Exploring the Relationship Between Academic Knowledge & Practice in Landscape Architecture

by

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A Thesis
presented to
The University of Guelph

in partial fulfillment of requirements
for the degree of
Master of Landscape Architecture
in
Landscape Architecture

Guelph, Ontario, Canada

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Abstract

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Academic knowledge serves specific functions within a profession, and can affect the relationship between a profession and its work. Due to a reliance on other disciplines, a specialized body of knowledge within landscape architecture is difficult to identify. Is there a specialized body of knowledge in landscape architecture, and if so, what is it? A mixed methods strategy was used where data from two pre-existing self-administered surveys, university curricula, and two comprehensive review articles published in ‘Landscape Journal’ were gathered to identify knowledge domains through content analysis. The results were analyzed to identify a specialized body of knowledge. Only two out of ten knowledge domains were consistently identified within each data set - design and natural. Each knowledge domain’s importance also changed depending on the perspective used, as well as over time. These results highlight the importance of academic knowledge to landscape architecture and its ability to conduct work.

Key words: Sociology of Professions, Research, Systems Thinking, Post-normal Science, Knowledge domains
Acknowledgments

Throughout the journey that would lead to this thesis, I was extremely fortunate to be surrounded by extraordinary people who believed in me and what I was doing. People who challenged me to try a little harder, while also offering support when I needed it the most.

Sean, thank you for your relaxed demeanour. It was a much needed reminder of home, especially during the more demanding periods of this program.

Bob, thank you for your unwavering positivity and guidance during the most fragile stages of this thesis.

Rob, thank you for giving me the freedom to see where this journey would take me, and believing that I would not get lost while tumbling down the rabbit hole.

Erin, thank you for pointing the way forward and believing that I would find my own path.

And finally to my family back home, thank you.
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Chapter 1: Introduction

What specialized body of knowledge are landscape architects relying on to inform designs that foster positive change? With issues such as climate change, food security, decreasing biodiversity, and declining human health, landscape architects will be called upon to be strong stewards of society’s cultural and natural landscapes. To address these complex problems, landscape architects will need to incorporate peer-reviewed research into various stages of their design process (Milburn & Brown, 2003).

The issues surrounding the use of peer-reviewed evidence in landscape architecture are not new, as the expectation for practitioners to justify their decisions has been steadily growing (Gunn, 1978; Lawson, 1980; Nassauer, 1985; Schon, 1988; Innes, 1996; Milburn et al., 2003; Brown & Corry, 2011). Despite the requests for high quality evidence to be incorporated into design, peer-reviewed scholarship has been found to be less important to practitioners when compared to expertise gained through practice (Fein, 1972; Chen, 2013). The disconnect between peer-reviewed research and practice has, in turn, hindered the development of the profession’s own specialized body of knowledge, as the culture within landscape architecture is largely eminence based (Fein, 1972; Chenoweth & Chidister, 1983; Brown & Corry, 2011). As a result, a reliance on borrowing knowledge from other disciplines is common within the profession when scholarly evidence is required (Tai, 2003). While creating important connections with a wide range of disciplines, this borrowing has also made it difficult to identify the specialized knowledge that is specific to the discipline of landscape architecture.

In his seminal book - *The System of Professions: An Essay on the Division of Labor* - Abbott (1988) argued that the strength of a profession lies within the specialized body of knowledge that it claims authority over, as it is from this knowledge that a profession competes with others over work and professional boundaries.

“The organizational formalities of professions are meaningless unless we understand their context. This context always relates back to the power of the professions’ knowledge systems, their abstracting ability to define old problems in new ways. Abstraction enables survival.” (Abbott, 1988, pg. 30)
Despite the strength of this argument, little scholarship has been conducted that investigates knowledge domains within the profession. Two large scale surveys of landscape architects in North America have been conducted - the 1972 ‘Fein Report’ & the 2004 ‘Landscape Architecture Body of Knowledge Study Report’ (LABOK) - but analysis of a potential body of knowledge across these surveys is lacking. More focused investigations from the perspective of landscape architecture faculty have been undertaken, and have shown a large disconnect between faculty and publishing peer-reviewed research (Chenoweth & Chidister, 1983; Milburn et al., 2003). Research is being published, however, and touches various knowledge domains (Powers & Walker, 2009; Gobster et al., 2010). But despite this continued research, identification of a specialized body of knowledge that is the foundation across the entire profession has not been established.

In conclusion, there is a need to investigate knowledge within landscape architecture. Using Abbott’s (1988) work on professional development as a lens to view the problem of identifying a specialized body of knowledge, the relationship between knowledge and the profession can be explored. Through this thesis it will be shown that, in addition to understanding what a potential specialized body of knowledge is comprised of, a more explicit acknowledgement of each actor within the profession is needed. By acknowledging the complexity surrounding the relationship between the profession and its knowledge, landscape architects can gain a richer understanding of the different actors within the profession, the purpose of their work, and the different types of knowledge they use and create. Through this understanding, the relationships within the profession can be enhanced, thereby strengthening the connection between landscape architecture and its work.
1.1: Research questions and objectives

It is within this context that my master of landscape architecture thesis research resides, as it asks the question: Is there a specialized body of knowledge in landscape architecture, and if so, what is it? In consideration of the above context and my research questions, my objectives are to: (1) identify and analyze the knowledge domains that were measured to be central to the profession by two distinct surveys (Fein, 1972; LABOK, 2004); (2) analyze the knowledge domains of published, peer-reviewed articles in ‘Landscape Journal’ (Powers & Walker, 2009; Gobster et al., 2010), (3) identify knowledge domains within the curricula course titles of accredited first-professional master of landscape architecture programs in North America; (4) synthesize the results from each source to identify a specialized body of knowledge in landscape architecture; and (5) use the results to assess the components of academic knowledge and their strength within landscape architecture (Abbott, 1988).

1.2: Structure of thesis

This thesis is organized into six chapters. Chapter 2 reviews prior scholarship investigating the issues surrounding research in landscape architecture. To gain a better understanding of knowledge’s role within a profession, the professional development of landscape architecture is investigated, as well as literature on the process of professionalization. Finally, Abbott’s (1988) theory of professional development is investigated and explored within the context of landscape architecture.

Chapter 3 outlines the methodology of this thesis research before describing the methods used within each secondary source of data that was gathered, along with their individual limitations. The method used to synthesize the results of these data sets to identify a specialized body of knowledge and its limitations is also described.

Chapter 4 presents the results of each secondary source of data, along with the results of identifying a specialized body of knowledge in landscape architecture.

Chapter 5 discusses the implications of the results within the framework of Abbott’s (1988) theory of professional development. The results are examined through
the context of time and the profession’s history in order to understand some of the contributing factors that may have influenced the results from each source of data. The results are also explored further using systems thinking and post-normal science literature in an attempt to account for the mixed results that were found when attempting to identify a specialized body of knowledge.

Finally, chapter 6 outlines avenues of advancement for landscape architects, different directions for future research, and questions for the profession.
Chapter 2: Literature Review

2.1: Introduction

The following discussion outlines the need for identifying landscape architecture’s body of knowledge and what it is comprised of. Within this chapter, there are two major sections: a literature review and a description of a theoretical framework. The literature review focuses on past investigations into the issues surrounding research within landscape architecture, and its incorporation into the design process. The second section reviews literature on professionalization and professional development. Within this section, I describe the relationship between a profession and its work using landscape architecture as an example. I also describe how the processes within professional development overlap with the design process and the work of earlier investigations. I conclude this chapter by outlining the components of academic knowledge (which will be used as a theoretical framework), the various functions of each component, and the importance of a specialized body of knowledge to a profession.

2.2: Knowledge in Landscape Architecture

The study of knowledge in landscape architecture is a road not frequently travelled. With a history shaped by the work of practitioners, knowledge in the profession has largely been created through the experience of practitioners (Fein, 1972; Chen, 2013). As the profession began to rely on universities to educate future practitioners, a new system of knowledge creation came into direct use, creating two discrete systems of knowledge creation. However, a dichotomy began to grow between these two forms of knowledge production and has created a debate amongst some as to whether academic research is important to the profession (Milburn, Brown, & Paine, 2001).

The imbalance of use and the perception of importance between experiential knowledge and academic knowledge in landscape architecture has been documented, and continues to exist today (Fein, 1972; Chen, 2013). Fein (1972) described this issue in terms of “boundary maintenance” and “boundary expansion”. He argued that members of the profession - practitioners, educators, and students - wanted to incorporate new
knowledge from external disciplines to expand the profession’s knowledge base - in other words, boundary expansion (Fein, 1972). This yearning for new knowledge can also be found today, although with different knowledge domains being sought after than what was identified by Fein in 1972 (Fein, 1972; LABOK, 2004; Chen, 2013). In addition, Fein (1972) noted that in terms of work, practitioners wanted a greater role in current projects, but did not want to expand into new types of work - in other words, boundary maintenance. This was in contrast to educators who felt that the profession needed to expand into new areas and not rely solely on what was being done at the time (Fein, 1972). Fein (1972) argued that for the profession to remain healthy and competitive, a balance between boundary maintenance and boundary expansion needed to be reached.

Today, there is great opportunity for boundary expansion. The epistemology - “the study of knowledge and justified belief” (Stanford Encyclopedia of Philosophy, 2005) - within landscape architecture is diverse, ranging from objectivist to subjectivist (Deming & Swaffield, 2011). This diversity affords a wide range of exploration and study into various questions relevant to the profession. Currently there are sixty-nine universities in North America offering accredited bachelor and master degree programs in landscape architecture (ASLA, 2014a). With this many programs operating and producing graduates, there should also be a healthy and functioning base of faculty conducting research in the discipline of landscape architecture, regardless of whether the research produced is valued equally by practitioners as experiential knowledge.

2.3: Research in Landscape Architecture

Despite the potential for scholarship and boundary expansion, a number of issues with respect to research, its use, and its purpose within the profession have been identified (Chenoweth & Chidister, 1983; LaGro, 1999; Milburn, Brown, & Paine, 2001; Milburn & Brown, 2003; Milburn et al., 2003; Chen, 2013). The results of these studies have consistently highlighted a mixed understanding of the word “research” and its purpose among landscape architects. Milburn & Brown (2003) identified numerous types of knowledge that were considered forms of research when they surveyed landscape architects.
architecture faculty - personal experience, literature review, precedent design study, case study, and inventory and analysis. It has been argued that this kind of confusion has damaged the strength of the discipline and the profession:

> "While the vernacular use of the word ‘research’ is acceptable among the general public, it diminishes the credibility of landscape architecture as a scholarly discipline when the term is used loosely by educators and their students." (LaGro, 1999; pg 180)

2.3.1: Issues with research production

Today, universities expect faculty to conduct scholarly research and to publish their results in peer-reviewed journals (Chenoweth & Chidister, 1983; Milburn et al., 2003; Milburn & Brown, 2003a). This expectation is important to faculty, as the system of promotion within a university is influenced by research production and publication rates (Milburn & Brown, 2003a). However, the publication rates of landscape architecture faculty has been found to be low when compared to faculty in other disciplines (Milburn & Brown, 2003a; Gobster et al., 2010). Despite the overall importance of conducting research for faculty members and their academic careers, faculty in landscape architecture continue to have low rates of documented scholarship (Milburn & Brown, 2003a).

Milburn, Brown, & Paine (2001) investigated this issue and discovered that while attitudes toward research and its use were becoming more favourable among faculty compared to earlier studies, their behaviours were not changing as rapidly. This negative behaviour towards conducting research was thought to be influenced by two factors - education in research, and the perceptions of research by colleagues in landscape architecture (Chenoweth & Chidister, 1983; Milburn, Brown, & Paine, 2001). It has been found that as education in topics such as research methods increased, the attitude towards research by faculty became more positive (Chenoweth & Chidister, 1983; Milburn & Brown, 2003a). However, very few faculty in landscape architecture have received a Ph.D in landscape architecture or another discipline (LaGro, 1999; Tai, 2003).
The pinnacle of university education in landscape architecture today revolves around a master’s degree, while historically it was focused around a bachelor’s degree (Fein, 1972; LABOK, 2004; Milburn & Brown, 2003a; Chen, 2013). In addition, very few students continue on in education to complete doctoral degrees in landscape architecture, as there are few programs in existence in North America that offer such a specialization (Tai, 2003). Despite the lack of doctoral programs in landscape architecture, a Ph.D is still a major requirement for faculty positions within landscape architecture departments in North America (CELA, 2015).

The issue of poor education in research methods has caused a compounding effect within the university education system as there are few faculty within landscape architecture departments who are qualified to teach research methods & other related topics to new students (Chenoweth & Chidister, 1983; Milburn, Brown, & Paine, 2001). Therefore, students finishing their degree in landscape architecture may also suffer from a poor education in research methods, which could have an effect on their opinions of research when they become practitioners. This, in turn, may come back to affect the actions of current faculty, as Milburn, Brown, & Paine (2001) have argued.

To further complicate matters, there is confusion over who should be tasked with conducting research in landscape architecture (Chenoweth & Chidister, 1983). Practitioners believe that educators are primarily responsible for conducting research, while educators have mixed perceptions (Chenoweth & Chidister, 1983; Milburn & Brown, 2003a; Chen, 2013). Despite this conflict of responsibility, Chenoweth & Chidister (1983) argue that universities have been given the task of producing knowledge through research by society - if landscape architecture is not meeting this requirement, then it is neglecting the responsibility given to them by society.

2.3.2: Design as research

Some faculty members have responded to the lack of research being conducted with a call for design to be considered research (Chenoweth 1992 - in Milburn et al., 2003). In one study, faculty acknowledged the lack of quality research being used in design, but
ultimately felt “that design is the profession’s key contribution” (Milburn & Brown, 2003; pg 61). A debate over design and research developed, with an opposing call from other landscape architecture faculty for a more precise definition of research. Milburn et al. (2003) were critical of this debate, and defined research while attempting to acknowledge design and its relationship to scholarly research. They defined research as:

“... rigorous endeavours which attempt, through generally accepted methods of data collection and analysis, to reduce data into a compelling, authentic, and meaningful statement that extends our understanding of a given state, issue, perspective, or action, and which is critically peer reviewed, universally accessible, and provides a new or substantially improved insight.”
(Milburn et al., 2003; pg 122)

While Milburn et al. (2003) argued that design shouldn’t be considered research, they also state that design could be used as either a topic or product of research. Therefore, there is a relationship between design and research, but they should not be considered the same.

