

# Garden as 1:1: Between Paper Thinking and Earth Moving in Landscape Architectural Learning

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Decisions about design are invariably decisions about materials (Temple, 2011, p 50).

Design education seeks to mimic the design process in landscape architectural practice. Yet the educational process is fundamentally different because design ideas are rarely tested through building. Student learning, therefore, remains in the realm of abstraction: the representation of a design idea without translation into the actual material these ideas are intended to shape. Thinking through ideas at full scale offers an alternative way to explore design learning so students understand the spatial, social and material consequences of their ideas. Working at the 1:1 scale gives them an insight into the implications of their design decisions and experience in working directly with the materials of their concern. It also offers an opportunity to work one to one with each other and clients.

There is an emerging pedagogy of design within the field of landscape architecture, where the 'one to one' in both its meanings – that is, 1:1, where students undertake representation at full scale or work directly with the material of their concern, and one to one, as human-to-human interaction between students and their peers, clients and teachers – became the medium for exploring design through making. This mode of design exploration has opened different pathways for the design learning process as well as diverse social and material challenges. The use of 1:1 scaled outputs also offers the potential to deepen the space of learning and transform the one-to-one transactions between student and teacher and between students within the classroom as they engage with the materiality of their thinking.

The paper reflects on two design studios undertaken in consecutive years in the field of landscape architecture. In these studios, students from the Landscape Architecture Program at RMIT University designed and built gardens. The project took place as part of The Avoca Project, in Avoca, a small rural town two-and-a-half hours from Melbourne in Australia, where students partnered with local clients to design and build their gardens. The private residential gardens were completed to coincide with an eco living festival in the town, when the gardens were opened for public display. As a consequence, students acted as designers, builders and team members, and the design process unfolded between paper thinking and earth moving in various ways. Measured by the garden outcomes, the project was a success; however, the social experience proved to be more complex. It ultimately challenged the reasons for undertaking a 'live' project, where student learning is situated in communities outside the university setting. Understanding this experience has led to a shift in my teaching practice,

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## KEY WORDS

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## REFLECTION

from framing community as something in the world beyond the university to constructing community between the students within the classroom. The notion of the 1:1 and the one to one has played a pivotal role in enabling this shift. This approach places material and social practice at the centre of individual learning while setting up a community of learning within the classroom between individuals instead of seeking to co-opt community by moving beyond the university setting.

## Making as pedagogy

Representation – that is, drawings or models that stand in for something else – is the predominant work of designers.

Much of the time ... a designer is not making anything at all but is instead only *predicting* what an object will look like, act like and experience like. Traditional design processes rely on prediction through the abstraction of representational models, drawings and mock ups to the extent that working with the actual materials is professionally relegated to others, out of the designers' hands (Temple, 2011, p 47).

Representation is a powerful tool. Through its very abstraction, and by setting the designer at one remove from the site, it allows for different kinds of thinking across different scales (Corner, 1992). When students begin learning to design, however, their grasp of the relationship between the abstraction of representation and its implication in the world is nascent. Working directly with materials at the 1:1 scale can bridge abstract thinking and material practice by providing an experience of spatial, social and material consequences.

'Learning through doing' is an accepted model of learning in the field of education that espouses the mantra 'it's not what the teacher does but what the student does that deepens learning' (Biggs, 2003, p 44). Design is learnt through undertaking a project or a problem that must be resolved. 'Doing' in design learning tends to occur through an intermediate medium, such as scaled drawings and/or models. This convention in design education allows for ideas to be explored at a range of scales within the classroom space. It is also informed by a tendency to privilege ideas over actual making: 'ideas are superior to matter, the command of drawing underpins the status of architectural design as intellectual and artistic labour' (Hill, 2005, p 14). As a result, the importance of understanding the translation of representation into the medium of landscape is often overlooked.

Unlike practitioners, students rarely have the benefit of actualising their ideas because their design usually remains in the realm of representation, as a static idea, whereas the matter of landscape is a living and changing phenomenon. As the students' drawings and models become increasingly sophisticated and comprehensive graphic productions, the inclination to get caught up in the representation as an end in itself, rather than seeking to understand how the drawing translates into a material project in the real world, is almost inescapable. Some students become so locked into the logic of their drawings and/or models they confuse the representation with the landscape itself, forgetting that 'a representation is an abstraction not to be confused for the actual experience of building' (Temple, 2011, p 91). This tendency is even more prevalent with virtual simulation of three-dimensional space, where the model can begin to replace the actual landscape in the student's mind. Till (2009, p 86) observes:

The computer brings the distancing of architecture from the temporality of the world right at the start of the design process. Its immense power tricks the users (designers) and viewers (potential clients) into believing that what is on the screen is what will be achieved on site.

This is not to disregard the value of representational modes of thinking; rather, it is intended to question the ubiquity of representation as the privileged output of learning in design. Exploring ‘making’ – that is, working directly with the materials at hand – can complement thinking on paper.

