Articles

Science on the Go: Evaluating Experiential Learning Assignments Across Science Disciplines

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Abstract

Undergraduate STEM students have limited opportunities to apply course-acquired knowledge in the community. Experiential learning opportunities that connect students with community partners offer one impactful way to apply course learning to communities within and beyond the university. While studies have established the value of experiential learning in building skills, few have explicitly invited students to articulate their experience and perceived value of community-based experiential learning. We designed a comparative research study to examine the student experience in community-based experiential learning assignments in three STEM courses at a research-intensive public university in Canada. Students from participating courses were invited to complete an anonymous survey and join focus groups to provide valuable insights on their experiences and skill development through experiential learning assignments. We found that the nature of the assignment and opportunity to clearly connect the experience to course content had an impact on student-reported outcomes. In addition, we found some discipline-specific differences in student reported learning and transferable skill development. Overall, students found their experiences enriching and reported on skill development and the value of community-partnered work. These models could be adapted by other instructors to enhance the learning experiences of students in STEM programs.

Keywords: community-partnered experiential learning, higher education, STEM, transferable skill development, student experience

Introduction

Opportunities for student learning outside of the classroom in which they engage with community-partnered projects, allows them to see the value of their learning in STEM (Astin et al., 2000; Begley, 2013; Kalas & Raisinghani, 2019; Kulesza et al., 2022). Applying course-learning in the broader community context has been shown to promote a better sense of belonging to the scientific community and renewed interest in coursework, which have important benefits for overall learning and student retention in these fields (Brownell & Swaner, 2012; Gallini & Moely, 2003). Previous work has also established the value of experiential learning assignments in developing transferable skills such as critical thinking, communication, and collaboration (Billig & Eyler, 2003; Jackson & Wilton, 2016; Smith, 2014). Participation in experiential learning can help students discover career options and better prepare them to consider future careers in STEM (Gibbs, 2022; Jackson, 2017; Peters et al., 2014). While experiential learning assignments have been established as valuable learning and community engagement tools, there is a limited understanding around the impact these types of assignments have on student learning and skill development across different STEM disciplines. Student perceptions and attitudes within different STEM disciplines can differ in the context of student identity (Wong et al., 2023), self-efficacy (Whitcomb et al., 2020), and sense of belonging (Veldman et al., 2021). Therefore, it is important to understand how experiential learning can impact overall student learning within a variety of STEM courses.

As such, we were inspired to examine experiential learning assignments in three fourth-year STEM courses (in the disciplines of biology, chemistry, and math) at the University of Toronto Scarborough (UTSC). Our collaborative project and comparative study we titled “science on the go”, to illustrate the broader community focus of the learning experiences we designed and investigated. In each of the three participating courses, students worked with a community partner to create a resource or presentation to engage and inform either the partner themselves, members of the public, or fellow peers on a topic of interest. We hypothesized that this experience would 1) engage students, 2) generate an appreciation for their university education by connecting their course learning to the community, and 3) build key transferable skills as part of the process. We also hoped that this assignment would significantly enhance student self-efficacy across STEM disciplines and result in positive impacts on all students' abilities to apply to and interview for future careers in STEM (Freudenberg et al., 2011; Freudenberg & Subramaniam, 2007; Pretti & Fannon, 2018). We used a mixed methods approach: survey instruments and focus groups were both used to observe and evaluate the impact of the experiential learning assignments in each of the participating STEM courses. Here, we describe the details of the science on the go assignments and the findings from our study, which we hope will inspire other instructors to adapt our design to enhance the student learning experience in STEM.

Methods

Participants

The science on the go pilot project involved comparing experiential learning assignments across three fourth year STEM courses in biology (BIOD29: Pathobiology of Human Disease), chemistry (CHMD47: Advanced Bio-Organic Chemistry) and math (MATAD02: Classical Plane Geometries) (Table 1). The project was funded by the Dean's Experiential Learning Fund (UTSC) and the pedagogical research study was approved by the University of Toronto Research Ethics Board (Protocol #: 00038372). The pilot study was initiated in September 2019 in the math course (MATAD02). Due to the COVID-19 pandemic, the pilot was delayed in the biology (BIOD29) and chemistry (CHMD47) courses until January 2022. Hence, math students had in-person interactions with their community partners, while chemistry and biology students interacted virtually (Table 1). Students in biology and math were connected with community partners through the assistance of the Integrated Learning Experience (ILE) team at UTSC. Chemistry students were asked to identify their own community partners from the broader community. MATAD02 community partners included a national institute for the blind, a robotics academy, arts organizations, architecture firms, and engineering firms. BIOD29 community partners included arts organizations, public libraries, a citizen's climate lobby, and a palliative care facility. CHMD47

Table 1. Course Details, Enrollment, and Specifics of the Science on the Go Assignments in Each of the Participating Fourth-Year STEM Courses.

