Research in Landscape Architecture Design Firms: Lessons from Practice

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ABSTRACT Landscape architecture offices are increasingly being asked to justify design decisions through performance metrics. In response, research is increasing within professional offices. However, while the breadth of academic research has been well-studied, little is known about research within the professional design office. To address this gap, interviews were conducted with research leaders and principals of U.S. landscape architectural firms that promoted research as part of their services. This pilot study explored the range of research conducted; motivations for engaging in research; and firms’ relationships to practice, research methods used, and perceptions of the research skills needed by employees. Examples of what constituted research in practice varied widely between interviewees and was more expansive than the traditional analytic, replicable research conducted in academia. The study found that firms had a range of organizational strategies, from research labs to non-profits, internal grants, and informal projects. Firms engaged in research to have a creative outlet and to inform existing projects. Engaging in research helped firms promote innovation, leadership, and marketing. Research allowed practitioners to follow topics that they were passionate about beyond the constraints of project contracts, and generally research was funded through overhead. A surprising result was that firms engaged in research to recruit and retain employees and promote continuing education. Interviewees indicated that academic programs should teach research and critical thinking skills so that graduates are better trained in justifying design decisions. Practitioners perceived a mismatch between academic research and the profession’s project-based knowledge needs, but they were receptive to collaborations with academics to address the challenging questions facing the profession. Future studies are needed to understand how practitioners and academics define research as a starting point for collaboration.

KEYWORDS Professional office, design labs, innovation, business management, motivations

INTRODUCTION Landscape architects are increasingly called upon to justify the efficacy of their design and planning solutions through performance benchmarks and evidence-based design. They are often expected to become leaders who can address challenges ranging from social equity to climate change (Francis, 2001; Domlesky, 2018; Deming & Swaffield, 2011). Engaging in research within design firms through specialized design and research labs is an emerging trend in addressing the gap between academic research and the applied answers needed by practitioners (Zeiger, 2019). However, while the scope of research within the academic programs in landscape architecture has been studied (Milburn & Brown, 2016; van den Brink et al., 2017), little research to date has looked at the role that research plays in landscape architectural offices. Reasons this topic remains underexplored might include factors such as the newness of the trend of practice-based research, offices’ nonacademic motivations for engaging in practice-based research, and a lack of training in research methods and scholarship among practitioners. This pilot study explored the range of research conducted by firms, their motivations for engaging in research, the relationship of research to their consulting practices, and favored methodologies. Furthermore, the study explored practitioners’ perceptions of how research should be taught within academic landscape architecture programs.

BACKGROUND Deming and Swaffield (2011) have argued for embedding research into landscape architecture practice and teaching research skills to graduates during their academic training for them to use as they enter the profession and throughout their careers. However, while there has been an increase in some research within design firms, this is currently not the case
across the discipline. In fact, Deming and Swaffield categorize most professionals as being “passive consumers” of research, or at best, “active consumers” who use the internet to seek out research findings. Research collaborations between academic researchers, research agencies, and professional firms constitute a more engaged level of practice-based research and often entail using landscape architectural firms’ project sites for research purposes, such as testing out new materials or measuring increased biodiversity. Deming and Swaffield categorize the highest level of practice-based research as work in which practitioners act as “research leaders,” conceptualizing, managing, and implementing research. These research leaders are the subject of our current study because little work has been done to identify the types of research they conduct, their motivations, and their roles within organizational structures in landscape architecture practice. Furthermore, most of the literature on research in practice appears in the “grey literature” of non-peer-reviewed magazine articles (e.g., the magazine Landscape Architecture) and conference panels and presentations. Peer-reviewed research conducted since Deming and Swaffield’s work has focused on areas of knowledge, as discussed below, rather than motivations.

Langley et al. (2018) note that surveys of practitioners and reviews of academic programs, including The Landscape Architecture Body of Knowledge report (LABOK, 2014), identify key knowledge areas as design, natural systems, and construction. Notably, these are not the priorities of academic research, which focuses more heavily on history, theory, and research areas ranked as much less important for landscape architecture training and practice. Milburn and Brown (2016) found a similar mismatch between research conducted in academic landscape architecture programs and the priorities of practitioners. Citing Chen (2013), they note that practitioners mostly use research on plants, materials, sustainable design, construction techniques, site engineering, and circulation, while academic research focuses more on history, theory, case studies, and education.

Similar mismatches are found in architecture. Aksamija (2021) lists architectural research covering topics related to history and theory, social and behavioral environments, economics, technology, tools and processes, products, and outcomes. Architecture and landscape architecture firms alike have seen an increase in research conducted by professionals (Aksamija, 2021; Samuel, 2017). However, professional design research is subjective, and its focus on projects has meant that it parallels the design process itself (Aksamija, 2021). For example, designers conduct detailed site analysis research for conceptual design, policy and regulatory research for schematic design, and construction and materials research for construction documentation. Do landscape architectural firms approach research in the same way as architects, their allied professionals, or do they take a different approach? Furthermore, do landscape architectural practitioners favor applied research over the basic or theoretical research that dominates academia? In his seminal book, Donald Stokes (1997) argues for the importance of connecting applied research to promote technical innovation as a long-standing bridge between science and industry that could be used to outline a model for landscape architecture research in practice.

