THE STATUS OF CLIMATE CHANGE EDUCATION

IN CANADIAN ACCOUNTING, ARCHITECTURE, ENGINEERING AND PLANNING PROGRAMS

APRIL 2025

NATIONAL SURVEY REPORT

UNIVERSITY OF WATERLOO | WATERLOO Climate Institute

ACKNOWLEDGEMENTS

This report is part of the **Accelerating Climate Education for the Next Generation of Professionals** (ACE) project being implemented by the University of Waterloo Climate Institute, with funding support from Natural Resources Canada's Climate Change Adaptation Program.

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CLIMATE CHANGE AT THE UNIVERSITY OF WATERLOO

The Waterloo Climate Institute is the focal point for climate change research, training, and knowledge mobilization at the University of Waterloo. As a hub bringing together researchers from across the University's faculties, the Institute's mission is to elevate and enhance the impact and excellence of innovative interdisciplinary research and education that empowers business, government and civil society to respond effectively to the climate crisis.

The University of Waterloo is also home to Canada's oldest and largest Faculty of Environment, with a long history of climate change education, including Canada's first Master of Climate Change, a graduate diploma in Climate Risk Management, and interdisciplinary collaborations such as a joint program in Sustainability and Financial Management with Waterloo's School of Accounting and Finance, and an interdisciplinary capstone (i-capstone) program with the Faculties of Arts, Engineering, Mathematics and Science.

The University of Waterloo acknowledges that much of our climate education work takes place on the traditional territory of the Neutral, Anishinaabeg, and Haudenosaunee peoples. Our main campus is situated on the Haldimand Tract, the land granted to the Six Nations that includes six miles on each side of the Grand River. Our active work toward reconciliation takes place across our campuses through research, learning, teaching, and community building, and is co-ordinated within the Office of Indigenous Relations.

FOREWORD

PROFESSOR SARAH BURCH

Executive Director
Waterloo Climate Institute

Canada's National Adaptation Strategy represents a bold and necessary step toward strengthening our communities in the face of a changing climate. It acknowledges that the effects of climate change—rising temperatures, extreme weather events, and shifting ecosystems—are not distant threats but immediate challenges that demand urgent and coordinated action. This strategy provides a framework for resilience by promoting nature-based solutions, climate-resilient infrastructure, and inclusive decision-making processes. However, policy alone is not enough. To translate these ambitious goals into tangible results, we must ensure that the next generation of professionals—architects, engineers, accountants, and urban planners—are equipped with the knowledge and skills to integrate climate adaptation and mitigation into their work.

Universities play a crucial role in bridging the gap between policy and practice. Climate change is not just an environmental issue; it is an economic, social, and ethical challenge that requires systemic change across disciplines. Architecture programs must emphasize energy-efficient and climate-resilient building design, accounting curricula should incorporate sustainability reporting and climate risk assessment, and engineering faculties need to train students in resilient infrastructure design. Planning programs, meanwhile, should embed climate adaptation into land-use and transportation policies. By integrating these principles into professional education, we can ensure that graduates enter the workforce prepared to implement climate solutions that align with Canada's adaptation goals.

The urgency of the climate crisis demands that universities act now to embed sustainability and resilience at the core of their programs. As educators, we have a responsibility to prepare students for the realities of a warming world, ensuring they have both the technical expertise and ethical grounding to lead the transition to a more sustainable and resilient Canada. The National Adaptation Strategy provides a roadmap, but its success depends on our collective commitment to learning, innovation, and interdisciplinary collaboration. By reshaping professional education, we can empower the next generation to not only adapt to climate change but to actively shape a more sustainable future.

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EXECUTIVE SUMMARY

INTRODUCTION AND PURPOSE OF THE REPORT

This study was undertaken by the University of Waterloo Climate Institute as part of a national project, supported by Natural Resources Canada, to accelerate the integration of climate change adaptation knowledge and skills into professional degree programs. The purpose of the survey was to provide a high-level assessment of the current state of climate change education (CCE) in Accounting, Architecture, Engineering, and Planning programs in Canada by exploring factors enabling CCE integration, perceived barriers, and the supports needed to accelerate progress. The study consisted of an online survey which was completed by 68 programs across the country from Accounting (6), Architecture (8), Landscape Architecture (2), Civil & Environmental Engineering (21), other Engineering programs (16) and Planning (15). Key findings across disciplines are highlighted in the sections below.

CURRENT APPROACHES TO THE INTEGRATION OF CCE IN PROGRAMS

Overall, the survey revealed that most institutions (93%) are already incorporating CCE through various means, including in program outcomes and course content, but to varying degrees. Architecture and Planning programs are at the forefront, with specialized courses aligning with program outcomes and professional priorities. Over two thirds (68.3%) of all respondents indicated that the basics of climate science were included in their program, but this was higher among Architecture, Planning, and Civil & Environmental Engineering (over 80%) than Accounting and other Engineering programs (under 36%).

Schools were also asked about the inclusion of climate change mitigation (CCM) and adaptation (CCA) in their courses and the results indicate that 37.1% of respondents across disciplines have a required course that addresses CCM, while only 25.4% have a required course that addresses CCA. Around 76.5% of schools include CCM and CCA topics in either required or elective courses, which is promising. There is much variability across programs and disciplines and further study is needed to investigate the depth and breadth of CCE content in both required and elective courses in each discipline.

When asked about pedagogical approaches used to teach CCE, 54.4% of respondents across all disciplines agreed that special teaching and learning approaches were needed to address climate education, while 19% were unsure. Overall, across all disciplines, the top methods used to address climate change included lectures (79.4%) and project work (72.1%). The least used method overall is outdoor learning (14.7%), but notably this is more common in Architecture and Planning. More "innovative" pedagogical approaches (including community partnerships, Indigenous pedagogies, decolonizing approaches and interdisciplinary collaboration) only made up about 50% of all approaches across all disciplines but were notably higher in Architecture (100%) and Planning (86.7%).

CLIMATE SKILLS AND COMPETENCIES

Survey results indicate that climate skills are widely considered to be relevant to students' careers, with an average rating of 4.21/5, though this varies by discipline: Architecture ranked climate knowledge as highly relevant (4.7/5), while Accounting rated it lowest (3.5/5). Despite this perceived relevance, confidence in students' current climate skills upon graduation was moderate (3.45/5), suggesting a gap between the importance of climate competencies and students' preparedness. The Canadian Climate Action Competencies Framework (CACF V2) provides a structured approach to integrating climate literacy into professional education, yet only 36.8% of respondents were familiar with it. Among its six thematic areas, "working together" (4.23/5) and "solutions design" (4.18/5) were ranked as the most relevant overall, reinforcing the need for collaborative, interdisciplinary approaches to climate education.

ENABLING FACTORS FOR CCE

Across disciplines, the top three existing enabling factors for CCE were (1) faculty members with interest/expertise in teaching about climate change (85.3%), (2) priority in the university/college strategic plan (73.5%), and (3) student enthusiasm and interest in learning about climate change (73.5%). The only enabling factor that was identified as present and/or significant by survey respondents for all programs was perceived student enthusiasm/interest. While this finding would benefit from further research on student perspectives, it indicates a promising foundation of support for the integration of CCE in all disciplines.

BARRIERS FOR CCE

Across all programs, the three most highly ranked barriers to the integration of CCE include (1) time constraints (3.56/5), (2) expertise/knowledge constraints of instructors (3.30/5), and (3) the need to cover other accreditation material (3.11/5). Other barriers described by participants included financial constraints (particularly in Planning and Architecture programs), lack of awareness of teaching/learning resources (particularly in Engineering programs), and disciplinary attitudes and norms (particularly in Engineering and Architecture programs).

SUPPORTS NEEDED FOR CCE

Across all disciplines, the top three most important supports needed by departments were: (1) Support developing and/or redesigning courses (3.8/5), (2) Access to relevant teaching/learning resources and tools (3.8/5), and (3) Climate pedagogy professional development for faculty (3.7/5). Other supports mentioned by participants across disciplines include collaboration (resource sharing, central references/resources, collaboration between instructors/faculty members), guidance (with acquiring funding, course design/development support, building expertise (professional development opportunities, new faculty hires with climate change expertise) and relevance (insights about which skills are relevant in industry).

Survey respondents highlighted the need for multiple levels of support to integrate CCE into their programs and courses.

- **Institutions and departments** can assist by helping faculty navigate existing CCE resources and providing professional development on pedagogical approaches. Encouraging collaboration through team-based projects, community partnerships, and interdisciplinary opportunities is also essential. Additionally, hiring (or having access to) faculty with climate expertise and supporting this work with dedicated funding can further advance CCE efforts.

- **Disciplinary networks and professional associations** can support CCE by developing discipline-specific resources, course design guidance, and professional development opportunities. They can also facilitate networking to connect faculty across institutions.

- **Accreditation bodies** can support CCE by identifying and prioritizing climate change and sustainability competencies within each discipline. They should provide guidance on integrating these competencies into existing accreditation requirements and collaborate with institutions to develop discipline-specific frameworks. Additionally, they can promote professional development opportunities for post-secondary instructors.

RESULTS SUMMARY ACROSS DISCIPLINES

	ACCOUNTING	ARCHITECTURE	CIVIL AND ENVIRO ENGINEERING	OTHER ENGINEERING	PLANNING
TOP ENABLING FACTORS	1. Institutional strategic priority 2. Faculty interest & expertise	1. Student enthusiasm 2. Faculty interest & expertise 3. Institutional strategic priority/ Indigenous partnerships	1. Faculty interest & expertise 2. Campus initiatives 3. Student enthusiasm	1. Institutional strategic priority 2. Student enthusiasm 3. Faculty interest & expertise/ campus initiatives	1. Faculty interest & expertise 2. Student enthusiasm 3. Institutional strategic priority/ campus initiatives
TOP BARRIERS	1. Need to cover other accreditation material 2. Time constraints 3. Expertise constraints of instructors	1. Financial constraints 2. Time constraints 3. Need to cover other accreditation material	1. Time constraints 2. Expertise constraints of instructors 3. Limited awareness of resources	1. Time constraints 2. Expertise constraints of instructors 3. Limited awareness of resources	1. Financial constraints 2. Time constraints 3. Expertise constraints of instructors
MOST RELEVANT CLIMATE ACTION COMPETENCIES	1. Climate risk assessment 2. Working together 3. Capacity building	1. Solutions design 2. Working together 3. Capacity building	1. Solutions design 2. Climate risk assessment 3. Working together	1. Solutions design 2. Working together 3. Capacity building	1. Working together 2. Capacity building 3. Effecting change
SUPPORTS NEEDED ACROSS ALL DISCIPLINES	1. Support developing and/or redesigning courses 2. Access to relevant teaching/learning resources and tools 3. Climate pedagogy professional development for faculty				
PERCEIVED SUPPORTS NEEDED FOR STUDENTS	1. Learn about climate change and how it relates to their program 2. Interdisciplinary climate learning and action 3. Engage in climate action on campus and in the community				

CONCLUSION

The survey results highlight both progress and challenges in integrating CCE across professional degree programs in Canada. Addressing time constraints, building faculty capacity, and fostering institutional and professional collaboration will be critical to achieving Canada's climate literacy goals. With targeted support and ongoing research on pedagogical best practices and student needs, post-secondary institutions can play a pivotal role in equipping the next generation of professional accountants, architects, engineers and planners with the knowledge and skills needed to address the climate crisis.

