

# What can academic research do for city-building practitioners?

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**Abstract:** Cities are where we need to begin solving global and local urban challenges by changing how we approach urban management, planning and design. Academic research, like the smart city field, currently focuses more on informing urban policy-makers than city-building practitioners such as architects, urban planners and designers, and engineers. These professions directly affect urban fabric, systems and behaviour through their practice. However, there is a disconnect between academic theories on achieving urban sustainability and city-building practices. In this article, we analyse 43 semi-structured interviews with practitioners based in Melbourne, Australia, to understand their perceptions about academic research related to the future of cities and its relevance for and relationships with practice. According to the participants, academic research rarely connects with practice, and research outcomes do not reach practitioners as they are not in an easily accessible form. The interviewees felt that academic research discounts the value of practical knowledge. These practitioners advocated for more innovative research and risk-taking in academic research with adequate proof and translation, making findings more applicable to practice. They praised collaboration across disciplines and stakeholders. Insights from this research indicate the need for pathways for translating academic research findings into practical advice for city-building practitioners.

**Keywords:** academic research; practical implementation; city-building practitioners.

## 1. Introduction

Cities are the constantly changing manifestation of humanity and collaborative networks of social, natural and built infrastructures (Komninos, 2011; Budde, 2013; Cocchia, 2014; Albino et al., 2015; Murgante and Borruso, 2015; Bansal et al., 2017; Musa, 2018; United Nations, 2018; Juniper Research, 2019; Katz, 2019). However, they are in crisis due to global and local factors. The global population is ever-increasing, and they increasingly live in cities, creating overpopulation, sanitation and health pressures, and economic challenges (The State of Victoria, 2006; European Commission, 2012; International Organization of Standardization, 2017; United Nations, 2018). Cities are known to consume around 70 per cent of resources, produce the same ratio of waste, while emitting more than 71 per cent of greenhouse gases

(International Organization of Standardization, 2012; Cocchia, 2014; Albino et al., 2015; International Organization of Standardization, 2017; United Nations, 2018). Local issues are partially the consequences of the global ones, with cities losing their uniqueness in the global competition or being endangered due to global warming effects (Morris, 1992; Belanche et al., 2016). For example, urban heat islands make cities uncomfortable and potentially hazardous to health, urban sprawl creates low density and fragile infrastructure, and nature and biodiversity seem to be missing from the built environment (Walt et al., 2014; Bansal et al., 2017; Musa, 2018; Shelton and Lodato, 2019).

Urban areas are increasingly acknowledged as the key to solving global challenges, such as climate change; therefore, urban management, planning and design need to take on this challenge in practice (Budde, 2013; Murgante and Borruso, 2015; Madden, 2019; Vanolo, 2019). Academia and science research into solutions for a better future (United Nations, 2015; Vanolo, 2019), such as the smart city concept (Komninos, 2011; Cocchia, 2014; Kunzmann, 2014; Albino et al., 2015; Murgante and Borruso, 2015; Aina, 2017; International Organization of Standardization, 2017). However, the research outcomes focus more on urban decision-makers and providing them with information (Giffinger et al., 2007; Angelidou, 2014; 2015; 2017; Angelidou et al., 2018). The smart city concept usually targets policy-makers and tries to help them transform their urban areas with global ideas (Giffinger and Gudrun, 2010; Kunzmann, 2014; Murgante and Borruso, 2015). However, the decision-makers are just part of the urban agent landscape. City-building practitioners, such as architects, urban planners and designers, and engineers, who can influence the urban fabric through their designs, are usually left out of the latest research (Giffinger et al., 2007; Giffinger and Gudrun, 2010; Giffinger et al., 2010; Walt et al., 2014). Even when their work is included, it highlights practitioner aspects from the point of view of the policy-makers instead of giving advice or providing practical knowledge directly to the city building practitioners (Walt et al., 2014).

Additionally, there seems to be a gap between academic theory and professional practice concerning the design of future cities (Komninos, 2011; Angelidou, 2014; Taylor and Hurley, 2016; Bansal et al., 2017; Arundel et al., 2018). The concepts for better urban futures rarely flow into practice or are seldom operationalisable and in a form useful for the city-building practitioners; they do not translate well to reality, even though the researchers highlight the need for bridging this gap (Giffinger et al., 2010; Taylor and Hurley, 2016; Fernandez-Anez et al., 2018). Academia continues to produce new ideas and approaches from their research that do not reach the design practitioners (Taylor and Hurley, 2016), even though the research aims to influence future design (Fernandez-Anez et al., 2018).

