CASE STUDY

Investigating interdisciplinarity in SaP programming: A 3-year retrospective study of student partnerships at McMaster University

***Elisa Do,** Department of Psychology, University of Victoria, **Kelsey Harvey**, Department of Experiential Studies in Community and Sport, Cape Breton University, and **Celeste Suart**, Department of Leadership, Higher & Adult Education, Ontario Institute for Studies in Education, Canada.*

Contact: doe3@mcmaster.ca

ABSTRACT

In recent years, many universities across the world have been implementing students-as-partners (SaP) programs to collaborate with students on teaching and learning projects. Within these SaP programs, for the benefits that cross-disciplinary learning brings, interdisciplinary partnership has been made a priority. To assess the extent to which interdisciplinarity has occurred within a university's SaP program, this study quantified the number of interdisciplinary partnerships that have occurred in the Student Partners program at McMaster University since 2020 and investigated the hiring practices within those partnerships. Results showed that certain faculties comparatively did not have as many interdisciplinary partnerships. Hiring practice analyses also revealed that there were faculties with a greater proportion of students applying to work with faculty/staff of the same faculty origin as themselves. This case study examines the variations in interdisciplinarity across faculties at McMaster University involved in a SaP program and explores ideas on future directions for enhancing interdisciplinarity in student partnerships.

KEYWORDS

interdisciplinarity, students as partners, partnered teaching and learning, quantitative research

Students as partners (SaP) is a growing practice in post-secondary education. The SaP movement centers around students partnering with faculty and staff members as active members in improving teaching and learning. Interdisciplinary partnerships, wherein individuals from more than one discipline collaborate (Nissani, 1995), offer the opportunity for more diverse perspectives (Han et al., 2018). Given the importance of broadening students' perspectives, it is crucial for institutions that are aiming to implement interdisciplinary learning to assess the degree to which interdisciplinarity is occurring within partnerships. We sought to examine interdisciplinarity within McMaster University's Student Partners Program (SPP), which is an institutionally supported program that provides funding to support teaching and learning

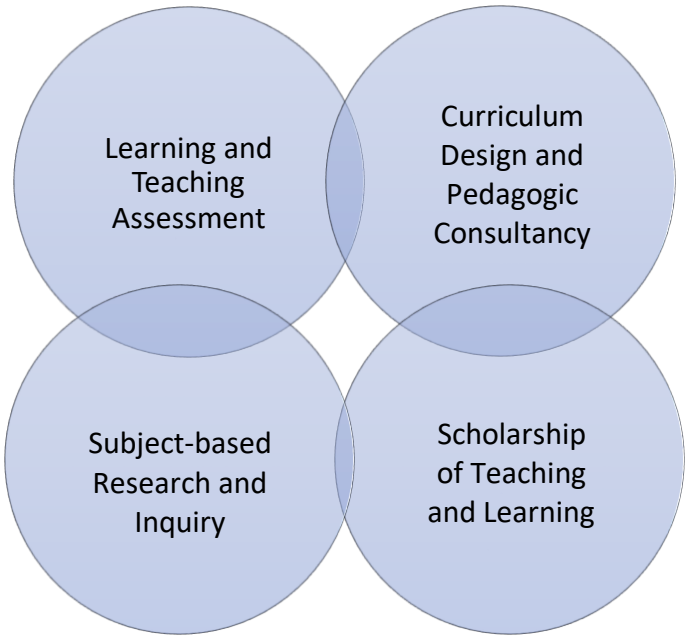
projects and research aligned with the students-as-partners movement in higher education (Harvey & McDermott, 2023).

BACKGROUND

Students as partners in higher education

Students can take on many different roles in partnerships. Healey, Flint, and Harrington (2014) modelled four interrelated ways that students may engage as partners: students might partner on topics related to learning and teaching assessment, subject-based research and inquiry, the scholarship of teaching and learning, and curriculum design and pedagogic consultancy (Figure 1). These categories are modelled as interrelated and overlapping to highlight the complexities that come with applying SaP in practice. The authors noted that rather than just categorizing student partnership activities, the model demonstrates how student engagement can be emphasized at different areas of the model (Healey et al., 2014).