SECTION 1

INTRODUCTION AND CONTEXT

In 2024, the University of Waterloo Climate Institute initiated a project with funding support from Natural Resources Canada's Climate Adaptation Program to help accelerate the integration of climate change adaptation knowledge and skills into professional degree programs at universities and colleges in Canada. The project focuses on Accounting, Architecture, Planning, and Engineering (Civil, Environmental and Systems) programs. This project, Accelerating Climate Education (ACE), responds to Canada's call to train professionals in these fields to meet the challenges of climate change, as outlined in Canada's National Adaptation Strategy (2023).

The ACE project has three components:

1. A national assessment of the current status of climate change education in the target professional degree programs, identifying gaps and supports needed.
2. Integrating climate adaptation into Waterloo's own professional degree programs.
3. Supporting communities of practice to enhance capacity building and sharing of information among post-secondary institutions across Canada.

This report is the culmination of work done under the first component of the project, which was implemented as a national online survey to assess current practices, gaps and opportunities for the integration of climate change knowledge and competencies into existing Accounting, Architecture, Engineering, and Planning programs in Canadian universities and colleges.

This survey adds to a growing body of research on Climate Change Education (CCE) in higher education. The impetus for this work is rooted in the climate crisis and urgent need for solutions. It is also a response to students across Canada and around the world who are worried about climate change impacts and their future (Hickman, 2021) and want to learn how to address it (Galway & Field, 2023).

Universities and colleges have a critical role to play in helping Canada meet the climate change challenge through research on climate science, mitigation and adaptation, climate-proofing post-secondary operations and governance, and integrating climate literacy and action into curriculum, course design and classroom activities (Alexander, 2023; Molthan-Hill et al., 2022). Of these three prongs for action, climate education is lagging the most (Henderson et al., 2017, Leal-Filho et al., 2023, Molthan-Hill et al., 2019). The implementation of university climate education policy is hindered by wider systemic factors related to organizational culture, values, and positionality (Hindley, 2022), as well as an uneven understanding of climate complexity

among faculty members (Leal Filho et al., 2023), how to address it in their courses and programs, and competing demands on curriculum (Leal Filho et al., 2018; Leal Filho et al., 2021). In a recent survey of sustainability topics being integrated into the curricula of Canadian higher education institutions, climate change was not featured as one of the key topics (MacKenzie & Chopin, 2022).

Some nascent research focuses on the integration of climate change and sustainability education into professional degree programs in Canada and elsewhere. These studies reveal some emergent but limited climate and sustainability education initiatives in Architecture (Boarin & Martinez-Molina, 2022; Martinez-Ventura et al., 2021; Mummé & Hawley, 2017; Perdue, 2024), Accounting (Boulianne & Keddie, 2018; Cho & Costa, 2024; Ebaid, 2021; Ferdous et al., 2024; Gomes et al., 2025; Powell & McGuigan, 2024; Sroufe et al., 2021; Wyness & Dalton, 2018), Engineering (Álvarez et al., 2021; Axelithioti et al., 2023; Liu et al., 2024; Ma & Jin, 2022; Powers et al., 2021; Ram, 2024), and Planning (Birchall, 2024; Farhangi et al., 2023; Hamin & Marcucci, 2013; Hurlimann et al., 2020; Infield et al., 2025; Matamanda et al., 2022; Nalla et al., 2022; Park et al., 2022), and point to some of the systemic, cultural, and professional barriers that are hindering CCE efforts as well as some emergent best practices.

In summary, some significant work is being done to integrate CCE and CCA into professional degree programs in the target disciplines, but in all cases, these initiatives are generally nascent and there is a need for an accelerated response. In Canada, research on the status of CCE in higher education in general and more specifically in Accounting, Architecture, Engineering, and Planning is very emergent. More research is needed to understand what is being done, what is working, what the enabling factors and barriers are, and what supports are needed to accelerate this work.

We hope that this study will begin to fill in some of those gaps and provide a foundation for future work and collaboration on CCE in higher education.

The report is organized into several sections:

SECTION 1	Executive Summary	
SECTION 2	Survey Overview	Describes the survey purpose and methodology
SECTION 3	Current Approaches	Presents the results related to how post-secondary institutions are integrating climate change into their programs and/or courses and pedagogical approaches, showing some differences across disciplines
SECTION 4	Climate Competencies and Job Skills	Presents respondents' views of the importance of climate competencies to students' careers, their confidence in students' current climate skills, and the relevance of climate action competencies to their disciplines
SECTION 5	Enabling Factors	Presents findings related to enabling factors that already exist in institutions and departments, and compares these across disciplines
SECTION 6	Barriers and Challenges	Presents perceived barriers that are slowing down the integration of CCE into programs
SECTION 7	Supports Needed	Presents respondents' views on supports needed for departments, instructors and students
CONCLUSION	A summary of key findings across disciplines and next steps to support the accelerated integration of CCE into professional degree programs	

SECTION 2

SURVEY OVERVIEW

This research study led by the University of Waterloo's Climate Institute focused on assessing the current status of CCE in several target professional degree programs, including Accounting, Architecture, Engineering (Civil, Environmental, and Systems Engineering), and Planning. The target programs were chosen because they are aligned with capacity building targets in Canada's National Adaptation Strategy.

The research questions guiding the survey were:

1. What is the current status of CCE in professional degree programs across Canada?
2. What are the barriers and opportunities for CCE in professional degree programs across Canada?
3. What supports are needed to accelerate the integration of CCE into these programs?

The survey was designed and administered as an online bilingual questionnaire using Qualtrics and included a blend of multiple-choice questions, matrix tables, Likert scales, and open text questions, and took approximately 30 minutes to complete. A list of the survey questions is available in Appendix B.

The survey targeted academic program leads with inside knowledge of the target program curriculum as a whole, such as the learning outcomes and content of the required and elective courses being offered to students to complete their degree. Most participants were department chairs and program directors (78%), while the remaining participants were professors and lecturers (22%). Universities and colleges across Canada offering these degree programs were invited by email, phone, and through education networks to fill out the online survey.

The survey was open from October 2024 to February 2025. A total of 68 complete responses were received from universities and colleges across Canada. The breakdown of responding programs is as follows:

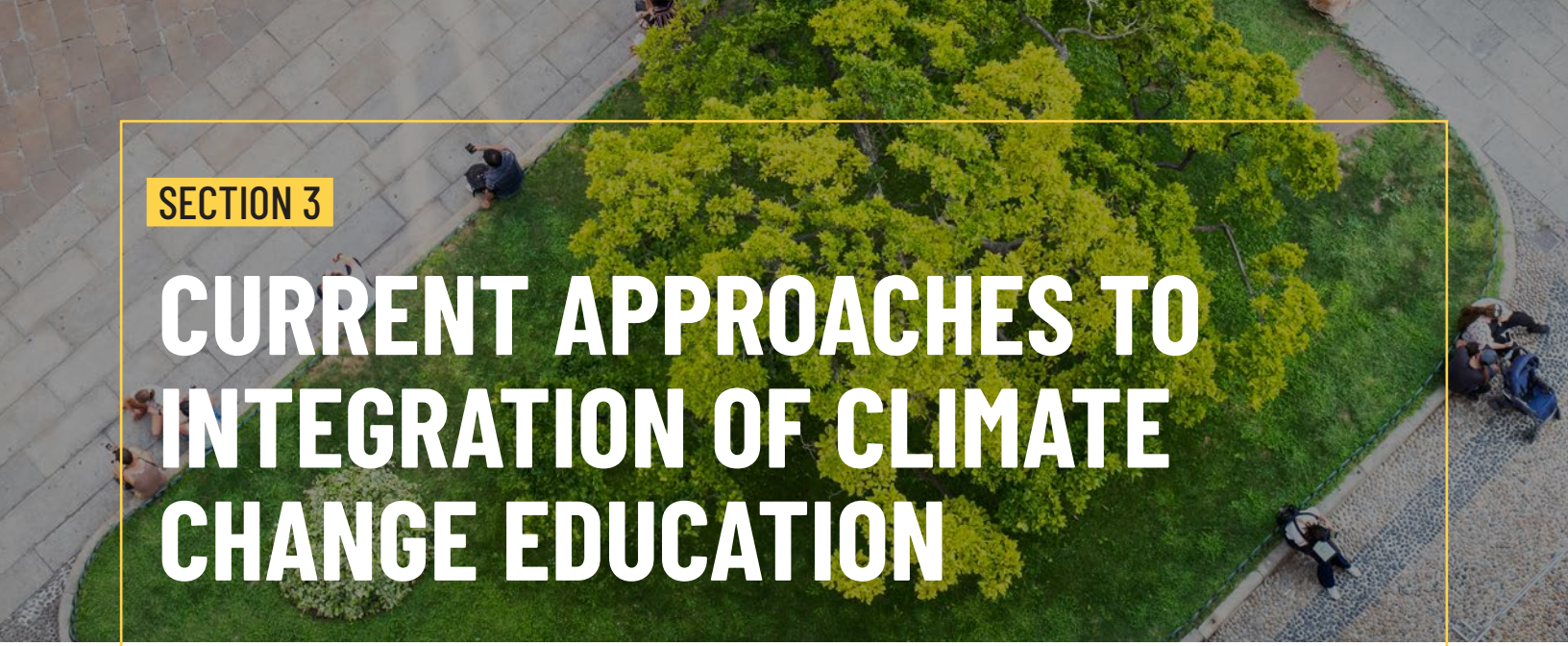
TABLE 1. Participating Programs

PROGRAM	# SCHOOLS
Accounting	6
Architecture (n=8) and Landscape Architecture (n=2)	10
Civil & Environmental Engineering	21
Other Engineering	16
Planning	15

For the purpose of analysis, all Civil & Environmental Engineering responses were grouped together while all other Engineering responses formed a separate group. Landscape Architecture programs were included in the Architecture category. Analysis was completed using the Qualtrics data analysis and results functions. Several open text boxes throughout the survey provided participants with the opportunity to provide qualitative data to supplement the quantitative data collected by the survey. The data from these text boxes was collected and summarized by the research team and is presented alongside the quantitative findings.

