LMS) and offered as a self-directed online course. The self-directed curriculum design was intended to allow students to complete the curriculum at their own pace. Submission dates for each of the modules were suggested, based on recommendations from FUSION partner institutions who had already had experience implementing the curriculum.

For all three implementations, the coordinator provided support such as a welcome Zoom session at the start of the program and regular check-ins on students' progress through the course (a bi-weekly review of workbook modules uploaded to Canvas and sending reminder emails to students that seemed to be lagging behind on course completion). Additionally, office hours – drop-in Zoom sessions – were offered. There was very little uptake across the cohorts: interestingly, 6-8 students from the USRA (Summer 2021) and USES (Spring 2022) cohorts attended the introduction to FUSION session; none of the students in the Fall 2021 attended their information session. However, no one from either the Summer or Fall 2021 cohorts attended any of the follow-up office hour Zoom sessions.

For all three implementations, the project coordinator also acted as a program facilitator, ensuring that registered students accepted their Canvas course invitation, acting as a point of contact for any issues or questions that arose from the students about the course or the course curriculum

An informational/welcome session was offered via Zoom before the Canvas course launched for all three cohorts. A separate session was offered for supervisors of USRA students. Drop-in Zoom sessions were offered on a bi-weekly basis for the USRA and Work-Study/General students through the summer and fall terms. The uptake was minimal, with between zero to two students showing up each week. A total of three students participated in total. One of those students participated twice. When asked, students commented that because the Zoom sessions were not mandatory, they did not make the time to attend.

Completion Rate by Program	
USRA students	68%
Work-Study students	65%
General population	58%
USES students	68%

Program	# of students who registered	# of students who completed the Orientation Module	# of students who completed program	Completion Percentage
USRA	100	78	66	66%
Work- Study Program	55	45	32	58%
General Population	17	12	11	65%
USES	35	25	21	68%

The program evaluation data indicates that students had a positive experience and were predominantly satisfied with the FUSION program. Students indicated that they gain valuable knowledge and increased their competency in all three skill domains covered by the curriculum, and, importantly were directly able to apply their skills to experiential learning activities in which they were involved – i.e., working in labs, their work-study context, and in volunteer roles within the university context.

In the Spring 2022 term the FUSION curriculum was implemented with no additional facilitation sessions to determine if the students could successfully work through the program without supplementary activities. We were also interested in whether a “low touch” program, which could be more easily maintained over time, would still support students.

Optional Supplementary Workshops

In the Summer 2021 term, three supplementary workshops offered via Zoom throughout the term. The workshops were designed to complement the curriculum. Participation was optional and this may have contributed to a low uptake by students. In addition, the FUSION Network offered a network-wide half-day workshop focused on skills articulation.

Workshop Title	Workshop Date	# of Registered Students	% of Cohort
<i>Solving A Complex Problem Workshop</i> Presenters: Dr Elizabeth Elle, AVPLT and Helena Fehr, Project Coordinator	June 10, 2021	22	28%
<i>FUSION Skills Articulation Workshop</i> Presenters: FUSION Network Project Leads	June 11, 2021	11	14%
<i>You've Finished Your USRA – now what?</i> Presenters: Tony Botelho, Director, Career and Volunteer Services and Helena Fehr, Project Coordinator	July 27, 2021	8	10%
<i>Communicating your USRA research</i> Presenters: Dr Elizabeth Elle, AVPLT and Helena Fehr, Project Coordinator	August 11, 2021	9	12%

Despite the overall low attendance, five students attended two or more of the optional workshops hosted by SFU.

FUSION Program Implementation Schedule

The 10-hour online interactive curriculum is supplemented by a workbook designed to create opportunities for self-reflection and insightful learning on student's experiential learning activity or work experience. The modules are designed to be completed at the students' own pace. Students are encouraged to move through the curriculum and to apply their learning to their research, experiential learning or work experience. To ensure completion of the curriculum, students are asked to upload completed sections of their workbook to Canvas. The project

coordinator reviews the modules to ensure that the work has been completed. (Students are prompted to upload their workbook through Canvas.)

In the initial implementation, in Summer 2021, students were provided with strict deadlines for completing and uploading their completed workbook modules. The deadlines for submitting each module (or unit/part of a module) was provided to the students at the start of the program. Module deadlines were set with an eye to providing students with sufficient time to complete the modules while completing their research. Feedback from the students indicated that the implementation timeline was too long; many of the students completed their USRA prior to the end of the academic term.

In the second implementation, in Fall 2021, the implementation schedule was shortened from 15 weeks to 12 weeks. Again, however, strict deadlines for uploading completed modules was implemented. While students were provided with an opportunity to submit modules late, it appears that once students began to fall behind their motivation to complete the program also waned.

For the third implementation, Spring 2022, further changes were made to the implementation schedule: the timeline for completing the program was reduced to nine weeks and a proposed schedule for completing modules (versus firm dates) was provided. Feedback from students was positive – having the flexibility to upload completed modules at their convenience supported students’ as they sought to balance academics, co-curricular and extra-curricular activities, work and other commitments.

Key Findings

- Participation in Zoom calls were not mandatory; there was no agenda, rather the purpose was to provide a forum for students to connect virtually with their peers and to check-in with questions about the curriculum. Students commented that given the optional nature of the invitation, they chose not to attend.
- A completion timeline of 10 weeks meets the needs of the majority of students, with a two-week buffer (i.e., the course closes at 12 weeks) encourages more students to complete the program.
- Students also preferred a recommended timeline for completing each module versus a mandatory schedule.
- Overall, the greater flexibility contributes to a higher number of students completing the program.

PROGRAM FEEDBACK AND ASSESSMENTS

PROGRAM EVALUATION

Only 43% of all the students who finished the program completed the program survey. Below is a selection of key findings and comments from all three cohorts.

