CLIMATE LITERACY & ACTION IN ARCHITECTURE EDUCATION

AUSTRALASIAN PERSPECTIVES

PROJECT REPORT
MARCH 2022

Australian Institute of Architects

ASSOCIATION OF ARCHITECTURE SCHOOLS OF AUSTRALASIA

ACKNOWLEDGEMENTS

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Title Climate Literacy and Action in Architecture Education: Australasian Perspectives

Cover Architecture Design Studio (Rawpixel/Adobe Stock)

March 2022

This report is a summary of the results of a survey conducted in 2021 across all architecture schools in Australia and New Zealand. The survey was undertaken as part of a broader project that aimed to understand curricula and engagement with climate change in architecture education. Additionally, the project sought to examine current knowledge, values, and beliefs about climate change among staff and students in architecture schools.

The project was funded and supported by the Association of Architecture Schools Australasia (AASA) and the Australian Institute of Architects.

The work has been completed by a team of academics across six universities: The University of Queensland, Queensland University of Technology, The University of New South Wales, Bond University, The University of Sydney, and Monash University. Copy-editing was funded by the Women in Research Sub-Committee, Queensland University of Technology, and supplied by Raspberry Editing Services.

“Architecture students today are the future architects for the world, so creating a more sustainable future must start with us.”

// Architecture Student

Figure 1. Student model construction (Jjfarq/Adobe Stock)

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01
EXECUTIVE SUMMARY

When it comes to climate action in Australasian architecture schools, students and staff are ready for change. This report provides insight into staff and students' knowledge, values, and beliefs about climate change at a critical junction for architecture schools, just as the entire built environment sector is called to respond to the climate crisis.

Figure 2 shows the five main themes emerging from 637 responses to a survey that was sent to staff and students across 26 architecture schools in Australia and New Zealand at the end of 2021. These themes are expanded on throughout the report, using a combination of qualitative and quantitative data.

Staff and students are almost universally concerned about climate change, are willing to take action, and wanting to see more teaching and research on sustainability and climate action in their schools (Theme 1). However, they feel obstructed by barriers, and their frustration, coupled with a strong sense of responsibility (Themes 2 and 3), causes feelings of powerlessness and uncertainty.

The survey responses indicate that architecture schools are a latent source of potential climate action, and are places where rich expertise sits adjacent to students who are readied but lacking agency.

There is a sense of stasis, which coincides with architecture schools favouring a curriculum focus and overlooking the potential of pedagogical approaches to support climate literacy (Theme 4). This oversight disempowers learners further, where more integrated approaches could foster agency and confidence. Higher order thinking needs to be incrementally constructed so that students can understand complex, system-scale problems like climate change (Theme 5). Without this pedagogical shift, architecture education risks superficial or tokenistic engagement with climate change issues.

The five themes emerging from the survey point to a state of tension between the action that staff and students want to see, and the challenges they face in implementing change. The urgent necessity for action has been reinforced by the widespread adoption of net zero carbon targets, as well as the accreditation requirements outlined in the National Standard of Competency for Architects (NSCA), which governs degree accreditation, professional registration, and ongoing continuing professional development[1]. Further, calls to transform architecture education in response to climate change also coincide with another crisis, as universities manage the strain of COVID-19.

The report's key recommendations show that addressing climate change in architecture education is not necessarily about radical curriculum overhaul. Rather, climate literacy in architecture can be developed using a wide range of lenses, by drawing on schools' existing research strengths that are connected at a program level.

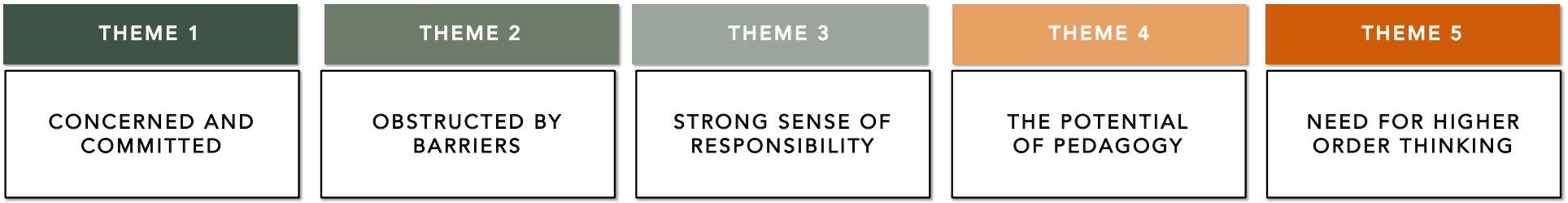


Figure 2. Summary of main themes

02
INTRODUCTION

Every level of Australian architectural accreditation and registration is currently under review. Schools of architecture are foregrounding climate change issues in parallel with architectural practice as the new 2021 NSCA[2] is being readied for implementation. Among its many changes, the new Standard reflects a substantially increased emphasis on issues of climate change and sustainability. This same Standard aligns architecture degrees with professional competency for registration and informs continuing professional development (CPD) for practicing architects.

Momentum for change is reinforced by initiatives such as Australian Architects Declare, and the Australian Institute of Architects committing to net zero operational carbon emissions in the built environment by 2030. As well, the National Construction Code (NCC)[3] is under review to improve energy efficiency and thermal performance, the Australian Building Codes Board (ABCB) has joined a newly formed Global Resiliency Dialogue[4] advocating for climate resilient building codes, and the CSIRO have released predictive weather datasets for building energy modelling until 2090[5].

Architecture is thus facing a "trickle-down" of impacts: industry is adjusting, and education is being called upon to respond. Hence, as an entire profession upskills and is transformed, architecture education finds itself at a crossroads where widespread curriculum reform is needed.