Figure 1. Ways of engaging students as partners in higher education



Although partnership practice varies at different institutions, principles such as respect, reciprocity, and shared responsibility underlie SaP values (Cook-Sather et al., 2014). This is the case for the SPP at McMaster University, which is overseen by the Paul R. MacPherson Institute for Leadership, Innovation and Excellence in Teaching. This program supports students, faculty, and staff across all disciplines to collaborate on teaching- and learning-related projects (MacPherson Institute, n.d.). Twice annually, faculty/staff and students are invited to submit a project proposal (Harvey & McDermott, 2023). Successful projects are funded. Partners have the option to hire student partners from within their personal networks or from a call for students, which is also overseen by the teaching and learning centre. This call is disseminated to student groups and newsletters across campus. Students apply to projects in which they are interested.

Interdisciplinary partnerships

Interdisciplinary teaching and learning promotes education from diverse perspectives (Cooke et al., 2020) and can challenge individuals to consider other ways of thinking and knowing (Tarrant & Thiele, 2017). Learning across different disciplines can also provide scholars the opportunity to connect with greater publication and funding avenues (Cooke et al., 2020). There are myriad examples of successful interdisciplinary partnerships, as well as cautionary tales (Woolmer et al., 2016; Clark et al., 2019; Dimon et al., 2019; Glover et al., 2020; Prescott et al., 2020; Healey et al., 2023). For example, there is debate regarding the value of disciplinary or interdisciplinary partnerships. Cook-Sather (2016) and Kiester and Holowko (2020) extol the benefits of interdisciplinary partnerships. They advise that students from a different disciplinary background than the instructor of a course can provide feedback as to how understandable the lesson might be for a novice to the field. Other scholars have argued that students who are within the same discipline or who had taken the course previously on which they would be consulting would already be familiar with the subject matter and could focus on the educational methods being employed (Foran, Knorr, & Taylor, 2020).

Interdisciplinarity in partnerships can be difficult to implement (Cooke et al., 2020). For example, projects may require skills that traditionally come from specific disciplines, deterring students from other disciplines from applying to those projects. Faculty, staff, and students may also be unfamiliar with interdisciplinary collaboration and find the work challenging. At McMaster University, the SPP is aligned with one of the university's teaching and learning strategies, *Partnered and Interdisciplinary Learning* (McMaster University, 2021). According to this strategy,

> students are partners in the learning process—we want to inspire them to explore their curiosity beyond their program, department or Faculty. By engaging in interdisciplinary teaching and learning, students can open their minds to diverse perspectives, sparking new ideas and smart collaborations. (p. 6)

Although the goals of the SPP inherently promote partnered and interdisciplinary learning, the extent to which the program has achieved interdisciplinarity within partnerships has not been measured. This is especially important given the two modes by which faculty/staff can hire student partners: directly from established networks versus from the campus-wide call for student partner applications. To better investigate how well the program truly aligns with the university's strategy, this study quantified the number and nature of interdisciplinary partnerships within the program.

METHODS

This study investigates the degree to which interdisciplinarity in faculty/staff and student partnership is truly implemented within McMaster University's Student Partners Program (SPP). Using data from cohorts between the summer of 2020 and fall/winter of 2022, the number and nature of interdisciplinary faculty/staff and student partnerships were examined. Specifically, data sets for this study consisted of secondary data from six SPP cohorts. Each cohort is defined as a separate time frame where new projects are proposed for SPP funding, and new students

are hired to work in partnership on accepted projects. The six cohorts assessed for this study included summer 2020, winter 2021, summer 2021, fall 2021–winter 2022, summer 2022, and fall 2022–winter 2023 cohorts (see Table 1). Each summer cohort spanned the start of May to the end of August, and each fall-winter cohort spanned the start of September to the end of April. In 2021, due to the COVID-19 pandemic and its restrictions, the SPP did not resume in the fall, and the winter cohort spanned the start of January to the end of April.

Table 1. Number of faculty and student partners per cohort

COHORT	NUMBER OF FACULTY/STAFF	NUMBER OF STUDENTS	TOTAL NUMBER OF PARTNERS
Summer 2020	31	28	59
Winter 2021	23	30	53
Summer 2021	55	60	115
Fall 2021–Winter 2022	28	38	66
Summer 2022	68	47	115
Fall 2022–Winter 2023	77	41	118

The first data set addressed the research question: what is the number and nature of interdisciplinary, cross-faculty partnerships within the SPP program? For each cohort, Microsoft Excel spreadsheets tracked project data, including the student and faculty partner demographic information and faculty affiliations. At McMaster University, there are six faculties: the Faculty of Business, the Faculty of Engineering, the Faculty of Health Sciences, the Faculty of Humanities, the Faculty of Science, and the Faculty of Social Sciences, as well as one independent program, the Arts and Sciences Program. For this study, the Arts and Sciences Program was considered as its own faculty. Analysis of this data set focused on quantifying the number of partnerships where the staff or faculty partner was affiliated with a faculty different than that of the student partner(s).