- 34% of respondents needed between 8 and 10 hours to complete the six modules and upload the workbook compared with 36% who needed between 10 and 12 hours
- 71% found the pace of the modules appropriate
- 41% were very satisfied with the design of the FUSION course; 45% were somewhat satisfied
- 88% did not need outside assistance as they worked through the FUSION curriculum
- 59% responded that the workbook was very important in supporting their reflection and learning processes throughout the curriculum compared to 23% who thought the workbook was somewhat important

Comments:

- I liked that it forced me to stop and think about what I was doing, because otherwise I might have just sped through the whole thing and not internalized any of the information. (USES cohort – Spring 2022)
- The checkpoints helped keep me organized and served as helpful landmarks in the course; however, sometimes they demanded more reflection than I felt capable of. (Work-Study/General cohort – Fall 2021)
- I think some of the questions felt kind of repetitive or could have been combined.
- I[t] felt more like a waste of time [than] a beneficial tool and I personally would have enjoyed the course more without it. (Work-Study/General cohort – Fall 2021)
- The workbook made me feel more engaged in the course, and the process of writing and recording my responses in the workbook made reflection on my progress much easier throughout the course. (USRA cohort – Summer 2021)
- It helped me to think about the content of the course, focus fully, and refer back for content for our work experience problem. (USRA cohort – Summer 2021)
- Rate the six FUSION modules (on a scale of 1-5) as to how much they helped you with understanding the curriculum and what was required of you:
 - 50% found the Metacognition modules very helpful; 18% found the modules moderately helpful
 - 30% found the Communication modules very helpful; 21% found the modules moderately helpful
 - 52% found the Problem-Solving modules very helpful; 18% found the modules moderately helpful

- 27% found the Apply module very helpful; 20% found the module moderately helpful
 - 30% found the Reflection module very helpful; 18% found the module moderately helpful
- 39% found that participating in the FUSION modules highly contributed to their skill development; 23% anticipate that participation in the program will highly contribute to the development of their career portfolio

Comments:

 - The modules allowed me to think about skillsets that I would not normally reflect upon. The content of these modules provided me with valuable information and tips that I could use in future. (USES cohort – Spring 2022)
 - I feel as though the six FUSION modules were very beneficial in contributing to my skill development in regards to securing employment in the future. (Work-Study/General Population cohort – Fall 2022)
 - I have been employed for several years now and much of the information from this course was information I already knew, therefore I don't feel it will be influential in my future career or life endeavors. (Work-Study/General Population cohort – Fall 2022)
 - Personally I think the best part of FUSION is that it goes on my co-curricular record, mostly because it provides almost "concrete proof" to future employers that I did indeed complete this course. Having that official documentation is great, as many extracurricular activities or learning opportunities don't. Of course, this would be meaningless without the modules, which is where I learnt everything! I will say that the [bi-]weekly drop-in sessions weren't very helpful, but only because not many people showed up. (USRA cohort – Summer 2021)
 - I did not attend the [bi-]weekly drop-in sessions, I found the optional workshops interesting and [they] helped me learning a few things about careers and skills in my field of study, but it was also too broad to focus on my own personal experiences. The FUSION modules were more helpful as they helped me identify which areas and skills I am strong in and which I am weaker in, which would be of more assistance in finding employment. Development of my career portfolio was the highest contributor because I feel that it is most directly linked to finding employment. (USRA cohort – Summer 2021)
- 34% found the overall experience with the FUSION curriculum to be highly positive; 46% found the overall experience to be a moderately positive experience

Comments:

 - I found most of the course redundant but I took away a few useful pieces of information. (USES cohort – Spring 2022)
 - The modules were interesting and helped me develop skills I didn't even realize I had or needed! (USES cohort – Spring 2022)

- I learnt a lot about myself through growth and experience, which further helped me inf driving my career goals to a new level. (USES cohort – Spring 2022)
- It helped me gain confidence and new strategies in tackling challenges at school and in my future workplace. (USES cohort – Spring 2022)
- I learned a lot more than I was expecting when I signed up. I think that the program is really well laid out and gave me the opportunity to practice the skills I learned. (USES cohort – Spring 2022)
- It wasn't anything shocking but a nice review of important work skills. (USES cohort – Spring 2022)
- It got a bit boring since some of the modules were sooooo long, but scheduling was flexible so I was able to set it aside whenever that happened and that was nice. (Work-Study/General Population cohort – Fall 2022)
- I was encouraged to enroll in FUSION because of the honorarium and the Co-op preparation content, but near the end I was super happy that I had taken it despite being busy because I learned so much, especially for the Problem Solving module, that I wouldn't have until later on. It prepared me mentally for my Co-op. (Work-Study/General Population cohort – Fall 2022)
- My overall experience with the FUSION curriculum was a highly positive experience in all aspects because I enjoyed the paces of the modules and how the course was set up overall. I found the content all relatively easy to follow and benefitted from the frequent self-assessments and workbook questions because they helped keep me engaged. (Work-Study/General Population cohort – Fall 2022)
- It helped me build my summer USRA presentation and reflect on my time during the work experience. Although the modules were pretty dry, in the end, I learned a few helpful things that I will incorporate into my life. (USRA cohort – Summer 2021)
- I appreciated having the curriculum available during my USRA because it allowed me to keep track of my experiences and allow for reflection. I know I will use this document as a reference when I am writing future cover letters/applications, etc. (USRA cohort – Summer 2021)
- Factors that motivated students to enroll in the FUSION program:
 - USRA cohort: Summer 2021
 - Supplement to my work experience, I wanted to get as much as I could out of my USRA.
 - Support from my USRA research team, my availability to do this on-top of my workload, and the honorarium support from the program.
 - It sounded like an interesting learning experience to supplement by NSERC USRA work term.

