Educating the Educators: Results of a Student Survey of Building Performance and Climate Literacy in Canadian Architecture Programs

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During their education, students of architecture in Canada take courses that cover various topics in building performance, including design for climate change and sustainability. But with rapidly changing tools, metrics, terms, and guidelines, educators cannot be sure if our professional requirements and institutional curricula are doing enough to prepare students for future practice. Their current education takes place in a housing crisis and climate emergency, and over the next few decades there will be an inevitable transition to increased use of retrofitting and renewable energy in buildings. There is a need to have a better understanding of how students feel prepared by their education for their future practice in Canada. This poster summarizes results of a web-based survey of Canadian architecture students, asking them if they feel ready for future practice based on what they've learned in their architectural education, specifically relating to design for climate change and sustainable design. Inspired by the ACAN initiatives in the UK, the goal of the survey was to collect the first national data of this kind, and to learn more about student perspectives to inform new thinking about our professional education of architects in Canada. Adapted from a questionnaire by the ARCH4Change Erasmus+ consortium, which is led by Tampere University (Finland), with Aarhus School of Architecture, Denmark; Bologna University, Italy; Taltech, Estonia; and TU Dublin, Ireland, this survey was administered online from Feb 2022 to May 2022. There were 196 responses from all twelve of Canada's accredited architecture schools. The survey asked questions about how the students rate their knowledge of general and specific building performance tools, sustainable design concepts, and climate change knowledge, how they feel building performance, sustainability and climate change are taught and evaluated in their education, and how important they see different aspects of building performance. Responses were a mix of short answer, multi-part questions, and some used a likert scale.

The poster illustrates some student responses and has a link to the actual survey used. The main results were that students report a gap between what they are taught, and what they think they need to know as future practitioners; students responded that they largely do not have confidence in their knowledge about building performance specifically many climate change key terms and concepts; respondents report strong positive opinions about the connection between architecture and climate change and sustainable design; and students report that climate change/ sustainable design issues are not currently being prioritized, evaluated or focused on in design studio. This is the first survey of its kind in Canada that specifically reports on student experiences of their architectural design education specifically relating to sustainability and design for climate change. The results are discussed in connection to responses from other climate literacy reports in Canada such as the Canadian Architects Benchmark Report for practitioners and in the context of international climate literacy initiatives for the professional education of architects such as ACAN in the UK. The analyzed student responses in the survey were used to develop recommendations and conclusions. The findings were used to propose strategies for updating the education of future professionals including focusing on educating the educators. The finding that many of Canada's future practitioners do not feel equipped to tackle the challenges they will face in future practice needs further investigation and immediate action.

Keywords: pedagogy, architecture education, student perception, climate literacy, Canada

EDUCATING THE EDUCATORS

Learning from Student Experiences about Building Performance and Climate Literacy