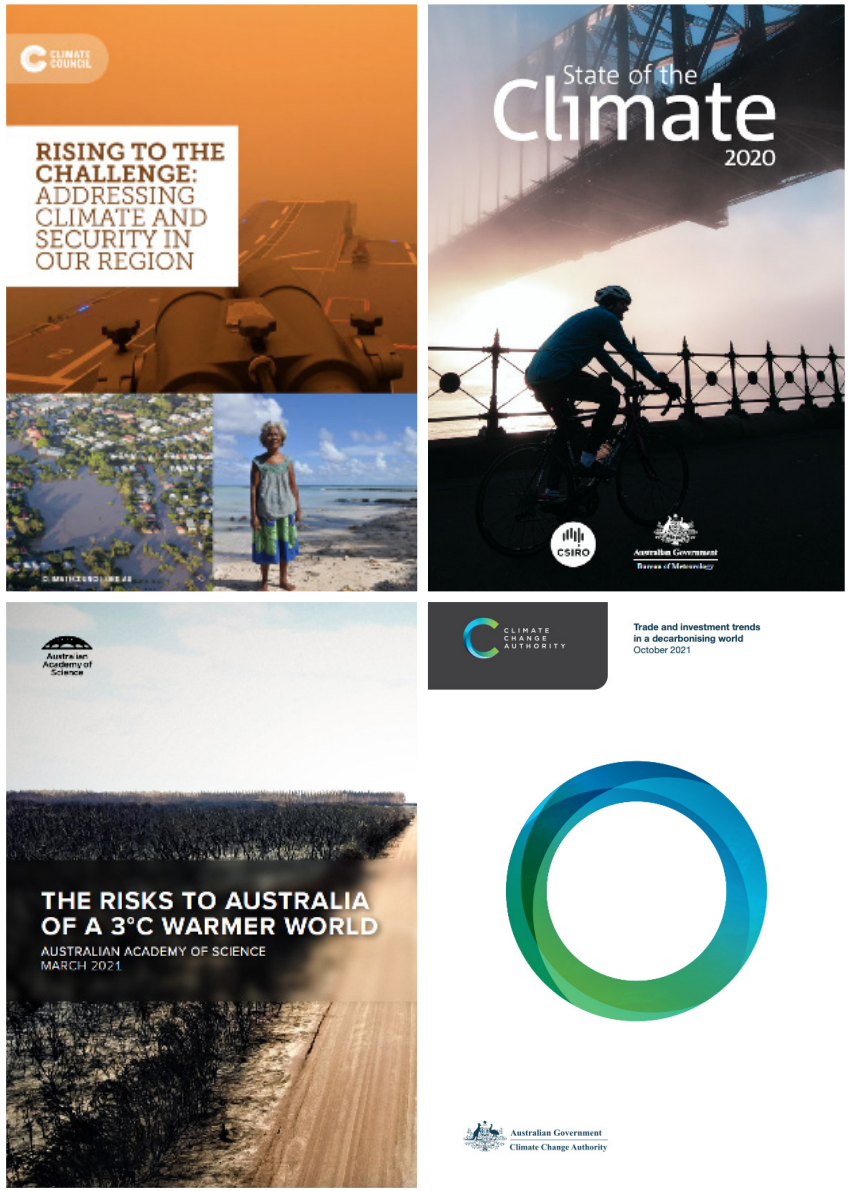


Figure 3. Key publications from Climate Council, CSIRO, Australian Academy of Science and the Australian Government

Figure 4. Design critique (as-artmedia/Adobe Stock)

Architecture schools are also fertile ground for lifelong learning via the practitioners who frequent design studios and bring "real-world" projects back into the classroom. Architecture education finds itself adjacent to an entire profession that is upskilling in parallel to widespread curriculum reform.

To effectively transition research activity, curricula, and pedagogical approaches in response to 21st-century sustainability challenges, architecture as a discipline must also reckon with the social dimensions that inform built environment design. At its most fundamental level, this shift needs to acknowledge the student learning experience within architecture programs, while also being aware of the emotional impact of learning about climate change and "crisis subjects". It is therefore also important to contextualise the student voice and ensure responsiveness to what the Deloitte Global Millennial Survey (2019) has described as "a generation disrupted"[6]. As awareness of climate change impacts increases, so too does the effect of climate- or "eco-anxiety", a challenge that impacts both learners and educators alike.

While this project is situated within a broader context of sector-wide change, to chart a path for architecture education, we must first examine the climate literacy of architecture staff and students in our region. When coupled with a clear understanding of current action within architecture schools through research, teaching, and learning, we can begin to design the future of architecture education.

03
THE SURVEY

The research design for the Climate Literacy and Action in Architecture Education project was conceived in three phases (see Figure 5). Phase 1 involved a pilot survey in late 2020, conducted as a scoping study of (primarily) architecture schools' leadership, as well as a small number of student respondents. Findings from that Phase informed the survey questions for the main Phase 2 survey, which was launched in October 2021. This report outlines the findings from the Phase 2 research.

The main survey was distributed throughout all architecture schools in Australia and New Zealand to gather perceptions about education in climate change and sustainability from all key stakeholders—students, PhD researchers, sessional academics, and faculty staff. Questions sought to explore: (1) general attitudes toward the climate crisis, (2) what is being taught and researched in schools regarding sustainability, (3) perceptions of the role architecture education can play in addressing climate change challenges, and (4) what stakeholders' hopes are for the future of architecture. Questions invited a combination of Likert scale and short answer responses that were analysed both quantitatively and using thematic analysis techniques.

As part of the project, two webinars were held to gather international perspectives and to present the initial results of the main survey. A recording of the results outlined in the initial version of this report can be viewed on the AASA website[7].

Figure 5. Research design

PARTICIPANTS

A total of **637 participants** completed the online survey, which was distributed to all architecture schools in Australia and New Zealand in October 2021. The survey link was emailed to distribution lists obtained through both AASA and the Australian Institute of Architects membership lists, and sent across multiple social media platforms.

Of the **410 student** responses, **69%** were undergraduates and **31%** were undertaking a postgraduate degree.

Of the **92 academic** respondents, **58%** identified as standard academic staff, **24%** as course coordinators, and **18%** were heads of academic units.

Of the **108 sessional staff** who responded, **74%** were solely involved in sessional teaching and **26%** were both sessional staff and research scholars—whether as PhD students or postgraduate researchers.

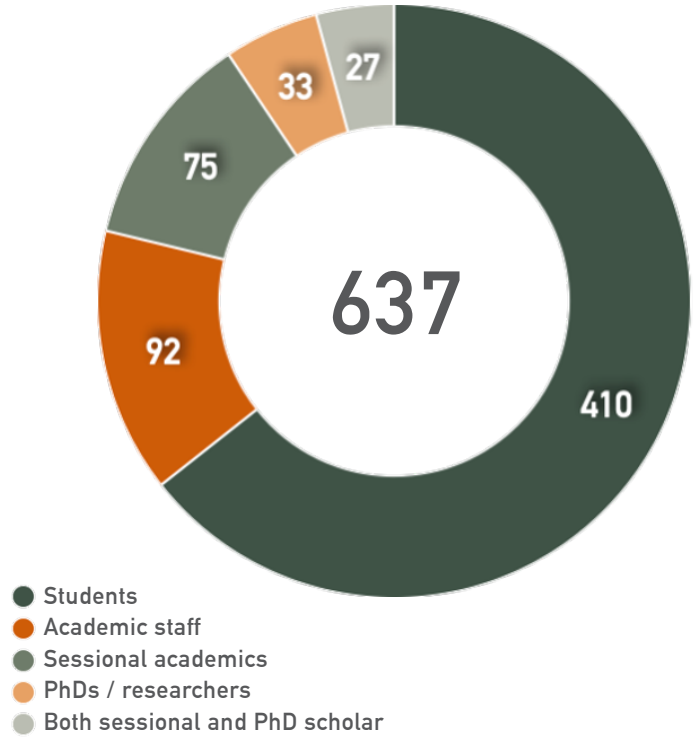


Figure 6. Summary of survey participants by type of respondent

04
POSITIONS ON CLIMATE ACTION

The first part of the survey aimed to reveal staff and student positions on climate change and sustainability, as well as establish perceptions about how "motivated to act" people are in relation to these issues.

Responses indicated high levels of concern about climate change and sustainability issues among both staff and students across all architecture schools. This concern was not only about climate change itself, but was reflective of a sense of responsibility, recognition of observed changes to practice, and the need to maintain a currency of knowledge. As one participant put it: "Information keeps evolving and I'm concerned about the currency of what I know."

The concerns expressed were matched with a strong sense of commitment from those surveyed. Respondents were keen to see more research, teaching, and learning about climate change and sustainability. They were more likely to express confidence in these areas if their own work was connected to climate action or sustainability in some way.

"Climate change and sustainability needs to be built into all subjects across the program and embedded into the curriculum

... with suitable resources I would be confident."

// Academic

How concerned are you about climate change and sustainability issues?