- This is my first time working as a research assistant, so I would like to learn some useful skills that can help me with the problems I'll meet during my research process.
- I was motivated to enroll since I recently graduated and have been thinking of ways to enhance my career opportunities.
- I enrolled because I was really excited about my co-op, and hoped to get more out of my co-op because of FUSION.
- The need to optimize problem solving skills.
- I want to pursue the academic career and I am currently on my second term as an Undergraduate Research Assistant. That being said, the program was an opportunity to grow and become better to do what I want. My supervisor (Dr. Lisa Shapiro) had sent me an email telling me about the program after I had [received] an email asking me to register. To me, that showed that I was doing the right thing. The CAD\$150 bonus and the note in our curriculum [CCR credit] are nice external motivations, naturally.
- Work-Study / General population cohort: Fall 2021
 - To learn how I can improve in communication skills
 - To learning something new and development of my career and acquiring new skills
 - Co-curricular record credit, honorarium, and the opportunity to learn career benefitting information
 - [Honorarium] and the fact that I'm currently Co-op seeking yet I lacked in problem solving skills for my science's application
 - I felt as though my skill set was not the most developed before the program, which is the main factor that encouraged me to enroll. I also appreciated that the course was offered fully online and at your own pace because I enjoy working through content at my own pace
- Undergraduate Student Entrance Scholarship program cohort: Spring 2022
 - I was interested in learning more about metacognition and gain CCR credit.
 - Wanting to learn more about how I can contribute to the world and its continual development
 - Co-curricular record and it being a short program. It helped that it was exclusively for USES students.
 - It was through USES, and we were given CCR credit.
 - First USES exclusive program - motivated me to try it out. Thought the skills were interesting and wanted to learn more on how I could develop myself.
 - I was interested to try and improve some of my soft skills for employment, because I am in a really STEM-centered major, and I

think soft skills will give me the edge over other applicants in the future

- Ideas for changing the FUSION curriculum:
 - The final reflection module seems a bit redundant as we have been reflecting throughout the modules. (USES cohort – Spring 2022)
 - I wish we were able to interact more with other FUSION participants and organizers! (USES cohort – Spring 2022)
 - I would make the deadlines more flexible, and allow for more than one week per unit if needed, or allow fast-paced completion of the program for people who want to complete multiple modules at a time. (USES cohort – Spring 2022)
 - Nothing, everything was good. (USES cohort – Spring 2022)
 - I would probably add a discussion section to engage with other people participating in the program. (Work-Study/General Population cohort – Fall 2021)
 - More interactive sessions and discussion. (Work-Study/General Population cohort – Fall 2021)
 - More modules. (Work-Study/General Population cohort – Fall 2021)
 - I would have liked some mandatory drop-in sessions, maybe like 3 check-in sessions over the course of the whole program? Just cause the drop-in sessions weren't attended by many people, and the main reason I wanted to attend was to meet and hear from the other people taking FUSION. (USRA cohort – Summer 2021)
 - More opportunities to meet the other members in FUSION and hear more about what they are doing for their research experience. (USRA cohort – Summer 2021)
 - I enjoyed the flexibility aspect, and that I could work at my own pace. (USRA cohort – Summer 2021)
 - Making more events where people can communicate more. (USRA cohort – Summer 2021)
 - Make the workbooks and uploading a little cleaner, having to backspace lines and create my own writing within a box was a little frustrating sometimes.
- 80% of students would recommend the FUSION program experience to a peer; 16% were unsure if they would recommend it
Comments:
 - I think it was really useful to gain more self-awareness, and really helped me to put to use skills I was already a little bit aware of but did not use much in my daily life. (USES cohort – Spring 2022)
 - This program was worth taking! (USES cohort – Spring 2022)
 - I would recommend the FUSION program to other classmates because it is a very convenient way to develop one's skills and prepare for the workforce,

while balancing a course load or other work responsibilities during the semester. (USES cohort – Spring 2022)

- I personally did not find much use in it. It felt very much like the co-op workshops we have to do, but not as good. (USRA cohort – Summer 2021)
- It is a great supplement to USRA/work experience. It will help students learn skills and reflect on their progress in their experience. (USRA cohort – Summer 2021)
- It was definitely a positive experience for me that helped me to understand better how to approach learning experiences, because typically these are things that are never really thought about, so I would recommend it to someone. (USRA cohort – Summer 2021)
- I would recommend a more condensed version of the FUSION program. I feel like the skills taught in this course are very useful and applicable to many settings, however, the program felt a little too long. (USRA cohort – Summer 2021)
- It would depend on the person, their goals, their current level of knowledge on the topics, and the amount of free time they had to spare. (Work-Study/General Population cohort – Fall 2021)
- Very useful, especially to new student. My high school mentality was different than what it currently is, so it would be a great introduction to essential skills in new inexperienced students. (Work-Study/General Population cohort – Fall 2021)
- I think this program should be made available to all students instead of only the work-study students. (Work-Study/General Population cohort – Fall 2021)

Key Findings

- Based on student comments and recommendations, shorten the program completion timeline to nine weeks
- Increase flexibility for module completion dates – while the program was designed to give students time to reflect on the learnings from the modules and for students to integrate those learnings into a work or experiential learning experience, providing flexibility gives students an opportunity to integrate the program into their other commitments
- To reduce the challenges of uploading the workbooks, key questions from the workbooks have been integrated into Canvas as quizzes with an eye to providing students with a seamless experience

IMPACT ASSESSMENTS

In addition to the program evaluation developed by the FUSION project team, SFU adapted and implemented an impact assessment. While monitoring and evaluation activities are essential for

measuring and reporting the success of a program through the collection and analysis of data, a program evaluation tool does not always allow managers to present the evidence of their work.

An impact assessment tool can assist program managers to better understand and improve the effectiveness of educational interventions by evaluating the impact of the curriculum on the students. Dr. Andrea Sator, Program Manager, Work Integrated Learning Curriculum and Ms. Jennifer Sator, Curriculum and Research Support provided guidance and technical knowledge on the development and interpretation of the impact assessment data collected from the USRA cohort (Summer 2021).