To bridge this gap, this paper investigates how city-building practitioners perceive academic research as being applicable to them and what role they see it playing in their practice. We present what city-building practitioners as participants of this study see academia's responsibility in establishing the future of cities and answer the question of what academic research can do for them. Our findings are based on semi-structured interviews with 43 city-building practitioners. Our outcomes include identifying opportunities for academic research to become more practical and valuable to the professions, which influence the design of the city, and hence its future, through their work.

The following sections introduce the research methodology and the interview participants, clarifying limitations. The findings and discussion sections present the advantages and disadvantages of academic research, according to the interviewees. The paper concludes by restating how best to translate academic research for practitioner use based on the participants' answers.

## 2. Methodology

The research involved 43 city-building practitioners residing in Melbourne, interviewed on their views on the future of cities and smart cities and their specific views on academia and its role in their practice. These professions were architecture, urban planning and design, and engineering, as these influence the urban fabric through their work.

With ethics approval, semi-structured interviews were conducted online between 2020 and 2021. The ethics application contained 14 starting questions for the average 60-minute interviews, but the semi-structured format implied the opportunity to follow the potential participants' answers to understand them more in detail. The questions were about the smart city and the future of cities' concepts' operationalizability in city-building practices and the connection between theory and practice. Questions like 'Do you read research?' and 'Whose responsibility is to initiate or establish the smart city or the future of cities?' helped to understand the participants' views on different urban segments, including academia.

A total of 179 practitioners were contacted with a list of starting questions, from which 43 agreed to the interview (Table 1). In total, 44,75 hours were spent interviewing online, using Microsoft Teams or Zoom. The recordings were transcribed with the Otter.ai service, checked manually and then sent to the participants for their approval. Afterwards, the transcripts were de-identified, resulting in 660 pages of material. These de-identified materials were loaded into NVivo to create the 5432 codes for thematic network analysis based on Attride-Stirling (2001). The thematic network analysis helps identify basic, organising and general themes and outliers across the investigated materials and visualises them in a network. The thematic networks were created from the codes using Cytoscape to organise them. The networks provided insights into overarching patterns and outlier ideas throughout the analysis. Figure 1 presents the thematic network for the interview question 'Do you read research?' – even though it was a yes-no question, the answers varied widely, providing insights into the practitioners' research reading habits and academic research connections, among others.

Table 55 – Disciplinary background of interviewed city-building practitioners

Profession	Number of participants
architect	16
architectural engineer	2
engineer	13
urban planner and designer	12
<b>Sum</b>	<b>43</b>

There are limitations to the findings. The research was not focused on the academic role but on how theoretical concepts can be used in city-building practices. Therefore, if the interviewees were explicitly asked about the academic research aspect, there might be additional roles for academia. The interview questions mitigated this shortcoming by asking broad questions, such as 'Whose responsibility is to initiate or establish the future of cities?' allowing participants to talk about any responsible party. Additionally, the 'Do you read research?' question immediately connected their thinking to academia.

Moreover, the findings can be seen as Melbourne-specific because of the participants' location. This limitation was chosen to have a physical boundary for the research and allow face-to-face meetings. These were later cancelled due to the COVID-19 pandemic, but the inclusion criteria had already been established. This limitation was mitigated by the interviewees' international attachments through

educational, working or personal experiences. Therefore, although the participants were Melbourne-based, the findings can be useful for a wider audience.