‘Making thinking’ is a term coined by architectural educator Stephen Temple to bridge the gap between thinking through representation and the abstraction that distances designers from the world, and working directly with the materials of their concern at the 1:1 scale. This approach to teaching comes from a belief that:

... beginning designers want to work ... from direct connection to the world because this intimacy offers grounds for inquiry. Direct experience, like putting hands on materials, working full scale, and deciding about construction and joinery enables connectedness to working processes that thinking alone through abstraction and analysis only seems to obscure (Temple, 2011, p vii).

Of course, drawing too can be an inquiry; however, in design practice the drawing always stands for something else. It implies an eventual material translation. This requires an understanding of the spatial and material implications of translating one thing into another; a line on a page can represent a wall but its material quality is another experience again. It is a sensory encounter. Architectural educator Katheryn Moore suggests sensory intelligence should be central to the education of designers because ‘the sensory mode of thinking is what those learning to design are expected to reap the benefits of, if they are to be successful in any way’ (Moore, 2010, p 3).

Making is an embodied thinking process that puts students in a direct relationship with the object of their concern. It ‘requires constant judgements of what is being done in terms of intentions, what the outcome will be, and what will work and will not work’ (Temple, 2007, p 15). This decision-making process is relational and has immediate consequences. Here the student exercises their spatial and sensory knowledge and thinks through what is involved in physically working with the material as their ideas unfold. If there is no interposing medium, the students must grapple with material on its own terms. While in the process of making, students must ask themselves questions ranging from ‘What does the material itself do?’ to ‘How can I work with it to achieve my intent?’.

The process of making invites the hands to think. As students make, they act and then witness the results of their decisions in these actions (Pallasmaa, 2009). ‘Making is learning because there are consequences’ (Temple, 2007, p 17). Making sets up an interactive and embodied conversation with the material in real time and space. It also enables students to experience the actual outcomes of their design thinking and to take responsibility for these decisions because they understand the consequences. Temple suggests it is the teacher’s task to stimulate these capacities in students. He says that ‘an instructor’s task is not to lead students on this path but to aid beginning design students in the development of sensibilities so they may guide themselves’ (Temple, 2007, p 13).

My opportunity to explore teaching design through working directly with the material of landscape arose through an invitation from artist and scholar Lyndal Jones to participate in The Avoca Project, her long-term venture investigating 'art, place and climate change'. The project took place in the town of Avoca in the Central Highlands of Victoria in Australia. Students from the Landscape Architecture Program at RMIT University went into the community to design and build gardens. The Avoca Project, which developed over 10 years, involved national and international artists, scholars and climate change experts exploring issues of climate change (Jones, 2016). Jones invited me to run a project with local residents where students could explore issues of climate adaptation in gardens. This proposal was one of many initiatives run during the Eco Living Festival which was an initiative of Lyndal Jones as part of the The Avoca Project. Gardens as a site of action made sense in Avoca because many locals were keen gardeners. It was also becoming increasingly difficult to grow common plants, especially fruit and vegetables, because of the impact of the 'millennium drought' that afflicted many parts of Australia. Increasing salinity in the town water was a further associated problem. It was an opportunity to undertake a 'live' teaching project, where students were learning in a real-world situation and community.

The studios in Avoca were framed by the broad research question: Can the garden become a model for testing ideas for growing gardens in harsh climates? Each studio ran for one semester and culminated in the display of the gardens at the Eco Living Festival. In two successive years, different cohorts of students undertook a variety of garden projects. The studio was set up as a laboratory to test design ideas for gardens in harsh climates. In an educational sense, students applied the larger issues of designing landscape in the microcosm of the garden. As eminent garden designer Dieter Kienast suggests, in spite of its small scale, the garden invites engagement with larger natural systems. Kienast (1997, p 6) asks, 'where else can we better and more directly practise a careful relationship with the world than in its microcosm, the garden?'. For example, there was no intention that these projects would solve issues of climate change; rather, they were a small-scale example to open pathways for action and thinking about design in the context of climate challenges.

The process of finding clients with appropriate gardens was different for each year. In the first year, a public announcement in the local newspaper invited residents to participate, asking, 'Do you want some students working in your garden?' (Harrison, 2009). Eight garden owners responded, and three gardens were selected as appropriate case studies. For the first year, the students were involved in the garden selection process and also self-selected their working groups. The following year, all 12 students designed and built a single, large kitchen garden in the local pub. Smaller groups undertook different parts of this larger project. This second-year project was negotiated before the students started the studio. Although the intention was to allow more time for building the project, this decision reduced the students' agency in the project and may have affected the one-to-one relational dynamic in the studio, as discussed later.