To explore the relationship between research and design, Milburn & Brown (2003) investigated the process of design to determine where and how research could be incorporated. They conducted a literature review of design and research, followed by a pilot study, and a survey of landscape architecture faculty in North America to assess the potential types of relationships between research and design (Milburn & Brown, 2003). It was found that the respondents of the survey perceived research to be part of the design process at three specific phases - before, during, and after design (Milburn & Brown, 2003). In their analysis, Milburn & Brown (2003) argued that research had a stronger role in the pre-design and concept assessment phases of the design process, whereas the concept exploration phase was dominated by more artistic freedom (Figure 2.1).
2.3.3: Evidence-based Landscape Architecture

In light of the issues surrounding research within landscape architecture, design in practice is still largely driven by the experiences of practitioners (Brown & Corry, 2011; Chen, 2013). However, there has been a renewed call for a closer connection between academics and practitioners - a reframing of the beneficial relationship that could exist between research and practice in landscape architecture (Brown & Corry, 2011). The term evidence-based landscape architecture (EBLA) was recently coined as:

“... the deliberate and explicit use of scholarly evidence in making decisions about the use and shaping of land.” (Brown & Corry, 2011; pg 328)

Despite the mixed understanding of research, landscape architecture faculty believe that it has value within the design process (Milburn & Brown, 2003). More importantly, with the growing number and severity of issues that society is facing today, landscape architects will have to increasingly justify their decisions to their clients (Innes, 1996; Milburn et al., 2003; Brown & Corry, 2011). Brown and Corry (2011) argue that this knowledge should be gained by relying upon more scholarly evidence within the design process. However, as described throughout this chapter, there are a few issues within landscape architecture that may impede the incorporation of peer-reviewed evidence into the design process. To further assess these issues, two questions need to be explored: (1) How does a profession function? (2) Is academic knowledge important to a profession?
2.4: Becoming a profession

At the turn of the twentieth century, cultural shifts in North America changed the hierarchy of society. A family’s name and wealth was no longer the deciding factor in an individual’s social standing - instead, people were judged based on their accumulation of specialized knowledge (Baird & Szczygiel, 2007). Landscape architecture’s roots come from garden estate design, but the term ‘landscape architect’ wasn’t utilized until 1860 when it was used as a title for Frederick Law Olmsted and Calvert Vaux in connection with their work in Central Park, NY (Beveridge and Schuyler, 1983).

Landscape architecture as a profession emerged when Warren H. Manning started to develop an idea surrounding a professional association in 1896 (Newton, 1971). Manning’s notions of an association were quickly dashed as other practitioners did not believe the time was right - founding members were retiring and the number of landscape architects was dwindling (Newton, 1971). However, Samuel Parsons, Jr. picked up the professionalization mantel in 1898, and on January 4, 1899 the American Society of Landscape Architects (ASLA) was founded. It was the first step towards the professionalization of landscape architecture (Newton, 1971).

2.4.1: Professionalization

Sociological theories on professionalization - how an occupation becomes a profession - describe similar stages of development, albeit in different sequences. These theories discuss stages such as the creation of professional associations, educational avenues through universities, licensure, and ethics codes (Baird & Szczygiel, 2007; Abbott, 1988; Macdonald, 1995). Landscape architecture can be shown to have met each of these milestones in the decades following the formation of the ASLA - education took root at Harvard University in the early 1900s, title acts came into legislation through lobbying in 1953, and society turned to landscape architecture during the period after the Great Depression (Baird & Szczygiel, 2007).

Even though it can be shown that these different stages in professionalization were met, landscape architecture faltered in its development compared to other professions,
such as law or medicine. When investigating this issue, two topics quickly bubble to the surface - a lack of public awareness, and a lack of authority with allied professions (Baird & Szczygiel, 2007). However, a common problem source within these two issues may derive from the absence of a singular definition of what landscape architecture is and does. From the first time ‘landscape architect’ was used as a professional title, there was apprehension towards its use (Beveridge and Schuyler, 1983). In addition, the definition of landscape architecture has changed repeatedly over the years. Prior to the 1960s, landscape architecture was defined as a profession concerned with singular garden designs (Baird & Szczygiel, 2007). But as the decades passed by, different disciplines were incorporated into the design process in order to respond to the issues of the time (Baird & Szczygiel, 2007). Despite the numerous changes to the definition of landscape architecture, there still isn’t a singular definition in use today (Table 2.1)(ASLA, 2014; CSLA, 2014; OALA, 2014; IFLA, 2014; Williams, 2014).

Table 2.1: Definitions of Landscape Architecture

<table>
<thead>
<tr>
<th>Source</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASLA (2014)</td>
<td>“Landscape architects design almost anything under the sky.”</td>
</tr>
<tr>
<td>CSLA (2014)</td>
<td>“The work of landscape architects is all around us in: planning our cities, towns, communities and neighbourhoods; designing our urban places, open spaces, waterfronts and scenic parkways; protecting and managing our national, provincial, territorial and municipal parks; conserving our heritage and historic sites; and ensuring efficient land use and natural resources conservation in local and regional areas.”</td>
</tr>
<tr>
<td>OALA (2014)</td>
<td>&quot;Landscape architecture is the profession which applies artistic and scientific principles to the research, planning, design and management of both natural and built environments.”</td>
</tr>
<tr>
<td>IFLA (2014)</td>
<td>“Landscape architecture combines environment and design, art and science. It is about everything outside the front door, both urban and rural, at the interface between people and natural systems. …landscape architecture nurtures communities and makes their environment human and liveable.”</td>
</tr>
<tr>
<td>Ron Williams (2014; pg3)</td>
<td>&quot;Landscape architecture involves the design, planning, management, and conservation of exterior spaces. It is defined by its practitioners as a social art, focusing on the creation of places for people to ‘circulate, to relax, to develop, and to undertake various activities both workaday and recreational.’ It is also an environmental art; landscape architects aspire to be ‘stewards of the environment’ and to apply their creative abilities to designing ‘outdoor places and systems of open spaces that are useful, imaginative, enjoyable, and environmentally appropriate.’ The ultimate goal of landscape architects … is to help integrate people into their environment.”</td>
</tr>
</tbody>
</table>
2.4.2: Professional development

The lack of unity and the broad scale of definitions used to describe landscape architecture, understandably, have caused problems for the profession in terms of awareness by the public, but also from a competitive standpoint with allied professions (Baird & Szczygiel, 2007). However, even though it is widely held that the various stages of development mentioned above are part of the process of professionalization, Abbott (1988) has argued that the conversation should revolve around a profession’s work:

“The central problem with the current concept of professionalization is its focus on structure rather than work. It is the context of the professions’ work that the case studies tell us is changing. It is control of work that brings the professions into conflict with each other and makes their histories interdependent. It is differentiation in types of work that often leads to serious differentiation within the professions.” (Abbott, 1988; pg 19-20)

Figure 2.2: The relationship between a profession and its work (adapted from Abbott, 1988)
The relationship or link between a profession and its work is what Abbott (1988) calls jurisdiction, which is determined by two factors - the components within a profession, and the public’s perception of a profession (Figure 2.2)(Abbott, 1988, pg 59). There are two components within a profession important to jurisdiction. The first is the problem-solving process of the profession, which takes an external problem and translates it into one that can be resolved. The second is academic knowledge. External to these components is the public’s perception of a profession, which revolves around the ‘exclusive rights’ that are bestowed on a profession by society. This includes rights like monopoly over work, control of education, and licensure, for example.

Upon a closer inspection, it becomes clear that a specialized body of knowledge is the foundation of a profession’s problem-solving process.

“… practical skill grows out of an abstract system of knowledge, and control of the occupation lies in the control of the abstractions that generate the practical technique.” (Abbott, 1988; pg 8)

In other words, the work of a profession is informed by its specialized knowledge. This specialized knowledge not only separates a profession from an occupation or trade, but is also the metric professions use to compete with each other (Abbott, 1988). Therefore, this body of knowledge should not be easily understood or gained without higher education and training if a single profession wants to lay claim to it over others (Baird & Szczygiel, 2007; Abbott, 1988; Macdonald, 1995).

2.4.2.1: A Story from the medical profession

Medicine has traveled an interesting path to becoming the profession it is today, and it is a story that is still useful to reflect on. One small part of this story centres around the competition between traditional medicine and homeopathy, as described by Abbott (1988; pg 20-21):
Medicine was not unlike landscape architecture in that its initial direction as a profession was towards the founding of schools to train new doctors, the creation of statewide professional societies or associations, and imposing licensure on those practicing medicine. These steps were great in controlling who could practice within the USA. Unfortunately, the Jacksonian era - a period that decreased the authority of those with higher education - changed everything, as it heralded a period of competition between professions. This change in government led to an intense battle between medicine and homeopathy over who would be able to heal the sick. Both sides had knowledge to bring weight to their arguments, and both debated over the health and well-being of the public. Not knowing of any other way, medicine continued down its former path - a national association was soon founded, and new rules of ethics were created to force medicine’s superiority over homeopathy. However, it wasn’t until medicine brought in new scientific knowledge from Europe that momentum began to shift in its favour, as the knowledge centred around new successful treatments and was rationalized by scientific knowledge. The degree of specialization of this knowledge secured medicine’s dominance over homeopathy, as homeopathy’s knowledge wasn’t perceived to be as specialized as medicine’s by the public. Centred around this new foundation of specialized scientific knowledge and public acceptance, medicine shifted their efforts as a profession - they created a national journal, revised their ethics codes, and reformed their schools. This shifted momentum in medicine’s favour for good, and homeopathy ultimately rejoined with medicine in order to compete with other burgeoning professions.

2.5: Solving a problem

According to Abbott (1988), a problem or task has two types of qualities - objective and subjective. Objective qualities exist on their own and serve as the foundation of problems encountered by a profession. Subjective qualities, on the other hand, cannot exist by themselves - they are created by a profession when it reinterprets the objective qualities of a problem. This reinterpretation, in turn, is an attempt to claim jurisdiction over specific work through the strength of a profession’s specialized knowledge and
expertise compared to other professions and their knowledge (Abbott, 1988). However, as the degree of reinterpretation increases and moves further away from the original problem’s objective qualities, the more important measurable results and outcomes become (Abbott, 1988). If the reinterpretation by a profession becomes too abstract, a client may want to see more measurable results to confirm that the problem was actually addressed to their satisfaction (Abbott, 1988).

Adding subjective qualities to a problem follows a sequential process with three phases - diagnosis, inference, and treatment (Figure 2.3) (Abbott, 1988).

Figure 2.3: The problem-solving process of a profession (adapted from Abbott, 1988)
2.5.1: Diagnosis

Diagnosis is the first opportunity to add a profession’s subjective qualities to a problem. It involves taking information from various external sources - the landscape, clients, etc. - and filtering it into a list of relevant material that a profession can then use to solve a problem (Abbott, 1988). Within diagnosis, two sub-actions take place. First, a coherent picture is developed from the different sources of information - a process Abbott (1988) calls ‘colligation’. Irrelevant information is discarded, while relevant information is collected and organized to create a picture that is easily understood by the profession attempting to solve the problem. Next, the assembled picture is compared with previously completed work in an attempt to classify the new problem (Abbott, 1988). This step helps to determine whether the problem is going to be easy (routine), or hard (obscure) relative to the existing knowledge and experience of the profession. This determination of complexity will, in turn, inform the strength of a profession’s services that can then be sold to a client.

2.5.2: Inference

The next stage, inference, involves critical thinking. It takes the relevant information identified in diagnosis and uses it to develop connections to a range of treatments through reasoned thought. Routine problems - problems that have a clear connection between diagnosis and treatment - largely ignore this stage (Abbott, 1988). However, if a problem carries a high risk and/or has only one chance to succeed - carrying a high monetary and/or time commitment - and the connection between diagnosis and treatment is not clear, inference is relied upon to bridge the gap between diagnosis and treatment (Abbott, 1988).

According to Abbott (1988), inference is conducted using one of two methods - exclusion or construction. Exclusion can be exemplified by medicine. It tackles lower risk problems where a profession may have multiple chances to find and test various treatments. It does this by prescribing more general treatments at first and assessing their results before moving to more specific treatments (Abbott, 1988). It is a relatively quick
and iterative process, but reaches a successful outcome at a much slower rate. A profession using this method is largely autonomous, and therefore has the ability to correct small issues that may arise throughout the process (Abbott, 1988). For example, if a new type of treatment is being developed that has potential to be more successful than current treatments, a physician can prescribe something different to try while waiting for information on the new treatment to develop. Alternatively, if a prescribed treatment is not having the desired outcome, a doctor can quickly shift course and prescribe something else without risking the overall chances of finding a successful treatment.

Construction, on the other hand, can be exemplified by architecture. It encapsulates higher risk problems - those carrying high monetary and/or time commitments - where a profession may have few chances to find a successful treatment (Abbott, 1988). It does this by using the highest quality evidence available to solve smaller, more specific problems, which build towards a larger, overall solution (Abbott, 1988). This method involves much longer periods of time when moving from diagnosis to treatment, but reaches success at a much faster rate because of its continuous process. However, due to the interdisciplinary nature of this method, a profession is less autonomous and must be cognizant of the risk of failure each small decision may bring. The danger being that numerous small failures will be amplified by the end of the process, and will have a tremendous effect on the overall success of the treatment.

2.5.3: Treatment

Finally, treatment is where a solution to a problem is prescribed, and is the opposite process of diagnosis (Abbott, 1988). Here, a profession will classify a treatment compared to previous work, and translate the new treatment from the profession’s language to the client’s by adding in the extraneous information that was removed during the diagnosis process.
2.5.4: Solving a problem in Landscape Architecture

In the case of landscape architecture, for example, the process described above could look like this:

A client would come to a landscape architect with a specific problem. This problem would contain objective qualities such as the soil type, existing trees, topography, the client’s requirements, etc. The landscape architect would begin with a diagnosis of the problem. They would identify useful information and filter out the unnecessary information, thereby creating a subjective picture of the problem. Next, the landscape architect would take the assembled picture and compare it with previous completed work. This would allow the landscape architect to determine the new problem’s degree of difficulty, and whether it carries a high or low risk of failure. If similar work has been completed before or the consequences of failure are low, the connection to treatment may be clear enough to largely ignore inference (therefore, a routine problem). In this case, the landscape architect would move to treatment and the creation of a prescription for the client. In this phase, the result of the design process would be compared with previous work in order to create a prescription that is tailored to the client. The extraneous information that was removed in the diagnosis phase would be added back in to translate the prescription into a language that can be easily understood by the client.

However, if the problem is new to the landscape architect or the consequences of failure are relatively high, the importance of inference would increase (therefore, an obscure problem). If this happens, a landscape architect would begin to unpack the larger problem into smaller issues and tasks. When doing so, each individual decision made should make use of the highest quality information available in order to limit the chances of failure. Through this process, each decision that is made will build part of the connection between the diagnosis and treatment phases that couldn’t easily be made before.
The difficulty in describing this process within the context of landscape architecture is the process of design. It can be misinterpreted that every design must move through inference rather than ignoring it. However, the key to understanding this problem is that the process of the profession - construction, as described by Abbott (1988) - is one that moves from numerous smaller individual problems towards a larger general solution (Figure 2.4).

In a routine problem, the picture that is created by filtering information in diagnosis is one that has been encountered and addressed before in previously completed work. This makes the connection between the new problem’s context, specific information, and design concepts much easier because most of the hard work - the critical thinking connecting specific details together to make concepts (inference) - has been completed before in another project. Detail drawings and specifications for construction have

![Diagram](image_url)
already been worked out, and the landscape architect can move through the entire process relatively quickly to create a new, but similar design solution (treatment) to projects that had come before.