Research by design is a theme that has been widely discussed in landscape architectural literature (LaGro, 1999; Steenbergen, 2008; Deming & Swaffield, 2011; Lenzholzer et al., 2017; Nijhuis & de Vries, 2020). Some argue that design has the potential to be a “strategy for research” and that “finding-out is embedded in the research practice” (Deming & Swaffield, 2011, p. 209). Lenzholzer et al. (2013) propose four types of research through design that are based on using academic research methods. One of these, “pragmatism,” is most akin to landscape architecture practice because it focuses on problem solving in the real world using practice-oriented knowledge and mixed methods. Design projects need to answer a range of project-based questions about site-based and technical issues, as well as qualitative, socio-cultural issues (Lenholzer et al., 2013). Nijhuis and de Vries (2020) provide a compelling argument for how design as research can be conducted, highlighting the role of design experiments as a new part of practice (Ahern et al., 2014; Lenzholzer et al., 2017). In contrast, other landscape architecture scholars argue that design is not research and that conflating these two processes is problematic and minimizes the analytic, replicable nature of research that seeks to produce generalizable knowledge for a
Academic landscape architecture researchers suggest that practitioners are driven by the need to find solutions to design project challenges and therefore benefit from research that takes a broad-scale, generalist approach (Lenholzer et al., 2013, 2017; Deming & Swaffield, 2011). Domlesky (2018) describes the increasing need for research in architecture, engineering, and landscape architecture due to the increasing complexity of projects, amplified by climate change, rapid urbanization, and technological innovation. Furthermore, for those who have called for the expansion of research within design practice, it is important to understand what might motivate practitioners to engage in research as part of professional practice (Deming & Swaffield, 2011; Milburn & Brown, 2016; van den Brink et al., 2017; Nijhuis & de Vries, 2020). Motivations are the precursor to taking action and therefore need to be better understood. Researchers have suggested that these motivations may be external, linked to the need for firms to appear “innovative” or in high demand by public and private clients who want to see the economic and scientific basis for design decisions (Deming & Swaffield, 2011). However, much of the research on motivations in the fields of environmental stewardship and conservation behavior has found that internal motivations create more lasting behavioral change than external motivations (Vallerand, 1997; Vallerand & Bissonnette, 1992; Ryan et al., 2001, 2002; Lee et al., 2022). Thus, it is critical to learn more about the motivations and attitudes of research leaders in professional firms as the first step in expanding research within practice.

Understanding how existing firms embed research into their organizational structure is another aspect of expanding research in practice. In one of the few articles to look at research labs in design and engineering firms, Domlesky (2018) describes sophisticated partnerships between researchers within professional firms, nonprofits, and government agencies/clients. Project types include the SWA’s Resilient Cities Project to address climate changes in cities such as Miami, the Cities Alive project by the engineering firm Arup to expand green infrastructure’s applications for multi-functional goals, and MASS Design Group’s work on health and design (Domlesky, 2018). Domlesky argues that more focused research approaches are needed in design firms compared to the ad hoc approach of many firms. For firms wishing to develop their research arm, it is important to understand the organizational approaches used by firms that have more formal research agendas and projects.

Knowledge of research methods is another aspect of promoting research in the profession. Landscape architecture education has seen an increase in literature on research methods for landscape architecture (Deming & Swaffield, 2011; van den Brink et al., 2017). Research methods courses are taught in many graduate landscape architecture programs, especially those with terminal masters’ theses and PhD dissertations. However, the divergence between academic and professional landscape architects has often been noted as problematic for education and professional training (Milburn & Brown, 2016; van den Brink et al., 2017; Deming & Swaffield, 2011). Thus, it is important to know if professionals think that research design and methods should be taught in accredited landscape architecture programs and which type of methods are most valuable for practice.

In summary, despite the call within the field of landscape architecture to increase the role of research in professional landscape architecture offices, few studies to date have explored this topic. The current study will investigate this topic by exploring the following research questions:

- What range of research and related activities is being conducted in professional offices, and how do these activities relate to academic research?
- What are the personal and professional motivations to engage in research among research leaders who work in practice?
- How have firms integrated research into their practices, and what types of organizational models are being used?
- How important do practitioners think it is to teach research in academic programs, and how do they see graduates using their research skills in the professional office?
METHODS
To answer these questions, this pilot study used a qualitative approach since this topic has received minimal attention to date (Gaber & Gaber, 2007). Interviews allow themes to emerge from participants to help guide future inquiry (Creswell & Creswell, 2018). A sample of landscape architectural design firms was selected based on one of three criteria. First, the firm listed research on their webpage as a service or department. The study used the ASLA’s firm finder search engine and Google search terms such as “research” and “experiment” to identify firms. Second, the firm had won a national ASLA award for research in the past ten years (i.e., since Deming and Swafield’s 2011 study). Third, the firm (or individual) was recommended by another interviewee as part of a snowball sampling approach (Babbie, 2020). The directors of research in the firm were interviewed; where no such position existed, the principal of the firm was interviewed. Interviewees were contacted via e-mail to participate in a virtual interview focused on a series of questions related to 1) the type of research conducted by the firm, 2) the role of research within professional practices and funded projects, 3) motivations for engaging in research, and 4) the type of personnel and skills needed to engage in research. A follow-up question addressed the importance of teaching research within landscape architectural education and the types of skills and methods the interviewees considered the most necessary for future practitioners. (See Interview Questions in Supplemental Information.) Initially, twelve firms were contacted to participate in the study and nine accepted the invitation.