## Building as design

'Design/Build' is an established model of 'live' studio pedagogy. It is intended to integrate thinking and making, and is significantly underpinned by an aspiration

for service learning, where education fulfils a dual role of enabling students to learn while also serving communities in the real world outside the university setting. A precedent exists for learning to design in the field of landscape architecture through making gardens. The Design/Build programme was set up at the University of Washington in 1995 by Associate Professor Daniel Winterbottom (Design/Build Washington University, 2016). Designing gardens provides a project of limited size where students can explore the specific challenges of working with a living landscape. In this example, many of the garden projects are public spaces, commissioned and funded by different institutions. The Avoca Project shared this educational aspiration of learning about landscape architecture through the microcosm of a smaller garden project; however, the garden settings were substantially different. In Avoca, the gardens were privately owned with individual clients funding the projects. These private gardens became ‘public’ through the garden-making because local people made them available for a university project. The public nature of these private gardens was temporarily amplified during the Eco Living Festival, when they were opened for public visits. Compared with the Design/Build programme at the University of Washington, where the design outcomes suggest the projects were amply funded, the budgets in Avoca were modest, ranging from \$250 to \$5,000.

Another long-term design/build programme run through Auburn University in Alabama, called ‘Rural Studio’, provided inspiration. Here, students design projects for underprivileged communities, including in private houses for local families. Since its inception, Rural Studio has become renowned for its social agenda and innovation with recycled materials – a practice that transformed the challenge of modest funding into an asset. Exploring the use of recycled materials was the impetus for my visit to Auburn University in 2007, where I observed how each building became a hand-crafted artefact. For example, the walls of one house were constructed of stacked pieces of carpet (figure 1). These walls were thick, nearly 1 metre wide, with the edges of different-coloured carpet creating striated designs across the walls both inside and out. Although Rural Studio is an architecture programme, many of the projects demonstrate an understanding of architecture as part of the landscape. Other aspects of the Rural Studio work that were relevant to the Avoca gardens were its rural setting and the intention that the gardens surrounding the houses would reflect their context. Samuel Mockbee, the initiator of the Rural Studio programme, emphasised that the best way to make real architecture is by letting a building evolve out of the culture of place (Oppenheimer Dean and Hursley, 2002, p 2).

*Figure 1: Rural Studio: house made of stacked carpet pieces. (Photos: author's own.)*



Unlike the Rural Studio and Design/Build programmes, the project in Avoca was not designed as a specific university programme and, therefore, did not receive specific financial or administrative support. As described above, the project was set up as a series of two design studios in response to an invitation. This meant practical arrangements, such as setting up classrooms, organising accommodation and delivering food, were part of the administration of the studio. As the teacher, I negotiated these arrangements each year.

In addition to their involvement in the project in Avoca, the students and staff attended other courses at the university 200 kilometres away. In contrast with the Design/Build and Rural Studio programmes, where graduating students undertook an independent assignment as a 'capstone' project to demonstrate their proficiency, the Avoca students were in their first or second year of studies. In this sense, the Avoca studio was experimental. Students were learning to design rather than demonstrating their proficiency in delivering a project. Yet, at this early stage, they were offered the rare educational experience of seeing the garden they designed become real.

The social and political aspects of working and designing in communities were an important reason for undertaking the project. It continued a lineage of 'live' studio teaching I have undertaken since 2003 and described extensively (Harrison, 2012a; 2012b) and also positioned within emerging Live teaching practices (Dodd et al, 2012). This current account focuses on a different aspect of the teaching, specifically the various ways the design process unfolded and the significance of the 1:1 scale and one-to-one interactions in the experience. Because the students were both designers and builders, the variability offered by the use of the 1:1 scale allowed them to undertake different design processes to explore the design intention while also allowing them to contribute according to their personal inclination.

## Garden as landscape

Gardens have long been sites of exploration within the landscape architecture field; as both a representation of an idea and an actual space. They offer a limited area within which to test and explore ideas at the 1:1 scale.

Landscape historian Marc Treib interrogates the role of the landscape exhibition to address the dilemma of the represented landscape versus the actual experience of the landscape. The garden show offers an actual experience of the living landscape.

Given the sizable dimensions of landscape architecture, its display is far from easy – a task made doubly challenging by the use of representations and surrogates to stand in for genuine places (Treib, 2014, p 41).

He suggests, 'Garden shows present what most landscape exhibitions cannot: the actuality of materials, reality of space, living organisms and human presence' (Treib 2014, p 45). The garden show is an actual garden space while also containing ideas relevant for broader application, thus it operates simultaneously as a landscape model. Although the gardens in Avoca were not 'garden shows' as such, they performed a similar role when opened for public display as part of the Eco Living Festival. As well as creating site-specific designs, the students were required to come up with design proposals that might have application elsewhere.

In this regard, the Avoca gardens were both for habitation and a container of ideas to apply at other sites. In this sense, the garden operates as both actual space and a representation of ideas and offers many possibilities for exploration within landscape architectural education.