Course	Enrollment	Assignment Outline
BIOD29: Pathobiology of Human Disease (Jan.-Apr. 2022, virtual)	40 (22 survey respondents, 3 focus group participants)	Students worked in groups of 4-5 to deliver one 50-minute workshop for their assigned partner's needs.
CHMD47: Advanced Bio Organic Chemistry (Jan.-Apr. 2022, virtual)	17 (11 survey respondents, 2 focus group participants)	Students interviewed a community partner in their field. They learned about the application of chemistry and discussed strengths and weaknesses of the partner's work with an EDI lens. Students identified content from the course that was directly applicable in addressing the issues learned from the interview.
MATAD02: Classical Plane Geometries (Sep.-Dec. 2019, in person)	50 (22 survey respondents, 0 focus group participants)	Students visited a site partner, presented a 5-minute introduction to their assigned course topic (with no jargon) and posed 3 research questions to conduct interviews and establish how their research topic is applied in the workplace.

community partners included professors at University of Toronto and UTSC, an engineer at Canadian Nuclear Laboratories, a pharmacist in Thailand, an analytical scientist at a pharmaceutical company, and a project manager at Resilience Biotechnologies. The details of each course's experiential learning assignment are provided in Table 1.

Design

Upon completion of the assignment, all students enrolled in the participating courses were invited to complete an optional and anonymous survey (Appendix) to report on their learning and overall experience with the assignment (consent rate = 55% of BIOD29 students, 65% of CHMD47 students and 44% of MATAD02 students). Some survey questions used a Likert scale rating from 1 (strongly disagree) to 5 (strongly agree). Agree and strongly agree responses (4 and 5) were aggregated as the positive responses. Five students from the participating biology and chemistry courses also participated in focus group interviews facilitated by two research assistants in June-July 2022. As over two years had elapsed since the assignment in the math course (MATAD02), these students were not invited to participate in focus group discussions. Questions in the survey instrument and focus groups were designed to address the science on the go project learning outcomes (Table 2).

Analytic strategy

Qualitative analysis of the focus group transcripts and open-ended survey questions was performed using the NVivo platform (NVivo12, Lumivero). Responses were coded into specific categories, aligned with our research questions outlined below.

Results and Discussion

In our comparative research study, we considered the following questions for interpreting and analyzing the survey data and focus group transcripts:

- Did students feel they were able to successfully create content for a broad and diverse audience? (learning outcome 1)
- Did the assignment improve student learning in the course and help students connect their course material to everyday life? (learning outcomes 4 & 6)
- Did the assignment allow students to enhance their understanding of the subject matter? (learning outcome 6)
- Did students enhance their work-ready skills or develop new transferable skills (e.g., communication, teamwork, science communication, creative thinking)? (learning outcomes 2, 3, & 5)
- Did the assignment broaden their world view, prepare them for work experiences, or help identify new career options? (learning outcomes 4 & 7)
- How did the experiences of students differ among the participating STEM courses with regard to this assignment?

Our analysis of the survey responses and interview transcripts from the focus group revealed that most of the student feedback was positive. At least 50% of students in each course reported a positive learning experience and reported that at least four of the seven assignment learning outcomes were met as part of their experience.