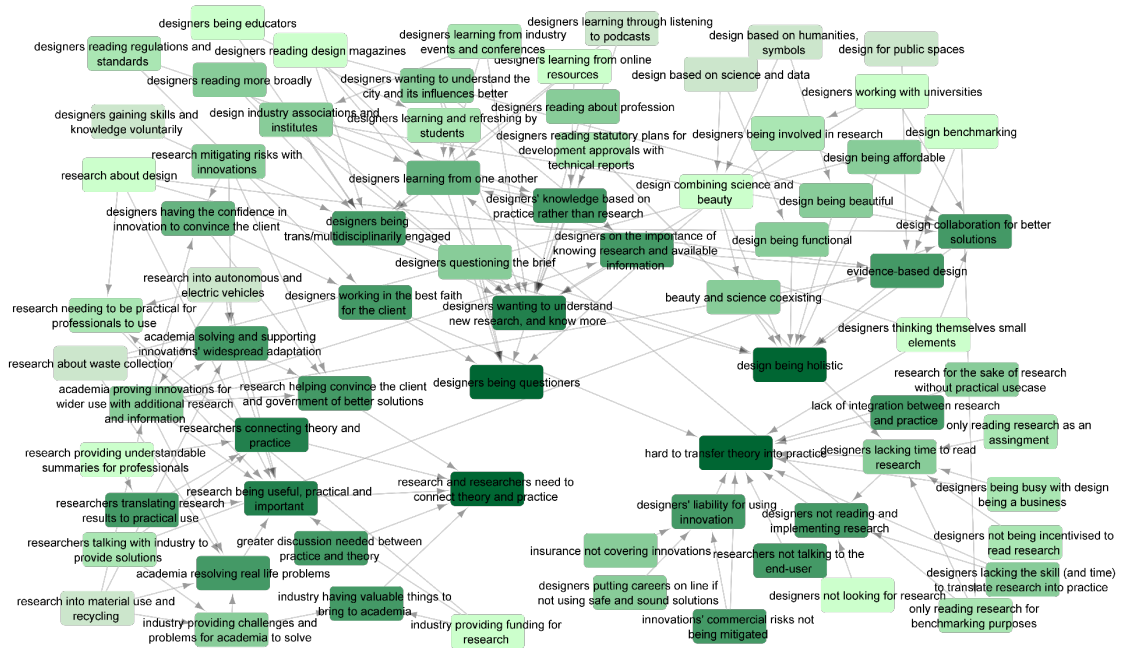


Figure 116 - Thematic network for the question 'Do you read research?' with the global - organising - basic themes gradient

### 3. Findings and discussion

City-building practitioners (identified only with their profession and plural pronouns for their safety) highlighted the advantages and disadvantages for academic research, according to the participants, their use (or non-use) of it, and specific roles which seemed helpful for them in their practice.

#### 3.1. Academic research advantages and roles for the interviewees

Regardless of the disadvantages, the participants saw great opportunities, responsibilities and roles for academia to help them in their practice. They advocated for scientific innovation to evolve in urban areas and proof generation for innovation to be reliable and defensible. They also admitted the need for research to flow into practice, with more appropriate translation and collaborative efforts between researchers and practitioners to make this happen. Advantages were found in innovation and risk-taking, research translation, collaboration and bringing together different agents.

##### *Innovation and risk-taking*

Academic innovative research seemed essential for the participants as creators and managers for knowledge innovation. Academic research was said to be crucial as long as it could service practitioners with real solutions to real, industry-provided challenges, such as new materials or building methods. The interviewees had fewer resources and less time to create scientific innovation, even though they did practical innovation. They argued that academia has the means to do innovation and take risks because of their connections, facilities, and generally trans- and multidisciplinary approaches. Furthermore, academics can risk researching something and then finding it unsuitable for broader use – the practitioners do not have this luxury.

Many stated their will and need to know and understand more about the urban environment and its academic research. They mentioned that if academic research can prove and provide more information about proposed innovations, the practitioners are more confident in using that research, even or especially with their obligation to their clients to act in the best faith. One urban planner advocated for university research pushing boundaries:

“I think it's really important, I think it's pretty good the way ... that it currently happens ... I do think though it's important for academia to be able to push the boundaries and that they should be pushing ... and pushing hard because ... pushing thing's quite hard.”

#### *Investigation and proving*

Participants also highlighted the crucial role of academic research in helping innovation become widespread. One of the difficulties in implementing academic research and theory in practice is that the practitioners are legally liable for any solution they provide; therefore, they risk their career and reputation when using a solution that is not adequately documented and supported by research. This notion also includes the insurance companies, which prefer to support tried-and-tested solutions, and avoid the commercial risks associated with new and novel ones. If academic research can provide the necessary proof to convince clients, governments, decision-makers, and insurance companies about better and more innovative solutions being reliable and valuable, then it is more likely to be used by practitioners. When academic research provides sufficient and convincing information for practitioners, they can mitigate and manage the risks involved while using innovative solutions in their practice. An engineer advocated for more proof coming from academia, helping the construction industry adopt innovative solutions:

“The industry ... is so reluctant to commit to something unless there is proof ... And that burden of proof is quite extensive ... [university] has done a lot of ... practical lab testing where you could like simulate any environment ... how that thing might perform or meet the current standards, using recycled content instead the usual virgin material.”