The second data set addressed the research question: how do the disciplines of students who applied to a project compare with the disciplines of students who were ultimately hired? This data set included student applications to the SPP and analysis focused on comparing the faculty affiliation of students who applied to a particular project with the faculty affiliation of students who were ultimately hired (and by extension, the faculty of students who were not hired). For some projects, students were hired outside of the program's call for applications, and such projects were omitted from these analyses.

Data analysis was conducted by a student partner who collaborated with a staff partner who oversaw the SPP. The staff partner and a graduate student partner guided the methodology and supported the student partner in performing statistical analyses. The staff partner de-identified both data sets by creating an Excel spreadsheet that assigned a numeric identifier to each project. All identifying information, such as partners' names, project titles, and contact information, was removed, leaving only the faculty affiliation of partners involved in each project and the faculty affiliation of students who applied to each project on the data sets.

The interdisciplinarity of partnerships was analyzed using Fisher's exact test with Bonferroni correction for multiple comparisons across all cohorts and within each of the six cohorts. Statistical analyses were completed using R (Foundation for Statistical Computing,

Vienna, Austria) and GraphPad Prism 8 (GraphPad Software, San Diego, USA). Hiring decisions within partnerships were descriptively summarized across all cohorts. For each faculty, the average percentage of students who applied to projects with faculty or staff partners affiliated with the same discipline was calculated. The percentage of student applications with same-discipline faculty/staff partners was then compared against the percentage of disciplinary partnerships that ultimately occurred within each faculty. This also allowed for a descriptive comparison of how often students were applying to projects within their discipline between the different faculties.

RESULTS

Partnership interdisciplinarity

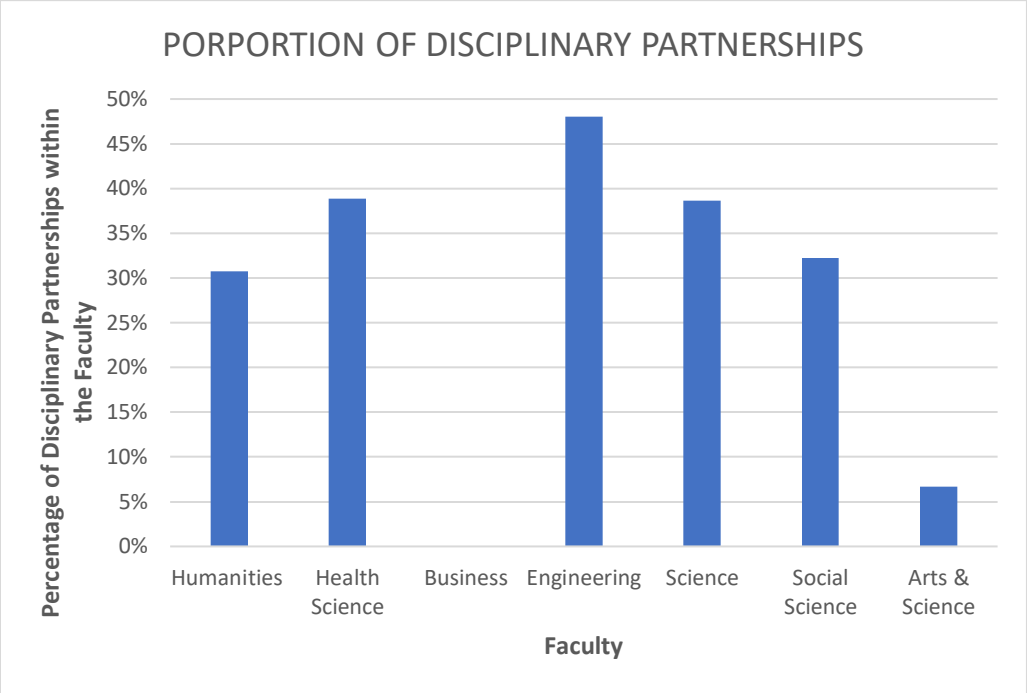
Across all six cohorts, the Faculty of Engineering had the greatest proportion (48%) of disciplinary partnerships (partnerships in which the faculty members/staff and students were of the same discipline). This proportion was calculated based on the total number of partnerships (both disciplinary and interdisciplinary) within the faculty. Across all cohorts and all faculties, 14 partnerships where a partner's affiliation was unknown were removed.