This assessment of CCE in professional degree programs in Canada has several limitations to consider, including varied response rates for some programs (notably Accounting, which had only 6 responses), potential limited knowledge of respondents of all CCE efforts in their department, and the risk of potential bias if institutions that responded to the survey have a prior interest in and commitment to CCE.

Despite these limitations, we believe that this study can provide a snapshot of the state of CCA and CCM curriculum in Accounting, Architecture, Civil & Environmental Engineering, and Planning programs. The information that participants have shared can provide insights about enabling factors, barriers, and supports needed to guide the accelerated integration of CCE into programs to prepare the next generation of Accountants, Architects, Civil & Environmental Engineers, and Planners.



SECTION 3

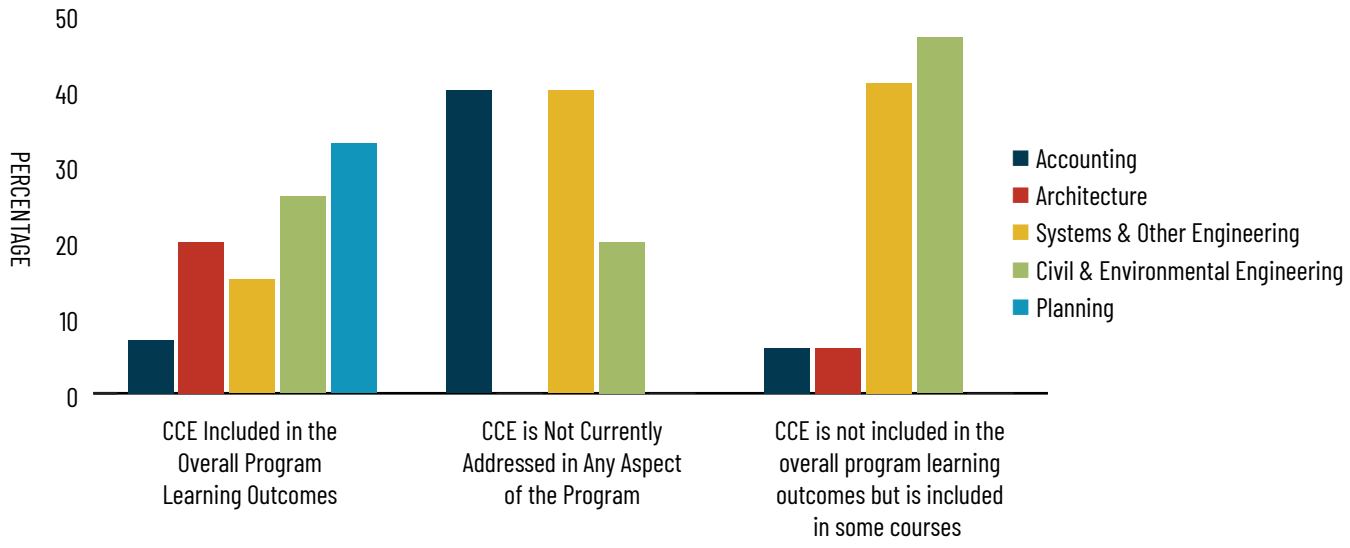
CURRENT APPROACHES TO INTEGRATION OF CLIMATE CHANGE EDUCATION

There are many different ways to integrate climate change into professional degree programs, including mainstreaming into the overall program outcomes, introducing specialized required or elective courses, introducing climate topics in existing required or elective courses, and supporting extra or co-curricular climate education opportunities. The survey sought to learn if universities and colleges are currently working on CCE in Accounting, Architecture, Civil, Environmental and Systems Engineering, and Planning programs, and if yes, how are they doing this.

PROGRAM OUTCOMES

When asked if climate change or sustainability is addressed in their overall program outcomes, 68% of respondents said yes while 7% said their program does not address any aspects of climate change at all. Figure 1 indicates that there are some differences across programs: Planning and Architecture tend to include climate change in program outcomes, while Engineering programs are more likely to include it in courses but not necessarily mention it in their program learning outcomes.

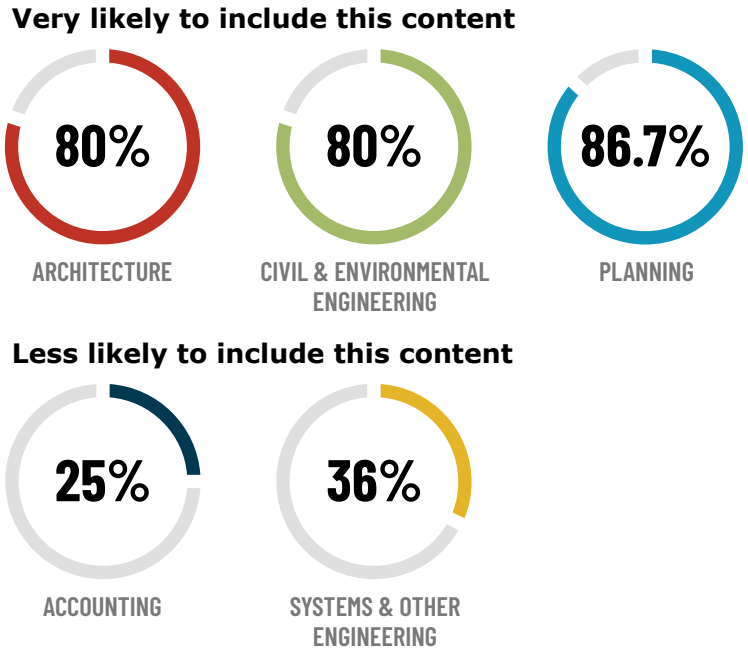
FIGURE 1. CCE inclusion in program learning outcomes and/or courses.
Note that totals do not add up to 100% as respondents could select multiple options



CLIMATE SCIENCE BASICS

By most definitions, CCE should include an introduction to the basics of climate science including the causes, impacts, and solutions. However, this is not always the case. Only 68.3% of respondents indicated that the basics of climate science were taught in their programs. The results regarding the inclusion of climate science varied by discipline, with programs in Architecture (80%), Civil & Environmental Engineering (80%), and Planning (86.7%) more commonly including it, and Accounting (25%) and Other Engineering programs (36%) less likely to do so. (Figure 2)

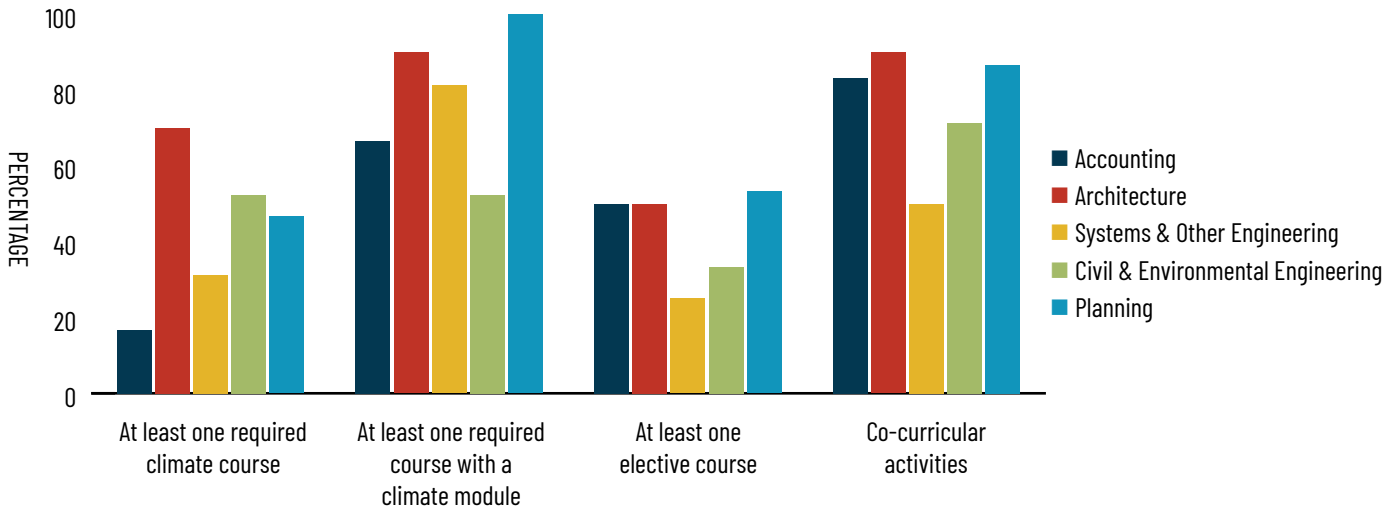
FIGURE 2. Programs that include climate science content



COURSE APPROACH

Programs can adopt a variety of strategies to integrate CCE into their courses. At the more committed end of the scale, they would introduce a required course on CCA, and another focused on CCM, or one that addresses both. They can introduce elective courses, but it can be assumed that not all students will take them. There is a strong argument to be made for the effective integration of climate change content and skills across existing required (and elective) courses, but this requires a high level of coordination between faculty members across the department. The easiest route is to introduce climate topics or modules into these existing courses, but without intradepartmental consultation, this strategy runs the risk of duplication and/or superficial treatment of CCA and CCM actions. Another option is to have co-curricular activities focused on climate change, such as hackathons, design challenges, student conferences, etc. These activities can supplement the curriculum but will not be attended by all students if they are not mandatory. The survey sought to understand some of the different strategies programs are using to integrate climate change into their courses, and the results reveal a wide range of approaches across disciplines, as can be seen in Figure 3.

FIGURE 3. Participants indicated the ways that their programs are currently integrating CCE. Note that totals do not add up to 100% as respondents could select multiple options



Using the information that respondents provided about their approach to the integration of climate change in program objectives and courses, their responses were classified as high/medium/low integration of CCE. The results across disciplines can be seen in Table 2.