Students' perceptions of the assignments

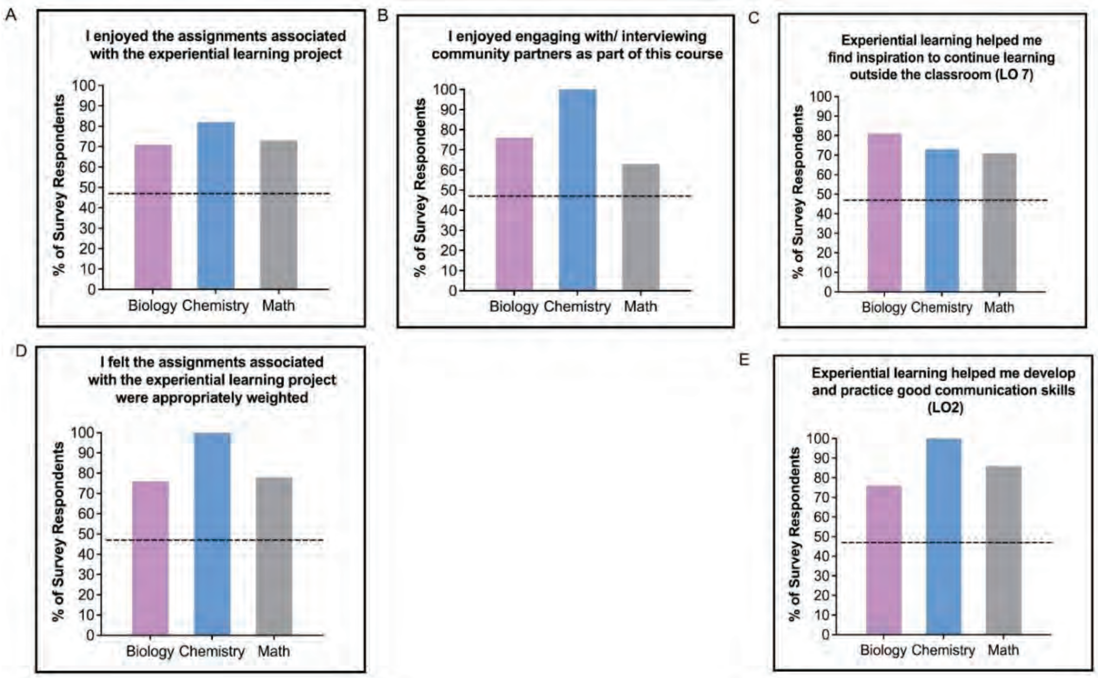
Students in all three courses enjoyed the experiential learning assignments and thought the assignments were appropriately weighted based on the workload (Figure 1A & 1D). This is important, as student enjoyment is correlated with improvement in student learning and retention (Blunsdon et al., 2003; Hernik & Jaworska, 2018). Students in all three courses reported increased interest in continuing to learn outside of the classroom (Figure 1C), meeting learning outcome 7 for the project (Table 2). Students also reported satisfaction with making a strong real-world connection to their assignment content (Figures 2A & 2C, Tables 2 & 3), which meets the objectives of learning outcome 4 (Table 2). Taken together, these results suggest that the experiential learning assignments contribute to developing a broader world view and inspire an expanded application of in-course learning.

Table 4 provides examples of how student responses to open-ended survey and focus group questions were coded in the various categories depicted in Figure 4. We included student perceptions (positive and negative) as part of the visualization of qualitative feedback (Figure 4). We found that 54% of responses contained positive opinions and 46% highlighted the unique aspect of these assignments in creating real-world connections to their course-based and/or disciplinary learning (Figure 4). Biology and math students were connected to specific community partners with a diverse range of collaboration topics. Students in these two courses reported that these connections did not always result in topics of direct relevance to their specific courses (Figure 3E, Tables 4 & 5). For example, the fourth-year biology course was focused on the molecular mechanisms underlying infectious and genetic diseases. However, some groups worked on resources related to a broader biological concept (e.g., teen sexual health, impact of music on human physiology and well-being). Chemistry students were more readily able to connect their course content to their community partner's area of work, and thus reported the highest level of deepened learning (Figure 3A). However, focus group discussions (Figure 4) and open-ended survey responses indicated that the experiential learning assignment did help students in the math and biology courses deepen their learning as well (Figure 3A). As students across all three courses reported an enhanced learning experience, this suggests that students perceived educational value in applying their knowledge and skills to communicate a discipline-related topic to those outside their discipline and/or campus community.

Table 2. Survey and Focus Group Questions' Alignment with the Learning Outcomes of Science on the Go.