Design studio is the primary course where students undertake a design project or a 'problem' to be explored and resolved through design. At RMIT University, students choose between a range of offerings led by different studio leaders with a particular approach to design, including site, issue and method of exploring design. Donald Schon, educational theorist, champions the design studio as a model of learning where inquiry occurs through reflection-in-action, because it asks students to respond to unique, uncertain or conflicted situations in creative and rigorous ways. No correct answer exists in a design studio; rather, it requires an iterative process of inquiry, problem finding and refining one's thinking and action as one proceeds. Schon (1985, p 31) suggests that although this kind of knowledge is relevant in many professions, education is often taught as an array of techniques to fix a given problem. Typically, the studio-leader-cum-design-practitioner models the iterative process of thinking by working alongside the student during the drawing process. The 'live' studio set up in Avoca began to disrupt this master-apprentice relationship by admitting another voice into the process – that of the client and/or community requiring one-to-one interaction about the process.

Often, students receive feedback through design critiques, where they present their work to a panel of designers who then evaluate it. The evaluation is based on a triangulation between the studio brief, the student intention and the design outcomes as evidenced by a set of representations, such as drawings or models, which could be in digital or analogue format. These are read as an intention for a built reality. In Avoca, because the gardens were ultimately built by the students, the design outcomes were experienced by the critics. The critique did not rely solely on the presentation of design intent.

### **Making, thinking, drawing, building**

Because the students acted as both designers and builders, the process, which typically begins with design and is then followed by building, was reconsidered. Rather than starting the design process with drawing, some students began their design by digging. Thus, digging became part of their design inquiry rather than simply physical labour. Likewise, representation took on different roles: sometimes it was speculative; sometimes it documented the completed project. It was essential the students were required to understand the particular local conditions so the gardens they created would survive and adapt over time. This aspect of the project was both explicit in the research question and strongly emphasised by the clients themselves.

To model an alternative way of working, and to foreground the material thinking process, each year the studio began with a small 1:1 project undertaken in the classroom. Students were asked to make 'equipment' bags, aprons and toolboxes. Each student was allocated an amount of cloth, a prototype pattern and a number. The number was a playful way of acknowledging that each person was part of a larger group, and it was also a simple way to vary each garment

(figure 2). Sewing machines were set up in the classroom and, rather than draw the design first and then 'build' it, students worked directly with the material, cutting and then stitching it. The softness of the fabric allowed the students to improvise, to make mistakes and to repair their errors. They were immediately involved in making, deciding, improvising, judging and negotiating with others. The outcome showed the multiple variations available within a limited set of materials. This task allowed conversations about composition, stretching the brief and learning construction techniques, all of which would be part of the garden design process. The students were required to document the process; some created drawings while others photographed their products. In this case, therefore, drawing occurred at the end of the process as documentation. This initial project suggested innovative ways of approaching the design process that were later explored in the field.

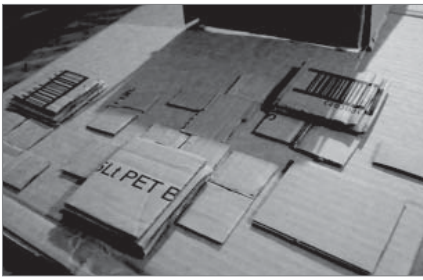
Once the studio started on site in Avoca, each garden group determined its own design pathway to the final built outcome. The process varied in each group, according to the client brief, the existing conditions, the design ideas and the students' inclinations. Some followed a typical sequence for the design process, beginning with drawings and completing the design process before starting on site. Others worked directly with the landscape itself as a way of unfolding their ideas. As a result, drawing and building played different roles in the process for each project. For some, thinking occurred through the medium of paper whereas for others it occurred by working directly with the material and drawing was used only as a means of later documenting the process. The design process chosen reflected the site and project intention and also eventually influenced the garden outcomes.

In one of the gardens, known as 'New Life', the students followed a conventional sequence for their design and started with drawing. Once the design was complete, they began building the garden (figure 3). 'New Life' was a newly built house situated on an old tennis court. Because of the highly compacted earth and the client brief requesting elevated vegetable beds, part of the project was to construct these beds. The students designed a series of elevated, interlocking wicking beds that were connected underground through a system of pipes for grey water as part of the watering system. The project required purchasing large amounts of new timber and pipes. The drawings involved much one-to-one interaction: the students needed to think through their ideas as a group, seek agreement from the client, calculate costs and order materials. Once the design was completed, the New Life group tested the scale through doing 1:1 drawings on site. Construction involved the implementation of the drawings and could have



*Figure 2: Studio equipment: the first 1:1 task in the design studio. (Photos: author's own.)*