A total of 10 interviews were conducted with research leaders and principals at 9 U.S. landscape architectural firms that promote research as part of their services. The firms varied in size from 5–250 persons, with the majority (66%) in the range of mid-size (50–100 persons) to large (100–250 persons); the firms also varied geographically, from the Northeast to the West Coast. Interviews were conducted via video call and lasted approximately 1 hour. In addition to recording and electronically transcribing the interviews, the interviewer took summary notes. The responses were analyzed by study question, and quotes illustrating important findings were highlighted and used in further analysis.

RESULTS
The research leaders who were interviewed varied in their backgrounds. A small number of interviewees had leveraged their backgrounds in academia to lead research efforts in practice, but the majority had research-based topics of interest. Despite the growth in PhDs in landscape architecture, none of the interviewees had doctorates, but all had a master’s degree in landscape architecture or a related field. The results of the interviews are presented below, roughly organized by interview questions on the following topics: 1) research within the firm and definitions, 2) structural organization of research, 3) research as part of professional practice, 4) research methods used, 5) motivations for engaging in research, 6) skills used, 7) disseminating research results, and 8) teaching research in landscape architecture programs.

Research within the Firm: Defining Research
Interviewees were asked whether their firms engage in research as part of their professional services, and if so, whether it was part of standard consulting. They were also queried about the type of research their firms did. It quickly became apparent during the interviews that practicing landscape architects had different definitions of research than their colleagues in academia, and in most instances, they were very cognizant of the differences. Understanding the definitions used by these practitioners became important when asking what types of research their firms engaged in. One interviewee made the distinction that professional research could be understood as applied research used to answer a particular question, in contrast to basic research, which was used less often in the profession and mostly served to answer more generalizable questions that were not tied to a particular project. In many instances, applied research revolved around focused “passion” projects on a topic of interest to members of the firm, such as urban tree survival or spontaneous urban plants. Another interviewee talked about “designer research,” which
he termed research that takes a loose approach and lacks the rigor of academic studies. This type of research is conducted in service to a project and resembles “design as research,” as described by academics (Nijhuis & de Vries, 2020). However, most disciplines would not categorize design exploration as research since the approach generally lacks standard methods and replicability (Babbie, 2020; LaGro, 1999). On the other hand, design-related explorations such as field experiments to test plant materials or soil mixes is generally considered research as it uses proven methods that are replicable and generalizable. Design experiments described by Ahern et al. (2014) fall into this category.

Another theme was “site analysis as research,” in which firms do “research” to learn about a site’s history, ecology, and other factors. Firms do project-based research to understand the baseline for a project. In fact, some firms have developed site analysis applications to standardize methods for gathering site information, such as measuring site temperature, wind speed, solar access, and other data. This allows them to use programs to analyze the implications for design, and after the project is built, it allows them to have before-and-after “performance benchmarks.”

Firms did engage in more traditional research projects to answer applied research questions. In some instances, they partnered with academics or other consultants to engage in these projects. Sample topics of these studies include the following: soil types for roof gardens, impacts of structural soil on urban tree survivability, air quality in parks above highways, and children’s playgrounds. These kinds of projects were more likely to be published in peer-reviewed journals than other research conducted in firms.

The Landscape Architectural Foundation (LAF) Case Study project was mentioned by most respondents as a type of research in which they engaged. Interviewees generally agreed that LAF case study templates made it easier to standardize work, and having an academic partner as a “neutral” observer allowed for more rigorous evaluation (LAF, 2022).

**Organization of Research within Firm Structure**

The study was interested in understanding how research is conducted within a landscape architectural firm and what organizational structures, formal and informal, made it possible. In other words, what was the impetus for doing research, and what sustained these efforts over time? This is important information for other firms that may want to do research but don’t know where to begin. The firms we interviewed varied in the type and level of formality of the organizational structure for doing research (Figure 1). Some firms took a more fluid, organic, bottom-up approach to research. Individuals with research ideas that they wanted to pursue could apply for funds (or release time) to work on a project by applying to a research committee or, in the case of smaller firms, directly to the principal of the firm. Individuals (or teams) then worked on their projects and presented them to the firm later. In some smaller firms the approach was even more organic, with research projects emerging from the interest of the principal or other employees. As described by one interviewee, research in small firms is much more opportunistic, or “catch-as-catch-can,” as interests and opportunities emerge.