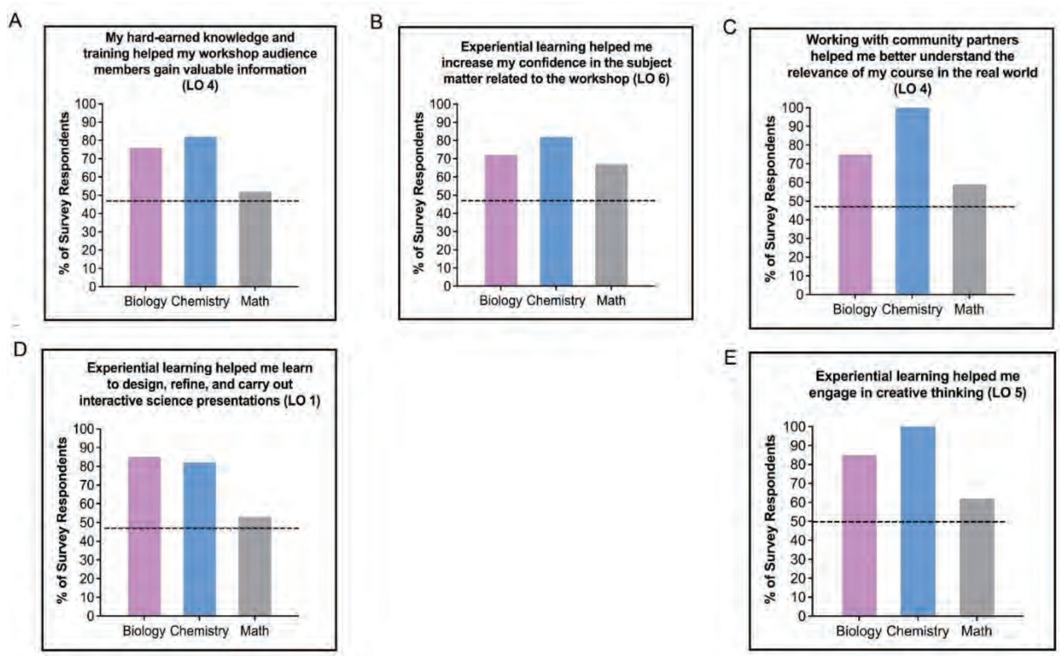
Learning Outcome	Survey Questions	Focus Group Questions
LO 1: Learn to design, refine, and carry out interactive science presentations suitable for members of the public at different levels of expertise, different age groups, and a range of interests from their specific disciplines.	Experiential learning helped me learn to design, refine, and carry out interactive science presentations suitable for members of the public at different levels of expertise, different age groups, etc.	How did the assignment impact the community members you worked with?
LO 2: Develop and practice strong communication skills.	Experiential learning helped me develop and practice good communication skills.	What skills did you gain by completing the project?
LO 3: Develop a strong and collaborative relationship with team members.	Experiential learning helped me develop collaboration skills when working with team members.	What skills did you gain by completing the project?
LO 4: Discover that their academic knowledge and scientific training is applicable outside of academia.	1. Working with community partners helped me better understand the relevance of my course in the real world 2. Experiential learning allowed me to apply my knowledge in a real-world setting. 3. My hard-earned knowledge and training helped my workshop audience gain valuable information.	Did this opportunity help you better understand the relevance of course concepts to your own life?
LO 5: Engage in creative thinking.	Experiential learning helped me engage in creative thinking.	What skills did you gain by completing the project?
LO 6: Enhance their understanding of the disciplinary concepts related to their workshop.	1. Experiential learning helped me increase my confidence in the subject matter related to the workshop. 2. Working with community partners helped me better understand course material. 3. I felt the assignments associated with the experiential learning project helped me deepen my learning.	How has the intentional focus on experiential learning impacted your learning?
LO 7: Find inspiration to continue learning outside the classroom.	Experiential learning helped me find inspiration to continue learning outside the classroom.	N/A

Figure 1. Survey responses: student perceptions of the assignment.



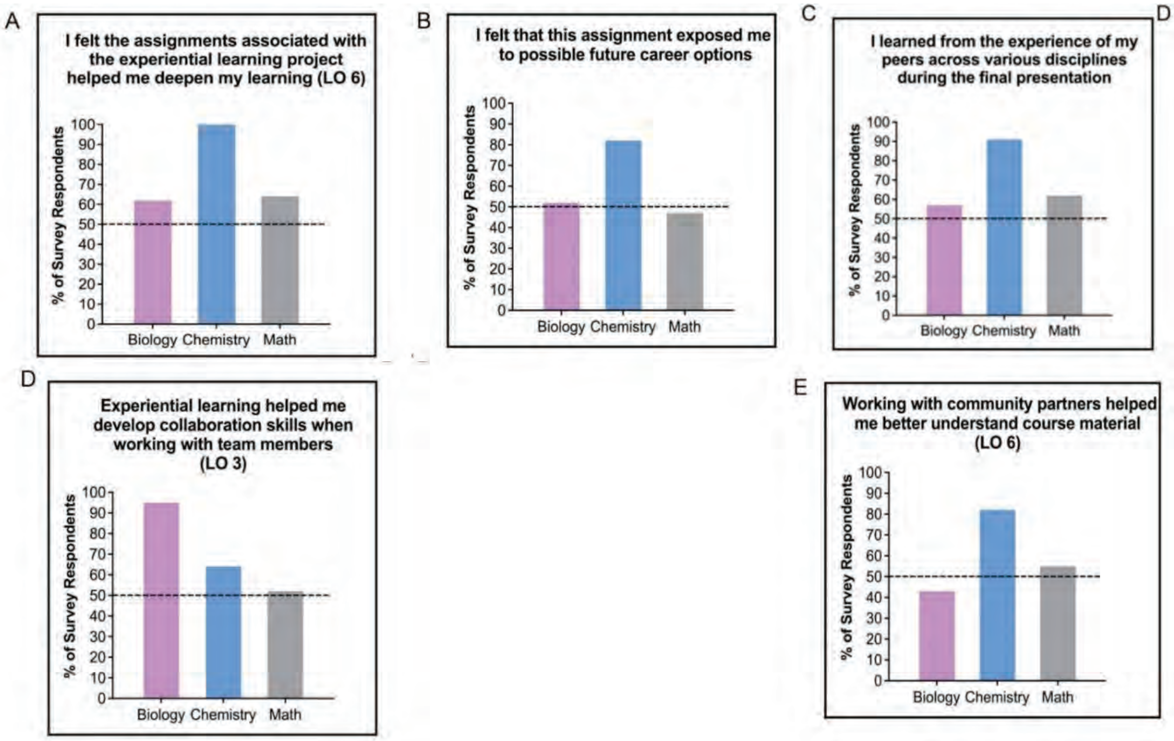
Note: Each figure panel presents the percentage of positive student responses for each of the three STEM courses (rating of 4 or 5; see Methods) for that survey question. The black dashed line represents 50% of respondents. Biology had 21 survey respondents (representative of 55% of course enrolment), Chemistry had 11 survey respondents (representative of 65% of course enrolment), and Math had 22 survey respondents (representative of 44% of course enrolment).