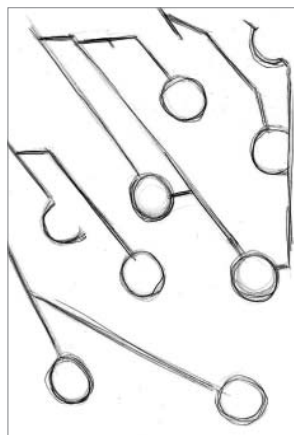




been undertaken by a builder. Their decision to privilege drawing was evident in their approach to building the beds. During construction, the students lamented the amount of work required to enact their drawing, as they shaved millimetres from the timber lengths to create an exact replica of their plan. The client gently pointed out that a slight adjustment to the size of the beds would have allowed the students to work with standard lengths of timber and thus to save time and reduce waste. It is only through the experience of building their designs that such valuable 1:1 insights arise. In this moment, the client, who was an experienced builder, became the teacher.

In contrast, the students working with the garden known as ‘Flow’ began the design process through working directly with the earth, exploring the possibilities in a range of 1:1 on-site tests. In ‘Flow’, drawings were used to document and develop ideas once the project was under way. This approach was driven by the design intent, which was to carefully manipulate the existing conditions. Working directly with the material on site allowed students to understand the implications of different design decisions in situ. The project focused on a small orchard of around nine fruit trees struggling to survive because of a lack of water. It involved digging a series of swales to direct excess stormwater from the street towards the orchard. To understand the hydrology, the students made several 1:1 tests on site by digging a series of small swales at different angles and slopes to test how the water moved. The swales were then planted with local gazanias to secure the soil. As it happened, it rained heavily enough to enable students to assess the performance of the swales. The client and the students then reviewed these tests, and the results informed their future decisions and the final design of the swale system. These 1:1 tests provided a direct understanding of the site materials and the complexity of the site and system (figure 4). An action research feedback

*Figure 3: ‘New Life’ garden: the design process began with drawing and models, then moved on to drawing on site before building started. (Photos: Bella Leber Smeaton.)*



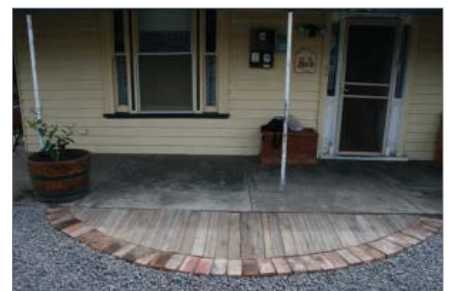
*Figure 4: Flow garden: the process began with testing the water flow on site; later a diagram of the layout of the swales system was drawn before the final design was built. (Photos: Jessica Van Swol.)*

loop between the initial tests and the decisions informed the layout of the lines feeding the trees. In this instance, the building itself became the design rather than simply the implementation of an already determined idea.

In the garden known as ‘Flatlands’, and in the Avoca Hotel project the following year, students chose to work with recycled materials. This decision was driven partly by budgetary constraints but mostly by the desire of both the students and clients for the gardens to fit with their surroundings. In both gardens, the process began with collecting materials and simultaneously developing an overall concept. The students moved between concept and making, as new materials were found. The ‘Flatlands’ garden was inspired by an unkempt railway verge opposite it, where the students noticed a complex array of plants thriving in different microclimates as well as some artefacts. They wanted to create a garden that thrived without a watering system, using subtle topographic changes to create different microclimatic zones for different plants. On the first visit, the students started the project by laying old carpet and other materials to degrade the existing lawn. They also propagated seedlings and took cuttings from other garden plants in the vicinity. These were planted in particular locations, with students paying careful attention to the different microclimates.

Before the earthwork started, this group of students made a collage to express their interpretation of the cottage garden brief (figure 5). Although the built garden that later emerged looked nothing like the original collage, the representation was an important one-to-one tool because it informed the students’ conversation with their clients about their approach. The methods used in the collage also mirrored the process the students undertook on the garden, which was to compile found objects into a whole. The client agreed to let the students use ephemera from around the property. Salvaged timber from an old tank stand on the property was transformed into a small deck while large, old bricks paved a sunken sitting area and a water catchment area (figure 6). The garden structure was strongly informed by the hydrology, which was later adapted so students could ensure water was directed to create wet and dry areas for different plants. This understanding arose by working directly with the ground: digging, adjusting levels and carefully guiding water. Models and drawings also provided an overall direction. These were adjusted in response to on-site discoveries and as the students sourced different recycled materials. The drawings and models allowed the students to retreat from practical engagement to think in the abstract and consider larger concept ideas. They could then return to working with materials to realise these forms.