The model created by Milburn & Brown (2003) was built to show how research could be incorporated within the overall design process (Figure 2.1). It clearly identified different phases where both research and artistic inspiration could be more or less important. This model is useful because it illustrates a process of design that incorporates research while still building towards an overall effective design solution. This model can also be used to describe how diagnosis, inference, and treatment fit into the design process of landscape architecture, as the structure of the model is largely the same as the one described by Abbott (1988) (Figure 2.5).

![Figure 2.5: The relationship between a profession’s problem-solving process (Abbott, 1988) and the process of design (Milburn & Brown, 2003)](image)

This adapted model (Figure 2.5) shows that the three stages outlined by Milburn & Brown (2003) - pre-design information gathering, concept exploration, and concept assessment - can be seen as analogous to the three phases described by Abbott (1988) -
diagnosis, inference, and treatment. The part that is slightly different is found within the inference phase. As discussed above, the connection between diagnosis and treatment can be either routine or obscure, making the overall problem either easier or harder to solve (Abbott, 1988). However, because landscape architecture is a profession that falls under the construction method, the process starts with numerous smaller problems or tasks and works towards a larger outcome (Figure 2.4)(Abbott, 1988). Each of these smaller problems can also be said to follow the same general process of diagnosis, inference, and treatment in the context of landscape architecture. Some problems are routine, while others are more obscure and need to be investigated. Because routine problems involve less risk, they require less critical thinking, and less external academic knowledge is required to solve the problem. This means that there are fewer restrictions on artistic freedoms (Figure 2.5). However, the opposite is true for obscure problems because they involve more risk. Therefore, they require more critical thinking, and more external academic knowledge is required to solve the problem. This means that there are greater restrictions on artistic freedoms (Figure 2.5).

The key to this process and the jurisdictional strength of a profession over a type of work is the balance between routine and obscure problems. If the majority of work is too routine, it will require less specialized knowledge and can be more easily learned by another profession (Abbott, 1988). Conversely, if the majority of work is too obscure, it will be difficult to show the link between the profession’s specialized knowledge and the process that moves from diagnosis to treatment (Abbott, 1988). In turn, the legitimacy of the profession will decrease because society will be less able to see the link between the profession’s specialized knowledge and cultural values (Abbott, 1988).
2.6: The Inner-workings of a Profession: Academic Knowledge

Due to the issues surrounding the use of research within the profession, a closer inspection of academic knowledge within Abbott’s professional development framework is warranted. To Abbott (1988), academic knowledge is distinct from the processes surrounding work as it deals with abstractions - it investigates small, discrete questions within a larger context. This is different from professional work because an academic does not necessarily translate the abstraction being investigated back into a language that can be easily understood by practitioners. But that is not the main purpose of academia, according to Abbott. Its value to a profession comes in three ways - legitimacy, research, and instruction (Figure 2.6)(Abbott, 1988).

Figure 2.6: The components of academic knowledge within a profession (Abbott, 1988)
2.6.1: Legitimacy

Academic knowledge legitimizes a profession by identifying the foundation of knowledge of the profession. In essence, it draws the boundary lines for competition with other professions. It draws these lines by linking the profession back to the cultural values the profession is situated within. In the case of landscape architecture in North America, the culture is one that values rational thinking, logic, and science (Abbott, 1988). To strengthen the link to cultural values, academic knowledge also shows the quality of knowledge being produced. These actions are critical in determining whether a society will accept the jurisdictional claim of a profession over types of work (Abbott, 1988).

2.6.2: Research

Academic knowledge also produces research by making novel connections between discrete types of knowledge - academics strive to find new methods of diagnoses, inference, and treatment. This work thereby tests, strengthens, and expands the boundary lines of the profession. Research in diagnosis serves two functions - it improves the method of identifying relevant information for a problem, and increases the clarity of connecting a problem with the knowledge and previous work of the profession. Research in inference is three fold - it increases the quality of evidence, strengthens logical connections, and balances routine and obscure problems. Finally, research in treatment serves four functions - it improves the ability to measure results, improves general treatments by making them more specific, improves translating treatments for clients to make them more acceptable, and it increases the chances of desirable results. The primary outcome of research, however, is not to translate its findings into a form of knowledge that can be easily understood by practitioners (Abbott, 1988). The implications of new research may ultimately change the knowledge base of professional practice in the future, but its primary function is to create new knowledge.
2.6.3: Education

Finally, academic knowledge serves to educate students in landscape architecture. It is here that abstractions from academic research are assembled into a cohesive and artificially complete picture for students to learn, bridging the divide between the disassembled and logical world of academia with the diagnosis - treatment world of practitioners.

2.7: Conclusion

By using the academic knowledge framework outlined by Abbott (1988)(Figure 2.6) and the results of prior research described above, different data can be organized under each component of academic knowledge to assess the strength and overall health of the profession. For example, Milburn & Brown (2003a) have shown that publication rates of landscape architecture faculty are low when compared to other disciplines. These results suggest that the research component of academic knowledge may be weaker compared to the other two main components - legitimacy and instruction. However, low publication rates do not necessarily mean the quality of research being conducted is poor. Therefore, further investigation into the types of research being conducted in landscape architecture should be undertaken.

In addition, the issues surrounding the current structure of education for the profession have been documented (LaGro, 1999; Tai, 2003). A master degree in landscape architecture is still considered the terminal degree for the profession, although doctoral degrees are beginning to be more common (Fein, 1972; LABOK, 2004; Milburn & Brown, 2003a; Chen, 2013). With this structure of education in mind, it can be argued that the education system functions to train new practitioners with a much smaller emphasis on training future academics who will conduct research in landscape architecture. This argument becomes even stronger when the expectations of practitioners and the accreditation requirements for landscape architecture programs are taken into account (Milburn, et al., 2003; Milburn & Brown, 2003a; LAAB, 2013).

What is left by the literature investigating research and Abbott’s (1988) work on
professional development is an incomplete picture of academic knowledge within landscape architecture. Therefore, further investigation is warranted. Each of the three components of academic knowledge rely on a specialized body of knowledge to carry out their functions - legitimacy is based on a body of knowledge in relation to cultural values; research is the pursuit of new knowledge, thereby expanding and increasing the quality of a body of knowledge; instruction is imparting a body of knowledge to future practitioners and academics. In order to understand the strength of each component, a specialized body of knowledge should be identified. Is there a specialized body of knowledge in landscape architecture - and if so, what is it?
Chapter 3: Methodology

3.1: Introduction

The following chapter outlines the question and objectives of this thesis research. It discusses the mixed methods strategy used, the challenges with this type of approach, and the overall limitations of this research. In addition, this chapter will also discuss the methods and limitations of each source of secondary data - Fein (1972), LABOK (2004), MLA Curricula Review (2015), Powers & Walker (2009), and Gobster et al. (2010).

3.2: Research questions & objectives

In consideration of the context outlined in the literature review, my research question is: Is there a specialized body of knowledge in landscape architecture, and if so, what is it? My objectives for this study are to: (1) identify and analyze the knowledge domains within two ASLA surveys (Fein, 1972; LABOK, 2004); (2) analyze the knowledge domains of research in landscape architecture that were identified by Powers & Walker (2009) & Gobster et al. (2010) in the peer-reviewed journal ‘Landscape Journal’; (3) identify knowledge domains within curricula course titles of accredited first-professional master of landscape architecture programs in North America; (4) synthesize the results to identify a specialized body of knowledge in landscape architecture; and (5) use the results to assess the components of academic knowledge and their strength within landscape architecture.

3.3: A mixed methods strategy

The purpose of this study is to identify a specialized body of knowledge within landscape architecture, if one exists. In order to fulfil this purpose, a sequential transformative mixed methods strategy is used (Creswell, 2009). Creswell (2009; pg 4) described mixed methods research as:
“... an approach to inquiry that combines or associates both qualitative and quantitative forms. It involves philosophical assumptions, the use of qualitative and quantitative approaches, and the mixing of both approaches in a study. Thus, it is more than simply collecting and analyzing both kinds of data; it also involves the use of both approaches in tandem so that the overall strength of a study is greater than either qualitative or quantitative research”.

In essence, the sequential transformative strategy used in this study employed two phases - an initial phase that focused on quantitative data, and a secondary phase focused on qualitative data. A theoretical perspective was also used, which served as a framework for the methods and results of both phases.

3.3.1: Reasons for use

Quantitative data from two previously completed ASLA surveys - the ‘Fein Report’ (1972) & the ‘Landscape Architecture Body of Knowledge Study Report’ (LABOK, 2004) - were used to identify the scope of the knowledge domains to be investigated. These two surveys were chosen because they were funded by the ASLA and sampled its membership. The results from the Fein survey were groundbreaking as it identified knowledge domains that were critical to the profession (Fein, 1972). The results of the LABOK survey identified which knowledge domains were important to first-professional university degrees in landscape architecture, which domains were important to students at the start of their careers, and which domains were important to practitioners when they were professionally responsible for their work (LABOK, 2004). The results of the LABOK survey also shaped the policy of different associations such as the Landscape Architecture Accreditation Board (LAAB), which oversees the course requirements and accreditation of landscape architecture university programs in the United States (LABOK, 2004). In addition, the length of time separating the two studies offered an opportunity to compare the results of each survey longitudinally to see how the profession has changed over three decades.

Qualitative data from currently accredited first-professional Master of Landscape Architecture programs in North American universities were collected and analyzed
This specific magistereate was chosen for two reasons. To start, a first-professional degree at both the bachelor and master level “…encompasses the body of knowledge common to the profession and promotes the acquisition of knowledge and skills necessary to enter the professional practice of landscape architecture” (LAAB, 2013). The only difference between a bachelor and a master degree is a less restrictive curriculum that encompasses numerous electives for a bachelor degree vs. a more focused curriculum specifically including research courses for a master degree (LAAB, 2013). Second, first-professional master programs were selected because the students entering these programs do not necessarily have an educational background in landscape architecture or other related professions. This means that for these students to be able to work within landscape architecture after graduation, they will need to have the same fundamental knowledge of the profession as someone in a bachelor program. Students entering a master program after completing a first-professional bachelor degree in landscape architecture will encounter a curriculum that is more focused on research methods than fundamental knowledge. Therefore, post-professional master degree programs were excluded.

Finally, the qualitative data from two studies - Gobster et al. (2010) and Powers & Walker (2009) - were incorporated, as their results identified the type of knowledge domains being researched and published in the peer-reviewed University of Wisconsin Press’ journal ‘Landscape Journal’. The analysis of content found within this journal is noteworthy because it is heralded as the eminent peer-reviewed journal in North America that focuses on disseminating research in landscape architecture to academics, practitioner, and students (Gobster et al., 2010; Powers & Walker, 2009). Its creation was a direct response by CELA that “… to grow as a discipline, [the profession of landscape architecture] must take responsibility for generating its own knowledge base of research and other scholarly inquiry” (Gobster et al., 2010, pg 52).

The data from the two phases mentioned above are connected through the transformation of the LABOK quantitative survey data into qualitative data through content analysis. The reason for combining both quantitative and qualitative data in this
way is to better understand the overall scope of landscape architecture’s body of knowledge across the profession by comparing similar data from practitioners (Fein Report & LABOK Report), university education systems (MLA curricula), and academics (peer-reviewed journal articles). In addition, comparing the quantitative survey data with qualitative data facilitates a comparison between what the profession - practitioners, students, and academics - think is important with respect to knowledge with what is actually conducted in education and research.

3.3.2: Challenges of approach

Using this type of mixed methods strategy has distinct advantages and disadvantages. First, it carries some of the strengths of both quantitative and qualitative methods (Creswell, 2009). The reverse is also true as it carries some of the weaknesses of both methods as well (Creswell, 2009). Overall, the two phases of the strategy bring structure to the entire process when gathering data, analyzing, and communicating the results as each step builds on the earlier stages.

Unfortunately, more time is required to carry out this type of strategy due to the two phases, which can be an issue with the short time period to complete this study. To alleviate this issue, previously completed survey data were reanalyzed, along with the reviews of published content in ‘Landscape Journal’. This reduced the amount of data collection, and allowed more time to be spent on secondary data analysis.

However, the largest issue with using this type of strategy is that little has been written on its overall process, and therefore there is little guidance on how to use a theoretical lens to guide the individual quantitative and qualitative methods. To address this issue, the literature on professional development discussed in chapter 2 acted as a guide for choosing which sources of data were included. More specifically, the framework of academic knowledge outlined by Abbott (1988)(Figure 2.6) acted as a guide for organizing the results from each data set, as well as an instrument for assessing the overall health of academic knowledge within the profession.
3.3.3: Validity & reliability

There are numerous issues in terms of validity and reliability using a mixed methods strategy, as described above. The first issue that should be mentioned is how this thesis research was pieced together. It is very difficult to know what data to include in an exploratory study, and which to ignore. The professional development literature (Abbott, 1988) provided some general guidance as to what type of data would be useful to help answer my questions. But due to time constraints with the thesis process, boundaries still had to be drawn that excluded potentially useful sources of data (for example: research published in other journals) or limited the scope of analysis (for example: only investigating curricula course titles instead of course content). However, the potential outcomes and insights from doing a study like this outweighed these limitations. Future research can always build on this work and address some of its shortcomings.

In addition, the limitations of each source of data needed to be explicitly stated because of the different levels of validity and reliability within each study. These limitations become important when using the results from each source together to identify a specialized body of knowledge. There will be irregularities within these sources and steps need to be taken to account for as many potential limitations within a study, whether those limitations were explicitly stated or not (for example, the limitations found within LABOK report). However, the potential benefits of this study again outweigh these issues, especially those stemming from the studies conducted by the profession. Each source of data was chosen because of its importance within the profession, in addition to how well it fit within the theoretical lens borrowed from Abbott (1988).

3.4: Methods

Within the mixed method strategy described above, five discrete sources of data were selected and analyzed. Each set of data had its own method - whether quantitative or qualitative in nature - along with separate strengths, assumptions, and limitations. In addition, the secondary data from each study were analyzed using content analysis in order to identify a specialized body of knowledge in landscape architecture.
3.4.1: The Fein Report

The Fein Report was the first large scale cross-sectional survey funded by the American Society of Landscape Architects (ASLA). It started in 1967 and was completed in 1972. The initial question of the study was: “What can, should, and ought to be done so that landscape architecture can make its full contribution to the development and maintenance of a suitable physical environment?” (Fein, 1972, pg 1-1). The investigation began with a pilot study in 1970, which was used to direct the aim of the full scale questionnaire. It involved 202 recorded interviews from landscape architecture practitioners, landscape architecture students, landscape architecture faculty, allied professions, government officials, social scientists, and people concerned with environmental issues (Fein, 1972).

The results from the pilot study led to the identification of four questions that would be investigated by the full scale self-administered questionnaire (Fein, 1972, pg 1-1 - 1-2):

(1) “What should be the scope and function of landscape architecture?”

(2) “What should be the central concern of landscape architecture?”