Figure 2. Survey responses: value of assignment and creative skill development.



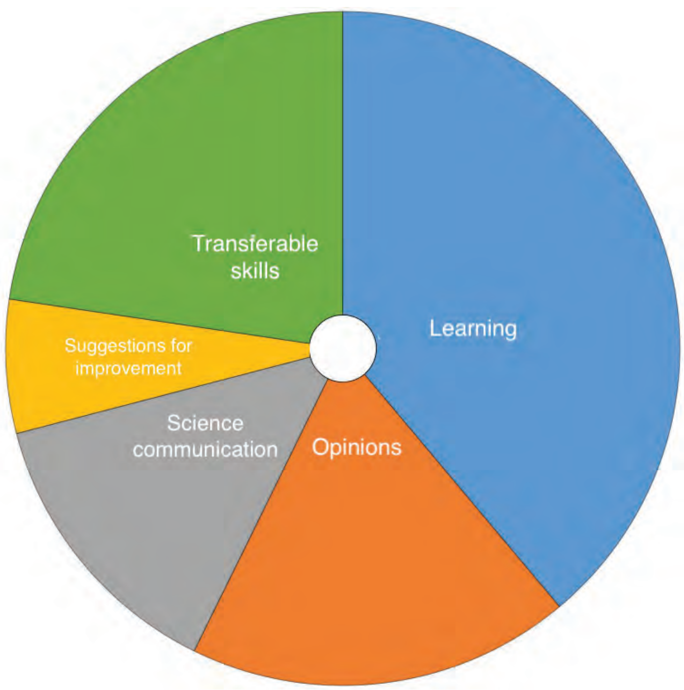
Note: Each figure panel presents the percentage of positive student responses for each of the three STEM courses (rating of 4 or 5; see Methods) for that survey question. The black dashed line represents 50% of respondents. Biology had 21 survey respondents (representative of 55% of course enrolment), Chemistry had 11 survey respondents (representative of 65% of course enrolment), and Math had 22 survey respondents (representative of 44% of course enrolment).

Figure 3. Survey responses: student-reported learning, career exploration, and collaborative skill development.



Note: Each figure panel presents the percentage of positive student responses for each of the three STEM courses (rating of 4 or 5; see Methods) for that survey question. The black dashed line represents 50% of respondents. Biology had 21 survey respondents (representative of 55% of course enrolment), Chemistry had 11 survey respondents (representative of 65% of course enrolment) and Math had 22 survey respondents (representative of 44% of course enrolment)

Figure 4. Hierarchy chart (sunburst diagram) presents the categories into which we coded students' responses to open-ended survey questions and the focus group transcripts.



Notes: The categories were based on the learning outcomes and research questions (pg 4): Student perceptions (positive or negative), Transferable skills (communication, teamwork, creative thinking, other), Learning (course content, real-world connection, other), Science communication (or specifically content creation for members of public), and Suggestions for improvement. The larger the box, the more responses were coded into that category

Table 3. Science on the Go Learning Outcomes that were Met Based on our Study.