Using a post-pre survey approach, SFU was able to evaluate the impact of the program content on the students' learning. Students were invited to assess their perceptions of changes in their knowledge and skills by rating themselves twice on each intended outcome, first their recollection of their abilities as they were beginning the curriculum, and second, their abilities after completing it. Both post- and pre- self-perception of skills were completed at the same time, after completing the online curriculum. The difference between students' retrospective pre- and post-ratings reflects the perceived impact of their learning on each outcome. The primary focus of items on our post-pre survey is on changes that can be linked directly to students' participation in the FUSION program.

Although students in all three cohorts were invited to complete an impact assessment, only the data collected from the 23 students in the USRA (Summer 2021) cohort has been used in this report. In the two implementations very few students completed the impact assessment: five students in the Work-Study/General Population cohort (Fall 2021) and four students in the USES cohort (Spring 2022).

The Impact Assessment developed for the FUSION program can be found in Appendix 1.

A detailed analysis of the data collected from the USRA (Summer 2021) cohort undertaken by Ms. Jennifer Sator, can be found in Appendix 2.

FEEDBACK JAMS (GROUP DEBRIEF SESSION)

In addition to completing the online program evaluation and impact assessment, students in the USRA (Summer 2021) cohort were also invited to participate in a Feedback Jam, an interactive session designed to engage with the students and invite them to co-create ideas for how we might improve the FUSION experience. Participation in the Feedback Jam was lieu of individual interviews with students participating in the pilot implementation. (The other five partner institutions hosted individual interview sessions.)

Two Feedback Jams were held via Zoom at the end of October 2021. Six students participated. All were in their senior year of study. Key questions were emailed to interested participants in advance, inviting them to reflect on their experience in advance of the Feedback Jam discussion.

In response to the question “*why did you decide to participate in the FUSION curriculum? How did the FUSION experience integrate with your USRA experience?*”, students provided the following responses:

- Intrigued by email invitation; then professor/supervisor suggested I register (*all 6 respondents*)
- Co-curricular credit – great for building CV (*all 6 respondents*)
- Zoom information session was motivating at the start; content kept me going
- Academic incentive – CCR and supervisor recommended the program would help me work better
- See completing the program as being helpful for my success in academia; the program gave me another perspective on the research experience
- Honorarium was motivating, particularly during COVID, however not deciding factor to participate
- Wanted to learn about thinking and how I can improve my skill in this area
- To improve my problem-solving abilities (never formally learned how to solve problems or reflect on them; eg bringing sub-conscious to conscious

The remaining questions, and the students’ responses, were recorded on a Padlet, which can be found in Appendix 3.

Key Findings

- Data from the students’ self-assessment demonstrates a significant percentage of students saw an improvement in each of the program’s seven outcomes.
- Responses from the program evaluation and Feedback Jams are overall very positive. Students indicated how their learning would be of benefit to them in their academic and future careers. They also frequently commented on how they gained a clearer understanding of their own capacity within each of the skill domains, recognizing as well where there remains room for continued growth.
- Students provided specific recommendations for program improvements – for example, shortening the implementation timeline, streamlining the workbooks, integrating more opportunities for more interaction between the students in the FUSION program – all of which future iterations of the program at SFU can accommodate.
- Suggestions for additional modules were also provided.

In sum, the program was broadly seen as a success and of great value to the students.

RECOMMENDATIONS AND NEXT STEPS

Based on the formal feedback from students, the Impact Assessments, and the Feedback Jams, the SFU FUSION Project Lead makes the following recommendations:

Timelines:

- Open registration for the curriculum one to three weeks after the start of the term
- Continue to provide a gap between the recommended module completion date for the Apply module and the Reflect module to facilitate learning and to encourage students to implement their problem-solving strategies

Communications:

- Continue to encourage students to complete all of the reflection questions for each module
- Encourage students to turn on the announcements function in Canvas and continue with regular announcements and engagement in Canvas

Canvas / FUSION Workbook:

- Integrate key workbook questions into Canvas as quizzes, thereby eliminating the need for students to complete the workbook in Word and upload to Canvas, streamlining the process (students will continue to have access to their responses as long as the FUSION curriculum remains on the Canvas server)

New curriculum:

- Integrate the three new FUSION modules currently being developed on the topics of adaptability, inclusivity, and collaboration into the current FUSION program. The new modules will be available starting in Summer 2022.
- Consider offering students who complete all 6 modules a FUSION Certificate of Completion in addition to Co-Curricular credit.

Appendix 1: FUSION Skill Development Program Impact Assessment

Instructions: *“Knowing what you now know, please rate yourself on the learning outcomes both before taking the course and after participating in the FUSION Skill Development program.”*

	BEFORE					AFTER				
	Very Poor	Poor	Ok	Good	Very Good	Very Poor	Poor	Ok	Good	Very Good
I understand why identifying and articulating personal strategies and strengths in learning and processing information is important to improving my research skills.										
I am able to adjust my communication based on context, audience, purpose, and medium.										
I am able to analyze and break down a complex problem into component parts to find a solution.										
I am able to adjust my personal approaches to a work-based challenge based on context and audience.										
I have identified professional goals and a plan for my continued growth based on a personal assessment of my progress.										
What might you want to learn more about based on your experience with the										

FUSION program?	
Did participation in the FUSION program provide you with a new perspective, challenge your point of view, or introduce you to new skills or ideas?	
Please share any other thoughts, specifically stating one key insight or take-away.	