At the other end of the spectrum, three firms, a third of the sample, had developed research labs with dedicated staff (Figure 2). These labs, under the direction of research directors and studying a range of topics, represent the most formal organizational approach to research. The landscape architectural research lab structure was found in larger firms and often included satellite labs at multiple locations. The benefits of this type of structure are that it allows the
firms to develop more long-term research and expertise in areas of interest to both principals and staff. The cost is having enough overhead to fund the labs and their staff time. It was interesting to learn that lab research staff acted as consultants on firm projects and helped lead efforts to embed research into projects. They also developed standardized methods to help gather and analyze site data, including even digital applications for staff. In addition, research staff served an educational role, implementing staff training and educational programs.

Research labs were part of some larger firms that had the overhead to support them, yet other large firms had consciously decided not to pursue the research lab format. These firms appreciated a more informal approach that derived from individuals in the firm pursuing a particular area of interest. In a few firms, research efforts were spearheaded by the principals who directed research in key areas of interest as determined by the firm’s leadership. These project areas included developing standardized methods for conducting case studies and post-occupancy evaluations of firm projects, as well as standardizing performance benchmarks. Other research leaders identified by three interviewees were technical directors who conducted materials research and ensured excellence in construction detailing and execution across the firm. As many interviewees mentioned, a lot of important information embedded within individual projects needs to be identified, catalogued, and shared to improve future projects. The notion of “not reinventing the wheel” comes to mind here. It is important to the profession as a whole that individual firms share these insights. Some firms do create books, reports, open-source computer apps, and webpages to disseminate their insights, but this is not as widespread as it could be.

Another research staff member at one firm was a landscape architectural librarian. The role of librarian is to oversee archives and help access information for projects, especially from periodicals or other digital resources. In some cases, this involves obtaining access to academic library system data bases. GIS coordinator or spatial data base coordinator is another allied role in some firms for doing project work and site research.

One organization we interviewed was a small nonprofit firm that focused on play research and developed professional design projects as a smaller percentage of their work. Its focus on research made this firm unique among our sample, but this suggests there may be a niche for firms in research consulting services. The nonprofit structure allows such firms more flexibility in the projects that they pursue and enables them to apply for project grants and funding. Our sample did not include small landscape architectural firms specializing in research consulting around other topics, such as accessible design, community participation, and historical/cultural research.

Another firm that was interviewed had a nonprofit foundation that focused on community outreach. Interviewees in other firms that had contemplated such a structure themselves talked about its pros and cons, including the challenges of keeping the
for-profit firm work separate from the foundation’s work. This requirement made a nonprofit foundation for research less attractive to firms that wanted to generate data and analyses to inform their design projects. (The Gehl foundation was mentioned as one example of an architecture firm that had this type of structure but closed their nonprofit foundation.)

**Research as Part of Professional Practice**

At the outset of this research, the study hypothesized that firms might embed research within the scope of services that they offered to clients as part of standard consulting contracts. Initial review of project websites appeared to support this hypothesis, but this notion of firms engaging in fee-for-service research work was quickly contradicted by interviewees. Eight of the firms (89%) conducted their research projects primarily through overhead-funded efforts that allowed for exploration of a particular research topic. In many instances, the research results might inform future projects, but that aspect was not written into the project’s scope.

In addition, the amount of research that was part of funded projects was much less than the quantity of stand-alone research projects funded by overhead. Several interviewees mentioned that clients did not want to pay for research. In those instances where research was part of a contract, it was often budgeted as part of a standard deliverable, such as site analysis or materials selection. The same went for conducting post-occupancy evaluations on projects that were only paid for by clients if they agreed to them as part of the initial scope of work.

**Research Methods Used**

When asked about the type of research methods that they used, interviewees often stated that the methods varied by project and that each project was unique. Thus, context was a critical component of research design and methods. This finding aligns with the way some interviewees talked about analysis as a research method when referring to site analysis or other analysis related to project investigations. Surprisingly, four (44%) interviewees described literature review as part of their research methods, and others included finding precedent or case studies as an important research method. The literature reviews that were discussed were primarily “systematic” literature reviews rather than integrative summaries or meta-analysis. As discussed above, one firm even had a librarian to assist in finding literature from academic libraries and other scholarly sources.

Materials research was also frequently mentioned as another common research method. In most instances, landscape architects studied the applicability of different materials for a project. Local sourcing of materials was part of some of this research as well. Some firms talked about how materials research was often buried in project files, and there was a need to catalogue and share these insights for future projects. At one firm that had its own fabrication division, materials research included building landscape features and testing them out by collecting and analyzing data on factors related to structural strength, resistance to weathering, and other factors typical in an experimental research project. Other firms did technical “mock-ups” in conjunction with contractors and material suppliers.