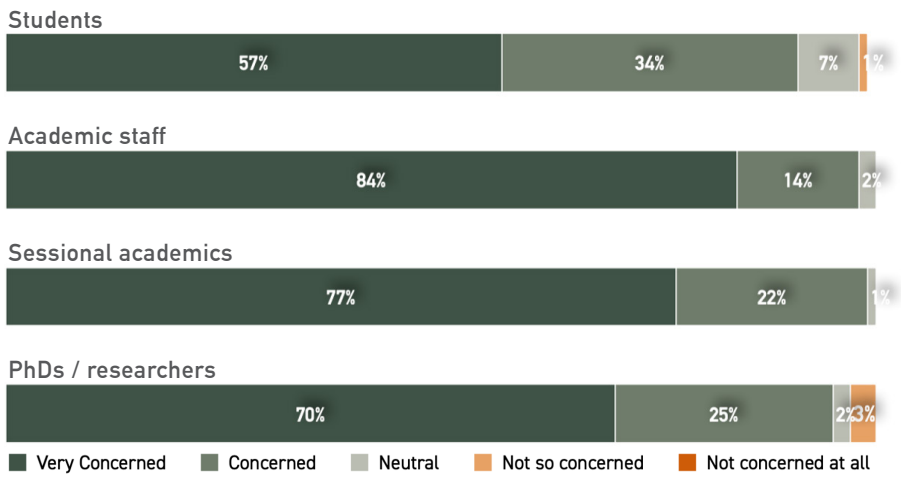


Figure 7. Comparative levels of concern

Can architects be part of the solution for climate change?

95%
Strongly Agree or Agree

STRONG LEVELS OF CONCERN

The distribution in Figure 7 shows very strong levels of concern about issues of climate change and sustainability across all types of respondents. At least 95% of respondents indicated that they were either "concerned" or "very concerned" about these issues.

Qualitative responses indicated that these concerns were magnified by frustration about "conservativism", "ignorance", and the sense that architecture only pays "lip service" to the problems of climate change and sustainability. Others expressed concern about their own knowledge or expertise regarding climate change and sustainability. Students often relayed concern about the future, inlcuding whether it would be possible to find work in practice where they could contribute towards sustainable and climate-responsive projects.

Academic staff had the highest levels of concern, with 84% indicating that they were "very concerned" about climate change and sustainability issues. This was followed by 77% of sessional academics, 70% of PhDs / researchers, and 57% of students indicating strong concern. Only PhDs / researchers (3%) and students (1%) had any response at all in the "not so concerned" categories.

These high levels of concern were coupled with strong agreement about architects' role in climate change and sustainability issues. At least 95% of respondents across all participant types "agree" or "strongly agree" that architects can be part of the solution to climate change.

HIGH LEVELS OF MOTIVATION

While survey respondents indicated high levels of concern, there was also a strong sense of both commitment to action and willingness to contribute to positive change through the work of architecture schools.

Interestingly, participants' self-reported motivation levels aligned closely with others' perceptions of their "motivation to act". 78% of students were described both by themselves and others as "very motivated" or "motivated"; this response held for 73% of academic staff. Perceptions of motivation declined for school leadership, where only 54% were seen to be either "very motivated" or "motivated", followed by 49% of university leadership, and 47% of industry groups and practitioners.

In total, 95% of all respondents "agree" or "strongly agree" that they want to see more teaching about climate change and sustainability in their degree programs. Qualitative responses indicated that this was seen as potentially beneficial for both students and the profession, provided schools don't allow "greenwashing" or "tokenism" in the curriculum. Many of the participants' remarks showed a strong commitment to upskilling and developing further understanding.

"We cannot continue to teach in a conservative ... climate ignorant manner. We still just pay lip service to this issue and students are not convinced we know what we are talking about."

"I am committed ... personally, as well as in conjunction with colleagues, for the benefit of our students. I am confident in being able to deliver this as part of a broader set of knowledge, tools, and skills, but for more advanced content, I'd undertake some upskilling."

Architecture Academic

"I believe that I have a good hand with observing and speaking about these principles whilst remaining critical to the times when they fall short and are greenwashing."

Sessional Academic

"I am a bit worried (about) when I finish my degree. Can I really join an architecture firm to solve climate problems? Will I have a chance to take part in the whole world of sustainable design?"

Architecture Student

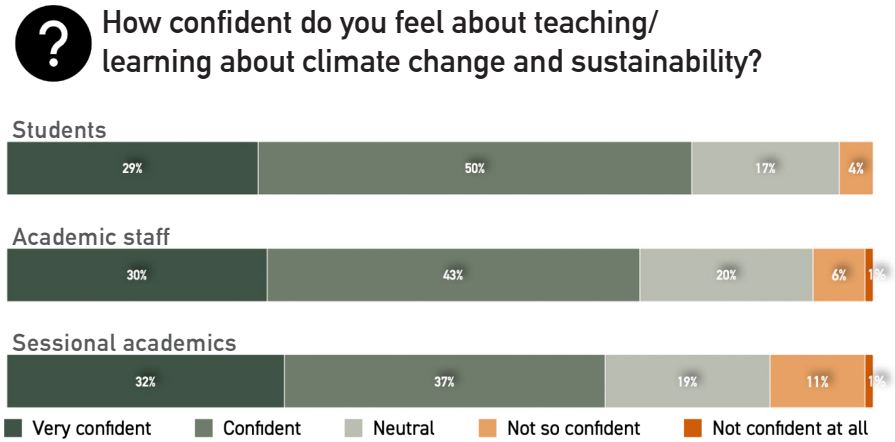


Figure 8. Comparative levels of confidence

"... given the lack of political will ... and also the sheer avoidance of responsibility for climate action from wealthy nations such as ours, ... I would like to see a radical overhaul of all aspects of architecture, I guess."

Architecture Academic

"[My hope is for] a discipline that acknowledges that it has been patriarchal, heteronormative, white, ableist, 'merit-based', and 'heroic' in all of our methods and primary representational techniques."

Architecture Academic

OBSTRUCTED BY BARRIERS

Educators often perceived themselves as competent but "not an expert" in matters of climate change, and expressed confidence in topic knowledge while sensing that they were lacking specialist knowledge and skills. This was linked strongly to new technology and software as well as to better support mechanisms and access to information sources. A desire was often expressed for proper "road maps" for curricula and learning and teaching training, to support embedding new knowledge and building confidence in educators and students alike.

Many participants described broader systemic barriers to necessary change, such as bureaucratic obstacles in their university and the built environment sector, including policy and legislation. Short answer responses (such as those at left) indicated a sense that transformative change was being obstructed by dominant paradigms that result in structural barriers for architecture.

CONFIDENCE AND ACTION

When asked about levels of confidence in teaching or learning about climate change and sustainability subjects, there was an observed increase in both neutral and negative responses in comparison to responses about motivation. 70%–80% of students and staff indicated that they were "very confident" or "confident" about these subjects; however, as Figure 8 indicates, between 4% and 11% were "not so confident", depending on respondent type.

Short answer responses revealed that confidence correlated with either personal passion or individual sustainability-focussed activities. For staff, this could be through research, teaching, or in practice, while students reported confidence that was linked to curiosity or personal interest in the area, as well as adequate learning opportunities.

POSITIONS ON CLIMATE ACTION SUMMARY

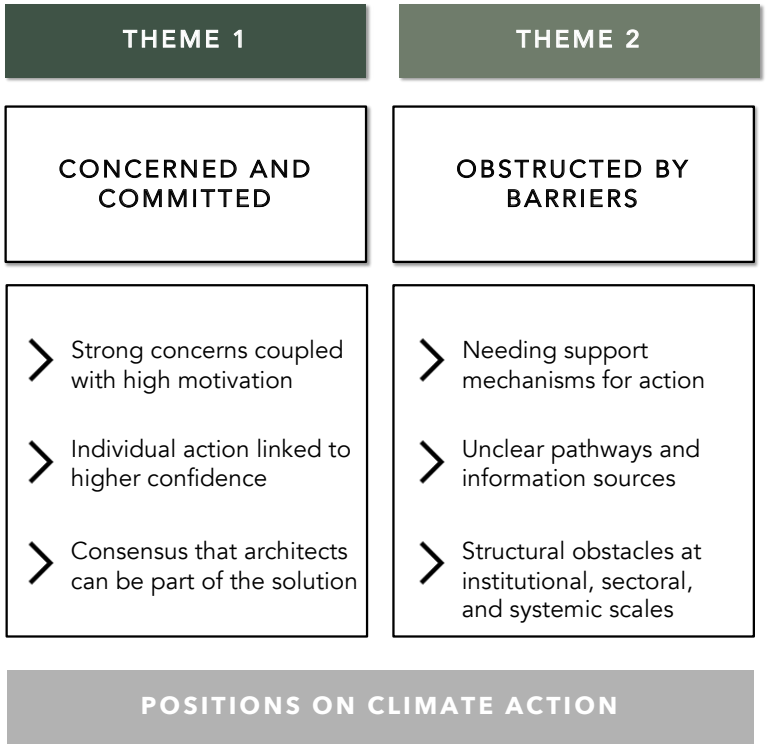


Figure 9. Themes illustrating general positions on climate action

The survey revealed that staff and students were very concerned about climate change and were also committed to action through architecture education and research. Where individuals were engaged in research, teaching, or personal activities related to climate change and sustainability issues, they were more likely to be confident in their climate literacy. There was a strong consensus that architects can be part of the solution for climate change, which in turn reinforced strong commitment to action.