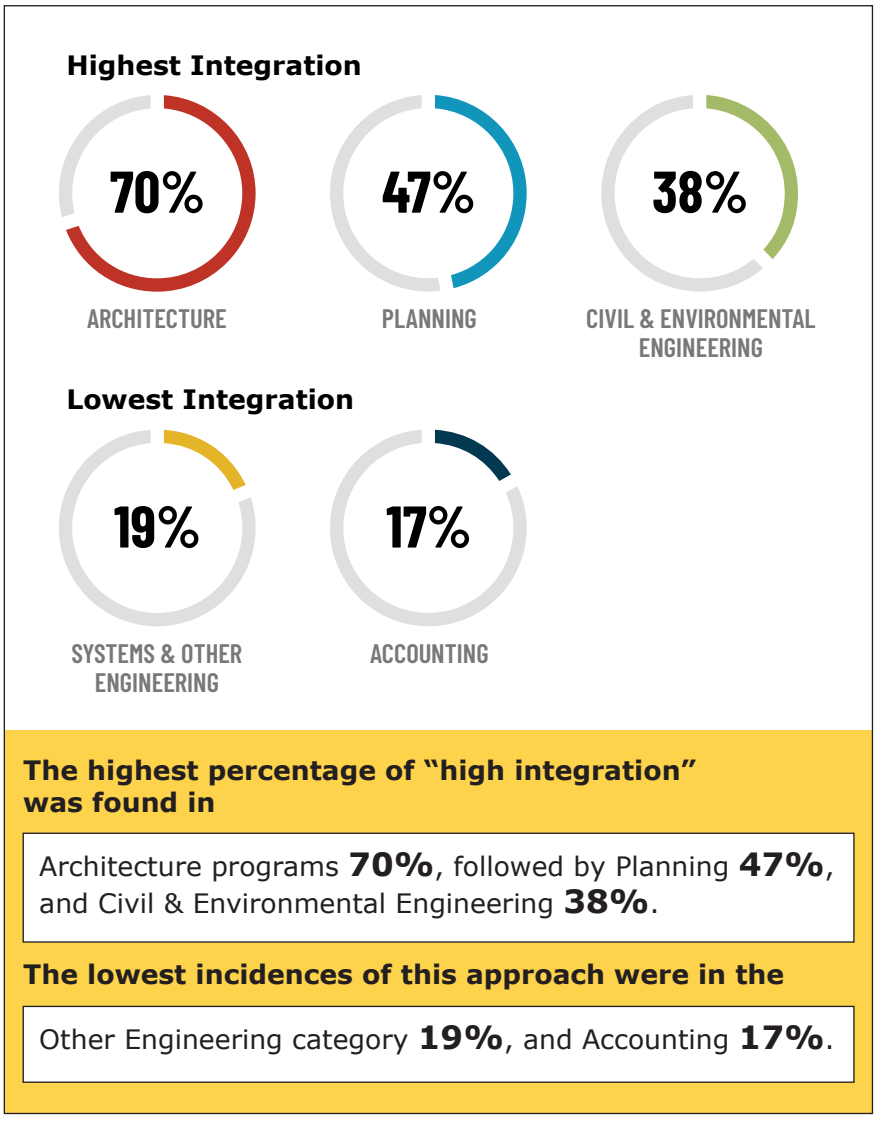
TABLE 2. Approaches to climate change (CC) and sustainability integration across disciplines

INTEGRATION CLASSIFICATION	CRITERIA	% OF RESPONDENTS IN THIS CATEGORY
High Integration	CC/sustainability in program outcomes AND at least one required CC course	38.2%
Medium Integration	CC/sustainability in program outcomes OR at least one required CC course	36.8%
Low Integration	CC elective course OR CC module in a required course	19.1%
No Integration	Not addressing CC	5.9%

Programs that were classified as "high integration" had climate change/sustainability in their overall program learning outcomes and at least one required course focused on climate change. Programs classified as "medium integration" had either at least one required climate change course or had embedded climate change/sustainability in their overall program learning outcomes. Low integration programs had at least a climate change elective course or climate integrated as a module in a required course. Some programs were classified as no integration because they are not currently addressing climate change.

There is a wide variation in the degree of current integration of climate change and climate science across programs. Overall, the responses across disciplines show that climate science is linked to high integration of climate change. For example, Architecture reported high levels of climate science (80%) and was classified as having "high integration" of climate change (70%).

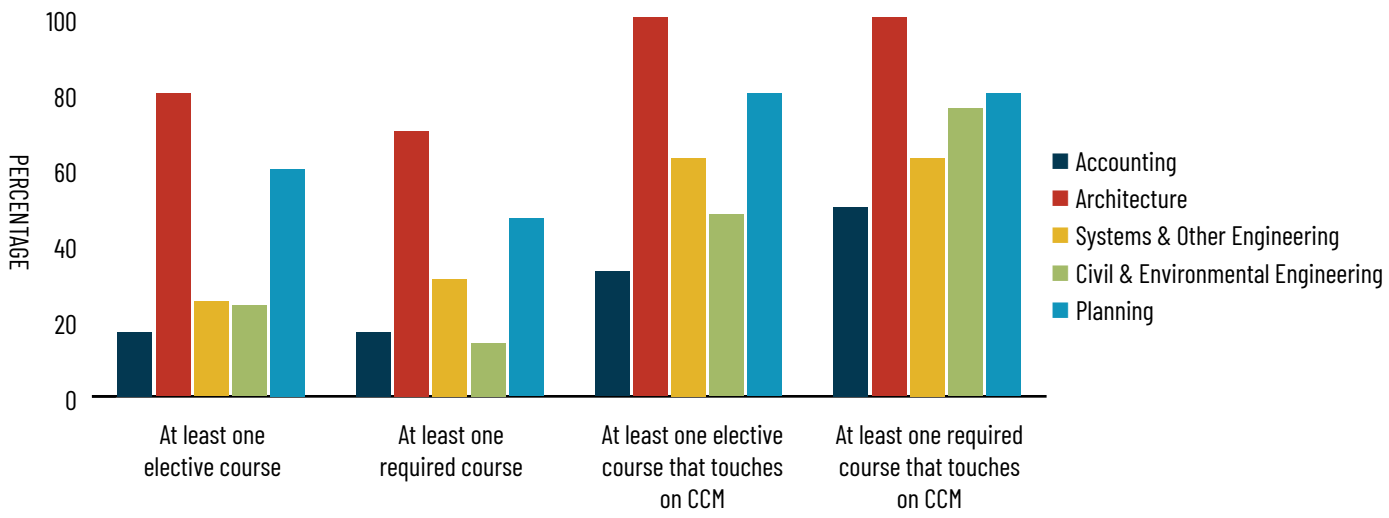
FIGURE 4 – Levels of CCE integration



MITIGATION COURSES

Climate change mitigation (CCM) refers to efforts to reduce greenhouse gas emissions (GHG) from human activities and sequester atmospheric carbon. Some programs have introduced topics related to CCM in their courses or even established dedicated required or elective courses that focus on CCM. Overall, 37.1% of respondents across all disciplines indicated that they have a required course focused on CCM, 43.5% have an elective course, 82.3% have a module on CCM in a required course, and 72.1% reported at least one elective course with a module focused on mitigation. The results indicate that programs are twice as likely to include CCM as a module than have a dedicated course, but also that there is widespread inclusion of CCM in the target programs, particularly in Architecture. Figure 5 provides an overview of how each discipline is integrating CCM.

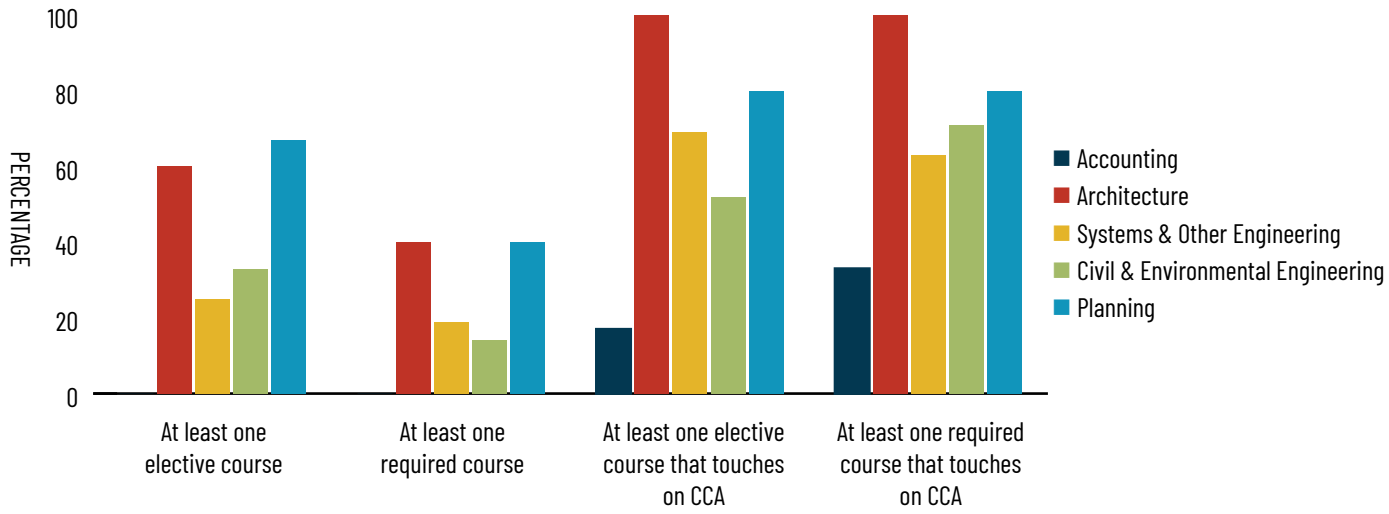
FIGURE 5. The integration of climate change mitigation (CCM) in courses across disciplines. Note that totals do not add up to 100% as respondents could select multiple options



ADAPTATION COURSES

Climate change adaptation (CCA) refers to actions that help humans to prepare for current and future climate change impacts and risks. Across all disciplines, when asked if their programs included CCA in courses currently on offer, 25.4% of respondents indicated that they had at least one required course, 43.5% had an elective course, 79% had a module within a required course, and 73.8% had a module within an elective course. These results indicate that CCA is at least appearing in course topics in all disciplines, and that there are instances in all programs, except Accounting, of required and elective CCA-focused courses being developed and offered. The breakdown across disciplines can be seen in Figure 6. Planning and Architecture are more likely to have dedicated CCA courses than the other disciplines. Although CCA is a newer climate change topic in Canada than CCM, the results indicate that universities and colleges are already addressing it in their courses, albeit mostly via topics in existing courses. The results are similar to those for CCM, suggesting that required or elective climate change courses touch on both CCM and CCA. However, this study did not allow for an evaluation of the depth and quality of these courses and further research is needed to better understand the degree to which programs are integrating CCA in their courses.