Appendix 2: FUSION Skill Development Program Impact Assessment – Survey Analysis (2021)

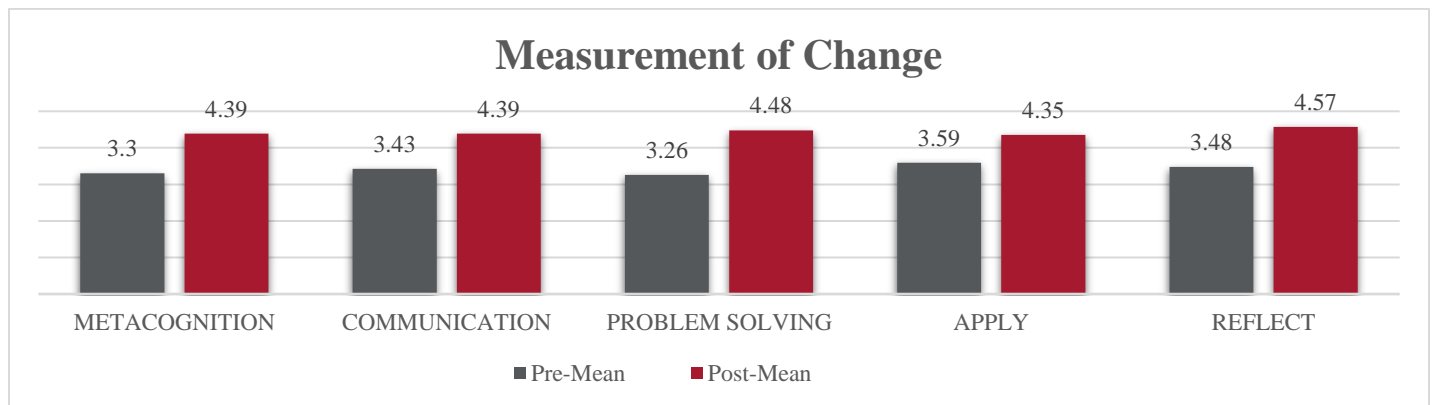
Survey Analysis: Jennifer Sator 2021.09.25

Survey with 5 questions, 1page

23 students submitted between September 6th and 12th, 2021

Survey Instructions: *“Knowing what you now know, please rate yourself on the learning outcomes both before taking the course and after participating in the FUSION Skill Development program.”*

Q1 & Q2: Weighted Averages: 23 participants rated their perceived status on the post-pre survey for 5 learning outcomes on 5 point rating scale. Each outcome is a statement corresponding in sequence to particular course modules. The extent of the growth in each outcome/module is represented in the bar graph below:

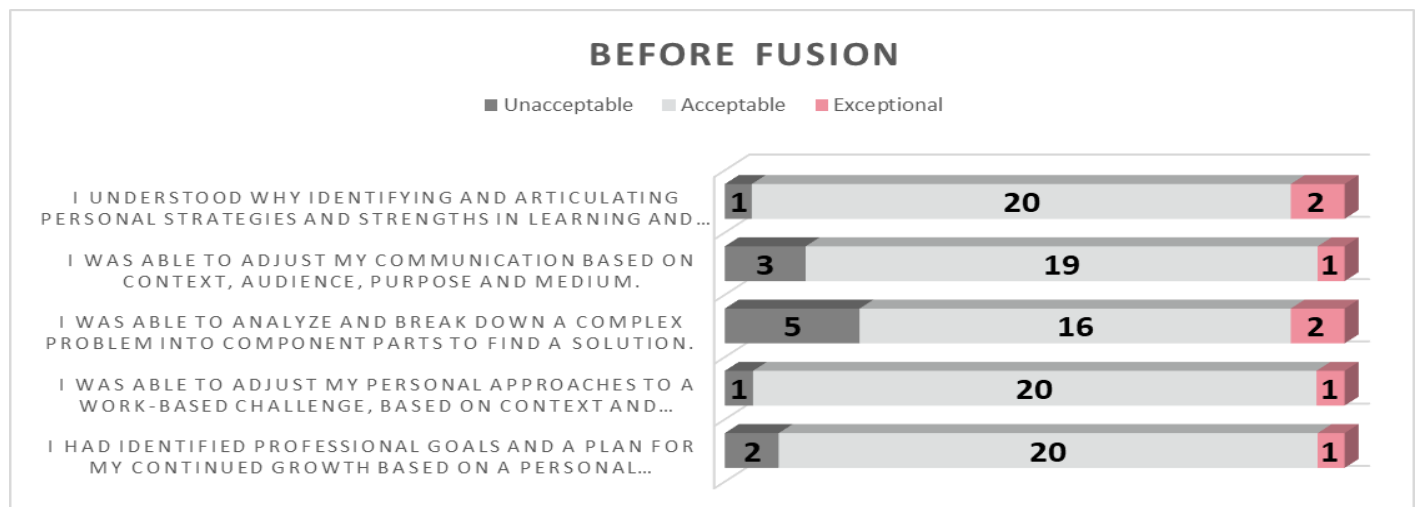
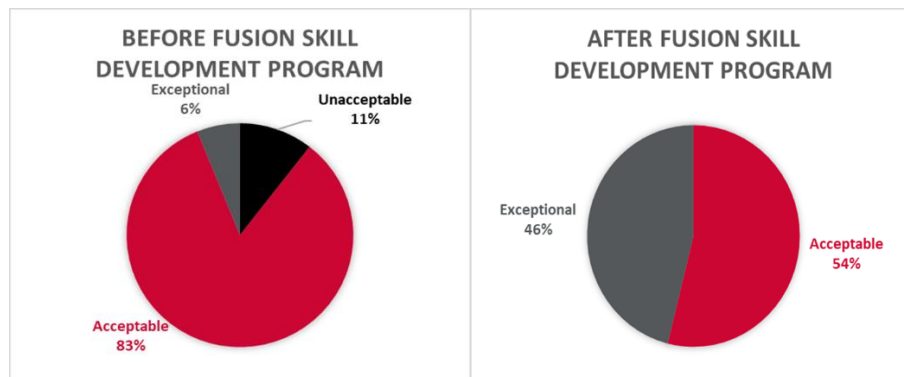


- **Metacognition Module:** Students started with a lower perceived understanding of why identifying and articulating their personal strengths in learning is important for improving their research skills. In this learning outcome students had a high rate of growth perceived between pre- and post-course.
- **Communication Module:** A higher reporting for the pre-assessment, so generally they thought their communication skills were already somewhat adaptable to different contexts and mediums. The growth was smaller because the post-mean matched that of the metacognition module, thus they perceived to have learned less in this area.
- **Problem Solving Module:** Students reported the lowest pre-assessment of their perceived problem-solving skills and reported one of the highest post-means. The difference shows this capacity had the largest perceived growth.
- **Apply Module:** With the highest pre-mean and lowest post-mean, students on average thought their application skills were not too poor before the program and after the course students perceived them as not very good. This lowest area of perceived growth.
- **Reflect Module:** Students started with a high pre- and high post-assessment. This larger difference in means show the area of growth is equal to the Metacognition Module, based on the student perceptions.