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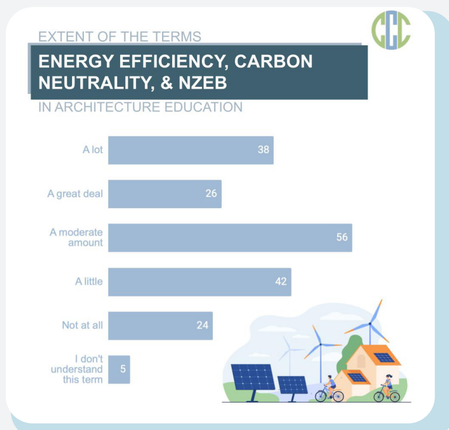
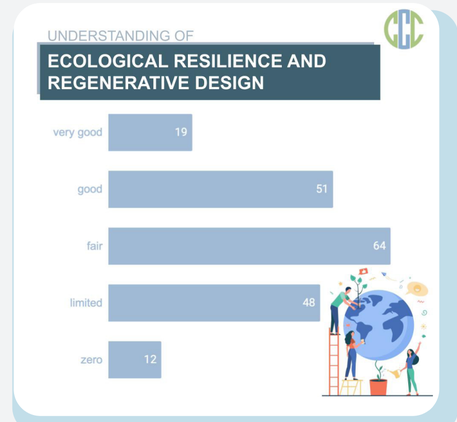
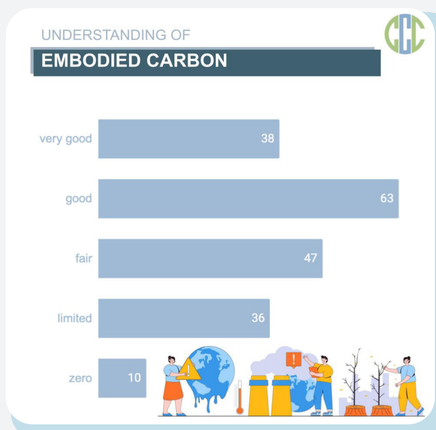
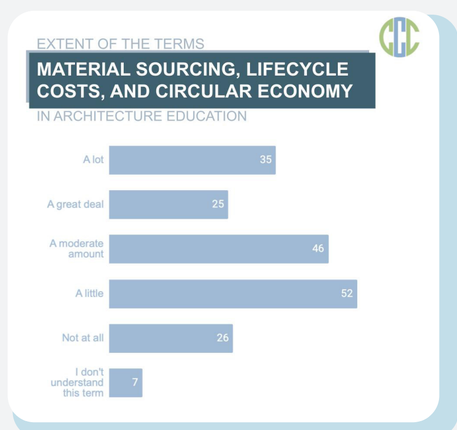
Introduction

During their education, students of architecture in Canada take courses that cover various topics in building performance, including sustainability. But with rapidly changing tools, metrics, terms, and guidelines, educators cannot be sure if our professional requirements and institutional curricula are doing enough to prepare students for future practice. Current professional education takes place in a housing crisis and climate emergency, and over the next few decades there will be an inevitable transition to increased use of retrofitting and renewable energy in buildings. There is a need to have a better understanding of how students feel prepared by their education for their future practice in Canada. This poster summarizes results of a web-based survey of Canadian architecture students, asking them if they feel ready for future practice based on what they have learned in their architectural education, specifically relating to design knowledge relating to climate change and sustainable design.









Background

This study focused on the student experience, but there have been relevant studies on the state of practice in Canada. Some recent initiatives to understand the state of practice include the Canadian Architects Benchmark Report (2023), and there is a section on architectural education (Peters and Kesik 2023) where educators are urged to enhance the existing curricula and initiate an 'adaptive reskilling of architecture' to respond to changing needs. Another relevant initiative is the Rise For Architecture initiative (2023) which aims to chart a path for architectural advocacy and education. Despite the will for more knowledge, leadership and action, the integration of climate change education is not yet reflected in the architecture curricula. There are twelve schools of architecture that meet Canadian Architectural Certification Board (CACB) requirements for accreditation for their professional programs in architecture (CACB 2024). These programs must teach certain courses and topics to maintain their accreditation because it is seen that these requirements prepare students for future practice. Students studying architecture in an accredited program in Canada do not explicitly have a course or project where they must demonstrate their awareness of, and ability to design for and measure their impact on our changing climate. Accredited schools teach sustainability and climate change to varying degrees, in varying ways, but it is not clear if this meets student needs or how it will work with future professional requirements.

Methods

Responses about Student | Attitudes + Preferences

It is important that sustainable design is a core part of the overall educational approach in our school	178/193 (92%) responses either agree or strongly agree
Sustainable design aspects should be embedded in architectural education curricula	184/194 (94%) responses either agree or strongly agree
I am teaching explicitly/am being taught explicitly about sustainable design	115/193 (59%) responses either agree or strongly agree
Addressing sustainable design aspects provides a creative input and inspiration to student designs	171/193 (88%) responses either agree or strongly agree
I am satisfied with the level and depth of teaching content on sustainable design being delivered in my courses	70/194 (36%) responses either agree or strongly agree and 56/194 (29%), are not sure
Sustainable design is formally assessed within the design studio projects	74/192 (38%) responses either agree or strongly agree
Successful student design studio projects must address and work through sustainable design issues	142/192 (74%) responses either agree or strongly agree that "successful" design studio projects must address and work through sustainable design issues
Sustainable design principles are introduced systematically throughout the course with their interdependence demonstrated	This is a slightly unclear question- which course? Is this asking about design studio? The responses were varied: Strongly Disagree - 10; Disagree - 32; Neutral - 51; Agree - 73; Strongly Agree - 28
My understanding of sustainable design concepts has improved since attending and/or being part of this school	148/193 (77%) responses either agree or strongly agree
This school successfully teaches sustainable design	88/194 (45%) responses either agree or strongly agree that their school successfully teaches sustainable design.