The LAF case study method was invoked by six of the firms (66%) who had done case study projects as well as by those who aspired to do so in the future (LAF, 2022). Firms appreciated having a uniform process for evaluation by a neutral third party, their academic partners. Post-occupancy evaluations (POEs) were also mentioned in a few instances, separately from the LAF case study methods. In fact, several firms had engaged in extensive POEs on many of their projects. Firms with research labs developed toolkits using apps and other strategies to create more uniform methods for gathering site data (i.e., readings on climate, wind, temperature, and sun exposure; soil testing; and even use patterns, such as behavioral mapping) as part of before-and-after studies. These efforts to create a more uniform methodology for gathering and evaluating landscape performance metrics were an important step in being able to highlight the benefits of their projects with quantifiable data.

In general, few firms engaged in social science studies, but for the four firms that did, behavioral observation of site users was the most common method that was used along with interviews with site users and other stakeholders (Figure 3). Some referred to established methods they used such as the SOPARC online method for observing play and recreation developed by the Rand Corporation...
The LAF Landscape Performance Metrics guidebook was also mentioned as a good source for finding landscape research methods (https://www.landscapeperformance.org/guide-to-evaluate-performance). One firm was researching the efficacy of different types of public participation techniques, especially those that had emerged recently, when the COVID crisis forced new experimentation with online participation methods. This firm and others were interested in learning how to improve their participation approaches when working with diverse communities.

Cultural landscape and historical research were also mentioned by a couple of interviewees in response to questions about the research methods they used. One interviewee talked about needing to explore site and memory. However, in smaller firms, detailed cultural and historic research was often done by consultants, especially for those sites with sensitive resources and/or historic ties to marginalized groups, such as Native Americans whose voices had often not been included in previous studies.

It was surprising that ecological research methods were not often explicitly mentioned, except for soil testing and analysis, which was common on most projects. In some cases, the topic of ecology was often subsumed within site analysis or may have been considered the bailiwick of other consultants and experts in ecology. However, one firm mentioned the need to have “before” ecological and biotic data to show the biodiversity improvements of the final project. Another firm was engaged in research on spontaneous urban plants, and two firms conducted research on urban trees.

Research typologies and methods conducted by firms fell along a gradient from project-focused, research-adjacent activities such as site analysis to experiments on materials and plants that used empirical scientific methods (Figure 4). Precedent studies of similar projects fell under the category of site-focused research and were distinguished from rigorous case studies. Literature reviews included both full-scale systematic literature investigations of peer-reviewed literature and much looser explorations of sources from grey literature and webpages. Many firms cited time and access as barriers to exposure to peer-reviewed literature; most were more interested in research summaries with focused...
insights. This gradient illustrates the need for a clearer distinction between site analysis and other research-focused activities.

Motivations for Engaging in Research
The motivations for landscape architectural firms to engage in research revolved around key themes related to the firm’s image, publicity, and marketing; staff development, recruitment, and retention; and curiosity, passion projects, and innovation. Interviewees talked about how research provides “value-added to their projects” and strengthens the design process. Research creates a different way of looking at a project and a site. It often accompanies high quality work that can be used to “pitch the firm,” allowing them to differentiate themselves from their competitors. Other interviewees mentioned how research made their projects more intelligent, while still others talked about having the opportunity to innovate and impact the profession through changing practice.

Curiosity was mentioned by six (66%) interviewees as a motivation to engage in research. Research allows firms to do aspirational work that goes beyond traditional design projects. Several interviewees discussed how research allowed them to step back and see the larger picture, to make sense of the many projects that they have worked on.

Interviewees also talked about how research by their firms filled the gap left by academic research, which they perceived to be disconnected from practice. Research is driven by the desire to answer questions that they find within their projects that go beyond project-based client needs.

In some instances, interviewees mentioned that clients were the instigators of research and were looking for sustainable approaches and innovations, especially for larger projects. This was especially true for institutional and public clients who own and manage sites for the long term. They talked about how “the emphasis on technology and science means the world wants data-based solutions.” Some felt that landscape architects need to respond to this expectation that they show the relevance of their projects.

Four firms (45%) discussed how research had an unintended benefit of helping them recruit and retain new employees, especially recent graduates. Research helps improve employees’ quality of life by letting them explore topics of interest. Improving firm culture was also discussed by several interviewees as a motivation to engage in research, as well as building leadership and expertise in staff members. One interviewee talked about how research helped energize them and the entire staff by allowing for curiosity and exploration of topics they are passionate about.

Another motivation for research was providing information and support to advocate for changes to policy and practice. For example, some firms engaged in research on children’s play spaces to show the benefits of increasing children’s physical activity and providing more challenging playgrounds to build children’s skills and confidence. Research data is also
needed to convince clients, as well as government officials, to allow new materials to be used. Some research examples by firms we interviewed included new uses for recycled materials, the impact of structural soils for urban trees, and soil materials for roof gardens (Figure 5).