Decision Matrix:

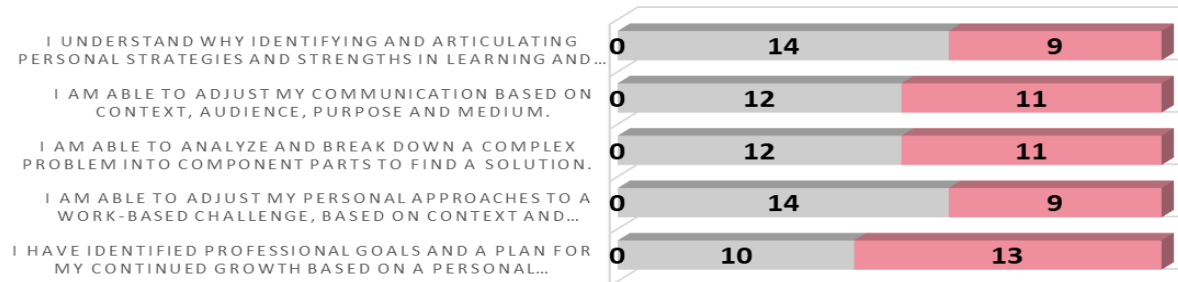
Unacceptable		Acceptable					Exceptional								
Very Poor		Poor		Neutral		Good		Very Good							
5 Modules	Learning Outcomes						Weighted Average		Learning Outcomes						Weighted Average
	BEFORE Fusion 2021	Very Poor	Poor	Neutral	Good	Very Good			AFTER Fusion 2021	Very Poor	Poor	Neutral	Good	Very Good	
Metacognition Module	I understood why identifying and articulating personal strategies and strengths in learning and processing information is important to improving my research skills.	0	1	16	4	2	3.30		I understand why identifying and articulating personal strategies and strengths in learning and processing information is important to improving my research skills.	0	0	0	14	9	4.39
Communication Module	I was able to adjust my communication based on context, audience, purpose, and medium.	0	3	8	11	1	3.43		I am able to adjust my communication based on context, audience, purpose, and medium.	0	0	2	10	11	4.39
Problem Solving Module	I was able to analyze and break down a complex problem into component parts to find a solution.	0	5	9	7	2	3.26		I am able to analyze and break down a complex problem into component parts to find a solution.	0	0	0	12	11	4.48
Apply Module	I was able to adjust my personal approaches to a work-based challenge based on context and audience.	0	1	8	12	1	3.59		I am able to adjust my personal approaches to a work-based challenge based on context and audience.	0	0	1	13	9	4.35
Reflect Module	I had identified professional goals and a plan for my continued growth based on a personal assessment of my progress.	0	2	9	11	1	3.48		I identified professional goals and a plan for my continued growth based on a personal assessment of my progress.	0	0	0	10	13	4.57
23 Respondants TOTAL		0	12	50	45	7			23 Respondants TOTAL	0	0	3	59	53	
% of pre- or post-		0%	10.53%	43.86%	39.47%	6.14%				0.00%	0.00%	2.61%	51.30%	46.09%	

BEFORE Fusion 2021	TOTAL	AFTER Fusion 2021	TOTAL
Unacceptable (0+12)/ 114 =	10.53%	Unacceptable (0+0)/ 115 =	0.00%
Acceptable (50+45)/ 114 =	83.33%	Acceptable (3+59)/ 115 =	53.91%
Exceptional 7/ 114 =	6.14%	Exceptional 53/ 115 =	46.09%



AFTER PARTICIPATING IN FUSION PROGRAM

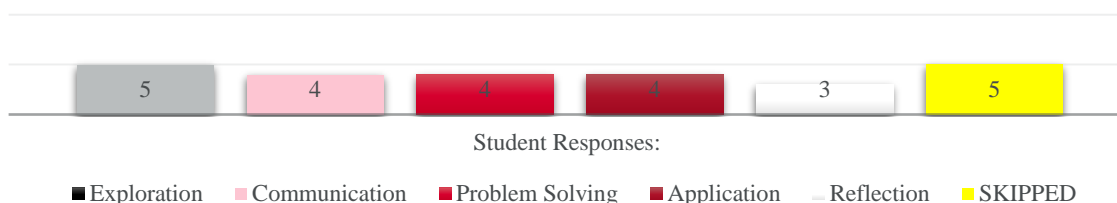
■ Unacceptable ■ Acceptable ■ Exceptional



Q3. *What might you want to learn more about based on your experience with the Fusion program?*

18 Responses; 5 Skipped

Responses for Further Learning



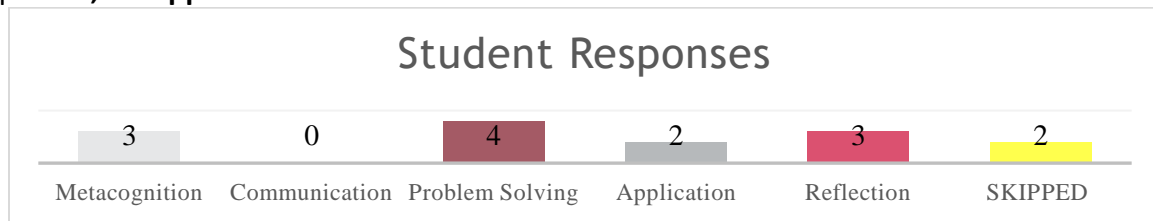
Students responded to survey question #3 showing interest in further learning in all of the areas of skill development covered in the curriculum. A large group of students also skipped the question.