*Figure 5: Flatlands garden: the speculative collage and the garden itself were a composition of found materials. (Photos: Blaise Macdonald.)*





The design process in the Avoca Hotel garden the following year was highly influenced by the large size of the group involved. In addition to making scaled drawings and models, group members found drawing 1:1 on site became a useful tool for decision making and negotiations amongst group members (figure 7). Each student could register the actual size of things in relation to their own body and the rest of the site. Drawing 1:1 occurred at several stages throughout the project. Students also took responsibility for different parts of the project. One student had more experience than others and mentored peers in the use of machinery. Another built a rough model to communicate the overall idea to the client. In addition to an orchard and an orange grove, large wicking beds were created to accommodate vegetables. The curvilinear shape of the garden beds was inscribed directly on to the ground. This allowed for a subtle determination of the form as it related to the slope. The curves were fashioned from corrugated iron donated by the neighbours. With an angle-grinder the iron was cut into strips and those strips were then riveted together to create a wall edge that could be formed into the curvilinear shape accommodated by the material. The students negotiated with the client to buy water tanks and to create compost heaps to close the system. They used off-cuts from the corrugated iron to build the compost heaps. The different colours in the iron were used to create distinct visual effects, depending on the aspect from which the edging was viewed. The garden was ambitious in scope. Although the process was slightly chaotic, it was completed on time and it worked. It was beautifully crafted and sat well in the larger landscape, both aesthetically and from a systems perspective.

Workmanship and the careful and intentional recursive process carried out on materials (Temple, 2011, p 77) played an important part in the design process. The process involved transforming ordinary materials into something that contributed to a larger design idea. Each material was met on its own terms and transformed into something else.

To implement their design ideas at the 1:1 scale, it was essential that students learnt new skills along the way. Building a granite retaining wall nearly 10 metres long and 40 centimetres high was one example. The wall was designed to create

*Figure 6: Avoca Hotel: local materials were sourced to construct the 10 metre retaining wall, donated corrugated iron sheets were sorted and used to form curvilinear wicking beds and the red sheets were used to create part of the compost heaps. (Photos: author's own.)*



*Figure 7: Avoca Hotel: the idea was first drawn on the ground in flour and then a conceptual model made for the client. Next, levels were resolved before measuring on site. (Photos: author's own.)*

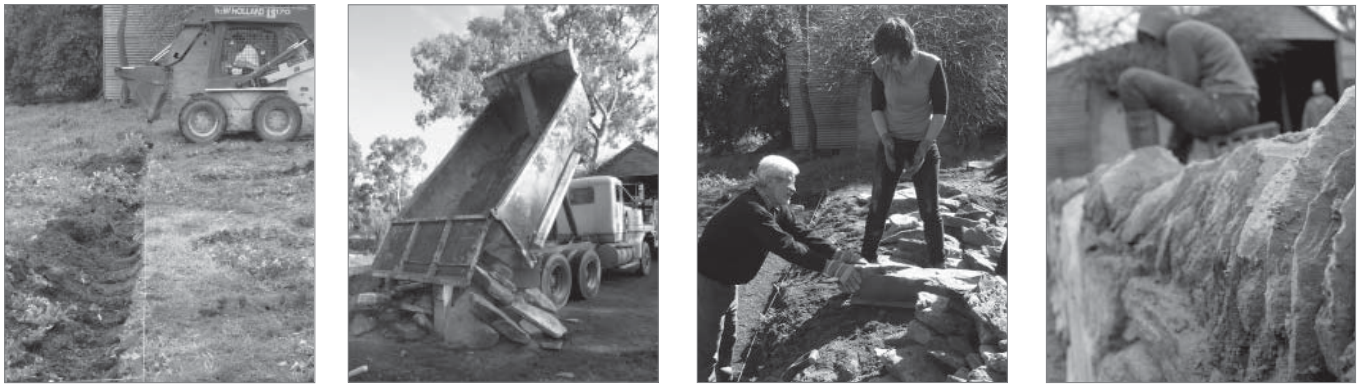
two flat areas. To construct the wall, the first line was drawn on site and then pegged with string to determine the location of the cut (figure 8). Granite was a locally sourced material and using it made sense; however, neither students nor staff had any skills in stone-wall building. Fortunately, one of the students asked her grandfather to mentor the group in the construction process. A backhoe with dingo attachment was hired to cut the line and dig the foundation. A 10-tonne truckload of local granite was then delivered. The next step was to sort the rocks into loose size categories to assess the material at hand. Different-sized rocks fulfilled different roles in the wall. Larger rocks were used to tie the wall together; the smaller ones fitted in between. Over two weeks a group of 12 students carefully crafted the wall, deciding which rock went where for every stone they placed. A large, flat rock was saved to create a surface suitable for a seat. At the end of the process, the students created a capping made from small left-over slivers of rock.

In addition to learning the principles of building a stone wall, the students learnt how to handle rock and make subtle choices about where each rock should sit as they constructed the wall. This was a process more akin to crafting than building. As Sennett (2008, p 9) suggests:

Every good craftsman conducts a dialogue between concrete practices and thinking; this dialogue evolves into sustaining habits, and these habits establish a rhythm between problem solving and problem finding.