Other faculties with significant associations between faculty/staff and student disciplines included the Faculties of Health Sciences (39%), Science (39%), Social Sciences (33%), and Humanities (31%). All faculties except for the Faculty of Business (0%) and the Arts & Science Program (7%) had a significant proportion of partnerships where faculty/staff and student partners were of the same discipline (Figure 2). Fisher's exact tests were performed, and a *p*-value cut off of 0.05 was used to determine statistical significance (Table 2). In this case, statistical significance represents a greater likelihood for each respective faculty to have disciplinary partnerships. Odds ratios indicate the likelihood of each faculty engaging in disciplinary partnerships rather than interdisciplinary partnerships. For example, faculty members/staff and students from the Faculty of Engineering were 46 times more likely to engage in disciplinary partnership than interdisciplinary partnership (Table 2).

Table 2. Statistical significance of disciplinary partnership proportions within faculties across all cohorts

FACULTY	*P*	ODDS RATIO	95% CONFIDENCE INTERVAL
Humanities	**<0.001**	17.18	4.55-67.97
Health Sciences	**<0.001**	11.33	4.62-29.04
Business	1.00		
Engineering	**<0.001**	46.30	12.23-204.59
Science	**<0.001**	5.29	2.60-11.05
Social Sciences	**<0.001**	41.99	8.13-421.99
Arts & Science	0.076		

Figure 2. Proportion of partnerships where faculty members/staff and students were of the same discipline ("disciplinary partnerships") across all cohorts



When the data was analyzed within each separate cohort, all faculties except for the Faculty of Business and the Arts & Science Program had a significant number of disciplinary partnerships in at least one cohort. Many faculties had a greater number of disciplinary partnerships in recent years. The Faculty of Science had a significant number of disciplinary partnerships since the summer of 2021, and the Faculty of Health Sciences had a significant number of disciplinary partnerships beginning in fall 2021–winter 2022. Similarly, the Faculty of Humanities had a significant number of disciplinary partnerships in the two most recent cohorts (summer 2022 and fall 2022–winter 2023). On the other hand, the Faculty of Engineering and the Faculty of Social Sciences had a significant number of disciplinary partnerships in previous cohorts as well as recent cohorts. Engineering had a significant number in summer 2020, winter 2021, summer 2022, and fall 2022–winter 2023. The Faculty of Social Sciences had a significant number in summer 2020, fall 2021–winter2022, and summer 2022 (Table 3).

Table 3. Partnership disciplinarity statistical significance within each cohort

	SUMMER 2020	WINTER 2021	SUMMER 2021	FALL 2021–WINTER 2022	SUMMER 2022	FALL 2022–WINTER 2023
Humanities	p =0.1700	p =1.0000	p =1.0000	p = 0.0523	**p = 0.0184**	**p = 0.0117**
Health Sciences	p = 1.0000	p = 0.3667	p = 0.4876	**p = 0.0104**	**p = 0.0003**	**p = 0.0002**
Business	p = 1.0000	p = 1.0000	p =1.0000	p =1.0000	p = 1.0000	p = 1.0000
Engineering	**p = 0.0006**	**p = 0.0067**	p = 0.0994	p =1.0000	**p = 0.0455**	**p = 0.0001**
Science	p = 0.1616	p = 1.0000	**p = 0.0448**	**p = 0.0077**	**p = 0.0045**	**p = 0.0408**