METACOGNITION: 5 Responses
"I am interested in furthering my understanding of metacognition."
"Metacognition." (2 responses)
"I would like to learn more about metacognition and how I can understand my own learning habits."
"More metacognitive theory and ideas."
"More metacognitive theory and ideas."

COMMUNICATION: 4 Responses
"Presentation skills"
"Communication in the workplace"
"Learning how to communicate in a professional setting better (ex. Email etiquette, thank you notes, etc.)"
"I would like to develop my communication skills more as I think they are still developing."
PROBLEM SOLVING: 4 Responses
"I think I need to learn more about solving different types of complex problems."
"What problem solving skills work best for my area of expertise."
"I look forward to learning more about problem-solving, especially different techniques for solving them and how to tackle different complex problems."
"More case studies how other students did a good job in terms of addressing problems and in some cases, they did bad jobs."
APPLY: 4 Responses
"I want to learn more about how I can further work on developing my skills and how to apply my skills to various different situations and environments."
"More case studies how other students did a good job in terms of addressing problems and in some cases, they did bad jobs."
"How to time manage metacognitive/ reflective activities when things are busier."
"How to react in the right way."
REFLECT: 3 Responses
"Ways I can make achievable and measurable goals."
"I'm interested in what motivates me."
"How to time manage metacognitive/ reflective activities when things are busier."

Q4. Did participation in the FUSION program provide you with a new perspective, challenge your point of view, or introduce you to new skills or ideas?

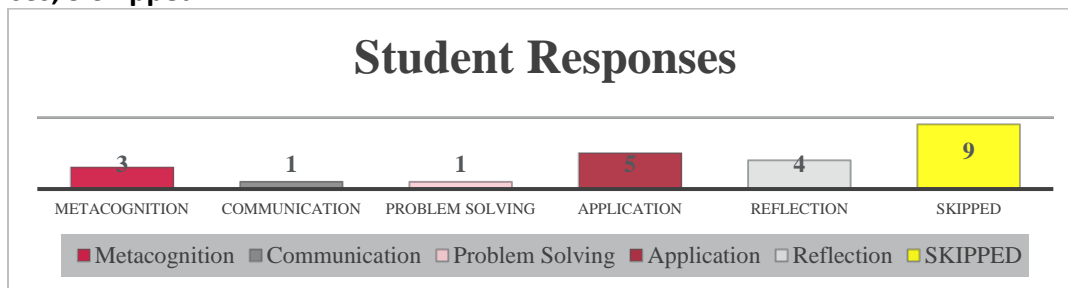
21 Responses; 2 Skipped



METACOGNITION: 3 Responses
"Participation in the FUSION program introduced me to some skills and ideas that I had previously not identified or really considered before. While I used metacognition skills before participating in the program, I had never identified and labelled what those skills were, so being able to do that has helped me work on developing those skills further."
"Yes, it introduced me to many new skills and ideas."
"FUSION definitely introduced me to new skills and ideas!" (etc.)
COMMUNICATE: 0 Responses
PROBLEM SOLVE: 4 Responses
"Yes, I learned a lot about how to deal with some complex problem in real life."
"Yes, before taking this course I usually only make a time schedule when making plans to solve problems. But after learning this systematically with FUSION, now I know more good ways to solve a problem."
"Yes, wasn't aware of all the strategies for metacognition or problem solving before taking the course."
"Introduced me to a lot of new skills in regards to reflecting and problem-solving."
APPLY: 2 Responses
"It made me more confident in my abilities to solve a problems by showing me methodical approaches to tackling a problem."
"Yes, especially in evaluate self-assessment part."
REFLECT: 3 Responses
"Yes. I now look at the problem as a whole and how it affects people I work with or the research it touches."
"Yes, I enjoyed the whole process of reflection, and being aware of how what I am currently working on does have an impact on my future career aspirations. Also, how reflection is all me to learn more/absorb more from my experiences."
"Yes, I think it made me want to be more self-aware of my progress and the ways in which I learn best. I want to be more reflective as I approach things."

Q5. Please share any other thoughts, specifically stating one key insight or take away.

14 Responses; 9 Skipped



METACOGNITION : 3 Responses

"I have learned a lot through this course. In the past, whenever I encountered failure or setback, although I would continue to try, I would be very upset about it. But now I know the word called *growing* mindset. I should have this way of thinking, which can help me to learn and improve even when I fail."

"Mindset is really important."

"Confidence in my abilities are just as important as my abilities themselves."

COMMUNICATE: 1 Response

"When communicating, it is very important to know your audience and to mold your presentation in a way that makes it clear for them to understand."

PROBLEM SOLVE: 1 Response

"One key take-away is to first articulate a specific problem by asking simple questions, then brainstorm creative solutions before narrowing down the options."

APPLY: 5 Responses

"I think that the biggest takeaway is to live in the moment so that way I can be more aware of myself and the ways in which I approach situations, and this will help me reflect on them."

"Learning about knowledge- metacognition-was a new term and I can to apply it very often in my daily life now."

"One of my takeaways is that I will always be viewed as a potential employee or worker before being viewed as a person."

"The biggest takeaway for me was learning about the interplay between the three FUSION skills, and how those skills are used in every aspect of my life."

"One key insight in the realization that these skills cannot be learned in one summer, but the courses allow us to continue to practice these throughout our lives."

REFLECT: 4 Responses

"FUSION taught me how self-reflection is an incredibly important tool that can help in many areas of your life, including areas like problem solving and communication but also extending to more personal areas, such as goal setting and career development."