(3) “Should landscape architects play a leadership role in the solution of ecological problems?”

(4) “How well known and understood is the field of landscape architecture?”

A full scale questionnaire was then developed by Professor Albert Fein & Dr. Irving Crespi of The Gallup Organization, Inc. There were seven versions of the questionnaire, which differed in length (the longest went to landscape architects) and subject matter, as certain questions were only applicable to specific groups. The questionnaire was distributed by the ASLA and was sent to numerous individuals within each group - 8297 individuals in total (Table 3.1). These groups included landscape architects (ASLA members, non-ASLA members; students enrolled in landscape architecture programs; faculty & administration in landscape architecture departments), allied professionals (consulting engineers of companies that were part of the Consulting Engineers Council;
architects from the American Institute of Architects; planners from the American Institute of Planners), clients (government agencies with landscape architects on staff; residential, industrial, or commercial land developers; executives from Fortune 500 companies), and natural and behavioural scientists (from disciplines important to landscape architecture). Each group was chosen by the ASLA, excluding scientists who were chosen by consultants. A total of 5227 questionnaires of 8297 were returned (63%).

Table 3.1: Fein (1972) Report Survey Groups and Response Rates

<table>
<thead>
<tr>
<th>Groups</th>
<th>Total Surveys Sent</th>
<th>Total Surveys Returned</th>
<th>Survey Response Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Landscape Architects</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASLA Members</td>
<td>1905</td>
<td>1521</td>
<td>80</td>
</tr>
<tr>
<td>Non-ASLA Members</td>
<td>838</td>
<td>447</td>
<td>53</td>
</tr>
<tr>
<td>Students</td>
<td>2179</td>
<td>1274</td>
<td>59</td>
</tr>
<tr>
<td>Faculty</td>
<td>299</td>
<td>197</td>
<td>66</td>
</tr>
<tr>
<td><strong>Allied Professions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planners</td>
<td>685</td>
<td>398</td>
<td>58</td>
</tr>
<tr>
<td>Architects</td>
<td>558</td>
<td>250</td>
<td>45</td>
</tr>
<tr>
<td>Consulting Engineers</td>
<td>756</td>
<td>494</td>
<td>65</td>
</tr>
<tr>
<td><strong>Client Groups</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government Agencies</td>
<td>447</td>
<td>344</td>
<td>77</td>
</tr>
<tr>
<td>Land Developers</td>
<td>144</td>
<td>42</td>
<td>27</td>
</tr>
<tr>
<td>Fortune 500 Companies</td>
<td>166</td>
<td>64</td>
<td>39</td>
</tr>
<tr>
<td><strong>Scientific Disciplines</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural Scientists</td>
<td>164</td>
<td>102</td>
<td>62</td>
</tr>
<tr>
<td>Behavioural Scientists</td>
<td>156</td>
<td>94</td>
<td>60</td>
</tr>
</tbody>
</table>
The questionnaire was mailed to all members of the ASLA and landscape architecture faculty. As there were no complete lists of non-members or students, as many were reached as possible. Architects and planners were randomly selected for inclusion, while any engineering company not employing landscape architects was omitted. The lists of clients and scientists were already small, therefore no sampling was conducted. In total, four mailings (with a cover letter) were sent to landscape architecture practitioners, faculty, natural & behavioural scientists, planners, and consulting engineers. Only two mailings were sent to architects, government agencies, land developers, and large corporations. Questions important to the scope of this study were asked using a five point semantic scale. For example: very great extent, great extent, fair degree, not too much, not at all (Fein, 1972, pg 42a). The data from the five point scales were then reduced to a three point scale. The results were typically reported through the combination of the two highest points on the five point scale. For example: very great extent joined with great extent, effectively collapsing responses into positive, neutral, and negative.

The generalizability of the results for the survey is mixed depending on which group is being investigated. The response of ASLA members is generalizable within a 1% margin of error given the number of returned questionnaires (Table 3.1) (Dixon & Leach, 1978). Unfortunately, the same cannot be said for any of the other groups surveyed in the Fein Report as complete lists of each group were not gathered for the study and cannot easily be inferred from historical records.

3.4.2: The LABOK Study Report

The Landscape Architecture Body of Knowledge Study Report was started in 2003 and was completed in 2004. This survey was conducted in conjunction with the major landscape architecture associations in North America and their members - American Society of Landscape Architects (ASLA), Council of Landscape Architectural Registration Boards (CLARB), Landscape Architectural Accreditation Board (LAAB), Council of Educators in Landscape Architecture (CELA), Canadian Society of Landscape Architects (CSLA) - to determine what landscape architecture’s body of knowledge
contained, as well as what knowledge was important to practicing landscape architects (LABOK, 2004). Unlike the Fein survey (1972), the LABOK survey was less interested in looking where landscape architecture should be in the future as it was at finding out where the profession was in 2004. In 2000, members of ASLA, CLARB, LAAB, & CELA met to discuss knowledge in relationship to the profession, and wanted to ascertain what knowledge was shared amongst all landscape architects. They were unable to come to an agreement on what was considered foundational knowledge, and agreed to form the LABOK task force to investigate two questions (LABOK, 2004, pg 1):

(1) “What are the core competencies shared by the profession in general that help define the profession?”

(2) “What is the fundamental body of knowledge that should be expected of all graduates from accredited schools?”

Within these two questions, each organization had a specific goals. For example, the LAAB wanted to use the results to confirm that their education mandates reflected the needs of practitioners (LABOK, 2004). To answer these questions, the task force outlined four phases to the study - interviews, a focus group (organized by The Chauncey Group), a pilot study, and a self-administered questionnaire. They began by selecting a sample of landscape architects they thought were representative of the profession to take part in the interviews, focus group, and pilot study. The framework for the initial interviews was derived from the results of the 1998 CLARB job analysis, which examined tasks and knowledge within the profession. The information from this job analysis could not be found to ascertain its contents. The results of the interviews identifying potential knowledge areas and competencies were analyzed and edited by the focus group. The results from the focus group were then edited by the task force. The results of the task force’s work created the content for the pilot study - the results of which became the content of the large scale questionnaire.
Each association taking part in the LABOK study chose who was sent a questionnaire. The ASLA chose 250 associates and 250 full members, including Fellows. The reason why they chose 500 individuals is unknown. To reach this number, their member list was organized by zip code and individuals were selected from each zip code until they reached their pre-determined number. How they selected individuals from each zip code is also unknown. CELA created a list including 222 assistant professors, associate or full professors, and department heads from each CELA school. Some alumni who were retired were also selected as part of the list. CLARB selected 505 licensed and soon to be licensed landscape architects. Their member list was sorted by the first three digits of zip codes, and the first person from each zip code was selected. It is not known if they selected names randomly from each zip code or chose the first name listed. CSLA chose 180 members from the ten professional associations within Canada by selecting every fourth person on their master list. Members from Quebec were limited to English speaking practitioners. Canadians identified by ASLA, CELA, & CLARB (38 in total) were also included. It was also decided that associates should be part of the study, so 38 were also selected by The Chauncey Group. Finally, a small list of 16 individuals was created by a member of the task force and was also included in the study. There was no information available as to who these 16 individuals were, or why they were chosen. Any duplicated names across the four sample lists were identified and removed by The Chauncey Group. A total of 255 questionnaires out of 1458 were returned (17.5%) (Table 3.2).

The questionnaire measured the perception of different knowledge areas within nine domains that were identified by the task force as components of the overall body of knowledge of landscape architecture - landscape architecture history & criticism; natural & cultural systems; design & planning theories & methodologies; public policy & regulation; design, planning & management at various scales & application; site design engineering: materials, methods, technologies, & applications; construction documentation & administration; communication; values, & ethics in practice (Table 3.3) (LABOK, 2004). Within these nine domains, there were one hundred and ten areas of
knowledge divided between a section on a body of knowledge (sixty-eight knowledge areas) and a section on competencies (forty-two knowledge areas).

Table 3.2: LABOK (2004) Study Report Survey Groups and Response Rates

<table>
<thead>
<tr>
<th>Organizations</th>
<th>Total Surveys Sent</th>
<th>Total Surveys Returned</th>
<th>Survey Response Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASLA</td>
<td>481</td>
<td>76</td>
<td>15.8</td>
</tr>
<tr>
<td>CELA</td>
<td>222</td>
<td>51</td>
<td>30.0</td>
</tr>
<tr>
<td>CLARB</td>
<td>489</td>
<td>91</td>
<td>18.6</td>
</tr>
<tr>
<td>CSLA</td>
<td>250</td>
<td>31</td>
<td>12.4</td>
</tr>
<tr>
<td>Task Force</td>
<td>16</td>
<td>6</td>
<td>37.5</td>
</tr>
<tr>
<td>Study's Total</td>
<td>1458</td>
<td>255</td>
<td>17.5</td>
</tr>
</tbody>
</table>

Table 3.3: LABOK (2004) Study Report Knowledge Domains & Number of Knowledge Areas within Body of Knowledge Section

<table>
<thead>
<tr>
<th>Knowledge Domain</th>
<th>Number of Knowledge Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landscape Architecture History &amp; Criticism</td>
<td>2</td>
</tr>
<tr>
<td>Natural &amp; Cultural Systems</td>
<td>5</td>
</tr>
<tr>
<td>Design &amp; Planning Theories &amp; Methodologies</td>
<td>9</td>
</tr>
<tr>
<td>Public Policy &amp; Regulation</td>
<td>4</td>
</tr>
<tr>
<td>Design, Planning &amp; Management at Various Scales &amp; Applications</td>
<td>13</td>
</tr>
<tr>
<td>Site Design Engineering: Materials, Methods, Technologies &amp; Applications</td>
<td>15</td>
</tr>
<tr>
<td>Construction Documentation &amp; Administration</td>
<td>9</td>
</tr>
<tr>
<td>Communication</td>
<td>7</td>
</tr>
<tr>
<td>Values &amp; Ethics in Practice</td>
<td>4</td>
</tr>
</tbody>
</table>
For the body of knowledge section, respondents were asked to determine when each knowledge area should be learned - the time of acquisition - through a seven point semantic scale broken into: (0) not required at all, (1) before entrance to a university program, (2) in a first professional degree university program, (3) in a post-professional degree university program, (4) in an entry-level employment position, (5) in a mid-level employment position, (6) in a continuing education program (LABOK, 2004; pg 6). Respondents were also asked what level of knowledge each person should have after their first professional degree, and when they take professional responsibility through a second five point scale. The possible responses were: (0) unnecessary - not required at all, (1) exposure - sufficiently aware of the knowledge to be able to look it up, (2) comprehension - able to discuss the concepts involved, (3) application - able to use the knowledge to solve problems, (4) mastery - able to apply the knowledge to new problems, to integrate information and to create, synthesize, and evaluate solutions (LABOK, 2004, pg 7).

There are numerous issues with how the questionnaire was developed, how samples were selected, and how generalizable the results are to the entire population of landscape architects in North America. To start, there was no indication of how the identified knowledge domains used to categorize knowledge areas were developed. The LABOK report acknowledges that the knowledge domains were based on information gathered from the LAAB, but how they reinterpreted this information and how they arrived at the domains used is unknown (LABOK, 2004; pg 53).

There are also a number of issues with the methods used for selecting participants. First, no rationale was given for why each association chose a particular number of people to send surveys to. There was no indication of the size of each association’s membership base within the report, or why each group had a different method of sampling. To make matters even more confusing, there was a discrepancy between the reported number of surveys sent and the reported number of responses received for each group depending on whether the information was read in the text of the report or found in the table provided (LABOK, 2004; pg 6). In the interest of consistency, the numbers
stated in the text of this thesis are the same as those from the text of the LABOK report, while the table presented also matches the table of the LABOK report.

The generalizability of the results of the survey are also in question due to the total number of landscape architects involved. Today, the ASLA has a membership of over 15000. If the study was generalizable to that population - a specific number for the population in 2004 could not be found - it would have needed responses from over 375 ASLA members to have a 5% margin of error (Dixon & Leach, 1978). The response rate of ASLA members for the LABOK report was 76 out of 481 (15.8%) (Table 3.2). This could create issues for each association involved depending on the outcomes they envisioned at the outset of this study.

Despite the LABOK study having two clear questions to answer, a thorough analysis was not conducted by the task force. Instead, it was suggested that “the constituent organizations will, amongst and between themselves, discuss what meanings the data may have for them” (LABOK, 2004, pg 3). Despite the lack of analysis, it was also mentioned that the results of the study “may also be used to communicate what landscape architects do” (LABOK, 2004, pg 3). If this was the case, and since one of the primary questions of the study was to identify a “fundamental body of knowledge that should be expected of all graduates from accredited schools”, a more thorough analysis of the data should have been conducted and reported publicly (LABOK, 2004, pg 1).

Instead, a series of tables were published that presented a picture of important knowledge areas in four different categories - core for the first professional degree; context for professional practice; more specialized knowledge areas; important areas for post-professional degree and in-practice acquisition (LABOK, 2004; pg 15-19). However, there was no explanation for why particular cut-off points were selected for each of the categories presented in the report. In addition, different parts within each scale - time of acquisition; command of knowledge at time of degree; command of knowledge at time of professional responsibility - were directly compared with each other across specific knowledge areas. For example, the knowledge area ‘land information sources’ was considered a part of the ‘core of the first professional degree’ because it was
perceived to be important to learn within a first-professional degree, and was important (>40% response rate) at the ‘application’ and ‘mastery’ level for ‘command of knowledge at time of degree’ and ‘command of knowledge at time of professional responsibility’, respectively. This comparison assumes that ‘application’ and ‘mastery’ can be grouped together and compared directly despite having very different definitions.

3.4.2.1: An Analysis of the LABOK Study Report

The knowledge areas used in the LABOK survey were categorized by pre-determined knowledge domains. However, it cannot be ascertained how the LABOK task force determined the knowledge domains used. In addition, these knowledge domains were not assessed by respondents of the survey. Therefore, these pre-determined knowledge domains were ignored in my analysis. In order to compare the quantitative results of the LABOK report with the qualitative results from data collected in phase two of this research, the knowledge areas used in the LABOK survey were transformed into new knowledge domains through content analysis (Babbie, 2015).

All 68 knowledge areas were coded by assessing the content of each area on its own. In other words, the knowledge domains were created using induction while moving through and assessing each knowledge area. Any knowledge areas that couldn’t be categorized because their titles were not clear were placed within a miscellaneous category. For example, the knowledge area of ‘natural site conditions and ecosystems’ was placed within the knowledge domain ‘natural’ because it probably describes knowledge that has to do with ecology and natural functions, while ‘emerging trends and issues’ was placed within the knowledge domain ‘miscellaneous’ because of its vague title.

The relative importance of identified knowledge domains was determined by looking at the knowledge areas measured to be important by the LABOK survey at two different time periods - within a first-professional degree, and when a practitioner would be professionally responsible for their work. These results were chosen because they were similar to three questions within the Fein (1972) report - what knowledge is / should be
important to practice, and what subjects are important to learn in university. For the second time period, two levels of understanding were chosen out of the five used in the survey - ‘application’ and ‘mastery’ - because they were described as being able to use a form of knowledge to solve problems.