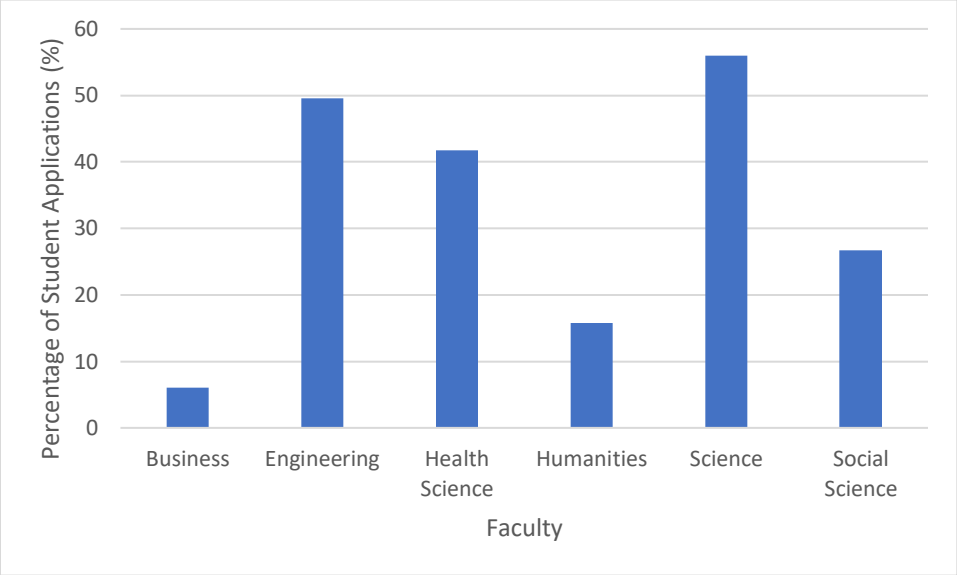
	SUMMER 2020	WINTER 2021	SUMMER 2021	FALL 2021–WINTER 2022	SUMMER 2022	FALL 2022–WINTER 2023
Social Sciences	**p = 0.0395**	**p = 0.0526**	p = 0.2265	**p = 0.0031**	**p = 0.0106**	p = 1.0000
Arts & Science	p = 1.0000	p = 1.0000	p =1.0000	p =1.0000	p = 0.0909	p = 1.0000

Partnership hiring practices

Across all cohorts, the average number of students who applied to projects with faculty members/staff of the same discipline as themselves were calculated. This included all applications, regardless of whether the student was hired. Findings showed that the Faculty of Science had the greatest percentage (56%) of disciplinary student applications. This finding may be a cause for our finding on partnership interdisciplinarity, where the Faculty of Science also had the greatest percentage of disciplinary partnerships across all cohorts compared to other faculties. The greater number of science student applications to science projects may have increased the likelihood of disciplinary partnerships within the faculty.

Findings for disciplinary student application in other faculties include the Faculties of Business (6%), Engineering (49%), Health Sciences (42%), Humanities (16%), and Social Sciences (27%) (Figure 3).

Figure 3. Average percentage of students who applied to projects with faculties of the same discipline across all cohorts



DISCUSSION

Our case study investigates how interdisciplinarity has been acknowledged or neglected within SaP practices. We found that faculty/staff and student partnerships in some faculties were more interdisciplinary than others. Partnerships within the Faculty of Engineering were more disciplinary than other faculties and students in the Faculty of Science were more likely to apply to projects where the faculty/staff partners were also in the Faculty of Science. These findings

provide some insight into Healey and colleague's (2023) call to investigate "what forms SaP might take in different disciplines" (p. 1). More research is needed to determine if these findings are similar across other universities or over time to determine whether the higher degree of disciplinarity in science might be due to the culture of science-related disciplines, related to the institutional culture of this university, or could be limited to the time frame of the study.

We also found variations across cohorts. For most faculties, there was a greater degree of disciplinarity in recent cohorts. Healey and colleagues (2023) ask "under what circumstances disciplines may be an important contextual factor in SaP" (p. 1). Willin and Aarsand (2019) argue that one circumstance might be institutional cultures, as those that embody collaboration and partnership might also value and promote interdisciplinarity (Willin & Aarsand, 2019). There exists a conflict between the cultural valuation of interdisciplinarity and the preference for disciplinarity in some contexts at McMaster University. Students in the course consultant stream of the SPP are preferentially matched with courses in their disciplines, rather than in interdisciplinary partnerships (Foran et al., 2020). This is at odds with the *Partnered in Teaching and Learning Strategy* (McMaster University, 2021), which promotes partnership and interdisciplinary teaching and learning. To overcome this conflict, the SPP must work to clarify its values and identify contexts in which disciplinary versus interdisciplinary partnered practices are most appropriate and should be promoted or dissuaded.