Even so, high levels of motivation were coupled with frustration about perceived barriers that obstruct desired action. Many respondents described the need for support mechanisms and coherent strategies for teaching about climate change. There was the sense that both clearer roadmaps and access to current information would aid necessary transitions in architecture education. This way, architecture schools could begin to overcome structural obstacles that exist within their school and/or university, as well as other systemic barriers to change.

05
ARCHITECTURE SCHOOLS NOW

The second part of the survey aimed to provide a comprehensive overview of current research, teaching, and learning activities across architecture schools in Australia and New Zealand.

Reported research activity showed promise of impactful growth across a diverse range of research areas. Self-reported levels of engagement with topics related to climate change and sustainability were high, but there was a disconnection in awareness regarding other research activities that were occurring within schools. Even so, researchers were gaining funding from a variety of sources and were forming both cross-institutional and cross-sectoral partnerships.

There was relatively strong consensus about what topics and methods are currently taught within architecture degrees, but varied understandings of where these are taught in the curriculum. The majority of schools indicated that they were currently reviewing their curriculum, and expressed that they would benefit from support to do this. Architecture educators felt a strong sense of responsibility regarding climate literacy. Educators also suggested that pedagogy is an important factor, as is how to foster the various aspects of higher-order thinking required for sustainability education.

“It is our responsibility to make this happen. We need to make this a primary focus. Now.”

// Academic

TEACHING AND LEARNING

When participants were asked whether their school engages well with climate change and sustainability issues through teaching and learning, sessional academics were the group least likely to agree. 40% of sessional staff and 32% of academic staff "disagree" or "strongly disagree" that their program engages well with these issues, compared to only 12% of students (Figure 10).

However, there was a varied distribution of responses to this query, perhaps indicative of either dispute in architecture schools or across the sector; about half of sessional and academic staff "strongly agree" or "agree" that these issues are being addressed.

Students were the most satisfied with teaching and learning on climate change and sustainability issues, with 77% saying they "strongly agree" or "agree" that these issues are being addressed well at their school.

Our school engages well with climate change and sustainability issues through teaching and learning.

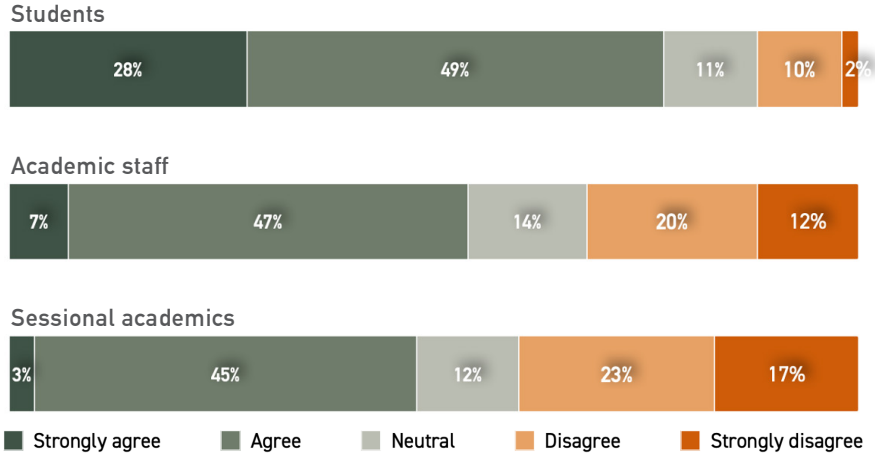


Figure 10. Perceptions of engagement through teaching and learning

What is the status of your curriculum regarding climate change and sustainability issues?

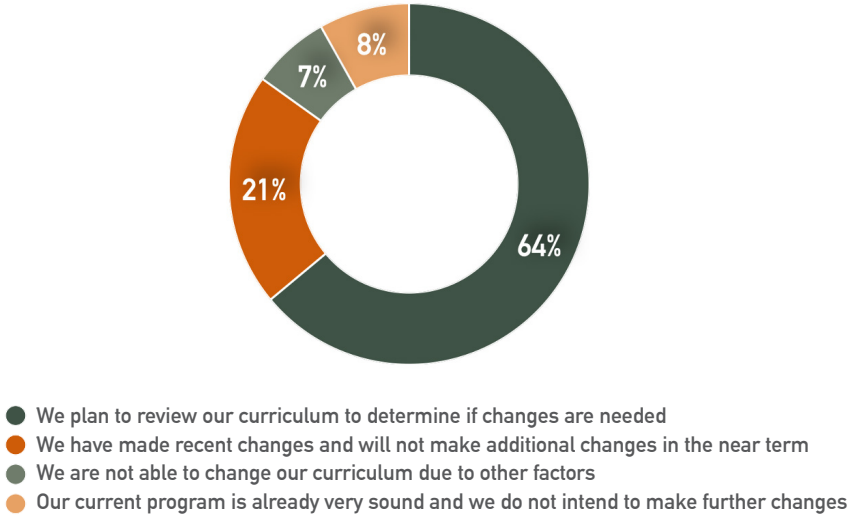


Figure 11. Review status of architecture curricula

Academic staff were asked about the status of their curriculum with regard to climate change and sustainability issues. 64% of schools were planning to review their curriculum, 84% indicated that their program would benefit from support or resources to help inform possible changes, and 21% indicated that they had recently made changes. In total, 85% of schools had either recently reviewed or had plans to review their curriculum.

This extent of curriculum change points to a substantial gap in knowledge that needs to be addressed—a gap reinforced by the 95% of staff and student respondents who "agree" or "strongly agree" that they want to see more teaching about climate change in degrees.

A STRONG SENSE OF RESPONSIBILITY

Short answer responses about climate action in research, teaching, and learning in architecture schools revealed a strong sense of responsibility from both educators and students. This responsibility expanded beyond higher education and into the profession. Educators felt a responsibility to shape the values of future practitioners who will consider ethical decision-making alongside aesthetics. Students tended to feel responsible for the future of the built environment itself, and sought to be prepared, adaptive, and willing to change.

Themes relating to "challenging the status quo" emerged throughout responses, including the importance of advocacy and activism, and the "radical transformation" of the curriculum. Educators mentioned the importance of empowering and building confidence in students while developing them as responsible future practitioners. They further expressed a desire to make sustainability subjects compulsory, and to include them earlier in the degree at undergraduate levels, and remarked on the need for research-led, multidisciplinary design projects in partnership with practitioners and industry organisations.

The need to build connectivity between higher education programs and practice was emphasised in many responses, not only in terms of shaping the actions of future practitioners but also with regard to explorations of alternative modes of practice and links between university learning and CPD—both for academic staff and industry.