Course	Learning Outcomes						
	LO 1 Science communication	**LO 2** Communication	**LO 3** Collaboration	**LO 4** Real World Connection	**LO 5** Creative thinking	**LO 6** Understanding course concepts	**LO 7** Inspiration to keep learning
Biology *BIOD29*	✓	✓	✓	✓	✓	✓	✓
Chemistry *CHMD47*	✓	✓		✓	✓	✓	✓
Math *MATAD02*		✓		✓	✓	✓	✓

Notes: Each learning outcome (LO) was considered met when the majority (>70%) of survey and focus group respondents provided positive responses to the questions designed to probe fulfilment of these LOs.

Table 4. Sample Quotes from Students' Responses that Demonstrate how the Responses were Coded to the Different Categories, as Illustrated by Figure 4.

Analysis Category	**Sample Quotes/Comments**
Positive student perceptions	"I liked working with members of the community." "It felt very independent, and I really enjoyed that."
Negative student perceptions	"Didn't feel relevant to the course"
Creative thinking	"This allowed us to get creative and research different topics and design fun assignments"
Teamwork	"It was overall really engaging working with others as a team."
Communication	"I have learned to voice and communicate my ideas to my peers and gained a little more confidence in speaking."
Science communication	"I liked how we get to make an impact in the community through the scientific skills and knowledge we have learned in this course."
Relation to course concepts	"It made me do additional research about concepts learned in class to further my understanding."
Real world connections	"Very helpful as most times you don't expect to encounter what you learned in class in real life."
Suggestions for improvement	"Difficult to find someone to interview." "It was a bit too open ended and needed more structure to it."

In addition to an enhanced learning experience (Figure 3A), students across all courses found that the experiential learning assignment helped them feel more confident in their knowledge of the topics they worked on (Figure 2B), demonstrating increased self-efficacy. By enhancing their understanding of the concepts related to their workshops, the goals for learning outcome 6 (Table 2) were met. Students in all three disciplines agreed that their disciplinary knowledge could be used to benefit the community (Figure 2A & 2C). This is of particular interest as it has previously been reported that STEM majors often show lower levels of social agency compared to non-STEM majors (Garibay, 2015). Therefore, these types of experiential learning assignments may work towards developing a sense of community responsibility among students across STEM disciplines. Based on student responses, the experiential learning assignment had positive impacts as students reported making real-world connections with their course content and discipline, developing higher self-efficacy, and gaining insights on how they can contribute to their community. As has been reported by other studies, the students' positive perceptions of the assignment may have constructive impacts on their future career goals and retention in STEM (Astin et al., 2000; Billig & Eyler,2003; Brownell & Swaner, 2012; Gallini & Moely, 2003; Jackson & Wilton, 2016; Smith, 2014).

Transferable skill development

We were also interested in understanding the assignment's effect on the development of communication skills (e.g., effective communication with team-members or community partners) and science communication skills (e.g., effective delivery of a workshop to a broad audience on a STEM topic). All three assignments had community partner interactions; chemistry students performed interviews, biology students collaborated with their partners to present a resource to a targeted audience, and math students presented to their partner as well as interviewed them. As part of this interaction, students engaged in oral, written, and social communications with their community partners. It is of significance that 76% of students across all three courses reported enjoying this interaction (Figure 1B) and 84% of students across all three courses reported development of their communication skills through participating in the experiential learning assignment (Figure 1E). This strengthening of communication skills meets the objectives of learning outcome 2 (Table 2). In addition, the open-ended survey responses and focus group discussion analyses demonstrated that the category with the most student responses was transferable skill development (Figure 4). Majority of coded responses (84%) in this category referred to how students appreciated developing skills such as communication and collaboration that would be applicable in future careers. Students also highlighted how they enjoyed interacting with their community and developing skills to communicate science concepts to general audiences, as this helped them understand the value of their coursework outside of the classroom. This meets the objectives of learning outcome 1, 4, and 6 (Table 2). While our study highlights how community interaction through experiential learning assignments can increase both general and science communication skills, other studies have demonstrated that building confidence in science communication skills can also increase engagement with community activities (Copple et al., 2020; Rose et al., 2020). Therefore, it may be that promoting community engagement and communication skills can act in a positive feedback loop, whereby both facets have positive effects on each other.