Finally, we found some variation in the projects to which students applied. It has been argued that an individual's disciplinary origin can vary the interest that they take in SaP involvement, so partnerships between those of the same discipline may be easier to cultivate (Healey et al., 2023). Students may choose to apply to projects within their own discipline because of familiarity with the discipline, interest in the subject matter that intersects with their own disciplinary interests, familiarity with faculty/staff partners within one's own discipline, and more. More research is needed to understand students' interests in, experiences of, barriers to, and needs when working in interdisciplinary partnerships. Meanwhile, given the known benefits of interdisciplinarity, such as broadening students' perspectives and promoting diverse epistemologies (Tarrant & Thiele, 2017; Cooke et al., 2020), it may be prudent to encourage students to seek out interdisciplinary partnership opportunities. Doing so might require education about the benefits of interdisciplinary work, as well as support to assist with the difficulties in cultivating interdisciplinary partnerships.

Limitations

The aim of this study was to assess the degree of interdisciplinarity in partnerships at one institution over a period of 3 years to establish a baseline and investigate possible trends. We did not collect qualitative data to understand partners' experiences of working interdisciplinarity. Future inquiry could address this limitation.

The data collected by the SPP is at the faculty level. Consequently, this study measured partnerships within and across faculties. The SPP does not collect data at the disciplinary level. Being that each faculty is made up of multiple disciplines (e.g., the Faculty of Health Sciences is made up of nursing, medicine, midwifery, etc.), it is possible that some of the partnerships found to be disciplinary in this study were actually interdisciplinary. Thus, it is possible that our findings underreport the degree of interdisciplinarity in the SPP.

CONCLUSION

Although the value of interdisciplinarity within SaP literature has been noted by previous scholars (Cooke et al., 2020; Tarrant & Thiele, 2017) and has been considered a priority at McMaster University (McMaster University, n.d.), measuring the degree of interdisciplinarity in a SaP program is needed to assess the effectiveness of implementing interdisciplinary partnerships. Our case study sought to better understand the interdisciplinarity within one university's SaP program, but findings from this case study also allow for further considerations beyond this university. Our findings demonstrated that despite efforts to promote interdisciplinarity, certain faculties were experiencing fewer interdisciplinary partnerships than others, and student applications to partnership projects also varied depending on students' faculty origin.

Our case study exemplifies the importance of measuring interdisciplinarity within SaP efforts so that the direction of partnership programs may be enhanced. More studies in the future could build upon our finding takeaways to better understand *why* there may be variations in interdisciplinarity between faculties and/or certain projects. For example, are students motivated to apply to work in partnerships with faculty/staff of the same faculty origin because of their beliefs in their qualifications, their confidence in offering valuable insights, or the nature of the project's objectives? Answers to such questions can offer a deeper understanding of how we may better promote interdisciplinary work within student partnerships in higher education.

NOTE ON CONTRIBUTORS

Elisa Do *is a social psychology graduate student at the University of Victoria. She studies how community events and activism affect queer people's experiences of embodiment and identity. She received her BSc in Kinesiology from McMaster University in 2022, where she also participated in the Student Partners Program.*

Kelsey Harvey *is an Assistant Professor in the Department of Experiential Studies in Community and Sport at Cape Breton University, Canada. She is a social and educational gerontologist whose qualitative research focuses on physical activity and aging, and interdisciplinary/interprofessional teaching and learning about age/aging in post-secondary education and life-long learning.*

Celeste Suart *combines her love of science and teaching in her work as the Patient Engagement Manager for the National Ataxia Foundation. She received her PhD in Biochemistry from McMaster University in 2023, and is pursuing her MEd in Higher Education Leadership at the Ontario Institute for Studies in Education.*

REFERENCES

Clark, L., Ribéreau-Gayon, A., Sotiriou, M., Standen, A., Thorogood, J., & Tong, V. C. (2019). Developing a collaborative book project on higher education pedagogy: The institutional, organizational, and community identity dimensions of student-staff partnerships. *International Journal for Students as Partners, 3*(2), 99–108. https://doi.org/10.15173/ijsap.v3i2.3714

Cooke, S. J., Nguyen, V. M., Anastakis, D., Scott, S. D., Turetsky, M. R., Amirfazli, A., Hearn, A., Milton, C. E., Loewen, L., Smith, E. E., Norris, D. R., Lavoie, K. L., Aiken, A., Ansari, D., Antle, A. N., Babel, M., Bailey, J., Bernstein, D. M., Birnbaum, R., . . . Woolford, A. (2020). Diverse perspectives on interdisciplinarity from Members of the College of the Royal Society of Canada. *FACETS, 5*(1), 138–165. https://doi.org/10.1139/facets-2019-0044

Cook-Sather, A. (2016). Undergraduate students as partners in new faculty orientation and academic development. *International Journal for Academic Development, 21*(2), 151–162. https://doi.org/10.1080/1360144X.2016.1156543

Cook-Sather, A., Bovill, C., & Felten, P. (2014). *Engaging students as partners in learning and teaching: A guide for faculty*. John Wiley & Sons.