**Skills in the Firm**

We asked participants about who in the firm engaged in research and the type of skills needed to do research. A follow-up question looked into whether staff came to the firm with these skills or learned them on the job. This led to discussions about how research results are shared within the firm and beyond. In some firms, many of the employees had been to graduate school and according to interviewees brought research skills with them. Curiosity was seen as an important attribute in new employees. Some firms also talked about their practice as being interdisciplinary and expressed the view that the best research projects were interdisciplinary in nature and capitalized on the range of skills and backgrounds of employees. Interviewees talked about the many experts they had on staff, a feature that allowed their practitioners to rely on colleagues for research partners. It is important to note that few firms had PhDs on staff, and when they did, these individuals were likely to have doctorates in allied disciplines, such as planning, ecology, or economics. In fact, one interviewee noted that they were looking for designers with insights and curiosity to do research projects as designers took an applied approach to gathering and interpreting data.

Three interviewees (33%) noted that research skills are unique and project specific, so it is hard to list specific skills. Thus, interviewees described “learning on the job” as being a common way to gain these skills and ask questions about projects. In addition, directors of research labs taught research methods that were needed for specific projects and therefore more systematic and rigorous than simply learning on the job. One cited the example of training staff on in-house toolkits and other resources that firms had developed. Others described specific skills, such as being able to find and document precedent studies quickly and efficiently for projects, knowing how to gather performance metrics, and developing SMART goals. Staff should also be able to do research on materials and other technical matters.

In many firms, participation in research was widespread. For example, one firm estimated that 60% of employees had participated in a research seminar, project, or other related activity. Others talked about how all employees were involved in research as part of the design process, making an assertion that speaks to the different notions of what constitutes research in design firms. These respondents’ definition of research differs markedly from how most academics would define it.
Sharing Research within the Firm and Beyond

Research results are shared in a variety of ways within these firms. The most common forums respondents cited for sharing research results in-house were brown-bag lunch presentations and lectures. Many firms also invited outside guests, including academics, to give guest lectures. In many cases, outside speakers were seen as catalysts to generate new thoughts and directions for the firm. Partnerships with nearby academic institutions or labs were used for research, but also for training staff in new methods or types of research as part of the firms’ lecture series or brown-bag lunch presentations.

Most firms talked about project pin-ups, weekly firm-wide meetings, and other similar gatherings to share research results. In many instances, these meetings were also used to frame research questions and review methods and to discuss design and research. In addition, directors of research and other related staff often taught seminars as part of staff training, including teaching staff how to conduct a literature review or manage projects. Others developed an online community engagement template that staff could adapt to their own projects.

Several firms relied on a variety of in-house digital platforms, including wikis, websites, and digital storage, to share research information across the firm. These were usually organized by subject area, such as urban forestry, plant material, and ecology. In some instances, in-house experts, such as ecologists, managed these pages and disseminated information firmwide.

Unlike academic settings, most firms disseminated research by means other than publishing results in academic journals. Many firms had presented their work at the ASLA National Conference, and some had written articles for Landscape Architecture magazine or similar venues. Dissemination of research conducted in firms also occurred through online posting of research results or white papers and exhibits of work. Most interviewees indicated that their firm’s research was not considered proprietary information but had a strong desire to share their results to help the landscape architecture profession. Toward that end, some firms had external-facing websites to share their research results. Other firms have built partnerships beyond ASLA and LAF to allied organizations like the Urban Land Institute to share their research with a larger audience.

Teaching Research in Landscape Architecture Programs

In general, there was uniform support for teaching research skills in university landscape architecture programs, especially in graduate school. In this respect, the interviewees agreed with the Landscape Architecture Accreditation Board’s requirements that distinguish graduate from undergraduate programs. However, respondents’ opinions varied when it came to the types of skills they thought should be taught.

The most common response was that students should be taught how to develop research questions, including how to defend their opinions or thesis with data and research results. Critical thinking was seen as essential to developing research expertise. They saw a role for universities in teaching students how to develop their own ideas and perspectives on important topics. Students should be taught processes and ways of thinking, or “approaches that will give them an efficiency about how to do research.” They should be able to ask process questions based on methods of inquiry. To deal with the complexity of many projects, students also needed to learn a broad range of methods, including landscape metrics.

One interviewee expressed the view that students needed to learn about experimentation and develop curiosity, passion, and nimbleness. Firms needed to be able to pivot in response to changing client demands and focus on mission, vision, and priorities. Several interviewees stated that students graduating today come with a passion for addressing climate change and social justice issues but could only address these complex issues in a meaningful way if they had the right tools.

In some cases, interviewees said that students needed to learn how to explain and justify their rationale for a project. Why did they make a certain design decision? According to some interviewees, students often focus on a design without a rationale or evidence for why they think a particular approach will solve the site issues and succeed. As noted by one interviewee, “the profession will have to do better than that.” As another interviewee stated, “design solutions need [to have] depth and to respond to communities’ needs.” Evidence-based design
requires the tools to show that a project works in the expected way. One interviewee suggested that professional practice courses could help students learn to measure a project from beginning to end. Familiarizing students with the LAF case study metrics and Performance Benchmarks is essential in this regard, especially as it teaches students the importance of having a baseline to measure metrics against.