Intriguingly, self-reported student skill development differed for biology and chemistry students in comparison to the math students. We observed a higher percentage of biology and chemistry students reporting transferable skill development in creative thinking (Figure 2E) and science communication (Figures 2D), compared to math students. Despite the difference in magnitude, we do observe that >50% of respondents across all courses met these learning outcomes (Figure 2D and 2E). Additionally, student responses in open-ended survey questions further affirmed development of these skills (Figure 4; Table 3). This revealed the importance of using open-ended writing to gain further insights on the perceived value of student learning during the assignment. This is in line with studies that suggest assessing learning for experiential learning assignments should not solely rely on grades and rather encompass multiple assessment tools that are more informative about the benefits of the experience (Batchelder & Root, 1994; Kezar, 2002; Rhoads, 1997). Students from all three courses developed strong creative thinking and communication skills (Figures 1E & 2E, Tables 2 & 3). The overall positive reporting on the development of transferable skills meets the objectives of learning outcomes 1, 2 and 5 (Table 2).

Lastly, we note that the biology assignment was the only iteration that required group work. Therefore, we observed a comparatively higher reporting of collaborative skill development among biology students (Figure 3D). Despite biology students not reporting that working with community members enhanced their learning of course material through this assignment (Figure 3E), majority of students (95%) reported being able to learn from their peers (Figure 3C). This aligns with previous findings that group work helps enhance course concept understanding and promote community building, especially in virtual courses (Drouin & Vartanian, 2010; Khan et al., 2017; Pranjol et al., 2022; Robinson et al., 2007). As a result of the required group work in the biology experiential learning assignment, learning outcome 3 was only met in this course (Tables 2 & 3).

Overall, students from all three courses reported developing transferable skills as a result of participating in the experiential learning assignment, which aligns with findings from other experiential learning assignments (Begley, 2013; Gibbs, 2022; Jackson, 2017; Kalas & Raisinghani, 2019; Kulesza et al., 2022; Peters et al., 2014; Pranjol et al., 2022; Robinson et al., 2007).

Table 5. Sample Suggestions Offered by Students to Improve Future Iterations of the Assignments.

Course	Student Suggestions for Improvement
Biology (BIOD29)	Better demonstration of how their project relates to the course content.
	Standardized time commitment, make sure community partners are on same page about expectations and deliverables.
Chemistry (CHMD47)	Provide a list of professors that can be contacted early in the semester and are willing to be interviewed.
	Provide more clarity with the assignment instructions and expectations.
Math (MATAD02)	Screen partner visits or have a TA/Prof present to keep discussion on track.
	More relevance between their assigned topic and the partner's work.

Conclusions

The science on the go assignments made a strong positive impact on students' learning experiences. They reported enjoying the assignment, as it was a unique learning experience compared to other assignments they have worked on in the past. Student responses in all three courses supported fulfillment of most of learning outcomes (Table 3). These findings agree with previous conclusions on the impact of experiential learning assignments on student learning and skill development (Astin et al., 2000; Begley, 2013; Billig & Eyler, 2003; Blunsdon et al., 2003; Kalas & Raisinghani, 2019; Kulesza et al., 2022). Students reported that working with community partners during the assignment also inspired them to continue learning outside of the classroom and volunteer for similar initiatives in the future.

In addition, we also found differences in student self-reporting of learning between STEM disciplines. The differences in enrolment and number of survey respondents in each course could have impacted the divergence in skill development between the different disciplines that we noted by examining students' responses. While math and biology courses had 22 (44% of course enrolment) and 21 (55% of course enrolment) respondents respectively, chemistry had 11 respondents (65% of course enrolment). The learning environment may have also played a role in the differential reporting of skill development. While math students were able to meet with their community partners and present to them in-person; chemistry and biology students had to interact with their community partners virtually. The biology students also had to interact with their group members virtually when managing communication and collaboration to complete their deliverable. In addition, standardizing the assignment structure between courses and ensuring strong overlap between course content and assignment content may help bridge the gaps and divergence in skill development between the different disciplines. In fact, the math course ran a second iteration of the assignment after modifications based on the feedback reported here (Table 5). Community partners were brought in for virtual workshops to help students build geometric models. This change in assignment format and course relevance increased positive reporting of learning course content and identifying real-world applications of course content (personal communication, unpublished results, September 14, 2022).

Based on the findings above, the experiential learning assignments were a beneficial addition to all three STEM courses, as they provided students the opportunity to develop transferable skills for their future careers and connect their knowledge to their community. Comparing across different courses with a similar assignment structure may reveal more discipline-specific trends and highlight differences in how students self-report skill development. This would help identify which forms of experiential learning assignments are more beneficial to specific disciplines. We recommend integrating experiential education in the context of community-partnered projects in undergraduate courses across STEM disciplines, along with integrating methods for students to articulate and reflect in multiple ways on their skill development and future career planning.

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Conflict of Interest

The authors have no competing interests to declare.

Author's Contributions

AA, NT and ZS conceptualized and coordinated the study. AJ and TM conducted the focus groups and analyzed the data. AA, TM and AR wrote the manuscript. AA, NT, ZS, AJ, TM and AR edited the manuscript.