FIGURE 6. The integration of climate change adaptation (CCA) in courses across disciplines. Note that totals do not add up to 100% as respondents could select multiple options



PEDAGOGICAL APPROACHES

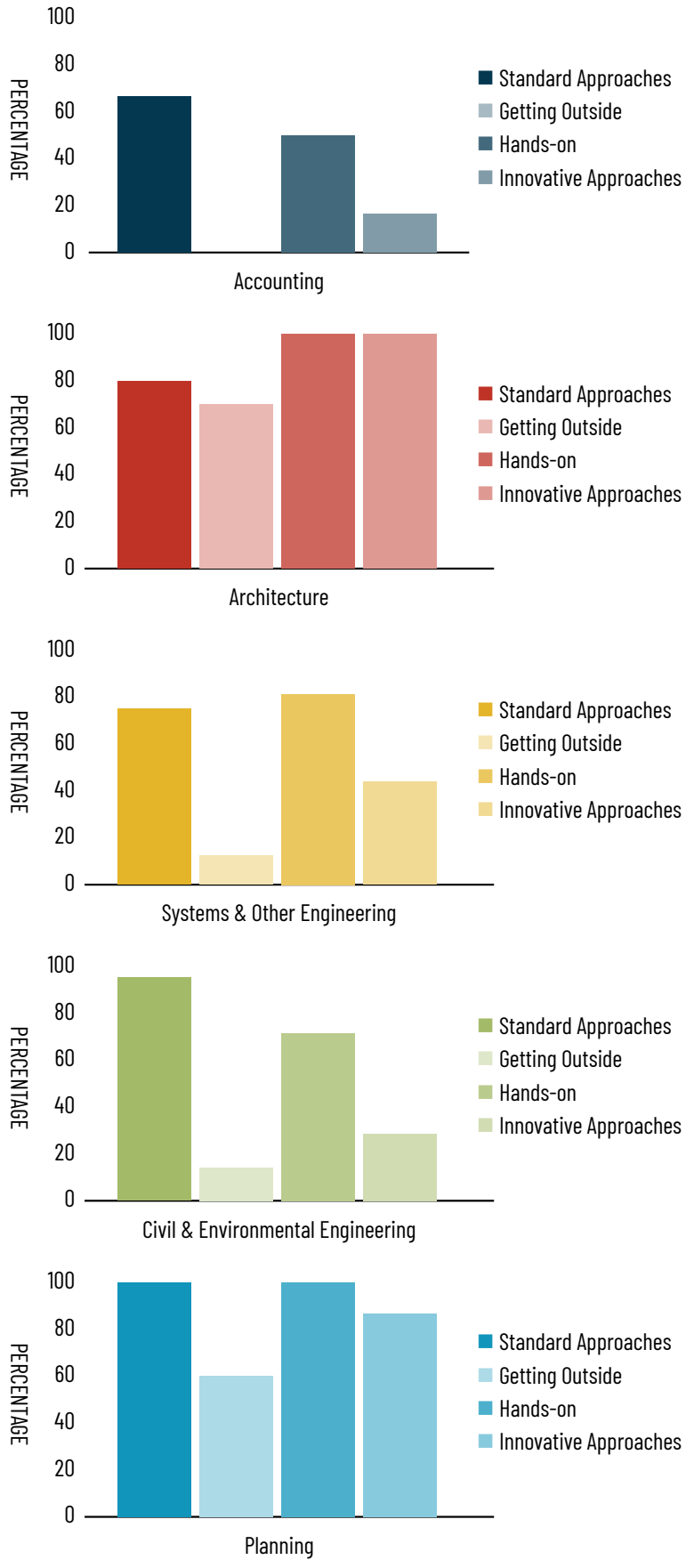
How climate change is taught is as important as what is taught. CCE is the focus of an increasing number of studies, some of which focus on best practices, such as opportunities for hands-on learning, connecting to real world examples with community partners, tools and real databases, engaging students in climate action project work, and integrating climate considerations into assessments (Field et al., 2024; Monroe et al. 2019). The survey found that 54.4% of respondents across all disciplines agreed that special teaching and learning approaches were needed to address climate education, while 19% were unsure.

These results varied quite widely across disciplines. Architecture had the highest percentage of "yes" responses (70%), followed by Civil & Environmental Engineering (61.9%). In contrast, Planning had the lowest percentage of "yes" responses (40%). Meanwhile, Other Engineering had the highest percentage of "unsure" responses (37.5%), and Accounting had the highest percentage of "no" responses (50%). Disciplinary beliefs about climate change requiring special pedagogical approaches/tools do not appear to necessarily correspond to the types of teaching methods used. For example, while Architecture had the highest "yes" response and Planning had the lowest "no" response, both disciplines reported using the most innovative and hands-on teaching approaches, that tend to be the most effective for CCE (Monroe et al. 2019).

Participants were asked to indicate the types of teaching methods currently in use in their departments. Results were grouped into "standard approaches" (lectures, guest speakers, seminars, and research), "getting outside" (field trips, outdoor learning, and place-based learning),"hands on" (case-based learning, experiential learning, workshops, active learning, and project work), and "innovative" (community partnerships, Indigenous pedagogies, decolonizing approaches, and interdisciplinary collaboration).

Across all disciplines, the top methods used to address climate change included lectures (79.4%) and project work (72.1%). The least used method overall is outdoor learning (14.7%), but notably this is more common in Architecture and Planning than in Engineering or Accounting. A breakdown of the approaches used in the different disciplines can be found in Figure 7.

FIGURE 7. Pedagogical approaches being used across disciplines. Note that totals do not add up to 100% as respondents could select multiple options



SECTION 4

CLIMATE COMPETENCIES AND JOB SKILLS

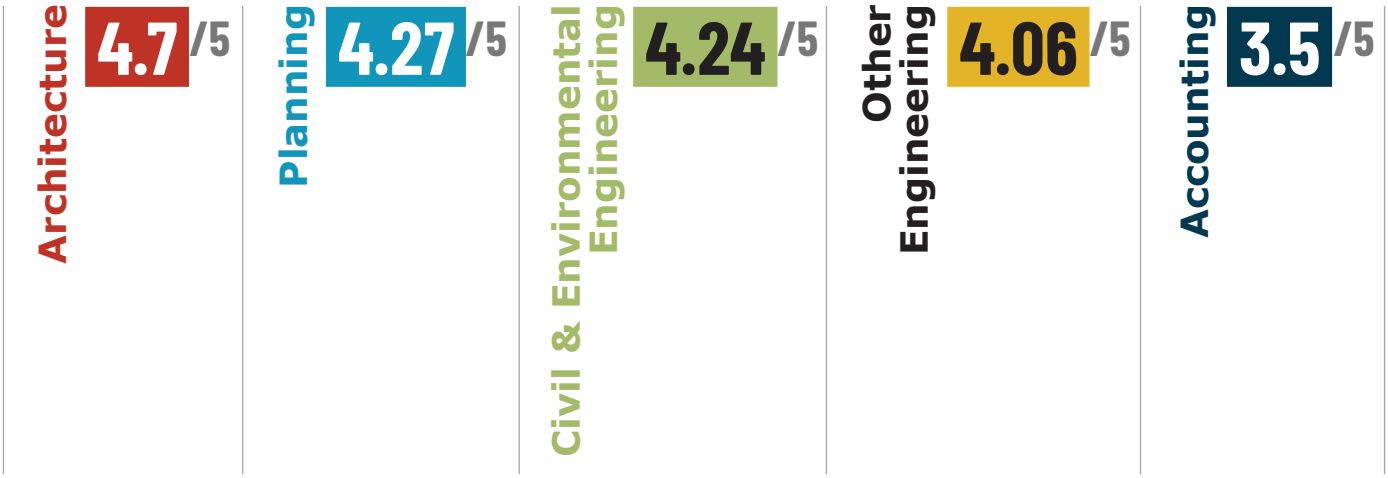
Several questions in the survey were focused on climate skills, or competencies that students need to acquire during their studies in order to be able to effectively address CCA and CCM in their careers. Respondents were asked if they felt that climate change knowledge and skills were relevant for job prospects, how confident they were in their students' current level of "climate skills" upon graduation, and their views on the relevance of climate action competencies to their particular disciplines.

RELEVANCE FOR CAREERS

In general, most participants indicated that climate change knowledge and skills are very relevant to their students' careers, with an average ranking of 4.21/5. However, this ranking varied across programs, with Architecture ranking climate change knowledge and skills as most relevant and Accounting ranking them as least relevant. This confirms that the relevance of climate change is perceived differently across disciplines and extra effort, evidence, and resources may be needed to convince some program leads and instructors of its connection to their profession and support them with CCE integration. (See Fig. 8)

The relevance rates for each of the disciplines, in descending order, are as follows:

FIGURE 8. Relevance of climate change to careers, across disciplines



CONFIDENCE IN STUDENT CAPACITY TO ADDRESS CLIMATE CHANGE

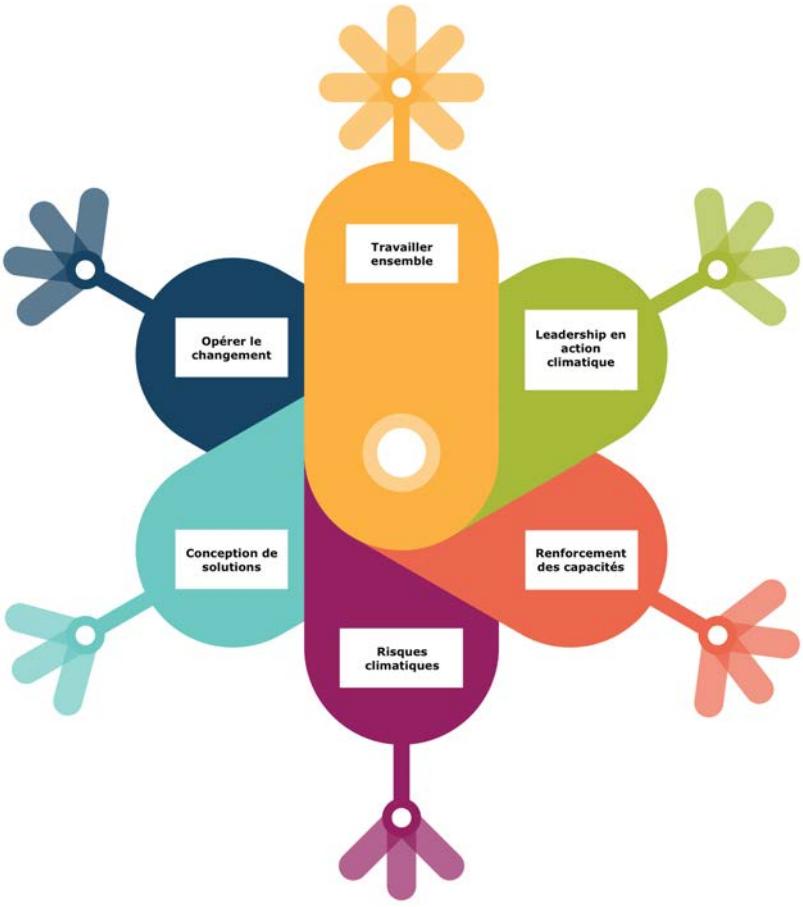
Across disciplines, participants were only somewhat (3.45/5) confident in their students' abilities to address climate change after graduation. It appears then that there could be a disconnect between the perceived (high) relevance of climate change skills to professional careers and the actual skills obtained by students in their education. It also highlights the gap between the stated importance of climate change skills in national strategies for CCA and CCM and instructors' confidence in students' abilities to address climate change: a finding that has consequences for Canada's ability to address climate change in the future.