Two interviewees (25%) had taught graduate courses, including research-related classes. They emphasized the need to teach future practitioners basic research skills and methods, including proposal writing. They felt that writing a research grant proposal would help prepare graduates to respond to requests for proposals (RFPs) and perform other professional writing tasks. Along those lines, interviewees discussed the importance of learning how to do literature reviews and find credible sources in peer-reviewed literature. Knowing how to find, categorize, and evaluate precedent and case studies was also discussed as a valuable research skill for students to learn.

Communication was another important skill raised by the interviewees. Students need to learn to convey their thoughts and ideas coherently and effectively, both in person and in writing. Students should learn how to share information, including with people in other industries (e.g., health experts or soil scientists). They should be able to understand and visualize data as well as communicate information about it to clients. In the words of one interviewee, “things are being quantified.” Students should be conversant in and able to question the validity of data associated with GIS, social media, carbon, ecosystems, and economics (e.g., real estate values). Interviewees mentioned in particular that students should be able to mine GIS and other sources for relevant data and conduct site analyses of all types.

A few interviewees talked about how landscape architecture students should know more about human behavior and social observations. “We are designing spaces for people and need to know how they will react and use those spaces, especially people who are different than us.” One interviewee thought all students should watch Holly (William) Whyte’s classic video The Social Life of Small Urban Spaces. Another talked about teaching ethnographic research and another about developing surveys and survey questions.

**DISCUSSION**

This discussion will focus on key cross-cutting themes within the research results while comparing this research to previous studies, articulating future research questions, and proposing future collaborative models for academics and practitioners.

Themes that emerged in this research were:

- Creativity and innovation
- Pragmatism
- Internal motivations
- Passion projects
- Project-focused research and case studies.

The theme of creativity and innovation spanned many of the responses to the interview questions. Research within firms is a means to explore topics of interest and spur creative solutions based on the knowledge generated by research. For example, Olin Lab’s work on using recycled glass as sand in landscape soil mixes is beneficial in several respects: it reduces both waste sent to landfills and the impacts of sand mining on the environment, and it also saves cities money on waste disposal costs (Olin, 2022). Research projects were seen as a way to retain employees by enabling them, especially recent graduates, to pursue their creative interests.

Pragmatism was another cross-cutting theme in the study. This is not surprising given the findings of previous research that firms generally emphasize “practical” research (Lenholzer et al., 2013). Landscape architecture practitioners were more interested in finding solutions that they could readily apply to their projects rather than addressing theoretical or historical questions. This finding aligns with previous research on architecture firms (Aksamija, 2021). In fact, interviewees in our study frequently mentioned that academics were not conducting research that could be readily applied to landscape architecture practice, with its focus on site design projects. In general, the study’s participants felt that academics needed to recalibrate their research to support the profession more.

While this study found a range of motivations that led practitioners to engage in research, the desire to follow one’s passion and curiosity was a consistent cross-cutting theme. Internal motivations have been found to be critical for developing a connection...
to nature and engaging in environmental stewardship; as such, they appear to be more long-lasting and durable than external motivations (Lee et al., 2022; Ryan et al., 2001; Vallerand & Bissonnette, 1992). This is good news for the continuation of research in practice and suggests an important avenue to pursue for future research studies on landscape architects’ internal motivations.

Finally, another cross-cutting theme showed that case study research was the most prevalent research method used and one that strongly connected practitioners and academics through the Landscape Architecture Foundation (LAF) case studies. This result differs from previous research that found case studies to be more commonly used by academics than practitioners (Chen, 2013). Case studies are a logical point of departure for future research collaborations between practitioners and academics. The current study found that landscape architects studied a broad range of topics, including materials, plants, sustainable design, and construction. In this respect it confirmed previous research (Milburn & Brown, 2016). However, the current study found more socio-behavioral studies being done by practitioners than in previous studies on research in practice (Chen, 2013; Milburn & Brown, 2016; Aksamija, 2021).

As a pilot study, this research helped to identify and articulate future research questions to inform research in practice:

- How do practitioners and academics define research?
- When in the design process should research occur?
- How can practitioners fund their research endeavors?
- How should design education prepare professionals to do research?

One of the central research questions is how practitioners and academics differ in their definitions of research. This study found a range of definitions of research that sometimes differed markedly from the traditional definition of research as an analytical, replicable process to produce generalizable results that answer a research question (Babbie, 2020; LaGro, 1999). Some practitioners talked about doing research as part of site analysis. However, if one uses this definition, then most landscape architects are doing research. However, confounding general site inquiry as part of the design process with research is problematic since site analysis does not usually lead to generalizable results to answer broader research questions. Confounding site analysis with research suggests a lack of understanding and training of many landscape professionals in research design and methods. A comparative study of research definitions between academics and practitioners would be a useful follow-up study since shared definitions and understanding are needed for meaningful collaborations.

A related future research question is when in the design process research should occur to inform practice. For example, materials research in the design development stage can inform what type of material will perform best in certain conditions. On the other hand, POEs of existing projects inform future projects but are infrequently used to redesign existing projects. Teasing out these differences in timing could be helpful for identifying critical moments in the design process when experimentation and new information are most needed.