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APPENDIX

Survey questions:

Engaging with community partners: This section of the survey asks you about your experience working with different community partners as part of your course experiential learning assignment.

1. I enjoyed engaging with / interviewing community partners as part of this course.
2. Working with community partners helped me better understand course material.
3. Working with community partners helped me better understand the relevance of my course in the real world.
4. Any other comments about what you learned from interacting with community partners?

Associated course work: This part of the survey asks you about any course assignments you completed in relation to the experiential learning project (i.e. reflections, presentations, etc.)

5. I enjoyed the assignments associated with the experiential learning project (i.e. Reports, presentations, reflections, etc.).
6. I felt the assignments associated with the experiential learning project helped me deepen my learning.
7. I felt the assignments associated with the experiential learning project were appropriately weighted (as in the percentage value assigned to each assignment on the syllabus).
8. Any other comments about assignments associated with the experiential learning project?

Skills Learned: This part of the survey asks you about skills you may have learned as a result of the experiential learning assignment on the whole.

9. Experiential learning helped me learn to design, refine, and carry out interactive science presentations suitable for members of the public at different levels of expertise, different age groups, and a range of interests.
10. Experiential learning helped me develop and practice good communication skills.
11. Experiential learning helped me develop collaboration skills when working with team members.
12. My hard-earned knowledge and training helped my workshop audience members gain valuable information.
13. I learned from the experience of my peers across various disciplines during the final presentation.
14. Experiential learning helped me strengthen my public speaking skills.
15. Experiential learning helped me engage in creative thinking.
16. Experiential learning helped me increase my confidence in the subject matter related to the workshop.
17. Experiential learning helped me find inspiration to continue learning outside the classroom.
18. Experiential learning allowed me to apply my knowledge in a real-world setting.
19. I felt that this assignment exposed me to possible future career options.

Overall Perceptions: This portion of the survey asks you about overall thoughts you have about the experiential learning assignment and any other final thoughts.

20. Overall, I enjoyed the experiential learning assignment.
21. What were some of the strengths or things you liked about this assignment?
22. What were some weaknesses or things you didn't like about this assignment?

Focus group questions:

Introductions:

1. Please state your name, year of study, and what program you are in.
2. What were the reasons you decided to take this course? (Probe for: motivation, goals, intentions)
    a. Did you know about the experiential learning component in this course before you enrolled? If so, was this a factor which helped you decide whether to enroll for this course or not?
3. Can you describe the experiential learning you engaged in and the project you completed in this course? (Probe for: who the community partners were, what was the work that transpired)

Perceptions of the Program:

1. What are your overall impressions of the experiential learning component in this course? How does this compare to your previous learning experiences? (i.e. experience with other courses).
2. What were the components of the experiential learning program that made it a success? Were there any factors that made it unsuccessful?
3. What do you think were the greatest challenges throughout the experiential learning program? What can we do to address these challenges next time?

Special Topics:

1. How has the intentional focus on experiential learning impacted your learning? How did it impact the community members you worked with? (Probe for: engagement, making real-world connections, any positive/negative feelings, impact on learning, relationships with educators, relationships with community, meaning making/relevancy of curriculum, workload, etc.)
2. What skills did you gain by completing the experiential learning project? (Probe for: global competencies like communication skills, collaboration skills, etc.)
3. Did this experiential learning opportunity help you better understand course concepts and their relevance to your own life? (Probe for: real-world learning, love of subject, career exploration, etc.)

Conditions and Recommendations:

1. What do you think are the conditions or factors for the success and effectiveness of this program? (Probe for: educator support, course design, community liaisons, community partners, prior skillset, etc.).
2. What would be your suggestions for things we should keep, do away with, or revise in future iterations of this program? (Probe for: assignment structure, timelines, etc.).

Wrap Up:

1. Is there anything that we didn't cover today that you would like to add?

Community partner questions:

1. What are your overall impressions of this outreach program? How does this compare to other instances when you facilitated partnerships with other institutions?
2. What do you think are the conditions or factors for the success and effectiveness of this program? Please tell us about some of the successes that you identified of this experiential learning program.
3. What would be your suggestions for things we should keep, do away with or revise in the future iterations of this program. Please tell us about any challenges that you identified with this experiential learning program.
4. In your opinion, how did the experiential learning opportunity impact development of students' communication skills, collaboration skills or any other transferable skills.
5. Please provide us with your reflection on this statement: This experiential learning opportunity engaged students and inspired them to pursue learning in this area outside the classroom/explore careers in this subject matter.
6. Is there anything else you would like to add?