As an example, an architect explained how innovation, in their specific case, the use of timber, was introduced:

“How do we utilise this material [timber] better to make it a more predictable material because that was the other problem. Structural engineers hated timber because it wasn't predictable. ... Now that they have engineered timbers that they can predict how they're going to perform, they're quite comfortable going up to 20 storeys, and more importantly, their insurance companies are quite comfortable with them going up to 20 stories.”

#### *Research translation*

Academic researchers need to improve their research communication with the practitioners. Academic research needs to be tied more closely to practice for it to be useable, and the results need to be appropriately translated for the practitioners to understand and operationalise in their practices. Researchers could present their findings where the practitioners could reach them more easily. Theory translation also included research summaries to let the practitioners know about the innovations using more understandable language. Research awareness benefited the practice, but interviewees also highlighted the need for the wider public to learn about such innovations and breakthroughs. Thus, translation needs to happen in a broader context.

A direct connection between industry and academia was also praised for the possibility of finding real solutions to real problems. An engineer expressed appreciation for researchers who try to understand industrial challenges, finding answers to those and then giving practical outcomes in an easily understandable format:

“I worked with some other great researchers where you could sort of take a problem to them, and then they would help you ... work through what the right path would be. Or they researched at least where they really try to understand the industry – [this is] where we got more of the practical outcomes. ... Research is very important in terms of stepping stone, but it’s got to be practical.”

#### *Collaboration and bringing together the different agents*

Interviewees also supported the need for academic collaborations, either across universities and fields or with outside agents. They valued how academia can bring the different stakeholders together and facilitate discourse among decision-makers. With this approach, researchers can also show how better urban understanding for designers, policy-makers and citizens leads to a better future for cities. The participants wished for collaboration with academic research groups, and some were fortunate enough to experience that positively when they were researching some specific parts of the urban fabric. An engineer praised the connecting role of academia:

“I think that the solutions lie within research ..., and I guess that those conversations need to be facilitated between our decision-makers and whether the world research lies.”

The practitioners strongly believed in the role that academia and industry could play together. An architect expressed that both parties have an essential role to play:

“I think there needs to be a greater integration between the two because the industry has valuable things to bring to academia ... that need to be resolved. And, ... testing things that academia is actually producing or things that are being research ... and can be adapted.”

### **3.2. Academic research disadvantages for the interviewees**

Although the participants admitted the importance and advantages of academic research, they highlighted specific shortcomings. These included the rare connection between theory and practice and the missing translation of research for them to be easily consumable and practical. There was also a need for academia to acknowledge the practitioners’ practical knowledge and let go of the urge to tell them how to do their job.

#### *Rare connection between academic theory and practice*

There seems to be a limited flow of knowledge from academic research into practice, although integrating the two is crucial for finding the best solutions. According to the interviewees, academic research is rarely linked from the beginning to the end-user, to answer pragmatic questions, or help real users. They experienced on several occasions that researchers created outputs and then tried to find a good use for them in reality. Doing research for the sake of doing research was also problematic for them. Moreover, participants also mentioned that they are unaware of what is happening in academic research, even though they acknowledged the need to keep up with innovation.

A striking example was around research being misused in practice. One practitioner used specific research, even referencing the name of the writers, but admitted never reading the research itself. Thus, they misrepresented the particular findings and the intended use of that research, which were highlighted in the research output but which never reached this specific practitioner.

Other interviewees described their specific experiences of researchers starting their research without trying to find a practical use for it but campaigning at organisations to support them financially. An engineer expressed the lack of connection between theory and practice for research:

“They need to connect at the start to understand all of those things that are going to be a barrier at the end. So, there is no point just doing research for the sake of research without understanding what those needs and requirements are of the industry that will actually enable it to be rolled out on a large scale to make the research more worthwhile.”

### *Missing translation*

The interviewees admitted not having the time and skills to follow and understand research outputs. Many advocated for researchers to disseminate their outcomes to a broader audience beyond the research community and specific conferences because practitioners are not usually part of such events. Additionally, the formal written output is challenging for the practitioners. They don't have the time to read through lengthy articles with scientific language and then have to translate that into real-world applications. Therefore, they argued that researchers should translate their findings to more legible platforms and formats for the everyday user to reach and understand them. Even participants with research backgrounds admitted that they need to use different languages depending on their audience being academic or pragmatic. An urban planner required academia to translate their outputs and communicate them without jargon:

“I think that certainly academics have responsibility to ... translate what they're on about to the general public. But also I think that some disciplines might be a bit more naturally inclined to stepping outside of the subdiscipline than others.”