"We are the upcoming generation who really need to be making changes in the way we design and it's crucial that we know about these issues and different ways of designing."

Architecture Student

"As always, this starts with education. For this reason, it is imperative students realise from the start the importance of not cutting corners and thinking only about the aesthetics, but also about the impact of the designed structure."

Sessional Academic

Which of the following topics and methods are taught in your architecture program?

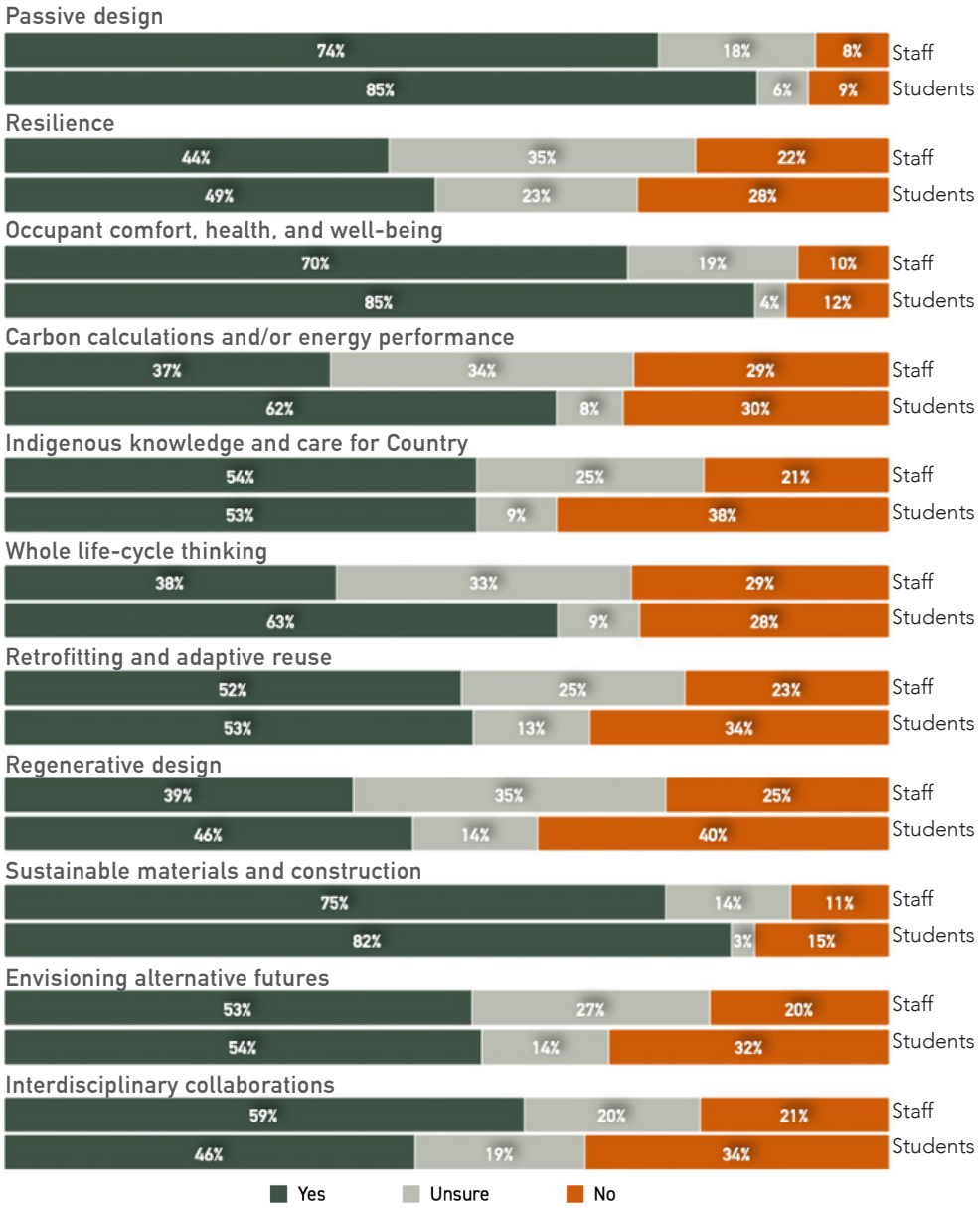


Figure 12. Topics and methods taught in architecture programs

CURRICULUM CONTENT

Figure 12 shows the extent to which various topics and methods are being taught across architecture programs. The responses of academic staff and sessional academics have been combined to provide direct staff–student comparison. Staff and students broadly agreed on what was being taught in most areas, with the most significant variation evident in regard to carbon calculations and energy performance. As this is seen to be a more advanced area of learning, it is possible that this variation is reflective of the 69% of undergraduate student respondents, who may not have encountered it yet in their coursework. It is also possible that students expect to be taught it in later years, but that this is not yet happening.

The most commonly recognised topics and methods taught in architecture programs included passive design, sustainable materials and construction, and occupant comfort, health, and well-being. Of note was the uncertainty that was evident about some learning areas. Up to one third of staff and students indicated that they were unsure if some topics/methods were being taught in their programs.

Certainty increased for foundational topics, such as passive design, occupant comfort, health and well-being, and sustainable materials and construction. This could be explained by the fact that over half of the students were in the early stages of their program, and/or that staff are unaware of everything that is taught across the curriculum. This points to the potential value of schools communicating learning content to both staff and students at a course-wide scale, to increase awareness of the topics and methods being taught across undergraduate and postgraduate degrees.

THE POTENTIAL OF PEDAGOGY

Survey participants were even less certain about where in the program students were learning about climate change and sustainability than they were about which topics were being taught. Figure 13 shows the combined responses of staff and students; a significant degree of uncertainty is evident across subject types when it comes to whether students are actually learning about climate change and sustainability.

Figure 14 (next page) shows the percentage of "yes" answers about learning areas according to participant type. There is a cascading level of certainty, where students were least likely to recognise where learning about climate change and sustainability is occurring in their degree. Academic staff were most aware of where these subjects or content were being taught, but sessional academics did not have the same level of certainty.

DEEP, INTEGRATED LEARNING

Students, in particular, expressed concerns about their university learning lacking depth, which in turn impacted their perceptions of whether they had properly learned about a topic. Some content offered at universities was perceived as "greenwashing" or "tokenism" rather than purposeful and meaningful learning that could create change or challenge the climate emergency.

Students and staff referred to a problematic gap between professional practice and university learning (as well as gaps between university knowledge and real-world applications); this gap influences the confidence of both educators and learners. This finding reinforces a need for the professional development of staff in line with current practice in industry.

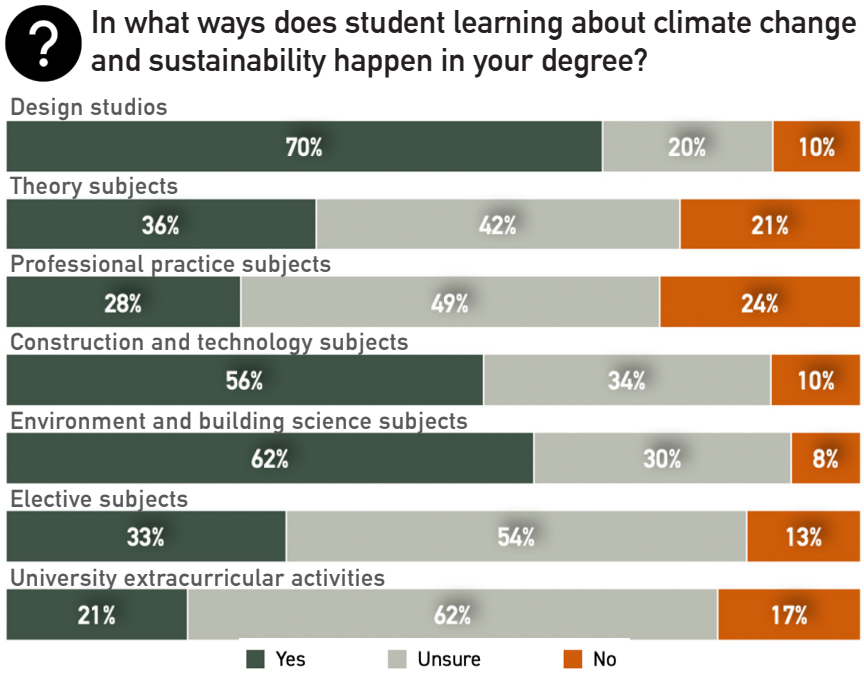


Figure 13. Types of teaching and learning

"The concepts and strategies are clear, where the difficulty is learning how to successfully implement them into design."