Because the students were both designers and builders they had to address the abstraction of the idea and then the material manifestation of that idea. Some started with a hunch and began by working with the earth itself and later used representation to think through their ideas at a larger scale. Others started with the concept and then used representation to resolve their ideas as they built. The variety of processes reflected both the project itself and the students' different inclinations. Their combined design and build role meant the students' connection between their representation and the material outcome was unavoidable.

Student feedback overwhelmingly reflected their appreciation of this opportunity to build and to see the outcome of their efforts. Inevitably, some expressed frustration at the amount of time and commitment required to complete the project. The time taken to undertake the studio was well in excess of the course allowance. The students also had to complete and I had to teach other courses at the same time as the Avoca studio, which involved competing deadlines and excessive travelling between Melbourne and Avoca. These pressures are a consequence of running the course as a design studio, a single course as part of a landscape architectural programme. In contrast, the Rural Studio is set up as



*Figure 8: Understanding the building process and learning skills to form raw materials into the material manifestation of design ideas. (Photos: author's own.)*

a stream within a programme that acknowledges the specificity of the learning models. Students are required to take other courses while undertaking the design/build project but these courses are part of the whole immersive experience of living in a small community. In this situation, the student experience is conceived as a whole; it allows for flexibility in relation to the demands of the project and acknowledges the demands of this specific model. Ongoing administrative support for the logistics of the project is also provided. Administrative support and the place of the studio within a programme are aspects that would need to be addressed before I would undertake such a project again.

### **From 1:1 to one-to-one**

The effectiveness of the one-to-one relationships, and especially of the teamwork between the students to enable them to both design and build the gardens, was a critical aspect of the design studio in Avoca. It was, however, the teamwork that was also the most challenging aspect of the studio. This was particularly evident during the second year when the students worked together on a single large project.

The garden outcome and engagement with clients were explicit aspects of the course structure, learning objectives and assessment, yet the inevitable requirement for teamwork skills was not stated in the course materials or planning. As a result, negotiations between students happened haphazardly and, when conflict arose, my intervention was required. This lack of acknowledgement that the students needed to learn to negotiate working relationships was a teaching oversight and had enormous ramifications for the dynamic of the studio. This dynamic is the visceral feeling of the space of learning, which is also evidenced by the presence or absence of a sense of goodwill and trust among the students and between the students and teacher.

Biggs (1999, p 3) suggests that strong students teach themselves and need little help from teachers; it is the weaker students who need help to learn how to learn. In Avoca, the students had to learn how to work successfully as a team – requiring different skills from those involved in working alone, which is common practice with design studio projects. In the first year, the students sorted out their working relationships among themselves, whereas in the second year they did not. Although it did not directly influence the designed outcome, the group dynamic was complicated and remained unresolved until the end of the studio. Initially, I attributed the difference in dynamics each year to the different sizes

of the groups. Reflection over an extended period and through teaching other courses brought me to the understanding that the learning infrastructure did not reflect the relational capacities the students required to work successfully with each other. The course preparation offered nothing to draw on to manage situations as they arose.

The intention in placing students in a 'live' community context was to give them a direct 1:1 experience of the impact of their ideas on the lives of others. It was based on the belief that people are motivated when they understand the implications of their work. This approach underpinned the 'live' teaching projects I had undertaken in rural communities in the seven years before the Avoca studio. In these projects, however, rather than build their designs, the students developed site-specific design proposals in response to local design issues and in conversation with local community members. The students' ideas were thus speculative – that is, ideas were explored and communicated through drawings and/or models and collage (Harrison, 2012b). The Avoca studio evolved this practice of 'live' pedagogy from speculative designs to built outcomes. This raised the stakes in two ways. First, the students were required to complete the gardens because clients had invested their time, enthusiasm and funds in them; there was an obligation to deliver a product. In classroom teaching, it is acceptable and sometimes important for a project to fail in order to understand the implications of actions. Total project failure is not an option in a live project. Second, because of the size of the project, students had to work in teams to complete the gardens.

In Avoca, the difference was clearly evident in the way the projects unfolded between the first and second years. In the first year, the project transitioned from teacher-led to student-led, whereas the second year saw no explicit handover to the students. Issues arose in each group in the first year but eventually roles were defined, the working dynamic was resolved and my role as arbitrator between the students diminished. Because the dynamic worked, the students felt proud of and pleased with their work, and there appeared to be no reason to modify the learning objectives. Yet aspects of the learning happened in spite of the course, not because of what it offered.

From the beginning of the second year, attempts were made to break the single large project into smaller deliverables, with different students responsible for different parts. However, as this approach relied on the students' willingness to lead the project, it largely did not happen. Although all of the students laboured on the project, a couple shouldered the bulk of the work because they were particularly driven to do the project well and also felt a sense of duty to the client. This was particularly evident at the end of each day when many students disappeared rather than helping to clean up the site.