CLIMATE COMPETENCIES

The **Canadian Climate Action Competencies Framework (CACF V2)**, developed by the Resilience by Design (RbD) Research Lab at Royal Roads University is a resource that can be used "to build climate literacy and climate action capacity" (Resilience by Design, n.d.) among professionals such as accountants, architects, engineers, and planners. Only 36.8% of respondents across all disciplines indicated that they were familiar with this framework.

The CACF V2 organizes climate action competency under six thematic areas, including working together, climate action leadership, capacity building, climate risk assessment, solutions design, and effecting change. Even if they were not previously familiar with the CACF, respondents were asked to score the relevance of these themes to their programs (Table 4).

FIGURE 9. Climate Action Competency Framework (CACF) themes



source: https://resiliencebydesign.com/competencies/

Across all disciplines, the top two relevant themes were working together (4.23/5) and solutions design (4.18/5); while climate action leadership was ranked the least relevant overall (3.4/5). All disciplines ranked the collective of CACF competencies as quite relevant (4.0/5) except Accounting programs, which ranked them lower (2.99/5). This may reflect synergies between the CACF competency themes, and competencies required by some program accreditation bodies. The relevance of "working together" and "solutions design" to respondents provides a strong basis for using the CACF to support the integration of climate competencies into courses required for students' graduation and eventual professional accreditation. This finding also supports the need for collaborative approaches to climate change action/solutions design across disciplines. Potential approaches to this could include team-based projects, activities and assessments, community partnerships, interdisciplinary opportunities, and other collaborative approaches to CCE.

Other highly ranked domains included effecting change and capacity building, while climate action leadership was not in the top 3 domains for any discipline. Given the variation in rankings across disciplines, it is essential for further work to be done to identify which competencies are most relevant for each discipline and incorporate tailored climate action competencies that professionals need into their professional degree programs.

TABLE 3. Relevance of the six domains of the CACF V2 to programs

Relevance of CACF V2 Domains to Degree Programs

	ACCOUNTING	ARCHITECTURE	CIVIL & ENVIRONMENTAL ENGINEERING	OTHER ENGINEERING	PLANNING
Solutions Design	**2.80**	**4.60**	**4.21**	**4.44**	**4.07**
Working Together	**3.33**	**4.60**	**4.16**	**4.44**	**4.60**
Effecting Change	**2.60**	**3.90**	**4.00**	**3.63**	**4.13**
Capacity Building	**3.20**	**4.00**	**3.53**	**3.94**	**4.27**
Climate Action Leadership	**2.40**	**3.40**	**3.68**	**3.80**	**3.73**
Climate Risk Assessment	**3.60**	**3.70**	**4.17**	**3.38**	**3.60**

SECTION 5

ENABLING FACTORS FOR CLIMATE CHANGE EDUCATION

There are many enabling factors and opportunities that already exist in institutions that can support the integration of CCE in their programs. These may include the availability of funding, existing climate initiatives on campus, other related curriculum initiatives (e.g. sustainability, EDI-R, Indigenous reconciliation), community partnerships, and student and faculty member interest.

ENABLING FACTORS ACROSS DISCIPLINES

Respondents were asked to identify the enabling factors that are already in place and could support CCE initiatives in their programs. (See Fig. 10)

Across disciplines, the **TOP THREE** existing enabling factors were:

1. Faculty members with interest/expertise in teaching about climate change **85.3%**,
2. Priority in the university/college strategic plan **73.5%**, and
3. Student enthusiasm and interest in learning about climate change **73.5%**. Student enthusiasm/interest was the only common enabling factor listed across all disciplines, but to varying degrees of importance.

The top enabling factors for each program were:

ACCOUNTING

Priority in university/college strategic plan (67%), faculty members with interest/ expertise (67%)

ARCHITECTURE

Student enthusiasm (90%), Priority in institutional strategic plan (80%), faculty members with interest/expertise (80%), Indigenous partnerships (80%)

CIVIL & ENVIRONMENTAL ENGINEERING

Faculty members with interest/expertise (90%), student enthusiasm (62%), campus sustainability initiatives (76%)

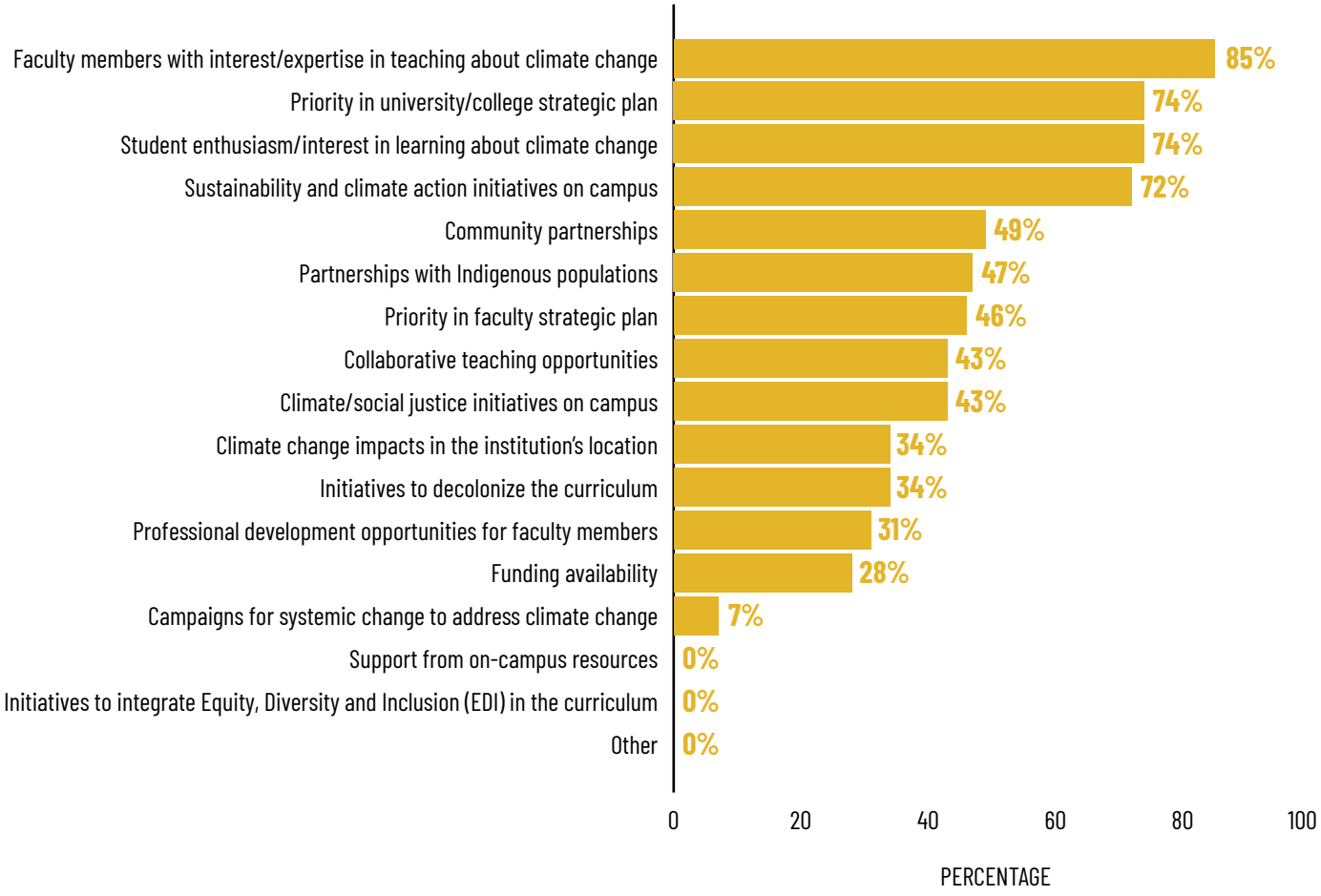
OTHER ENGINEERING

Priority in institutional strategic plan (88%), student enthusiasm (81%), Faculty members with interest/expertise (75%), campus sustainability initiatives (75%)

PLANNING

Faculty members with interest/expertise (100%), student enthusiasm (87%) and priority in institutional strategic plan (80%), campus sustainability initiatives (80%)

FIGURE 10. Existing enabling factors to support CCE across all disciplines



TOOLS AND RESOURCES

Respondents were given the opportunity to share any tools or resources that their department is already using to support climate change teaching and learning. There are a growing number of resources to support CCE in secondary schools and higher education, but few of these were specifically mentioned. For example, resources such as the Climate Atlas of Canada, EnRoads Climate Solutions Simulator, and Climate Insight can be used to find climate data, simulate solutions and find case studies and solutions for climate adaptation. The following resources were mentioned:

- **Accounting:** Existing program with a sustainability focus, faculty members with expertise and interest, and a sustainability team
- **Architecture:** Specializations in climate change; interdisciplinary collaboration; teaching resources such as simulation software, archives, datasets, and reference websites; design-build learning experiences; libraries and faculty members with expertise; and community connections
- **Engineering (all):** Existing courses with sustainability focus; competency framework; research hub; engineering regulatory body website resources; webinars; teaching resources including websites, datasets, and guidebooks; and faculty expertise
- **Planning:** Existing courses; collaboration and partnerships; education support programs; teaching resources including library/archives, digital maps, datasets; faculty members; and supportive departmental environment

SECTION 6

BARRIERS AND CHALLENGES

There are multiple challenges in integrating CCE in professional degree programs, including an already overcrowded curriculum, competencies that must be covered to meet accreditation requirements that do not explicitly mention climate change, and competing strategic and curriculum priorities set within institutions. In addition, instructors may feel hindered by inadequate training in climate science as it relates to their discipline and may have limited time (and interest) to work on curriculum revisions when other teaching, research, and administrative duties may take priority. They may also not be sure where to access climate change teaching/learning resources and data relevant to their discipline.

BARRIERS ACROSS DISCIPLINES

Respondents were asked to identify the greatest barriers to the integration of CCE in their programs and rank them on a scale of **1 TO 5 (5=MOST SIGNIFICANT)**.

Across all programs, the most highly ranked barriers to the integration of CCE include:

Time constraints **3.56/5**, expertise/knowledge constraints of instructors **3.30/5**, the need to cover other accreditation material **3.11/5**, and financial constraints **3.08/5**. (See Fig. 11)

There were a few variations in barriers across the disciplines:

ACCOUNTING

The most significant barriers were the need to cover other accreditation material (4.4/5), time constraints (4.2/5), and expertise/knowledge constraints of instructors (4.2/5).

ARCHITECTURE

The most significant barriers were financial constraints (3.6/5), time constraints (3.6/5), and need to cover other accreditation material (3.6/5).