"I feel like I've learnt a lot of things about the climate crisis but not as much about how to apply this knowledge."

Architecture Students

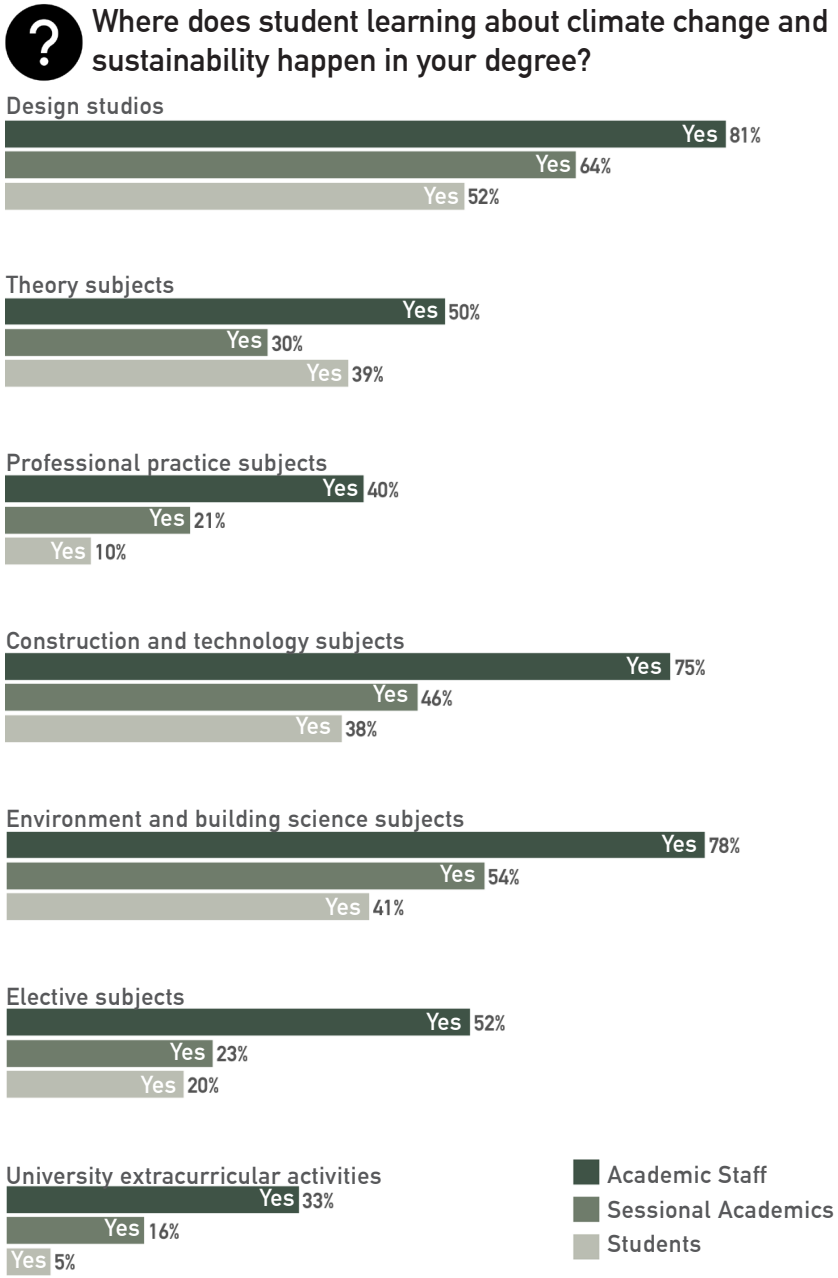


Figure 14. Comparative consensus on types of teaching and learning

THE IMPORTANCE OF HIGHER ORDER THINKING

Many of the participants' short answer responses highlighted the importance of higher order thinking in architecture education. This included complex, system-scale awareness and notions of empathy and care, as well as connectivity across traditionally disparate knowledge domains and "breaking down silos".

All participant groups perceived that sustainability learning and teaching could empower future practitioners. Responses indicated that this was achievable through the development of a "systems-thinking mindset" reflective of "deep empathy", "care", and "harmony" with ecosystems. Parallelling this was the sense that architects need to develop design approaches in collaboration with other disciplines. This was evident in sentiments about the need to connect across knowledge domains, which is the basis of integrated higher order thinking.

> "We should be training our students to become very sensitive observers of the built environment with critical thinking skills."

> "Education of transdisciplinary thinkers is essential to workable, realistic, effective solutions for the upcoming environmentally conscious generations."

Academics

Is your research related to climate change and sustainability or a related area?

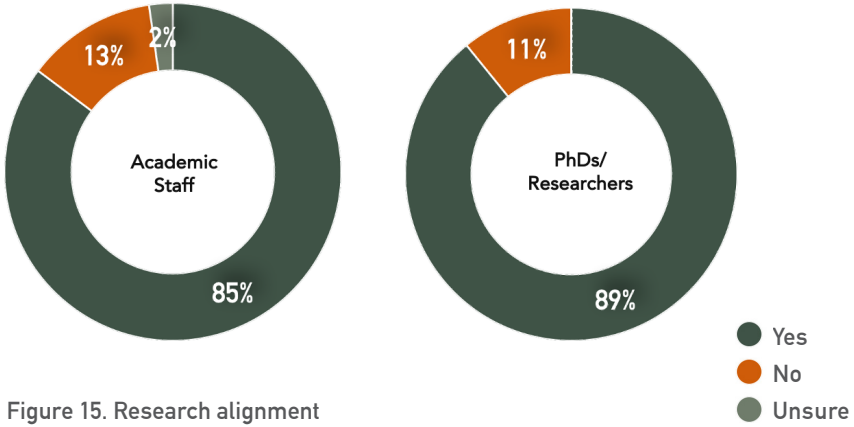


Figure 15. Research alignment

Our school engages well with climate change and sustainability issues through research activities.

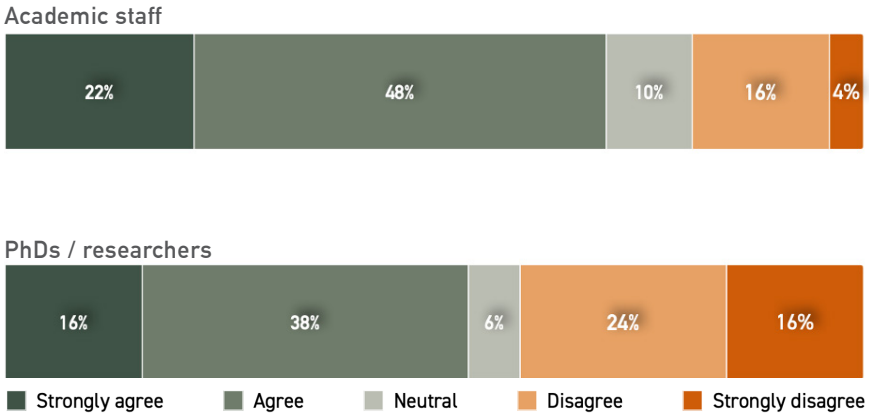


Figure 16. Perceptions of engagement through research

RESEARCH ACTIVITY

85% of academic staff and 89% of PhDs/researchers said that their research related to climate change and sustainability issues. The high proportion of self-reported research activity in this area could be attributed to response bias, in that those researching sustainability were more likely to respond to the survey. It could also reflect the wide range of research areas that broadly relate to sustainability (e.g., as encompassed by the 17 Sustainable Development Goals).