Inspired by the ACAN initiatives in the UK (2024), the goal of the survey was to collect the first Canadian data of this kind, and to learn more about student perspectives to inform new thinking about our professional education of architects in Canada. Adapted from a questionnaire by the ARCH4Change Erasmus+ consortium, which is led by Tampere University, Finland: Aarhus School of Architecture, Denmark; Bologna University, Italy; Taltech, Estonia; and TU Dublin, Ireland, this survey was administered online for four months from February to May 2022. There were 196 responses from all twelve of Canada's accredited architecture schools. The survey asked questions about how the students rate their knowledge of general and specific building performance tools, sustainable design concepts, and climate change knowledge, how they feel building performance, sustainability and climate change are taught and evaluated in their education, and how important they see different aspects of building performance. Responses were a mix of short answer, multi-part questions, and some used a likert scale. This poster illustrates some student responses and some takeaways for teaching and learning in architectural design education.

Results

The results confirm that accredited schools explore sustainability and climate change in varying ways resulting in a variety of student experiences. The full results will be published in an upcoming journal article in 2025. A main finding of this study is that students are aware that future practice will require a greater understanding of the environmental impacts of architecture, and that they will be asked to design net-zero buildings and understand metrics for embodied carbon and renewable energy. The results show that students do not feel prepared in some areas. Students report a gap between what they are taught, and what they think they need to know as future practitioners; students responded that they largely do not have confidence in their knowledge about building performance specifically many climate change key terms and concepts; respondents report strong positive opinions about the connection between architecture and climate change and sustainable design; and students report that climate change/ sustainable design issues are not currently being prioritized, evaluated or focused on in design studio.

There was strong agreement that these topics are important and worthy of study. Responses to a question about the importance of studying sustainable design as a core part of architectural education had 178 of 193 (92%) of respondents either agreeing or strongly agreeing. Similarly, 184 respondents either agreed or strongly agreed that it should be embedded in the design curricula. Surprisingly, only 59% of respondents felt that they are being explicitly taught knowledge about sustainable design. The question about whether students felt satisfied with the level and depth of their sustainable design education had only 36% of students either agreeing or strongly agreeing. There were questions that asked student to rate their level of confidence and understanding of key terms in sustainable design and relating to climate change and architecture and the responses largely showed that students would like to learn more.

Discussion + Conclusions

Architecture advocate Scott McAulay has stated: "To not educate students about climate change and sustainability is negligent and verges on denialism" (Crook, 2021). The role of the architect is expanding and changing, and disciplinary boundaries and being challenged. This is the first survey of its kind in Canada that specifically reports on student experiences of their architectural design education specifically relating to sustainability and design for climate change. The study was designed to raise some relevant questions for Canadian educators, some controversial. Should architecture students learn and be assessed on their ability to design carbon-neutral buildings? Or do educators have enough to do in just teaching the required topics to continue to meet accreditation requirements? In Fall 2021, the Architects Registration Board (ARB) in the UK recently announced that schools of architecture must start teaching sustainability (and fire- and life-safety design) to students of architecture to prepare them to be future professionals (Hopkirk 2011). While changing the conversation in schools and in practice is not simple, it is hoped that studies like this one are the start of collecting and analyzing national data about the student experience in education. If new skills are needed from educators, how can we upskill and teach educators? Should there be required learning for architectural design and building science educators?

Future work will discuss the findings in relation to specific new skills and courses that could be developed by – and perhaps for- Canadian educators and students. The findings can be used to propose strategies for updating the education of future professionals including focusing on educating the educators. The finding that many of Canada's future practitioners do not feel equipped to tackle the challenges they will face in future practice needs further investigation and immediate action.

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