Another area of future study is the question of how practitioners can fund their research endeavors and how client-instigated and practitioner-instigated research differ. Institutional and public clients who are long-term owners and managers of sites may be more receptive to fee-for-service research to measure long-term benchmarks of success, especially those that have ecological, economic, and social benefits. Examples of such benchmarks are the amount of water saved by using drought tolerant plants, the level of increase in park use, and increased diversity among visitors to a site. Developing strategies to fund research beyond overhead is critical to convince more practitioners to engage in research. Industry partners in materials and construction could be another source of research funding.

This study has insights for landscape architecture education and accreditation, including the Landscape Architecture Accreditation Board (LAAB). Existing education standards already require critical thinking skills as an educational outcome within landscape architecture programs (LAAB, 2021). The study results show that professionals support this requirement and are looking for graduates who are
critical thinkers and who can articulate research and project-focused questions. The study results also point to an increased need to teach students a range of research methods, including case studies. LAAB should explore expanding educational standards to encompass more research methods, including sampling, quantitative and qualitative research methods, and basic inferential statistics, even in undergraduate programs, where they are currently not emphasized.

Landscape architects are a receptive audience for partnerships with academics, and a wealth of research could potentially be conducted within the fast-paced, project-based work of landscape architecture firms. This collaboration could take a myriad of forms. LAF case studies provide one existing framework for partnerships between academics and practitioners. Informal partnerships include inviting academics and practitioners into firms and academic programs for guest lectures on research areas of interest. Student internships are a common way in which firms engage in research projects of interest. Internships for professors or professionals who are beginning collaborations might be another promising area. Some academic departments have sabbaticals or study leave opportunities that allow academics to work within firms and share their knowledge. Practitioners also take leave from firms for “professor of practice” positions in academic programs. The ASLA’s Professional Practice Networks are another area to develop research connections (asla.org).

Several of our interviewees described bringing in academics as experts to discuss emerging research areas, and others included some of them on existing project proposals. For academics, partnering with professionals allows them entrée into research study sites and questions that are relevant to both the profession and clients, including government agencies. Professionals described including academics as “experts” on their interdisciplinary projects. Opportunities often arise for academics to engage students and professionals on research studies that might run parallel to and/or incorporate design projects and timelines. Another approach would be to pursue research grants collaboratively, capitalizing on academics’ expertise and ability to apply for research grants that are only available to academic or nonprofit institutions while including firms as consultants on projects that can benefit from their professional expertise and community connections.

CONCLUSION
In summary, this pilot study has conveyed the diversity of research engagement within landscape architectural firms and shown that interest in research is growing, fueled internally by a desire to explore and innovate and externally by the increasing emphasis on evidence-based design and performance benchmarks. For firms that have not yet embraced research, a range of models exists, from academic partnerships to internally funded research grants and research labs. The creative design studio format lends itself well to the interdisciplinary team-based approach of many of the research studies being conducted within firms. In some instances, especially for smaller firms, interdisciplinary research involves partnering with like-minded experts from allied disciplines in other firms and with academic, nonprofit, or government partners. In the competitive world of private consulting practices, distinguishing one’s firm through innovative research embedded within design solutions is essential to address the challenges of sustainable design, environmental justice, and climate change.

A surprising finding from this study is that research plays a valuable role in promoting a creative culture in firms and engaging employees’ interest and curiosity. Research is an outlet to explore areas of interest beyond the limitations of project contracts and timelines. It was interesting to discover that the desire to recruit and retain high-caliber employees, especially recent graduates, was a very important motivation for engaging in research. After cultivating a mindset of curiosity, inquiry, and exploration in school, new graduates seek a professional setting that allows them to continue that exploration upon joining a professional firm. There appears to be a tension that deserves further exploration between firms wanting their new employees to have critical thinking skills and the fact that in many instances, recent graduates are bringing research skills and interests from their graduate research that they want to explore in practice. Even firms that have never considered doing research are well advised to explore ways to engage their new employees in creative endeavors that can build knowledge for the firm and allow them to grow as designers. While the traditional route many firms
have taken is to engage in design competitions, this study suggests new strategies including research grants for employees, which usually involve paid time to explore passion projects, or even informal research labs to explore areas of common interest. It was interesting also to see that some of the most creative artistic exploration taking place in firms whose practitioners we interviewed were part of the firms’ research endeavors and included new ways of seeing sites, plants, and materials.

As this was a pilot study involving a small number of firms, there are certainly more insights to be gained from further exploration of research within the landscape architectural profession. For example, interviews with members of firms that do not currently conduct research could explore their attitudes and aspirations in that area. The study results also point to the need for stronger collaborations that would help bridge gaps between academic landscape architects and practicing professionals. Practicing landscape architects need more research that helps them address the problems they need answered. The future of the profession depends on innovation that can develop from these kinds of project-based research collaborations.

REFERENCES


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