Interviewees admitted they could do more to reach, read and implement research because academic innovation does not flow into practice without that. Many said they don't have the time to find and understand the articles, as they are occupied in their businesses, where they are not incentivised to read academic research. Others advocated for broader discussions for the research outputs to challenge or validate them properly for real-world application. When they read for their profession, they admitted that most research they read is related to specific tasks or benchmarking exercises for a current design project. One engineer admitted their lack of time and incentive to reach out to research:

“There is a level of ability to use somehow research findings and plug them into the actual work of the practitioner. The reason being you are not asked to do that. So, it is something that you have on top of your activity. And that's because you want to provide that more

valuable work that reflects the needs of the community and that embeds the latest thinking. But it's on top of what you are asked to do."

#### *Missing acknowledgement of practical knowledge*

The interviewees did not resent the missing academic acknowledgement of the value of practical knowledge; however, the need for practice and academia to learn from each other, constantly urging evolution and development, was highlighted. Practitioners create investigations during their processes of analysing the urban fabric. They try to find the best spatial solution, root causes and perfect answers to urban challenges through questioning the urban situation, status quos, challenges, stakeholders and other elements. They also talked about how they are engaged with other disciplines and learn from each other. This trans- and multidisciplinary was present in their information gathering as well. They mentioned reading magazines, being part of different and multidisciplinary institutions and associations, participating and attending industry events and conferences, being educators and learning from and with students, and even taking the time to gain new skills and knowledge through online resources. Additionally, they also mentioned that their reading is wider than the design profession itself, thus increasing their knowledge's multi- and transdisciplinary attributes. This knowledge could be utilised in updating academic research, which could help practitioners answer their current problems.

One example of this is the academic establishment of the smart city concept. Academic researchers try to create a global definition for it (with respect to honourable exceptions, such as Angelidou (2017)) as a solution to urban problems. However, practitioners know from their practice that cities need differences worldwide; therefore, one specific urban future will not suit all cities. Many participants questioned the idea of creating one global concept because, based on their wisdom and experiences, they found that each urban situation requires a specific answer suited to the local characteristics.

The smart city concept is also a good example of how academia shows a lack of value in practice. Smart city designs started to emerge in the 1990s in practice. However, the first scientific articles were about such case studies in the 90s, according to Cocchia (2014). Then, academia tried to help practice with researching the topic, producing increasing research outputs (Cocchia, 2014). Now, academia creates smart cities and urban futures in theory, but without connection to the practice itself, which was disturbing to the practitioners. One even stated that they don't need academia to teach them how to do their job:

"I think it's very easy to start getting prescriptive, and I notice a lot of academics will start saying you should design in this way or there are rules to design. And when I think of myself as designer, I don't follow any rules."

## **4. Conclusion**

Cities need transformation to achieve a better future and solve the current challenges caused by global or local problems. Academic research has produced theories on accomplishing this, like the smart city concept. Still, these seem separate from how practice can influence the urban fabric through their work. Based on semi-structured interviews, this article presented how 43 city-building practitioners – architects, urban planners and designers, and engineers – see academic research and its role in their practice.

The participants expressed their disappointment over the disadvantages they experienced with academic research, particularly that academic research seems disconnected from practice and that researchers are producing outcomes that are unusable for the interviewed practitioners. They admitted



lacking the time and incentive to reach out and translate research findings and apply them in practice. Furthermore, their practical knowledge seems not to be acknowledged in academic research, which results in a feeling that academics try to teach the practitioners their professions rather than evolve their findings in a form useful for practice.

On the positive side, the interviewees identified beneficial roles and responsibilities for academia. Academic innovation and risk-taking remain crucial input to their work, and deep investigation and proof generation can help to spread such innovation. This makes it easier for practitioners to apply the knowledge with good conscience and to convince decision-makers on innovative designs. Translating research into a usable and understandable form could help with implementing and understanding knowledge for a wider audience. Academia's role as collaborators was also praised for bringing the different stakeholders together and finding transdisciplinary answers to presented challenges.

Further investigations can enhance the practitioners' understanding of and requirements for academic research with targeted investigations, as these findings were only a by-product of professional-focused research. Additionally, future research in this area should include a wider group of participants to discover the global differences in academic and practitioner collaboration.

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