The main research areas described by the researcher respondents were:

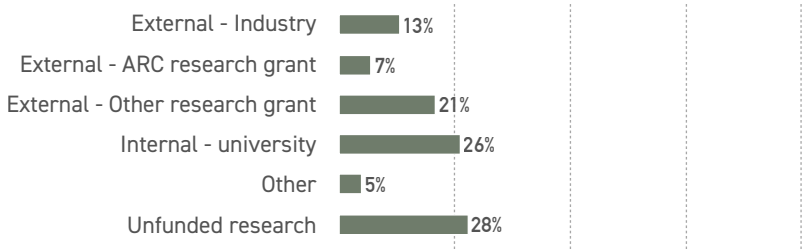
- materials, construction, and fabrication
- passive design
- housing design
- regenerative design
- Indigenous perspectives
- sustainable technologies
- history, conservation, and heritage
- retrofitting and adaptive reuse
- resilient design
- design for health, inclusivity, and ageing
- building services and systems
- climate adaptation
- life-cycle assessment and post-occupancy evaluation
- participatory, co-design, and communal design.

When asked about other researchers in their school and their engagement with climate change and sustainability issues, PhDs /researchers were less convinced than academic staff about research engagement. 20% of academic staff, and 40% of PhDs /researchers "disagree" or "strongly disagree" that their school engages well with climate change and sustainability research. This points to a potential disconnect between self-reported research activity and other research occurring in architecture schools.

Figure 18 shows a strong range of climate and sustainability topics and methods being explored through architectural research at universities in Australia and New Zealand. The suggested areas shown were provided as a multiple-choice list of options. The most commonly researched areas included sustainable materials and construction, and occupant comfort and well-being.

While 27% of research activity in this area was unfunded, universities were the leading source of research funding for these projects, followed by external and industry research grants (see Figure 17). Only 6% of research was funded by the Australian Research Council. (ARC).

Which of the following sources of funding do you receive for your research?



Who are you partnered with through your research?

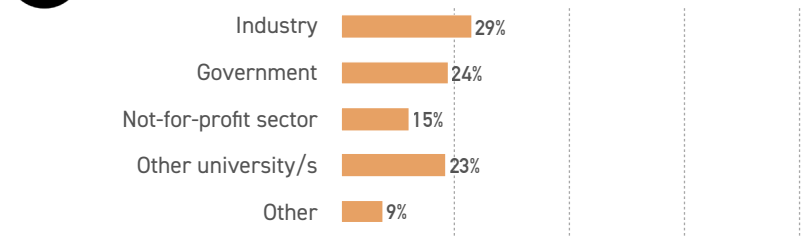


Figure 17. Research partnership and funding opportunities

Which of the following topics or methods are explored through research at your university?