To identify the relative importance of identified knowledge areas, a cut-off point of 50% for response rates was used. This was chosen because the purpose of this thesis research is to attempt to identify a specialized body of knowledge for the entire profession of landscape architecture - any knowledge area found to have a response rate less than 50% was considered to be knowledge that is not a foundation for the profession because less than half of respondents think it is important. However, because there were limitations with how the LABOK survey was conducted, it cannot be said for certain whether there were extenuating factors that may have altered or skewed the reported results slightly. Therefore, knowledge areas that fell between 45% - 55% were included and were identified as knowledge of marginal importance. Once the selection process was complete, the knowledge domains that were identified and associated with each knowledge area earlier on were counted to find the relative importance of each knowledge domain.

The main limitations of using content analysis surround the validity and reliability of the results. I am the instrument in this process - therefore, despite my attempts to transform knowledge areas into knowledge domains based upon only what was presented to me within the LABOK data, another researcher conducting a similar study of the same data may come up with slightly different results. In light of this issue, I attempted to keep the analysis as simple as possible by identifying key words in knowledge area titles and placing them under categories with the same or similar key words. For example, any knowledge area that had the word natural within it was placed in the ‘natural’ knowledge domain.

However, there was an issue with this method when assessing any area with the word “design” in it, as it can have different definitions depending on its use. In addition, the word “design” was usually used in conjunction with other information that may have
been categorized under a different knowledge domain if design hadn’t be used. In light of
the importance of design as a knowledge domain found in the results of the Fein Report
(1972), it was analyzed in two ways with the LABOK data. First, any knowledge area
with the word “design” was placed within the knowledge domain ‘design’. However,
after each knowledge area was assessed and categorized, the areas that contained design
were re-assessed to see where they would fall if design wasn’t present. For example, the
knowledge area ‘elements of vehicular and pedestrian circulation systems and their
design requirements’ was initially categorized under ‘design’, but was re-categorized
under ‘construction’. By assessing design in this way, the validity of the analysis was
increased to more appropriately represent the breadth of use and meaning of the word
design amongst different people.

3.4.3: Landscape Architecture curricula

As of 2014, there are 56 first-professional master degree programs in landscape
architecture in North America accredited by the LAAB / LAAC - 52 in the United States
and 4 in Canada (ASLA, 2014a). All 56 programs and their curricula were investigated
using program outlines found within each program’s website. The course titles within
each program were coded using induction to identify categories of knowledge (Babbie,
2015). For example, a course titled ‘history of landscape architecture’ was placed under
the category ‘history.’ A course was categorized under only one knowledge domain.
These categories were then re-assessed to remove any groups that weren’t knowledge
domains.

Moving through the course titles within each program shaped the categories used and
whether discrete categories would be merged together. For example, some programs had
a separate course for both history and theory, while other programs grouped them
together. Therefore, the two types of knowledge would be joined into one knowledge
domain - history and theory. In addition, the use of the terms media, technology, and
communication varied between programs. However, there was a consistent string of
courses that used each term in conjuncture with creating visual communication pieces
through either hand drawing or computer programs. Therefore, the three terms were
joined together into one category of knowledge. In the interest of consistency, any course
title that used the term technology by itself was also included in this category.

The category ‘capstone’ was used to group together final courses for each program.
These courses typically dealt with a thesis or project. However, the use of the word
“design” in conjunction with both thesis and project made it difficult to separate the two
into other identified categories. If a course title could not be assessed, it was placed
within a miscellaneous category - for example, a course titled ‘elective’. The course
content of electives were not investigated further because students could choose from a
list of different courses to meet their program’s requirements. The knowledge within
these courses were therefore considered optional and not an important part of a potential
body of knowledge. If they were, the courses would not be optional.

The main limitations of using content analysis surround the validity and reliability of
the results. I am, once again, the instrument in this process - therefore, despite my
attempts to transform university curricula into knowledge domains based upon only what
was presented to me on university websites, another researcher conducting a similar
study of the same data may come up with slightly different results. In light of this issue, I
attempted to keep the analysis as simple as possible by identifying key words in course
titles and placing them under categories with the same or similar key words.

Identifying content from course titles proved challenging in a few instances. First,
like in the LABOK results analysis, the word “design” was a challenge because it can
have many different definitions. In addition, the word “design” was usually used in
combination with other information that may have been categorized under a different
knowledge domain if “design” wasn’t present. The word “studio” was also found to have
a similar problem. Both of these words were used extensively within course curricula of
most programs. Therefore, this issue was approached in two ways. First, any course title
with the word design or studio was placed within the knowledge domain ‘design’ or
‘studio’. If a course title had both words, it was placed within the knowledge domain
‘design’. After all of the MLA programs and their courses were assessed and categorized,
the ones that contained design and studio were re-assessed to see where the courses would fall if they did not include “design” and “studio” in the course title.

Second, numerous programs offered different paths for students to complete their degrees, often allowing a choice between taking different courses. This was assumed to allow students with prior university education in specific subjects an outlet to take courses where their knowledge might not be as strong. A first-professional master’s degree in landscape architecture is open to anyone with an undergraduate degree in a different field of study. Therefore, these pathways were categorized by the first course described, as it would most likely be the course that the majority of students would take.

3.4.4: Research in Landscape Architecture

Two separate studies were conducted in order to investigate the content of the peer-reviewed journal ‘Landscape Journal’ (LJ), each with a slightly different approach towards analyzing the subject matter of its publications.


The first investigation into the content of ‘Landscape Journal’ publications was conducted by Powers & Walker (2009). In this study, they investigated the content of the first twenty-five volumes of Landscape Journal from 1982 through 2007. The purpose of their investigation was to “… provide a descriptive portrait … by profiling the people who have contributed articles, as well as the subjects, methods, and results of their work” (Powers & Walker, 2009, pg 98).

To do this, Powers & Walker (2009) inventoried each journal by volume, number, and year, and then proceeded to categorize articles by pre-determined terms that were related to the study’s question - authorship participation, author demographics, subject analysis and trends, analysis of methods, and article products. Once that was complete, they used content analysis to investigate further. In this stage, they used pre-determined categories to organize their data by an author’s title, affiliation, education, gender, and the total number of authors.
However, pre-determined categories were not used when analyzing subject matter or research methods of individual articles. Instead they used an open-coding technique with content analysis for each of the 312 articles. First, an article’s abstract was read to identify the method(s) and topic(s) of research, and was followed by an examination of the entire article. Once completed, each article was given a descriptor. This process was carried out by multiple researchers to “… ensure inter-rater reliability for categorization and coding” (Powers & Walker, 2009, pg 100). If there were multiple methods or topics identified, they were all recorded. Once the data were collected, a framework from CELA conference tracts were used to organize the results (Table 3.4).

Table 3.4: Subject Categories from 25 Volumes of Landscape Journal (1982-2007), Classified According to CELA Conference Tract (Powers & Walker, 2009)

<table>
<thead>
<tr>
<th>Subject / Topic</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>History and culture</td>
<td>141</td>
<td>24</td>
</tr>
<tr>
<td>Landscape planning and ecology</td>
<td>112</td>
<td>19</td>
</tr>
<tr>
<td>Human and environment relationships</td>
<td>80</td>
<td>13</td>
</tr>
<tr>
<td>Design theory</td>
<td>48</td>
<td>8</td>
</tr>
<tr>
<td>Urban design</td>
<td>42</td>
<td>7</td>
</tr>
<tr>
<td>Landscape design and implementation</td>
<td>36</td>
<td>6</td>
</tr>
<tr>
<td>Communication and visualization</td>
<td>36</td>
<td>6</td>
</tr>
<tr>
<td>Methods of inquiry</td>
<td>30</td>
<td>5</td>
</tr>
<tr>
<td>Sustainability</td>
<td>30</td>
<td>5</td>
</tr>
<tr>
<td>Landscape architecture as a profession</td>
<td>30</td>
<td>5</td>
</tr>
<tr>
<td>Design education and pedagogy</td>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>605</strong></td>
<td><strong>101</strong></td>
</tr>
</tbody>
</table>

The authors of this article addressed one specific limitation to their study with respect to their analysis of subject matter in LJ - “… since most articles address more than one topic and each topic was recorded, the total number of topics within all categories is higher than the number of articles reviewed” (Powers & Walker, 2009, pg 103).
The reliability and validity of this study are strong, as the researchers took precautions to make sure that their results could be reproduced and that they effectively represented the depth of the data being investigated. The use of CELA conference tracts also helped to increase the reliability of the study, as it served as a framework that other researchers could use in the future. However, there is a latent assumption that needs to be addressed - the authors do not describe how the CELA conference tracts were developed, what conference they were gathered from, or whether more than one conference was used to derive the categories. Their use may frame the study’s results in a familiar way to readers & other academics, but an investigation into the rationale of the CELA conference tracts should be conducted before they are used in any future study - an investigation that is difficult to perform due to the lack of citation for where the conference tracts originated, as well as limited access to the members section of the CELA website (thecela.org).

3.4.4.2: Publications from 1982 - 2008 (Gobster et al., 2010)

The second investigation into the content of ‘Landscape Journal’ publications was conducted as a result of goals outlined by CELA for the journal - (1) embrace diverse subject matter; (2) nurture scholarship in landscape architecture; (3) increase readership and impact; (4) reach out to new contributors and increase the diversity of contributors; (5) relate scholarship to the practice of landscape architecture. The purpose of the study, therefore, was to assess LJ’s history in relationship to each of the five new goals identified by CELA (Gobster et al., 2010).

To address those goals, citation analysis was used to investigate LJ publications from 1982 through 2008 - volumes 1 through 27. Web of Science and Scopus databases - in conjunction with Google Scholar, the Avery Index to Architectural Periodicals, and a manual search of LJ publications - were used to create a picture of the publications within LJ during the period of time being investigated. However, the data were analyzed in a different way for each of the five goals. The data that are important to this thesis report were covered by the first goal - embrace diverse subject matter. To understand the subject
matter that had been covered by the Journal, the authors “classified the thematic content of past articles” (Table 3.5)(Gobster et al., 2010).

Table 3.5: Subject Categories Identified in Landscape Journal (Gobster et al., 2010)

<table>
<thead>
<tr>
<th>Subject Category</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landscape history/ people/ historic preservation</td>
<td>97</td>
<td>27</td>
</tr>
<tr>
<td>Theory/ criticism of design, ecology, aesthetics</td>
<td>67</td>
<td>19</td>
</tr>
<tr>
<td>Landscape perception/ assessment</td>
<td>47</td>
<td>13</td>
</tr>
<tr>
<td>LA education/ research/ profession</td>
<td>35</td>
<td>10</td>
</tr>
<tr>
<td>Design case study/ methods</td>
<td>34</td>
<td>9</td>
</tr>
<tr>
<td>Environmental management/ sustainable design/ urban forestry</td>
<td>27</td>
<td>8</td>
</tr>
<tr>
<td>Regional landscape planning/ policy study</td>
<td>25</td>
<td>7</td>
</tr>
<tr>
<td>Other (photography/ literary/ tribute/ sketch/ poetry/ etc.)</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>Technique/ GIS/ computer graphics/ visualization/ etc.</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>359</td>
<td>100</td>
</tr>
</tbody>
</table>

The authors of this article addressed two kinds of limitations to the overall study. First, they noted that the breadth of work - journal articles, magazine articles, conference proceedings, book chapters, design competitions, etc. - produced by researchers in landscape architecture could not be addressed entirely. Secondly, the citation information from each source of data did not line up perfectly with their manual search of LJ, which made it difficult to compare one set of data directly with another in some cases.

The data used for the purpose of this thesis and the method of their analysis should also be addressed. The largest limitation with this set of data is its reliability. There wasn’t a great deal of explanation as to how subject matter from LJ was classified, or where the different categories were derived from. Therefore, while the results of the classification may be valid, another researcher may not be able to reproduce the results of this study as published. The authors also did not mention how articles with more than one topic were addressed. This may have an effect on the validity of the findings (compared to the methods of Powers & Walker’s (2009) investigation).
3.5: Identifying a specialized body of knowledge

In order to search for a specialized body of knowledge, the knowledge domains identified from the secondary data used in this research - Fein (1972), LABOK (2004), MLA curricula (2015), Powers & Walker (2009), and Gobster et al. (2010) - were categorized as a group using content analysis.

The knowledge domains from each source of data were coded using induction following the same sequence that each source of data was analyzed earlier in phase I and II - (1) Fein (1972); (2) LABOK (2004); (3) MLA curricula (2015); (4) Powers & Walker (2009); (5) Gobster et al. (2010).

The results from the analysis of Fein (1972) and LABOK (2004) had multiple components that needed to be categorized. The data from Fein (1972) were broken into ‘knowledge important to practice’ and ‘knowledge important in university’. The data from LABOK (2004) were broken into ‘knowledge important to professional practice (application)’, ‘knowledge important to professional practice (mastery)’, and ‘knowledge important in university’.
Chapter 4: Results

4.1: Introduction

This chapter presents the knowledge domains found to be important within each of the sources of data used in this thesis research - Fein (1972), LABOK (2004), MLA Curricula Review (2015), Powers & Walker (2009), Gobster et al. (2010). It also outlines the results of synthesizing these results to identify a specialized body of knowledge in landscape architecture.

4.2: Results of the Fein (1972) Report

One of the key outcomes of the Fein (1972) pilot study was an identification of four knowledge domains that were perceived as being critical to practice in landscape architecture - ‘aesthetics’; ‘ecological needs’; ‘public welfare and enjoyment’; ‘comfort and pleasure for individual’. With these four domains identified, Fein used this information to explore which domains were perceived to be central to the profession at the time of the survey (Table 4.1) and which domains should be central (Table 4.2).

<table>
<thead>
<tr>
<th>Knowledge Domains</th>
<th>A.S.L.A. Members</th>
<th>Non-A.S.L.A. Members</th>
<th>Faculty</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aesthetics</td>
<td>75 (1)</td>
<td>69 (1)</td>
<td>73 (1)</td>
<td>69 (1)</td>
</tr>
<tr>
<td>Comfort and pleasure for individual</td>
<td>63 (2)</td>
<td>60 (2)</td>
<td>57 (2)</td>
<td>60 (2)</td>
</tr>
<tr>
<td>Public welfare and enjoyment</td>
<td>51 (3)</td>
<td>40 (3)</td>
<td>40 (3)</td>
<td>48 (3)</td>
</tr>
<tr>
<td>Ecological Needs</td>
<td>27 (4)</td>
<td>19 (4)</td>
<td>20 (4)</td>
<td>29 (4)</td>
</tr>
</tbody>
</table>
Table 4.2: Knowledge domains that should be central to practice (% response (rank)) (Fien, 1972)

<table>
<thead>
<tr>
<th>Knowledge Domains</th>
<th>A.S.L.A. Members</th>
<th>Non-A.S.L.A. Members</th>
<th>Faculty</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecological Needs</td>
<td>95 (1)</td>
<td>88 (2)</td>
<td>96 (2)</td>
<td>96 (1)</td>
</tr>
<tr>
<td>Aesthetics</td>
<td>95 (1)</td>
<td>91 (1)</td>
<td>92 (3)</td>
<td>89 (3)</td>
</tr>
<tr>
<td>Public welfare and enjoyment</td>
<td>93 (3)</td>
<td>88 (2)</td>
<td>98 (1)</td>
<td>94 (2)</td>
</tr>
<tr>
<td>Comfort and pleasure for individual</td>
<td>83 (4)</td>
<td>83 (3)</td>
<td>77 (4)</td>
<td>88 (4)</td>
</tr>
</tbody>
</table>

4.2.1: Subjects that are central / should be central to landscape architecture

4.2.1.1: Subjects that are central to practice

The initial impression given by the results to the question of what domains were central to landscape architecture is one of uniformity across the four groups of landscape architects. ‘Aesthetics’ was ranked number one, followed by ‘comfort and pleasure for individual’, ‘public welfare and enjoyment’, and ‘ecological needs’ (Table 4.1).