Dimon, R., Pettit, L., Cheung, C., & Quinnell, R. (2019). Promoting botanical literacy with a mobile application—CampusFlora—using an interdisciplinary, student-as-partners approach. *International Journal for Students as Partners, 3*(2), 118–128. https://doi.org/10.15173/ijsap.v3i2.3671

Foran, G., Knorr, K., & Taylor, R. L. (2020). Evaluating factors contributing to positive partnership work in a students-as-consultants partnership program. *International Journal for Students as Partners, 4*(2), 27–44. https://doi.org/10.15173/ijsap.v4i2.4095

Glover, N., Knox, K. J., Kirman, B., Topham, M., Westbury-Hawkins, K., & Holland, P. (2020). Catastrophic co-production: A student-staff partnership for developing an educational game. *International Journal for Students as Partners, 4*(2), 122–131. https://doi.org/10.15173/ijsap.v4i2.4120

Han, X., McDougall, J., Mott, C., & Sudbury, S. (2018). Hunger by the sea: Partnerships in the brave third space. *International Journal for Students as Partners, 2*(2), 71–84. https://doi.org/10.15173/ijsap.v2i2.3493

Harvey, K., & McDermott, A. (2023). Problematizing shared responsibility and sustainability in a grant-funded students as partners program. *International Journal for Students As Partners*, *7*(1), 55–70. https://doi.org/10.15173/ijsap.v7i1.5197

Healey, M., Flint, A., & Harrington, K. (2014). *Engagement through partnership: Students as partners in learning and teaching in higher education*. The Higher Education Academy. https://www.advance-he.ac.uk/knowledge-hub/engagement-through-partnership-students-partners-learning-and-teaching-higher

Healey, M., Healey, R. L., & West, H. (2023). Reflections on disciplinary perspectives on students as partners. *International Journal for Students as Partners*, 7(1), 1–13. https://doi.org/10.15173/ijsap.v7i1.5444

Kiester, E., & Holowko, J. (2020). Redefining the roles of master and apprentice: Crossing the threshold through the co-creation of a first-year seminar. *International Journal for Students as Partners*, 4(1), 66–81. https://doi.org/10.15173/ijsap.v4i1.3826

MacPherson Institute. (n.d.). Student Partners Program. https://mi.mcmaster.ca/student-partners-program/

McMaster University. (2021, June). McMaster Teaching and Learning Strategy. https://provost.mcmaster.ca/app/uploads/2021/06/McMaster-TLStrategy-Web-final.pdf

McMaster University. (n.d.). Partnered and Interdisciplinary Learning. https://provost.mcmaster.ca/teaching-learning/strategy/partnered-and-interdisciplinary-learning/

Nissani, M. (1995). Fruits, salads, and smoothies: A working definition of interdisciplinarity. *The Journal of Educational Thought (JET)/Revue de la Pensée Éducative, 29*(2), 121–128. https://www.jstor.org/stable/23767672

Prescott, J., Cross, D., & Iliff, P. (2020). Co-creating real-world research skills. *International Journal for Students as Partners, 4*(1), 120–127. https://doi.org/10.15173/ijsap.v4i1.3716

Tarrant, S. P., & Thiele, L. P. (2017). Enhancing and promoting interdisciplinarity in higher education. Journal of Environmental Studies and Sciences, *7*(2), 355–360. https://doi.org/10.1007/s13412-016-0402-9

Wallin, P., & Aarsand, L. (2019). Challenging spaces: Liminal positions and knowledge relations in dynamic research partnerships. *International Journal for Students as Partners*, 3(1), 69–83. https://doi.org/10.15173/ijsap.v3i1.3739

Woolmer, C., Sneddon, P., Curry, G., Hill, B., Fehertavi, S., Longbone, C., & Wallace, K. (2016). Student staff partnership to create an interdisciplinary science skills course in a research intensive university. *International Journal for Academic Development, 21*(1), 16–27. https://doi.org/10.1080/1360144X.2015.1113969