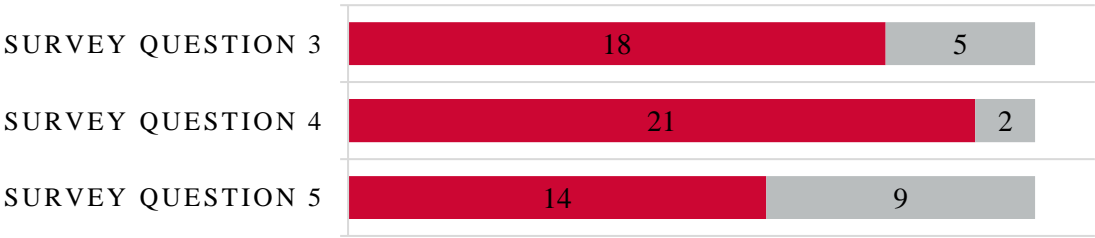
"The FUSION curriculum functioned as a supporting guide to my personal growth and reflection during my time as an RA with the Faculty of Gerontology and I will take these reflections with me in my future career and personal experience."

"It was overall a great experience and an awesome learning opportunity!"

"I enjoyed the program."

SURVEY RESPONSES #3-5

■ Responses ■ Skipped



Appendix 3: FUSON Curriculum Feedback Jam Padlet responses

padlet

SER SFU + 4 • 3mo

FUSION Curriculum Feedback Jam

Capturing your experience with the FUSION curriculum and insights on how we might improve the curriculum content and delivery.

How might we improve your experience as a user moving through the FUSION curriculum – think about both the workbook and Canvas?

I found that the videos and workbook were a bit repetitive in regards to the ratings. I think if the ratings were put as a quiz in canvas and removed from the other places that would be better.

2 3

SER SFU 3mo
Interesting ideal

SER SFU 3mo
Would it matter to you if you could not keep a copy of your ratings to refer back to later?

Anonymous 3mo
No I am fine with keeping the ratings!

Add comment

How might we improve the problem-solving module to help you better identify and solve a complex problem from your work experience?

- Implement problem-solving techniques/solutions when working remotely during Covid
- Include different types of employer management styles (e.g. those who give directions, or those who let you completely take the reins, or a combination of both) when it comes to completing a project and steps to tackle problem solving in these different scenarios

2 0

Add comment

How do you see yourself applying, or using, what you learned in the curriculum in the future? (i.e., at school, work or life?)

apply the problem thinking skills in my workplace and write down my process for solving complex problems... this will help me identify where I can improve in my problem solving skills

1 4

SER SFU 3mo
communication skills - making sure whatever audience you are addressing

SER SFU 3mo
parts of the curriculum were helpful in other parts of life too - break problem down into smaller components, helped me to ask the right questions

SER SFU 3mo
metacognition - never think about thinking - very helpful

SER SFU 3mo
great purpose instead of just completing a task

Add comment

How might we improve the curriculum to ensure that it is more inclusive?

having more examples from different workplaces - wide variety of examples
both include research labs and other work situations

1 0

Add comment

How might we improve the facilitation to support your learning and progress through the curriculum? For example, were the deadlines and pacing support helpful? Did you encounter any barriers?

having email reminders of the workbook deadlines but I found the pacing good!

2 0

Add comment

Any other thoughts or comments?

would recommend to others; found really eye-opening - think everyone should try the program!

0 0

Add comment

How might we improve the curriculum to ensure that it is more inclusive?

celebrate diversity, get to know the students

2 1

Anonymous 3mo
maybe add an introductions page using Padlet - mandatory for students to submit an introduction

Add comment

How might we improve the curriculum to ensure that it is more inclusive?

record workshops so we can watch on our own time

1 7

SER SFU 3mo
completing FUSION alongside USRA helped cement what I was learning

SER SFU 3mo
When I initially saw FUSION - monetary was helpful to motivate me to research; once I started program I realized it was valuable

SER SFU 3mo
adding reviews from other peers would help motivate - identify as USRA, faculty/department and year

SER SFU 3mo
monetary value did have slight influence - anything that I see that communication improvement I would apply; metacognition / communication skills - ask as questions, hook

SER SFU 3mo
self-paced; low time commitment

SER SFU 3mo
~10 hours; 12-15 hours; reiterate for you and not for marks

SER SFU 3mo
remind students that their answers are for them, not for marks - before every workbook upload

Add comment

How might we improve the curriculum to ensure that it is more inclusive?

I find that smaller tasks that are spread-out are easier than completing one big task, and the 3 workbooks felt like a larger task to complete. Perhaps breaking the workbooks in half (or even smaller) would be helpful for students to pace their achievements during this program.

2 5

Anonymous 3mo
not smooth part - going back and forth inputting the answers in the workbook; identify ways to apply what was learned - behaviour change project/assignment

Anonymous 3mo
capstone project

Anonymous 3mo
did like could look at initial and then second assessment because could see improvement/changes

Anonymous 3mo
add wording to share why you are doing

Anonymous 3mo

How might we improve the curriculum to ensure that it is more inclusive?

I had a hard time thinking of examples for complex problems because this was the first time I was learning how to differentiate between simple and complex problems. Maybe have examples of complex problems from a wide variety of workplaces and maybe talk more about categories of complex problems

0 3

SER SFU 3mo
Idea: short video with students sharing their complex problems would be helpful.

SER SFU 3mo
Identifying little complex problems within a larger one is challenging. Two videos - one for WIL/work and another specifically in research. One coming from professor - how you can better articulate a complex problem. Students share complex problem and receive feedback.

Anonymous 3mo
Mandatory - 2-3 posts

Add comment

How might we improve the curriculum to ensure that it is more inclusive?

I was nice to do this course while working on a research project because it allowed me to reflect on my strengths and weaknesses. Also, I didn't really know what metacognitive skills are. Now that I know, I am mindful when applying these skills to my research.

2 0

Add comment