However, a slightly different picture emerges when comparing the degree of change between each rank for the responses from individual groups. For ASLA members, ‘aesthetics’, ‘comfort and pleasure for individual’, and ‘public welfare and enjoyment’ all decrease in importance by an equal amount (12% per domain). ‘Ecological needs’, on the other hand was measured to be the least important by a substantial margin (24% decrease from the next highest domain). For non-ASLA members, ‘aesthetics’, and ‘comfort and pleasure for individual’ were found to be of a similar importance (69% and 60%, respectively), while ‘public welfare and enjoyment’, and ‘ecological needs’ decreased in similar, albeit greater amounts than the first two (decreasing in importance by 20% and 21%, respectively). The domains ranked by faculty were found to decrease in importance in roughly similar amounts (decreasing by 16%, 17%, and 20%, respectively), while the domains ranked by students were found to decrease in similar amounts (decreasing by 9% and 12%, respectively) except for ‘ecological needs’, which was measured to be 19% lower than the next highest domain.
4.2.1.2: Subjects that should be central to practice

The results from the question asking what domains should be central to landscape architecture were less straightforward than the last. ASLA members and non-members thought that ‘aesthetics’ was the most important knowledge to the profession, while ‘ecological needs’ was thought to be the most important by ASLA members & students (Table 4.2). Faculty felt ‘public welfare and enjoyment’ was the most important.

Overall, the response rate for each domain was very high for this question, and was measured to be above 80% in every case but one. Clearly, each knowledge domain was perceived to be very important from each groups perspective. Faculty’s fourth pick - ‘comfort and pleasure for individual’ - was the only potential outlier, which was measured to be important by 77% of respondents.

A particular area of interest, however, was the response of students and their perceptions of ‘aesthetics’ - it was ranked third in importance and was the only case where it measured to be below 90%.

4.2.1.3: Knowledge important to practice

When looking at the results as a whole, it is clear that ‘aesthetics’ are considered to be the most crucial type of knowledge to the profession, as it was perceived to be the most important domain to practice at the time and was also perceived to be the most important domain in the future by ASLA members and non-members. Secondly, it is interesting to see how poorly landscape architects thought ‘ecological needs’ were being addressed by the profession at the time. ‘Ecological needs’ was perceived to be the least important domain, yet for some reason, it was perceived to be the most important domain for the future of the profession.

4.2.2: Subjects that are important for students of landscape architecture

The results were unanimous across landscape architects - ASLA members, ASLA non-members, faculty, and students - that ‘principles of design’ should be the most important subject to be taught out of eleven possibilities, followed closely by
‘ecology’ (Table 4.3). The third most important subject from the perspective of landscape architects - excluding students - should be ‘construction’. In the case of students, they felt that ‘conservation’ was more important to learn. Interestingly, faculty also thought that ‘social and behavioural sciences’ was of similar importance as ‘construction’ - a perspective not shared by ASLA members, non-ASLA members, or students as they ranked ‘behavioural sciences’ sixth, eighth, and sixth respectively. Finally, ‘fine arts and aesthetics’ was found to be fourth - by ASLA members and students - and fifth - by non-ASLA members and faculty - in terms of importance.

The subjects with less than half of respondents thinking they were important to teach to students - with a few exceptions - were found to be: ‘social and behavioural sciences’, ‘problem solving’, ‘physical geography’, ‘botany, horticulture, agriculture’, ‘business management’, and ‘history’ (Table 4.3). The exceptions to this statement were: ‘social and behavioural sciences’ to students (61%) and faculty (57%), ‘problem solving’ to faculty (56%), and ‘botany, horticulture, agriculture’ to non-ASLA members (57%). ‘botany, horticulture, agriculture’ was measured to be important by 49% of students. ‘history’ was found to be the least important subject to ASLA members, non-ASLA members, and students, while ‘business management’ was found to be the least important subject to faculty.
4.3: Results of the LABOK Report

Due to the issues involving the LABOK results - how they were organized and presented - along with a poor description of how knowledge domains for the study were developed - as described in chapter 3 - new knowledge domains and their relative importance were identified using content analysis. In addition, when looking at the total number of categories that were created, it became apparent that some were not knowledge domains. For example, ‘urban’ is a place where landscape architects conduct work - it is not a type of knowledge. The category ‘miscellaneous’ is also not a type of knowledge because of the vague nature of the knowledge areas that were placed within it. Therefore, these two categories were omitted from the analysis of LABOK (2004) results.

Table 4.3: Subjects perceived to be important (% response) for students to learn in landscape architecture (Fein, 1972)

<table>
<thead>
<tr>
<th>Subject Areas</th>
<th>ASLA Members</th>
<th></th>
<th>Non-ASLA Members</th>
<th></th>
<th>Faculty</th>
<th></th>
<th>Students</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>rank</td>
<td>%</td>
<td>rank</td>
<td>%</td>
<td>rank</td>
<td>%</td>
<td>rank</td>
</tr>
<tr>
<td>Principles of Design</td>
<td>97</td>
<td>1</td>
<td>93</td>
<td>1</td>
<td>95</td>
<td>1</td>
<td>95</td>
<td>1</td>
</tr>
<tr>
<td>Ecology</td>
<td>81</td>
<td>2</td>
<td>74</td>
<td>2</td>
<td>76</td>
<td>2</td>
<td>89</td>
<td>2</td>
</tr>
<tr>
<td>Construction</td>
<td>79</td>
<td>3</td>
<td>70</td>
<td>3</td>
<td>57</td>
<td>3</td>
<td>65</td>
<td>5</td>
</tr>
<tr>
<td>Fine Arts and Aesthetics</td>
<td>76</td>
<td>4</td>
<td>66</td>
<td>5</td>
<td>56</td>
<td>5</td>
<td>72</td>
<td>4</td>
</tr>
<tr>
<td>Conservation</td>
<td>66</td>
<td>5</td>
<td>69</td>
<td>4</td>
<td>53</td>
<td>7</td>
<td>78</td>
<td>3</td>
</tr>
<tr>
<td>Social and Behavioural Sciences</td>
<td>45</td>
<td>6</td>
<td>36</td>
<td>8</td>
<td>57</td>
<td>3</td>
<td>61</td>
<td>6</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>37</td>
<td>9</td>
<td>22</td>
<td>10</td>
<td>56</td>
<td>5</td>
<td>41</td>
<td>9</td>
</tr>
<tr>
<td>Physical Geography</td>
<td>43</td>
<td>7</td>
<td>41</td>
<td>7</td>
<td>44</td>
<td>8</td>
<td>42</td>
<td>8</td>
</tr>
<tr>
<td>Botany, Horticulture, Agriculture</td>
<td>43</td>
<td>7</td>
<td>57</td>
<td>6</td>
<td>30</td>
<td>9</td>
<td>49</td>
<td>7</td>
</tr>
<tr>
<td>Business Management</td>
<td>33</td>
<td>10</td>
<td>33</td>
<td>9</td>
<td>15</td>
<td>11</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td>History</td>
<td>14</td>
<td>11</td>
<td>14</td>
<td>11</td>
<td>19</td>
<td>10</td>
<td>11</td>
<td>11</td>
</tr>
</tbody>
</table>
4.3.1: Content analysis of the LABOK Report

4.3.1.1: Knowledge domains important in a first-professional degree

When looking at the knowledge domains found to be important in a first-professional degree, eleven types of knowledge were identified. ‘Construction’ was found to be the highest ranked domain, followed by ‘natural’, and ‘design’ (Figure 4.1). Next, a group of similarly ranked domains were found to have a lower importance compared to the first three - ‘planning’, ‘social’, ‘technology’, and ‘media’ (Figure 4.1). Finally, another group of domains were found to be the least important - ‘profession’, ‘communication’, ‘history’, and ‘research’ (Figure 4.1). Within these results, eight knowledge areas out of forty-seven (17%) were found to be within the marginal importance range of 45-55%. These knowledge areas were categorized under five knowledge domains - three under ‘construction’, two under ‘natural’, and one under ‘research’, ‘communication’, and ‘planning’, respectively.

Figure 4.1: Knowledge important in a first-professional degree (with design domain)
In the second stage of analysis, all of the knowledge areas that were placed under the ‘design’ knowledge domain were recategorized under the assumption that the word “design” was no longer a part of each title. When this re-categorization was complete, the knowledge domain ‘construction’ and ‘social’ increased in importance, while a new domain - ‘theory’ - appeared (Figure 4.2).

![Knowledge Domains](image)

**Figure 4.2**: Knowledge important in a first-professional degree (re-categorizing design domain)

### 4.3.1.2. Knowledge domains important in professional practice

When looking at the knowledge domains considered to be important in professional practice, two different levels of understanding were investigated - ‘application’ and ‘mastery’. At the ‘application’ level, nine knowledge domains were identified. ‘Construction’ was found to be the most important to practice at this level of
understanding (Figure 4.3). A group consisting of ‘natural’, ‘planning’, and ‘profession’ were found to be the next highest ranked domains after ‘construction’. ‘Social’ and ‘design’ followed the previous group in level of importance. Finally, a group consisting of ‘media’, ‘communication’, and ‘history’ were found to be the least important knowledge domains. Within these results, thirty-two knowledge areas out of thirty-two (100%) were found to be within the marginal importance range of 45-55%.

Figure 4.3: Knowledge important in practice at application level (with design domain)
When looking at the same data but reallocating “design” into other knowledge domains, ‘construction’ and ‘social’ increased in importance, while the domain ‘theory’ became an important domain (Figure 4.4). All other knowledge domains remained the same.

At the ‘mastery’ level, four domains were found to be important - ‘design’, ‘construction’, ‘natural’, and ‘media’ (Figure 4.5). ‘Design’ was found to be the most important domain, while ‘construction’, ‘natural’, and ‘media’ were found to have the same level of importance. Within these results, six knowledge areas out of six (100%) were found to be within the marginal importance range of 45-55%. When looking at the same data but re-categorizing “design” into other domains, ‘construction’ and ‘theory’ became the most important domains, followed by a tie between ‘natural’ and ‘media’ (Figure 4.6).
Figure 4.5: Knowledge important in practice at mastery level (with design domain)

Figure 4.6: Knowledge important in practice at mastery level (re-categorizing design domain)
4.4: Content analysis of first-professional master degree curricula course titles


When looking at these categories, it became apparent that three are not knowledge domains. ‘Studio’ - while an important component of learning for students in landscape architecture programs - is not a type of knowledge. The category ‘capstone’ is an important outcome of any master degree, but it also is not a type of knowledge. ‘Urban’ is a place where landscape architects conduct work. Finally, the category ‘miscellaneous’ is not a type of knowledge. These categories were therefore excluded from the list of knowledge domains identified by the content analysis of MLA curricula, leaving nine knowledge domains - ‘design’, ‘natural’, ‘construction’, ‘planning’, ‘social’, ‘theory & history’, ‘profession’, ‘research & methodology’, and ‘media, technology, and communication’.

However, it should be mentioned that some of these excluded categories were found to be very important within first-professional accredited programs. ‘Miscellaneous’ was found to be the second most important type of course, while ‘studio’ ranked fourth, and ‘capstone’ ranked tenth (Table 4.4). When re-categorizing design & studio courses into other categories, ‘miscellaneous’ became the most important type of course, ‘studio’ dropped to sixth, and ‘capstone’ remained unchanged.
Table 4.4: Categories identified through content analysis of accredited first-professional master of landscape architecture programs in North America

<table>
<thead>
<tr>
<th>Categories</th>
<th>n</th>
<th>rank</th>
<th>n</th>
<th>rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
<td>292</td>
<td>1</td>
<td>103</td>
<td>6</td>
</tr>
<tr>
<td>Misc</td>
<td>228</td>
<td>2</td>
<td>228</td>
<td>1</td>
</tr>
<tr>
<td>Media, Tech, Communication</td>
<td>154</td>
<td>3</td>
<td>180</td>
<td>3</td>
</tr>
<tr>
<td>Studio</td>
<td>145</td>
<td>4</td>
<td>103</td>
<td>6</td>
</tr>
<tr>
<td>Natural</td>
<td>132</td>
<td>5</td>
<td>186</td>
<td>2</td>
</tr>
<tr>
<td>Theory &amp; History</td>
<td>117</td>
<td>6</td>
<td>138</td>
<td>4</td>
</tr>
<tr>
<td>Construction</td>
<td>84</td>
<td>7</td>
<td>111</td>
<td>5</td>
</tr>
<tr>
<td>Profession</td>
<td>78</td>
<td>8</td>
<td>79</td>
<td>8</td>
</tr>
<tr>
<td>Research &amp; Methodology</td>
<td>54</td>
<td>9</td>
<td>76</td>
<td>9</td>
</tr>
<tr>
<td>Capstone</td>
<td>45</td>
<td>10</td>
<td>64</td>
<td>10</td>
</tr>
<tr>
<td>Planning</td>
<td>21</td>
<td>11</td>
<td>42</td>
<td>11</td>
</tr>
<tr>
<td>Social</td>
<td>9</td>
<td>12</td>
<td>17</td>
<td>13</td>
</tr>
<tr>
<td>Urban</td>
<td>6</td>
<td>13</td>
<td>38</td>
<td>12</td>
</tr>
</tbody>
</table>

Investigating the remaining knowledge domains, ‘design’ was found to have the largest number of courses represented (Figure 4.7). The next three highest ranked domains - ‘media, technology, and communication’, ‘natural’, and ‘theory & history’ - were found to have half as many courses devoted to their types of knowledge (Figure 4.7). Another group of three domains were also found to have similar importance - ‘construction’, ‘profession’, and ‘research & methodologies’. Finally, the knowledge domains ‘planning’, and ‘social’ were found to be the least important (Figure 4.7).
In the second stage of analysis, the course titles placed within the ‘design’ knowledge domain were re-categorized under different domains assuming the word “design” was removed from the titles. When this happened, a slightly more balanced picture evolved. ‘Natural’ became the most important knowledge domain, followed closely by ‘media, technology, and communication’ (Figure 4.8). The third highest ranked domain was ‘theory & history’. Contrary to the LABOK results, ‘design’ did not disappear as a
knowledge domain in this case. Out of all of the knowledge domains, ‘natural’ and ‘urban’ increased in importance the most, while ‘profession’ and ‘social’ changed the least. ‘Social’ was found to be the least important knowledge domain (Figure 4.8).