CIVIL & ENVIRONMENTAL ENGINEERING

The most significant barriers were time constraints (3.6/5), expertise/knowledge constraints of instructors (3.3/5), and lack of awareness/knowledge of resources (3.1/5).

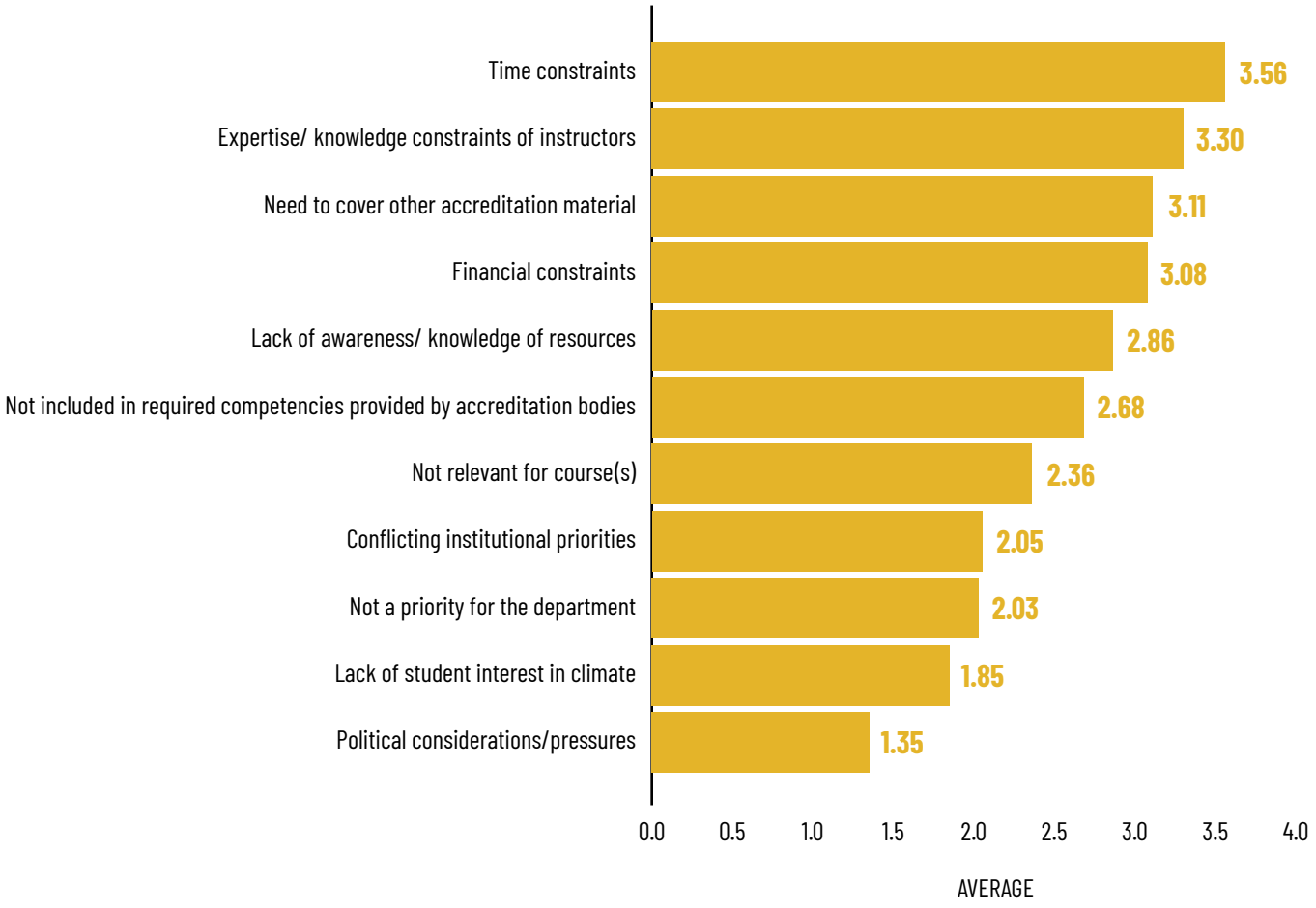
OTHER ENGINEERING

The most significant barriers were time constraints (3.6/5), expertise/knowledge constraints of instructors (3.1/5), and lack of awareness/knowledge of resources (3.0/5).

PLANNING

The most significant barriers were financial constraints (3.2/5), time constraints (3.1/5), and expertise/knowledge constraints of instructors (3.1/5).

FIGURE 11. Barriers to the integration of CCE across all disciplines



The need to cover accreditation materials was only identified as a significant barrier by Architecture and Accounting programs. Because professional competencies defined by accreditation bodies were not mentioned as a significant constraint for Planning and Engineering programs, this suggests that their professional competencies either already include some climate or sustainability content or are broad enough to be interpreted that way.

Participants used text boxes to elaborate on the barriers that are hindering or preventing the incorporating of climate change into their programs. Six key barriers were described:

1) **Accreditation Limitations:** Responses across all programs mentioned accreditation as being a barrier to further integration of CCE. Responses discussed the need to cover other accreditation material, the lack of focus on climate change from accreditation bodies, and the need to teach concepts beyond what is required by accreditation standards.

2) **Time Limitations:** Responses from Engineering, Accounting, and Architecture all mentioned time constraints as a barrier to CCE integration. These time constraints were related to the amount of content that needs to be taught, the need to address existing learning (non-climate related) objectives, full curricula, and students' workloads. In Architecture responses, it was proposed that CCE could be addressed through complementing or reframing existing course topics, or in exchange/replacement of current content.

3) **Expertise/Knowledge Limitations:** Expertise, knowledge, and resource limitations were discussed in Engineering and Architecture responses. Examples include instructors' lack of expertise, differing knowledge levels among academic staff, and uncertainty about what content is being taught in other courses. Another factor that was mentioned is students' limited background knowledge of climate change.

4) **Resource Limitations:** Resource limitations were discussed in Architecture and Engineering responses. These limitations include a lack of awareness regarding institutional resources or supports and a lack of teaching materials.

5) **Funding/Financial Limitations:** Financial constraints were mentioned in Architecture and Planning responses. In particular, the difficulty of addressing CCE given institutional budget constraints was discussed.

6) **Disciplinary Attitudes/Norms:** In Engineering and Architecture, departmental attitudes regarding pedagogy and climate change were mentioned as potential barriers. These factors included a lack of consensus among faculty members about whether climate change is an important/relevant topic for engineering students, and the challenge of integrating CCE into Architecture's design studio-centric pedagogy.

SECTION 7

NEEDED SUPPORTS

Integrating climate change across the curriculum can be a daunting undertaking. As noted in the previous section, there are many barriers that make it challenging for departments to undertake this work, particularly in some disciplines where the connection to climate change is not as obvious (such as Accounting). The survey invited respondents to identify supports that could help accelerate the rate at which climate change integration was happening in their departments.

SUPPORT FOR DEPARTMENTS AND INSTRUCTORS

Across disciplines, participants ranked the importance of different forms of support on a scale of 1 to 5.

Across all disciplines, **the top three most important supports** were:

Support for developing and/or redesigning courses	3.8/5
Access to relevant teaching/ learning resources and tools	3.8/5
Climate pedagogy professional development for faculty	3.7/5

The bottom three supports needed by departments to help them with CCE integration were:

Opportunities to network with other universities and colleges	3.2/5
Support building community partnerships	3.1/5
Insights about students' interests/priorities	3.0/5

Of note, the supports least needed all ranked at over 3/5 and may still be important. Also, the reasoning for the low ranking could be either because these are not considered to be important OR because the departments are already doing this and do not need help.

Several other insights about supports needed by departments with respect to specific barriers emerged:

Respondents who chose **"time constraints"** as a barrier to integrating climate change into the curriculum seem to have identified two important supports needed:

- Developing and/or redesigning courses
- Climate pedagogy development for faculty members

Respondents who chose **"expertise/knowledge constraints of instructors"** as a barrier identified two important supports needed:

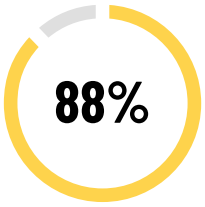
- Climate pedagogy development for faculty members
- Insights about students' interests/priorities

The above findings regarding supports were further confirmed by suggestions shared by respondents for supports that would help with the integration of CCE. Most of the supports mentioned fall under four categories: collaboration, guidance, expertise, and relevance.

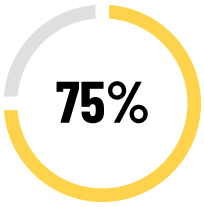
COLLABORATION	Resource sharing, central references/resources, collaboration between instructors/faculty members
GUIDANCE	Support acquiring funding, course design/development support
EXPERTISE	Professional development opportunities, new faculty hires with climate change expertise
RELEVANCE	Insights about which skills are relevant in industry

SUPPORT FOR STUDENTS

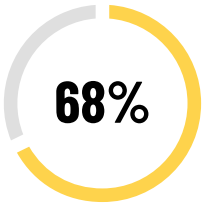
Respondents were asked what supports they believed students needed in order to develop climate change competencies by the time they graduate. The top three supports across all disciplines are:



Opportunities to learn about climate change and how it relates to their program



Opportunities for interdisciplinary climate learning and action



Opportunities to engage in climate action on campus and in the community

These responses are based on the beliefs of program department heads and professors about their students' needs, not on insights provided by students. There is a need for further research into student views on CCE topics and learning methods that they believe would be most useful to help them acquire climate competencies related to their chosen field of study and future profession.

SECTION 8

CONCLUSIONS AND NEXT STEPS

Canada's National Adaptation Plan calls for 70% of professionals, including accountants, engineers, planners and architects/landscape architects to be climate literate by 2027 (Government of Canada, 2023). Reaching this target will require an enormous national effort by the government, municipalities, the private sector, and professional associations across the country. It is imperative that universities and colleges play their role in preparing the next generation of professionals for this work and doing this requires the integration of climate change adaptation competencies into programs and courses across the country. This survey provides a high-level assessment of the current status of climate change education (including adaptation) in Accounting, Architecture, Engineering, and Planning programs in Canada, the factors that help to create an enabling environment for this work, perceived barriers, and supports needed.

SUMMARY OF RESULTS

An overview of the key findings emerging from the survey across disciplines can be found in Table 3. Some overall trends can be seen that seem to transcend disciplines, for example most respondents pointed to the importance of institutional prioritization of CCE and department expertise as important enabling factors for its integration into the curriculum, but most of them (except Accounting) also highlighted the importance of student interest and enthusiasm in CCE as a fundamental enabling factor for this work. Not surprisingly, some of the perceived barriers to the integration of CCE in professional degree programs mirror findings of similar studies across disciplines, particularly faculty time constraints and expertise constraints of instructors. These barriers align with the top supports needed across disciplines, namely support developing or redesigning courses, access to relevant teaching/learning resources, and professional development in climate pedagogy for faculty members.