Although the project surpassed the client's expectations, in feedback to the students at the end, the client mentioned the project had relied on only a few for its completion. Biggs (2003, p 14) might distinguish this as the difference between deep learning and surface learning. As Biggs (2003, p 3) says, this is not a reflection on the nature of the student; rather, it is the difference between those students who understand how to learn and those who need to learn how to learn. One student showed great initiative by following through on an individual design project within the Avoca Hotel studio while also contributing to collective

work. He designed and built fold-up furniture for the group to use during the studio. In between these tasks, he also helped in labouring on the building of the garden. In this way, he was a team participant and also extended his design skills. As the teacher, I encouraged him to do this but he showed the maturity to drive the project and learnt more from the studio as a result. This student showed what David Boud (1981, p 11), educationist, might describe as a student autonomy or responsibility for their own learning.

Although the Avoca studio's 'live' context mimicked the professional client–designer relationship, it overlooked an important aspect of the learning required for students to undertake the project successfully – that is, the communication and collaborative skills needed to enable them to work together to design and deliver the project. Participation in the 'community of learning' within the community needed to be explicit in the Avoca studio. The bag- and apron-making task at the start of the studio implied the idea of a team, with each student making a kind of uniform with the same materials and colours but differentiated through their design and particular number. This act was a clue to the need for teamwork but it remained a symbolic gesture and the more explicit learning was lost in the process. Including teamwork as a learning objective in the Avoca studio would have provided an instrument through which to ask students to reflect on their own engagement with the group and would have provided the grounds to discuss issues with the students as they arose as well as to develop skills and capacities to address them. This inner aspect of learning is, in many ways, the real learning and reflects Zajonc's suggestion that learning is an experience that occurs in the outer and inner dimensions of human life (Zajonc, 2010, p 60). This reorients the focus of learning from the material landscape out there to the human dimensions of what it means to practise.

Although I am yet to run another studio where students design and build gardens, the lessons from Avoca have continued to inform my teaching. In my current approach, student engagement with the work of their peers, the one to one, is an integral part of the learning environment. This includes learning through individual student projects undertaken within the classroom setting that are not anchored in the on-site grit. This acknowledges the value of the learning that occurs between students and builds community within the classroom. It is an approach that extends the 1:1 practice of working with materials to include the interactions between students as a different kind of one to one, which is a consequence of real-life experience that can occur within the classroom.

The students' engagement with the work of their peers is articulated in the course guide as participation in the community of learning and is explicit as part of the teaching method. It sets up an experience that Biggs (1999, p 61) would describe as students working collaboratively and in dialogue with others, both peers and teachers. Part of the teaching is to model different ways of speaking about the work. Asking students to participate in the community of practice as adults and to engage with the work of their peers invites them to draw on and build their embodied knowledge. It also appears to build the confidence of individual students and confidence in the web of relationships between class members. Articulating this aspect of the learning has consistently transformed

the space of learning within the classroom. It reframes community as those within the classroom, including teachers and students, rather than just seeing community as something in the world outside the university.

## Conclusion

Working at full scale in design education gives students the opportunity to work directly with materials and in real time. It admits both the thinking and the sensing body as part of the process of doing design. In landscape architecture, gardens provide a useful site within which to explore ideas while also working with living materials, thereby providing the opportunity to bridge the abstraction of representation and the material resolution of ideas. The small scale of many residential gardens offers a limited area within which to test ideas at the 1:1 scale while also being a model for testing ideas at a larger scale. By acting as both designers and builders in the Avoca studios, students were able to explore the design process in a range of ways. These varied according to the site conditions, the students' own individual inclinations and those of their peers. Some students conceived their designs through the abstraction of representation whereas others began through working with the earth. Students experienced the consequences of their decisions and bore witness to the work of others.

Reflection on the successes and failures of teaching the design/build studio in Avoca has led to a reconsideration of the construction of the space of learning. Although design is predominantly measured by material outcomes, the one-to-one human capacities and relational skills are equally critical aspects of the design process. While design through making is relational through the physical crafting of materials, the building of larger projects, such as the gardens in Avoca, requires working together as a team. Rather than leaving students to sort out issues between themselves and assuming they will pick up the relational skills they need along the way, the teacher needs to recognise that these relational skills must be learnt and therefore include them as part of the teaching process. This is the case with all projects requiring students to interact together. These same inter-personal relational skills are also relevant when establishing a community of practice within the classroom. Including students' participation in the community of learning as part of the learning objectives is one way of foregrounding the responsibilities students have in relation to each other and acknowledges the potential contribution each person can make to the larger class. To maximise individual contribution, education in social practices needs to be an explicit aspect of live design studios. Through this process, community is constructed within the student group rather than as something outside the university. This provides a bridge between teaching inside the classroom and the 'live' projects like the gardens designed within Avoca.

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