Figure 4.8: Knowledge important in accredited first-professional MLA programs (re-categorizing design domain)
4.5: Subjects of published articles in ‘Landscape Journal’

4.5.1: Results from Powers & Walker (2009)

The results show that investigations into ‘history and culture’ were the most published articles over the four editorial periods (1982-2007) in LJ. ‘Landscape planning and ecology’ articles were ranked second, while investigations into ‘human and environment relationships’ ranked third (Figure 4.9).

Figure 4.9: Subjects published in Landscape Journal by category and percentage of editorial period (Powers & Walker, 2009)
‘Landscape planning and ecology’ ranked number one for the first editorial period (1982-1988), but was replaced by ‘history and culture’ in the remaining three periods (Figure 4.9). However, ‘human and environment relationships’ increased in publications from within the 1995-2007 editorial period of the journal. ‘Urban design’ and ‘sustainability’ both received more publications between 1995-2002, while articles exploring ‘design education and pedagogy’ increased in numbers between 2003-2007.

4.5.2: Results from Gobster et al. (2010)

The results show that articles investigating ‘landscape history / people / historic preservation’ were the main focus of inquiry in LJ from 1982-2009, and were published the most in three of the four editorial periods explored by the authors (Table 4.5). Articles involving ‘theory / criticism of design, ecology, aesthetics’ were the next most published over the same time period, followed by articles on ‘landscape perception / assessment’.

Table 4.5: Subjects of publications identified in Landscape Journal across four editorial periods (Gobster et al., 2010)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Landscape history/ people/ historic preservation</td>
<td>16 18</td>
<td>29 34</td>
<td>27 26</td>
<td>25 31 97</td>
<td>27</td>
</tr>
<tr>
<td>Theory/ criticism of design, ecology, aesthetics</td>
<td>12 14</td>
<td>22 26</td>
<td>24 23</td>
<td>9 11 67</td>
<td>19</td>
</tr>
<tr>
<td>Landscape perception/ assessment</td>
<td>20 23</td>
<td>13 15</td>
<td>10 10</td>
<td>4 5 47</td>
<td>13</td>
</tr>
<tr>
<td>LA education/ research/ profession</td>
<td>8 9</td>
<td>9 10</td>
<td>8 8</td>
<td>10 13 35</td>
<td>10</td>
</tr>
<tr>
<td>Design case study/ methods</td>
<td>6 7</td>
<td>4 5</td>
<td>13 12</td>
<td>11 14 34</td>
<td>9</td>
</tr>
<tr>
<td>Environmental management/ sustainable design/ urban forestry</td>
<td>10 11</td>
<td>5 6</td>
<td>4 4</td>
<td>8 10 27</td>
<td>8</td>
</tr>
<tr>
<td>Regional landscape planning/ policy study</td>
<td>9 10</td>
<td>2 2</td>
<td>5 5</td>
<td>9 11 25</td>
<td>7</td>
</tr>
<tr>
<td>Other (photography/ literary/ tribute/ sketch/ poetry/ etc.)</td>
<td>0 0</td>
<td>1 1</td>
<td>13 12</td>
<td>2 3 16</td>
<td>4</td>
</tr>
<tr>
<td>Technique/ GIS/ computer graphics/ visualization/ etc.</td>
<td>7 8</td>
<td>1 1</td>
<td>1 1</td>
<td>2 3 11</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>88 100</strong></td>
<td><strong>86 100</strong></td>
<td><strong>105 101</strong></td>
<td><strong>80 101 359 100</strong></td>
<td></td>
</tr>
</tbody>
</table>
While ‘landscape history / people / historic preservation’ was found to be the largest subject of focus for three of the four editorial periods of LJ, a shift in research subjects ranked second and third can be seen in the last two periods - 1996-2002, and 2003-2009 (Figure 4.10). Between 1996-2002, ‘theory / criticism of design, ecology, aesthetics’ remained the second most investigated subject, while ‘design case study / methods’ and ‘other (photography / literary / tribute / sketch / poetry / etc.)’ tied for third. Between 2003-2009 period, ‘design case study / methods’ became second, while ‘LA education / research / profession’ was close to a tie for second. ‘Technique / GIS / computer graphics / visualization’ and ‘other (photography / literary / tribute / sketch / poetry / etc.)’ were found to be the two least published subjects, except as noted above. ‘Landscape perception / assessment’ was found to decrease in number of publications as time went on. ‘Environmental management / sustainable design / urban forestry’ and ‘regional landscape planning / policy study’ both decreased in publications from 1989-2002, but returned to similar rates as the first editorial period by the 2003-2009 editorial period.

Overall, there is a notable change in focus when looking at publication rates across all four editorial periods - a focus that concentrated on a few subjects of inquiry within the first editorial period to one that covered a more diverse set of subjects equally, excluding the continued focus on ‘landscape history / people / historic preservation’.
Published Subject Areas

Figure 4.10: Subjects published in Landscape Journal by category and percentage of editorial period (Gobster et al., 2010)
4.6: Comparing knowledge across five sources of data

When looking at the results from Fein (1972), LABOK (2004), MLA curricula (2015), Powers & Walker (2009), and Gobster et al. (2010) together, the only knowledge domains that were identified in every set of data were ‘design’ and ‘natural’ (Tables 4.6 - 4.9). There was, however, one knowledge domain that was missing in only one data source out of the five - ‘social’. It was found to be missing from the knowledge important to professional practice (mastery) in the LABOK (2004) report.

The knowledge domain ‘construction’ was found to be missing from the knowledge important to practice in the Fein (1972) report and from peer-reviewed articles within ‘Landscape Journal’ (Gobster et al., 2010). ’Research’ was found to be absent from all sections measuring knowledge important to practice, while ‘education’ was found to be only important in peer-reviewed articles in ‘Landscape Journal’ (Powers & Walker, 2009; Gobster et al., 2010). ‘Theory and history’ was found to be missing from the knowledge important to practice in the Fein (1972) report, while ‘history’ was found to be missing from the knowledge important to professional practice (mastery) in the LABOK (2004) report. ‘Planning’ and ‘profession’ were found to be absent from the Fein (1972) report and the knowledge important to professional practice (mastery) in the LABOK (2004) report. Both knowledge domains were accounted for in every other set of data. ‘Media, technology, & communication’ was found to be missing from knowledge important to practice in the Fein (1972) report, while ‘communication’ was found to be missing from the knowledge important to professional practice (mastery) and ‘technology’ was found to be missing from the knowledge important to practice (application & mastery) in the LABOK (2004) report. ‘Education’ was missing from all sources of data except from peer-reviewed articles within ‘Landscape Journal’ (Powers & Walker, 2009; Gobster et al., 2010).
Table 4.6: Knowledge domains identified within the Fein (1972) report

<table>
<thead>
<tr>
<th>Knowledge Domains</th>
<th>Knowledge Important to Practice</th>
<th>Knowledge Important in University</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
<td>Aesthetics</td>
<td>Principles of Design</td>
</tr>
<tr>
<td>Construction</td>
<td></td>
<td>Construction</td>
</tr>
<tr>
<td>Natural</td>
<td>Ecological Needs</td>
<td>Ecology</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Conservation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Physical Geography</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Botany, Horticulture, Agriculture</td>
</tr>
<tr>
<td>Social</td>
<td>Public Welfare and Enjoyment</td>
<td>Social and Behavioural Sciences</td>
</tr>
<tr>
<td></td>
<td>Comfort &amp; Pleasure for Individual</td>
<td></td>
</tr>
<tr>
<td>Theory &amp; History</td>
<td></td>
<td>History</td>
</tr>
<tr>
<td>Media, Technology, &amp; Communication</td>
<td></td>
<td>Fine Arts &amp; Aesthetics</td>
</tr>
<tr>
<td>Planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profession</td>
<td></td>
<td>Business Management</td>
</tr>
<tr>
<td>Research</td>
<td></td>
<td>Problem Solving</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 4.7: Knowledge domains identified within the LABOK (2004) report

<table>
<thead>
<tr>
<th>Knowledge Domains</th>
<th>Knowledge Important to Professional Practice (Application)</th>
<th>Knowledge Important to Professional Practice (Mastery)</th>
<th>Knowledge Important in University</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
<td>Design</td>
<td>Design</td>
<td>Design</td>
</tr>
<tr>
<td>Construction</td>
<td>Construction</td>
<td>Construction</td>
<td>Construction</td>
</tr>
<tr>
<td>Natural</td>
<td>Natural</td>
<td>Natural</td>
<td>Natural</td>
</tr>
<tr>
<td>Social</td>
<td>Social</td>
<td></td>
<td>Social</td>
</tr>
<tr>
<td>Theory &amp; History</td>
<td>Theory</td>
<td>Theory</td>
<td>Theory</td>
</tr>
<tr>
<td>History</td>
<td>History</td>
<td></td>
<td>History</td>
</tr>
<tr>
<td>Media, Technology, &amp; Communication</td>
<td>Media</td>
<td>Media</td>
<td>Media</td>
</tr>
<tr>
<td>Planning</td>
<td>Planning</td>
<td></td>
<td>Planning</td>
</tr>
<tr>
<td>Profession</td>
<td>Profession</td>
<td></td>
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</tr>
<tr>
<td>Research</td>
<td></td>
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<td>Research</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 4.8: Knowledge domains identified from MLA curricula course titles (2015)

<table>
<thead>
<tr>
<th><strong>Knowledge Domains</strong></th>
<th><strong>MLA Curricula</strong></th>
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Table 4.9: Knowledge domains identified within studies conducted by Powers & Walker (2009) & Gobster et al. (2010)

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<td>Subjects</td>
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<tr>
<td>Design</td>
<td>Design Theory</td>
<td>Theory / criticism of design, ecology, aesthetics</td>
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<td>Urban Design</td>
<td>Design case study / methods</td>
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<td>Natural</td>
<td>Sustainability</td>
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<td>Social</td>
<td>Human and environment relationships</td>
<td>Landscape perception / assessment</td>
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<td>Theory &amp; History</td>
<td>History and culture</td>
<td>Landscape history / people / historic preservation</td>
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<td>Design Theory</td>
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<td>Media, Technology, &amp;</td>
<td>Communication and visualization</td>
<td>Other (photography / literary / tribute / sketch / poetry / etc)</td>
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<td>Technique / GIS / computer graphics / visualization / etc</td>
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<td>Planning</td>
<td>Landscape planning and ecology</td>
<td>Regional landscape planning / policy study</td>
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<td>Profession</td>
<td>Landscape architecture as a profession</td>
<td>LA education / research / profession</td>
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<td>Research</td>
<td>Methods of inquiry</td>
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<td>Education</td>
<td>Design education and pedagogy</td>
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Chapter 5: Discussion

5.1: Introduction

In this chapter, the results of chapter 4 are discussed and compared with the findings of a recently published study. In addition, the results are also explored within the context of academic knowledge and its functions. In an attempt to understand the potential reasons for the mixed results that were found, a systems thinking and post-normal science lens is used to situate the results within a historical context before exploring the perspectives of different actors within landscape architecture. Finally, the insights gained through this new perspective are used to re-assess the components of academic knowledge and its functions within landscape architecture.

5.2: Identifying a specialized body of knowledge

The first question asked of this thesis research was seemingly straightforward in nature: Is there a specialized body of knowledge in landscape architecture? However, the answer to this question could be answered by both a yes (with a maybe), and a no (with a but) depending on a person’s perspective. The results from each data source - Fein (1972), LABOK (2004), MLA curricula (2015), Powers & Walker (2009), Gobster et al. (2010) - identified domains of knowledge within landscape architecture. Together, they indicated that there are a total of ten knowledge domains used within the profession - ‘design’, ‘construction’, ‘natural’, ‘social’, ‘theory & history’, ‘media, technology, & communication’, ‘planning’, ‘profession’, ‘research’, and ‘education’ (Table 4.6 - 4.9). This would indicate that there is a potential body of knowledge within landscape architecture.

Unfortunately, when each source of data was assessed together as a group, the results showed that ‘design’ and ‘natural’ were the only knowledge domain identified by each data set as being important, with ‘social’ found to be missing from only one data set. The other seven domains were found to be missing from more than one data set. Therefore, to answer the second question of this thesis research - What is the specialized body of knowledge? - these results would imply that ‘design’ and ‘natural’ were the most
consistent and critical knowledge domains, followed closely by ‘social’. Therefore, the less clearly defined knowledge domains were ‘construction’, ‘theory & history’, ‘media, technology, & communication’, ‘planning’, ‘profession’, ‘research’, and ‘education’.

These results are similar to findings in a recently published study investigating knowledge in landscape architecture. Meijering et al. (2015) conducted a study assessing the importance of research domains (knowledge domains) to the discipline of landscape architecture and to practice. They did this using a three stage Delphi method with landscape architecture academics and practitioners from across the globe (Meijering et al., 2015). In stage one, academics thought ‘global landscape issues’ was the most important domain, followed by ‘biophysical dimensions of planning and design’, and ‘rural and natural environments’ (Meijering et al., 2015). Practitioners, on the other hand, thought ‘aquatic environments’ was the most important domain, followed by ‘global landscape issues’, and ‘rural and natural environments’ (Meijering et al., 2015). In stage two, academics thought ‘human dimensions of planning and design’ was the most important domain, followed by a tie between ’global landscape issues’ and ‘built environments and infrastructure’ (Meijering et al., 2015). However, practitioners thought that ‘green urban development’ was the most important domain, followed by ‘rural and natural environments’ (Meijering et al., 2015). Finally, in stage three academics and practitioners identified ‘human dimensions of planning and design’ as the most important domain, followed by ‘green urban development’, and a tie between ‘built environments and infrastructure’ and ‘global landscape issues’ (Meijering et al., 2015).

Unfortunately, the domains identified in stage three as ‘most important’ had perceptions ranging from 4% to 37%. This would indicate that the knowledge domains perceived as important to landscape architecture is a contested topic. Meijering et al., (2015) also found that perceptions of landscape architects changed depending on their continent of origin. The domains ‘historic dimensions of planning & design’ and ‘theories’ were important in Europe, ‘aquatic environments’ was important in North America, and ‘measuring landscape performance & impact’ and ‘biophysical dimensions of planning and design’ were important everywhere but Europe. These results suggest
that the question of knowledge in landscape architecture is complex, and what is perceived to be important by individuals may also be influenced by their contextual foundations.

The issues identified by Meijering et al. (2015) were also discovered within the result of this thesis research. Within the LABOK (2004) study, the knowledge domains identified as important to practice at both the application and mastery level were within a window of marginal importance (45%-55% response rate). In addition, the knowledge domains identified as important across landscape architecture within a body of knowledge were found to change when investigating each knowledge domain’s relative importance from different perspectives.