There are also some key differences across disciplines, which reflect the very nature of those disciplines. For example, Accounting and other Engineering programs scored low on integrating CCE overall, reflecting that these disciplines may not yet see themselves as key players in addressing the climate crisis. Accounting was the only discipline that didn't identify student enthusiasm as an enabling factor, suggesting that the student body may share this view. However, Accounting identified "climate risk assessment" as the most relevant climate action competency, indicating that there is scope for more work to be done in training these professionals.

TABLE 3. Comparison of enabling factors, barriers, and supports needed by disciplines

	ACCOUNTING	ARCHITECTURE	CIVIL AND ENVIRO ENGINEERING	OTHER ENGINEERING	PLANNING
% WITH HIGH INTEGRATION OF CCE	17%	70%	38%	19%	47%
TOP ENABLING FACTORS	1. Institutional strategic priority 2. Faculty interest & expertise	1. Student enthusiasm 2. Faculty interest & expertise 3. Institutional strategic priority/ Indigenous partnerships	1. Faculty interest & expertise 2. Campus initiatives 3. Student enthusiasm	1. Institutional strategic priority 2. Student enthusiasm 3. Faculty interest & expertise/ campus initiatives	1. Faculty interest & expertise 2. Student enthusiasm 3. Institutional strategic priority/ campus initiatives
TOP BARRIERS	1. Need to cover other accreditation material 2. Time constraints 3. Expertise constraints of instructors	1. Financial constraints 2. Time constraints 3. Need to cover other accreditation material	1. Time constraints 2. Expertise constraints of instructors 3. Limited awareness of resources	1. Time constraints 2. Expertise constraints of instructors 3. Limited awareness of resources	1. Financial constraints 2. Time constraints 3. Expertise constraints of instructors
MOST RELEVANT CLIMATE ACTION COMPETENCIES	1. Climate risk assessment 2. Working together 3. Capacity building	1. Solutions design 2. Working together 3. Capacity building	1. Solutions design 2. Climate risk assessment 3. Working together	1. Solutions design 2. Working together 3. Capacity building	1. Working together 2. Capacity building 3. Effecting change
SUPPORTS NEEDED ACROSS ALL DISCIPLINES	1. Support developing and/or redesigning courses 2. Access to relevant teaching/learning resources and tools 3. Climate pedagogy professional development for faculty				
PERCEIVED SUPPORTS NEEDED FOR STUDENTS	1. Learn about climate change and how it relates to their program 2. Interdisciplinary climate learning and action 3. Engage in climate action on campus and in the community				

ACKNOWLEDGING CURRENT EFFORTS

The survey showed that 93% of all institutions who participated in the survey are addressing climate change in their programs, through a variety of means including integration into program outcomes and courses. Some disciplines are well advanced in this work with specialized courses, notably Architecture and Planning programs, and this is well aligned with developments and climate prioritization within these professions. Others are just beginning to work on this, starting with the integration of climate topics in existing elective or even required courses. This provides a very promising foundation for the urgent work of integrating climate competencies into professional degree programs. It also means that there are some best practices in strategies and course design that are beginning to emerge, providing scope for cross-institutional learning and collaboration.

OVERCOMING BARRIERS

Barriers identified by respondents can provide a useful starting point for programs to determine how best to support the integration of climate change. Some barriers were universal across programs while others provide insights into the unique challenges faced by each discipline. Of note is the finding that lack of student interest and political pressures were not identified as barriers, and that time and effort are better spent addressing the real obstacles.

TIME CONSTRAINTS

Time constraints were consistently ranked as one of the most significant barriers by all disciplines indicating that supports should be targeted towards alleviating the time commitment necessary for instructors/departments to incorporate climate change into courses/curricula. Respondents who identified time constraints as a significant barrier indicated that two key supports were needed: (1) help developing and/or redesigning courses and (2) climate pedagogy development for faculty. These results indicate that supports should be targeted towards alleviating the time commitment necessary for departments to incorporate climate change into courses/curricula, and for instructors to benefit from climate pedagogy professional development. Further, strategies enabling universities and colleges to share existing curricula, modules and resources would save time needed to develop new courses and modules from scratch.

CLIMATE EXPERTISE

The second highly ranked barrier across disciplines was the limited availability of faculty members with climate expertise to lead the integration of CCE. A correlation analysis revealed that supports to address this barrier should focus on climate pedagogy development for faculty, better understanding students' interests/priorities, and strengthening relevance of climate change/green skill development for careers in the field. This suggests that the solution is not necessarily to hire new faculty members with climate expertise, but rather to help build capacity among existing faculty members, to draw upon students' insights and priorities, and to bring in industry experts who can speak to climate actions in the workplace and the demand for green skills. Because climate action is still an emergent field, there is scope for instructors to learn alongside their students and provide opportunities for open-ended project and community action work that allow for co-production of climate action knowledge related to each discipline.

ACCREDITATION CONSTRAINTS

The need to cover other accreditation material was also highlighted as a barrier by many respondents across disciplines, particularly in Accounting and Architecture. This points to the need for iterative dialogue between post-secondary institutions and their respective program accreditation bodies, especially for Accounting and Architecture, about the best mechanisms to integrate climate action into the competencies required for graduation and also ensure alignment with current professional requirements. All disciplines recognized the relevance of the Canadian Climate Action Competency Framework (CACFv2) thematic areas, particularly "working together", confirming that the CACFv2 can be a useful resource for reframing professional degree program accreditation requirements.

LIMITED KNOWLEDGE OF AVAILABLE RESOURCES

Civil & Environmental Engineering was the only group to rank lack of awareness/knowledge of resources among their top three barriers. This suggests that these disciplines could benefit from a community of practice and repositories of resources to facilitate the development and exchange of teaching and learning materials related to climate change.

FINANCIAL CONSTRAINTS

Planning was the only program to list financial constraints as their most important barrier. Future studies could investigate the impact that financial constraints have on planning programs and identify activities that are limited by lack of financial resources. One potential strategy to overcoming financial barriers could be to collaborate with other campus initiatives or departments.

SUPPORTS NEEDED TO ACCELERATE CCE INTEGRATION

Survey respondents identified several supports needed to help them with the task of integrating CCE into their programs and courses. Support is needed on multiple levels simultaneously to advance this work. We suggest a list, derived from participants' responses to the survey:

INSTITUTIONS AND DEPARTMENTS

- Support faculty members in navigating/accessing existing CCE resources
- Offer professional development opportunities related to CCE, including pedagogical approaches
- Encourage team-based projects, activities and assessments, community partnerships, interdisciplinary opportunities, and other collaborative approaches to CCE
- Hire faculty members with climate change expertise or collaborate across disciplines to share climate expertise from other departments
- Support faculty members in acquiring funding to pursue CCE

DISCIPLINARY NETWORKS AND PROFESSIONAL ASSOCIATIONS

- Develop and share discipline-specific teaching and learning resources
- Provide discipline-specific guidance in course design/development
- Offer professional development opportunities related to CCE and teaching in each discipline
- Offer networking opportunities to connect faculty members across institutions

ACCREDITATION BODIES

- Identify relevant climate competencies and knowledge for the discipline
- Prioritize climate change and sustainability competencies
- Provide guidance and/or professional development for institutions on how to incorporate climate competencies alongside existing competency/accreditation requirements
- Work with institutions and teaching communities to develop discipline-specific climate competency frameworks
- Provide, facilitate or promote professional development opportunities in climate change and CCE for post-secondary instructors

FURTHER RESEARCH NEEDED

This survey provides insights about the current status of CCE in professional degree programs, barriers, enabling factors, and supports needed, but it has also uncovered the need for further research to better understand how to accelerate this work. Several areas for further research include:

(1) Evaluating the depth and quality of climate change in courses and the degree to which they are contributing to the acquisition of climate action knowledge and competencies among graduates;

(2) Improving understanding of student needs and demand for CCE, and views on climate skills and career paths from students' perspectives;

(3) Gathering insights from the industry perspective on climate knowledge and skills needed in the workplace;

(4) Working from the CACFv2 and other frameworks, identify which competencies are most relevant for each discipline and incorporate tailored climate action competencies that professionals need into their professional degree programs;

(5) In addition to competencies, improving understanding of climate related knowledge to be incorporated into different disciplines (to avoid overuse of introductory/superficial climate content);

(6) Documenting and evaluating best practices for climate pedagogy for the different disciplines.

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APPENDIX - NATIONAL SURVEY TEXT

National Survey: Assessment of Climate Change Education in Canadian Professional Degree Programs

QUESTIONNAIRE

PART 1 – ABOUT YOU

1.1 Which higher education institution are you affiliated with for the purposes of this survey?
1.2 Which discipline are you representing?
1.3. What is your position?

PART 2 - CURRENT APPROACHES

2.1 How does your program address sustainability and climate change education?
2.2 Are the basics of climate science taught in your program?
2.3 Tell us more about climate change adaptation in courses
2.4 Tell us more about climate change mitigation in courses
2.5 What types of learning activities or pedagogical approaches are currently being used for climate change education?

PART 3 – CAREER/PROFESSIONAL DEVELOPMENT

3.1 How relevant are climate change skills/ knowledge to students future job opportunities in the field?
3.2 How confident are you in your students' capacity to address climate change in their careers after graduation?
3.3. How familiar are you with the Climate Action Competency Framework (CACFv2)?
3.4. Please rank the relevance of each of the six domains of the CACFv2 to your program.

PART 4 - ENABLING FACTORS FOR CLIMATE CHANGE EDUCATION

4.1 At your institution which enabling factors are in place to support the integration of climate change education into existing curricula or courses?
4.2 In your view does teaching about climate change require special support for learning, pedagogical approaches and/or educational resources?
4.3 Please explain your response
4.4 Describe any tools or resources that your department is already using to support climate change teaching and learning

PART 5 - BARRIERS AND CHALLENGES

5.1 In your view, please rank the significance of the following challenges or barriers that are preventing your department from incorporating climate change into the program curricula/courses
5.2 If desired, please elaborate on any of these barriers or challenges

PART 6 – SUPPORT NEEDED

6.1 In your view, what types of support would be most important, for your department to incorporate climate change into your program's curriculum or courses?
6.2 Please elaborate on any of these responses if needed.
6.3 In your view, what types of support do students need to develop climate change competencies?

PART 7 – ADDITIONAL DETAILS ABOUT YOUR PROGRAM

7.1 Please describe any other institutional / departmental initiatives and priorities that could intersect with climate change, e.g. decolonizing the curriculum, collaborating with Indigenous communities, co-op programs, mental health initiatives, interdisciplinarity, EDI-R, etc.
7.2 Please share any resources or other information about climate change education in your professional degree program, e.g. links to websites, information about courses, student groups, etc.