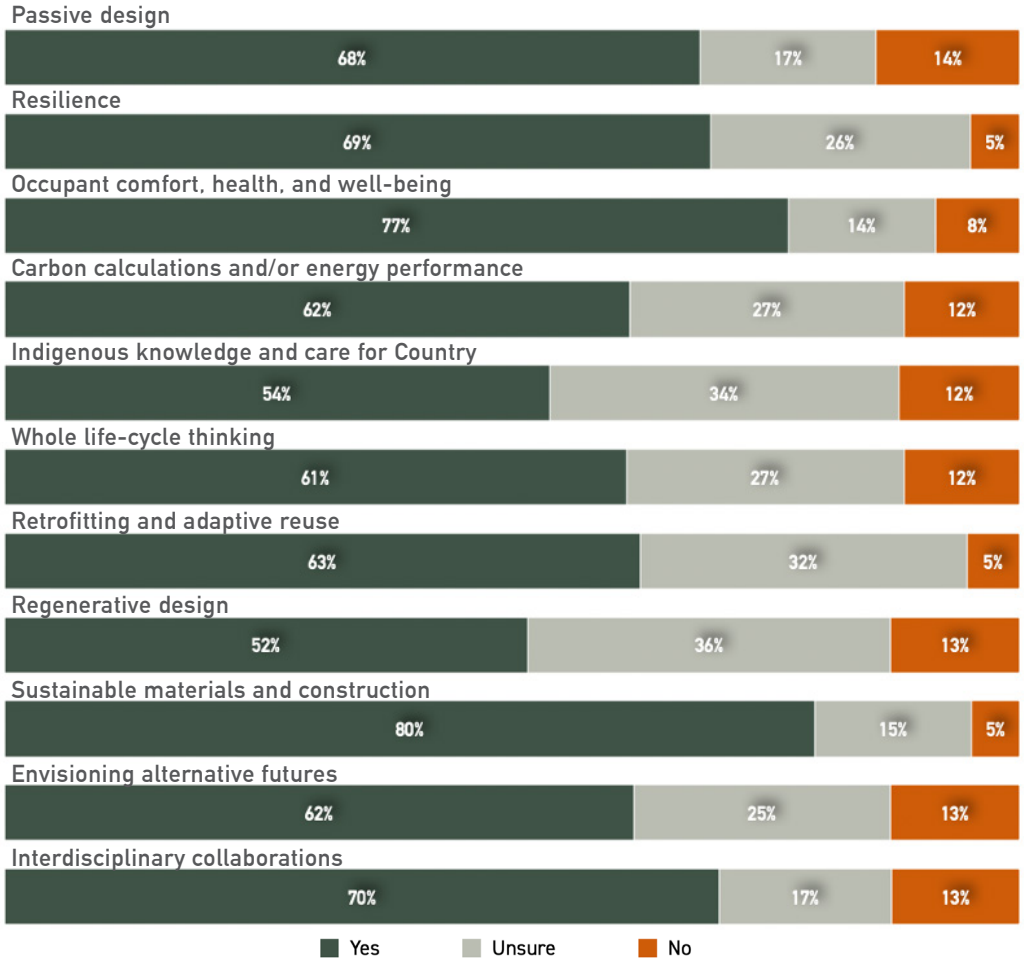


Figure 18. Research topics and methods explored

06
RESULTS

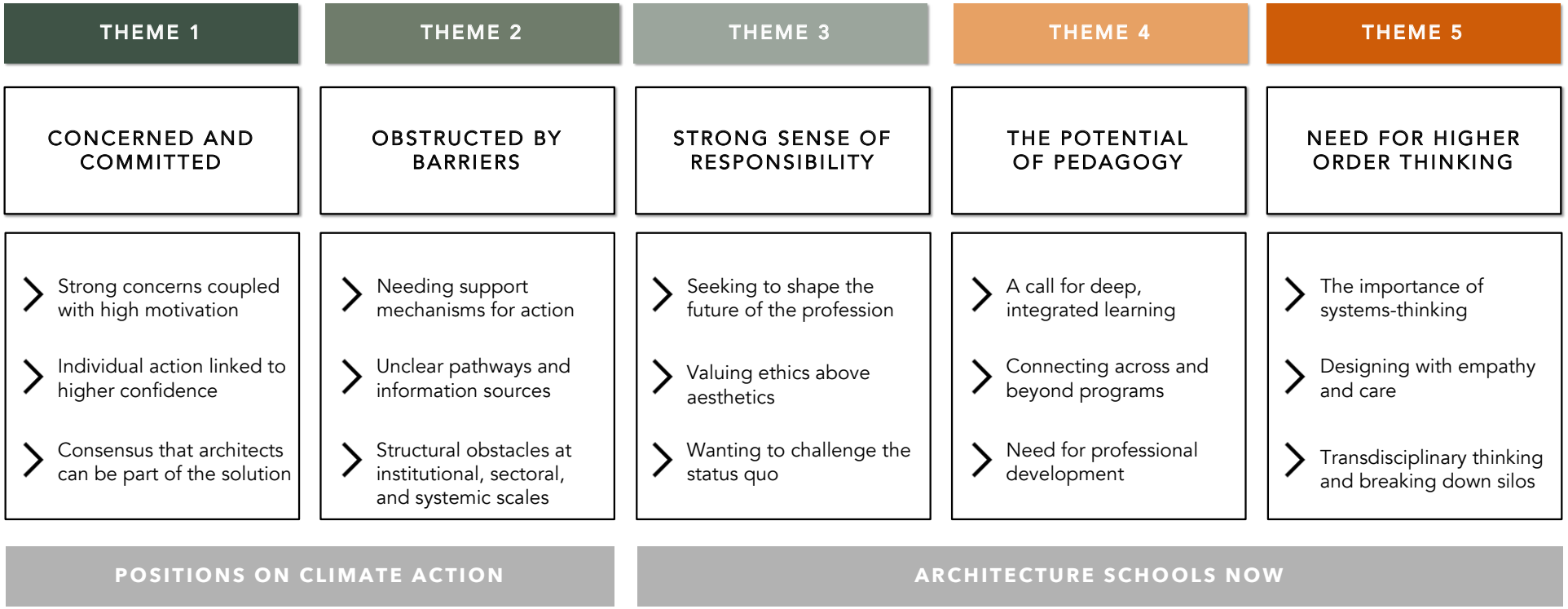


Figure 19. Summary of emergent themes

06
RESULTS

Figure 19 (previous page) outlines the themes emerging from staff and students' positions on climate action, and the current activities in architecture schools. Staff and students are **concerned and committed** to action on climate change. Where there is personal interest, research, or practice that aligns with sustainability and climate action, confidence to act is higher, and there is strong agreement that architecture can be part of the solution to climate change.

High levels of motivation are coupled with frustration at being **obstructed by barriers** when it comes to climate action in architecture schools. Staff, especially, want support and opportunities to upskill, as well as clear access to the latest information. There is also the perception that obstacles to change exist at a paradigmatic level and at a systemic scale.

Motivated staff facing barriers to change feel a **strong sense of responsibility** in shaping the future of the profession, as well as their students' future. Sustainability and climate action evoke strong ethical positions in staff and students, with action linked to notions of justice, equity, and the valuing of Indigenous knowledges. Climate action in schools is often values-driven, resulting in an activist desire to challenge the status quo by overcoming barriers to change.

A sense of responsibility, combined with a lack of clarity, can be disempowering, particularly when it comes to how new knowledge should be integrated into architecture programs. Staff and students are more confident about what is taught about sustainability and climate change than they are about how or where in the program it is taught. This disconnect points to the **potential of pedagogy** when building climate literacy. Survey responses showed a desire for deep, integrated learning that is connected across the program, to avoid "tokenism" or "greenwashing". This relates back to the need for upskilling and professional development so that educators can construct competencies at a program level.

Building climate literacy at a program level is essential to achieving the **higher order thinking** required for climate literacy. Complex systems cannot be parachuted into a course at a master's level; rather, the maturity required to apply empathy and care through design takes time to develop. The survey revealed a wide range of research activity in architecture schools that relates to climate literacy. This expert base is available for leveraging change, but there are issues with disconnected and siloed efforts and knowledge domains. There is also a perceived gap between architecture education and practice. However, growing inter- and transdisciplinary trends are evident in architectural research, with sustainability and climate change topics presenting opportunities for cross-sectoral partnerships.

In summary, the survey examined: (1) general attitudes toward the climate crisis, (2) what is being taught and researched in schools regarding sustainability, (3) perceptions of the role architecture education can play in addressing climate change challenges, and (4) what stakeholders' hopes are for the future of architecture. The final questions about hopes for the future invited speculative, solution-oriented responses, which informed the development of key recommendations outlined in Figure 20 (next page).

07
KEY RECOMMENDATIONS

Figure 20. Key recommendations

08
CONCLUSION

This report is a first step in understanding climate literacy knowledge, values, and beliefs in architecture schools across Australia and New Zealand. The findings illustrate not only the desire for transformative change in architecture education, but also opportunities to reimagine the role of the architect in volatile and uncertain times.

A series of emerging themes informed key recommendations for action, including examples of how these recommendations can be actioned by architecture schools. However, the themes also illuminate critical gaps in architectural knowledge, as well as opportunities for future research on climate literacy as it relates to architecture education and practice.

Schools have yet to develop a comprehensive and interconnected understanding of *what climate literacy is* in architecture education. While it is clear that staff and students are concerned about climate change, are motivated to act, and want to see more in their curriculum, many describe the need for better resources, clearer information, and professional development to increase their confidence and capabilities.

Despite this uncertainty, schools report teaching and research activity across a wide range of areas relating to sustainability and climate action. This suggests that the challenge lies in knowing how and where climate literacy is to be addressed in programs, as much as in what is covered. In short, pedagogy needs to be considered in conjunction with curriculum review that is guided by clear conceptual frameworks. This way, schools can leverage existing expertise and develop distinctive programs in response to climate change.

As the built environment sector transforms in response to net zero carbon targets, architecture education can reinforce complementary concepts and skills to foster deep, integrated understandings of climate literacy across environmental, economic, and social domains. In doing so, architecture schools are positioned to shape the future of sustainability discourse and champion architecture's relevance in the 21st century and beyond.

Figure 21. Student in workshop (JackF/Adobe Stock)

09
ENDNOTES

1 Architects Accreditation Council of Australia, AACA. "National Standard of Competency for Architects (NSCA)." July 1, 2021, Sydney, Australia. https://www.aaca. org.au/national-standard-of-competency-for-architects/2021nsca/

2 Architects Accreditation Council of Australia, AACA. "National Standard of Competency for Architects (NSCA)." July 1, 2021, Sydney, Australia. https://www.aaca. org.au/national-standard-of-competency-for-architects/2021nsca/

3 Australian Building Codes Board, ABCB. "National Construction Code (NCC)". 2014, Canberra, Australia. https://ncc.abcb.gov.au

4 Global Resiliency Dialogue. "Delivering Climate Responsive Resilient Building Codes and Standards." 2021. https://www.iccsafe.org/ advocacy/global-resiliency/

5 Commonwealth Scientific and Industrial Research Organisation, CSIRO. "Predictive Weather Files for Building Energy Modelling." 2021. https://acds.csiro.au/future-climate-predictive-weather

6 Parul Gupta. "A Generation Disrupted: What do Millennials Really Think About their Lives, Government, Businesses and the World at Large in 2019?" Deloitte Diversity blog, July 24, 2019. https://www2.deloitte. com/au/en/blog/diversity-inclusion-blog/2019/generation-disrupted-what-millennials-really-think-about-lives-government-businesses-world-large-2019.html

7 Association of Architecture Schools of Australasia, AASA. "Climate Literacy in Architecture Education." Webinar presented November 26, 2021. https://www.aasa-arch.org/copy-of-climate-action-aust-perspec

"We need to radically reinvent the role of a future architect and the education we need to meet that role."

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