5.2.1: Knowledge in education

An issue arose immediately with the results discussed above from the perspective of knowledge in education. The knowledge domains ‘design’, ‘construction’, ‘natural’, and ‘social’ were all found to have different levels of importance within each data set that measured knowledge in education - Fein (1972), LABOK (2004), and MLA curricula (2015). While ‘design’, ‘construction’, and ‘natural’ knowledge domains were typically found among the more important domains across these three data sets, ‘social’ was consistently found to be ranked among the lowest. Even though landscape architects have expressed a higher opinion with respect to social knowledge, the data gathered from first-professional program curricula course titles tells a different story - one where social knowledge is the least important knowledge domain. This discrepancy between practicing landscape architect perceptions and what is taught to students can be seen across many different knowledge domains - ‘construction’, ‘theory & history’, ‘media, technology, & communication’, ‘planning’, and ‘research’. The only knowledge domains that were found to be relatively consistent in measured importance between the perceptions of landscape architects and course curricula titles were ‘design’ and ‘natural’.

While using slightly different terminology, this finding was consistent with the results of the Fein (1972) report - design and natural knowledge can be seen as the cornerstones of
It is, however, important to mention a limitation of the method used to investigate MLA program curricula - the method only considered course titles and did not investigate course descriptions. Therefore, the results in the curricula review might not represent the content of each course accurately. This limitation could be addressed in a future study where course descriptions and course weighting within a program are investigated fully.

Another interesting result was the large importance placed on media, technology, and communication knowledge within the profession. The results from the Fein (1972) report showed that ‘fine arts and aesthetics’ was ranked very high, and followed the domains ‘principles of design’, ‘ecology’, and ‘construction’ in level of perceived importance. This result was also found in the LABOK (2004) report when assessing the domains ‘media’, ‘technology’, and ‘communication’ together as a single group. However, when looking at first-professional course curricula titles, the domain ‘media, technology, and communication’ ranked second in total number of classes offered (behind ‘design’) and was almost identical in total number of courses offered to the highest ranked domain ‘natural’ when design was recategorized. Therefore, the domain ‘media, technology, and communication’ receives a greater emphasis in education than its perceived importance by landscape architects would imply.

These findings are interesting to think about within the context of professional development and the functions of academic knowledge (Abbott, 1988). To Abbott (1988), the purpose of instruction - one of the three primary functions of academic knowledge to a profession - is to present a cohesive, albeit constructed, picture of knowledge for students to learn. In essence, instruction becomes the connection between the knowledge of academia and the knowledge of practice. This period of learning informs and shapes the knowledge of future practitioners and academics in landscape architecture. The results of this research show a disconnection between what landscape architects identify as important knowledge types to be learned and what is actually taught today. In addition, the knowledge domains found to be important to education were found to change in their importance between data sets. If these kind of issue exists, is the purpose of instruction
being fulfilled? How are university programs created in light of the results found in section 5.2?

5.2.2: Knowledge in practice

When looking at the knowledge domains from each data set within the context of professional practice, a few interesting relationships develop. At the time of the Fein (1972) report, the perceptions of ASLA members and what knowledge domains they thought should be important to practice were clear - ‘ecological needs’ and ‘aesthetics’ were the most important and was closely followed by ‘public welfare and enjoyment’. ‘Comfort and pleasure for individual’ was perceived to be the least important knowledge domain. These results are in contrast to the knowledge perceived to be important to a practitioner by the LABOK (2004) report results. At the level of application - where a practitioner is able to use knowledge to solve problems - ‘construction’ was amongst highest-ranked domain. It was also the highest ranked domain when ‘design’ was re-categorized. This is interesting because the pilot study from the Fein (1972) report did not identify construction as a major concern of landscape architecture at that time. It was found to be an important component of education, but construction was not considered a form of knowledge that defined the profession.

The changing importance of the knowledge domains ‘natural’ and ‘social’ between the Fein (1972) report and the LABOK (2004) report is also interesting. The results suggest that despite the lower measured importance of the two domains in the 1970s, they were perceived to be critical to the profession (Fein, 1972). This outlook was reproduced to a certain extent in the LABOK (2004) report, where ‘natural’ and ‘social’ knowledge domains ranked very high in importance within a specific level of understanding - application. However, this changed within the highest measured level of understanding - mastery. ‘Social’ was no longer an important knowledge domain, and ‘natural’ was among the least important.

To reiterate, application was defined by the LABOK (2004) report as being able to use knowledge to solve problems. Mastery, however, was defined as being able to apply
knowledge to solve novel problems. What this crucial distinction means within the context of a profession’s problem solving process suggests that these two forms of understanding are similar to the relationship between routine and obscure problems (Abbott, 1988). The application level was concerned with solving routine problems, while the mastery level was concerned with solving obscure problems. This is particularly interesting because of what happened to the total number of knowledge domains that were perceived to be important to each level of understanding. Application included ten knowledge domains (including ‘theory’ which became important when ‘design’ was re-categorized) - ‘design’, ‘construction’, ‘natural’, ‘social’, ‘media’, ‘communication’, ‘planning’, ‘profession’, ‘theory’, and ‘history’ - with ‘construction’ being identified as the most important. However, mastery included only five domains - ‘design’, ‘construction’, ‘natural’, ‘media’, and ‘theory’. It is important to keep in mind what happened when the design domain was recategorized within the mastery level - the knowledge domain ‘theory’ was identified while ‘design’ disappeared completely. Therefore, the total number of knowledge domains identified as important at the mastery level was actually four: ‘design (theory)’, ‘construction’, ‘natural’, and ‘media’.

This result is quite perplexing in light of how obscure problems were described by Abbott (1988). When facing an obscure problem, the highest quality of information should be used by a professional to assess and address the problem at hand (Abbott, 1988). If landscape architects “design almost anything under the sky” (ASLA, 2014), surely a great diversity of obscure problems are faced and addressed with many different types of knowledge by practitioners. What this result showed was that obscure problems faced by landscape architects in 2004 were addressed using knowledge from design (theory), construction, natural, and media. Are landscape architecture practitioners well equipped to face obscure problems that might be faced today - such as climate change - with only four knowledge domains to rely upon?

Another way to look at these results is to ask whether the profession is addressing obscure problems. If the profession is largely addressing routine problems, there would be a reduced need to rely upon specialized knowledge domains. This, however, would be
detrimental to the profession as it would signal to the public that the work of landscape architects is not very specialized and could be conducted by other professions (see chapter 2). This discrepancy could also be accounted for if landscape architects consult with other allied-professions or researchers to address obscure problems. However, the results from Chen’s (2013) research would suggest that landscape architects do not consider consultation with other professionals a worthwhile endeavour.

5.2.3: Knowledge in academic research

The results from investigations conducted by Powers & Walker (2009) and Gobster et al. (2010) were somewhat peculiar in terms of the knowledge domains identified, especially considering they were working with many of the same data from almost identical time periods. For Powers & Walker (2009), each of the domains identified from other data sets used in this thesis were accounted for in their results. However, ‘construction’ and ‘urban’ domains were found to be absent from the results of Gobster et al.’s (2010) investigation, but were found within Powers & Walker’s (2009) results.

This discrepancy may be explained when considering the different methods used by each study to identify the subject matter of published articles. Powers & Walker (2009) used a method with a framework that could be reproduced by future researchers, while Gobster et al. (2010) used a valid, but less precise method for their investigation. This could account for why ‘LA education / research / profession’ was identified as a category by Gobster et al. (2010), while Powers & Walker (2009) identified three distinct categories - ‘design education and pedagogy’, ‘methods of inquiry’, and ‘landscape architecture as a profession’.

Despite this issue between the two studies, the knowledge domain ‘history’ was identified by both as the main subject of inquiry for published research by landscape architects in ‘Landscape Journal’, with ‘theory’ not far behind. The results found with respect to these domains is interesting because they are not consistent with the domains identified to be important to education or practice, which placed theory and history either in a place of unimportance - for knowledge important to practice - or in a place of
relatively high importance - for knowledge important to education.

These results could be explained by the purpose of education and its function within the academic knowledge of a profession (Abbott, 1988). In other words, the constructed picture of education taught to students with respect to theory and history could be seen as a middle ground between the lower importance given to the knowledge by practitioners, and the higher importance given to the knowledge by academics. However, the high number of identified articles investigating subjects of landscape architectural theory and history call into question whether the studies being conducted by landscape architecture faculty are responding to the function of research within a profession - such as creating new methods of diagnosis, inference, and treatment (Abbott, 1988). According to Abbott (1988), research is responsible for investigating new questions and increasing the boundary of knowledge for the profession. An emphasis on ‘history’ and ‘theory’ suggest researchers may be following a different purpose (for example: maybe funding is an issue) instead of investigating questions that could further the knowledge of the profession in new ways.

5.3: Gaining understanding through systems thinking

In light of the mixed results discussed so far, is attempting to identify a specialized body of knowledge within landscape architecture the right course of action? Within Abbott’s (1988) theory of professional development and the functions of academic knowledge that he described, focusing on a specialized body of knowledge allows the strength of academic knowledge within the profession to be assessed in an exploratory manner. However - as the discussion so far has shown - practitioners, academics, and students have different relationships with knowledge and these relationships can have a drastic effect on what is identifiable as a specialized body of knowledge. With so many different relationships to account for, was it appropriate to reduce knowledge within the profession to a single defining body of knowledge? Is there a reason why each should identify different domains?
The data collected for this research covered a large period of time in the history of landscape architecture and gathered data from multiple perspectives. In addition to the difficulty in understanding the relationships of practitioners, academics, and students with knowledge, time adds another level of complexity. Could any clarity be gained by investigating the relationship of different landscape architecture actors and their work within the context of time?

Recent research in ecology and sustainability suggests that the problems being faced by society today are inherently complex, with a great deal of uncertainty, and have a diverse range of attached values (Funtowicz & Ravetz, 1993; Waltner-Toews et al., 2008). It is argued that these types of problems should be addressed from multiple perspectives in order to appropriately address that complexity. This shift in approach towards holism is in contrast to the more traditional approach of understanding a problem by reducing it into smaller pieces to be studied separately, and is a primary consideration of systems thinking (Waltner-Toews et al., 2008).

Systems thinking could be used to approach the problem of identifying a specialized body of knowledge in landscape architecture and may bring clarity in understanding the relationship between landscape architects, their work, and the knowledge they perceive to be important. By creating a description of the different kinds of actors within landscape architecture and their work, a greater understanding of the relationship between the profession and knowledge may be possible. The sources of data used within this thesis research covers over forty years in the history of landscape architecture. Understanding the context surrounding each data set, in addition to a change in perspective using systems thinking, may be able to add some sense of structure to the mixed results that have been identified so far when attempting to identify a specialized body of knowledge.
5.4: The historical context of knowledge in landscape architecture

With each data set in mind and the time periods they were investigating, what was the historical context like surrounding each source of data? Are there any connections between the social problems of each time period, the results of each study, and the work of landscape architects? Would any potential connections account for the mixed findings when attempting to identify a specialized body of knowledge?

5.4.1: The 1970s

The Fein report was completed in 1972 - this was the time of Ian McHarg, the rise of the environmental movement, and the publication of ‘Silent Spring’ in 1962 by Rachel Carson (Baird & Szczyszgiel, 2007). It was during this time that environmental issues and regulation gained prominence within the public discourse. At the same time, the Fein (1972) report highlighted the changing importance of ‘ecological needs’ and ‘public welfare and enjoyment’ with respect to landscape architecture practice. In addition, ‘ecology’ ranked second amongst subjects that should be taught to students of landscape architecture behind ‘principles of design’ (Fein, 1972). This is interesting because it would imply that the knowledge important to landscape architecture was shifting in response to a large social issue of the period. Based on the increased perceived importance of ecological knowledge within the profession, what kinds of problems were landscape architects responding to at the time? Were they able to work on ecological problems even though they were not trained ecologists? What degree of uncertainty were they facing in their work? Was there research being produced by landscape architects that focused on ecology?

While the data sets used in this thesis do not cover published research in the 1970s by landscape architects, the results from Powers & Walker’s (2009) investigation does show that within the 1982-1988 time period, ‘landscape planning and ecology’ was the most researched subject in ‘Landscape Journal’. This would suggest that the research function of academic knowledge within landscape architecture was strong at the time, and that it was producing knowledge within the context of landscape architecture.
5.4.2: The 1980s

The studies conducted by Powers & Walker (2009) and Gobster et al. (2010) investigated the subject matter of peer-reviewed articles published in ‘Landscape Journal’ beginning in 1982. At this time, landscape architecture was struggling with an art-science dichotomy that had caused a split within the profession (Lyle, 1985; Baird & Szczygiel, 2007). Peter Walker became the Chair of the Landscape Architecture Department at Harvard in the 1980s, and he refocused the education of landscape architecture students around design (Baird & Szczygiel, 2007). In addition, the work of John Lyle (1985) was focused squarely on the process of design. When inspecting the results from Powers & Walker (2009) for the 1982-1988 time period, ‘landscape planning and ecology’ was the most researched subject. However, by the 1988-1995 time period ‘landscape planning and ecology’ dropped in importance and was replaced by studies investigating ‘history and culture’ (Powers & Walker, 2009). This is interesting because the change in research focus from ‘landscape planning and ecology’ to ‘history and culture’ implies that traditional and/or applied science research within the profession became driven by questions surrounding the history of the profession. What kinds of problems were practitioners facing in the 1980s? Was their work still driven by socially relevant issues like the environmental movement in the 1960s and 1970s?

5.4.3: The 1990s & 2000s

In 2004, the results of the LABOK study report were published. In the period leading up to 2004, landscape architecture was recovering from the loss of control over infrastructure projects to engineers in the 1990s (Baird & Szczygiel, 2007). Landscape architecture was originally connected to these projects through the work of Olmsted, which legitimized the profession’s ability to work on the planning of cities and open spaces (Baird & Szczygiel, 2007). Here, too, a connection becomes apparent - this time, it is between a change in the profession and the results of the LABOK study. At each level of data - knowledge important to education; knowledge important to practice (application); knowledge important to practice (mastery) - construction was a leading
knowledge domain in terms of overall importance. Was this increase in construction knowledge importance a response to the loss of work related to the large scale planning and design of cities and open spaces, or because of a relegation to site design and construction drawings? Was landscape architecture still addressing the issues of society at the time? What kinds of work drove the profession during this time?

The results from Powers & Walker (2009) and Gobster et al. (2010) for the periods 1995-2002 and 2003-2007+ line up well with the LABOK report, and may give an indication as to what subjects were being researched both prior to 2004 and slightly after. The results from Powers and Walker (2009) showed that in the 1995-2002 period there was a movement away from ‘history and culture’, ‘landscape planning and ecology’, and ‘landscape design and implementation’. At the same time, there was an increased focus in ‘human and environment relationships’, ‘urban design’, and ‘sustainability’ (Powers and Walker, 2009). The results from Gobster et al. (2010) for the same time period showed a decrease or tie across all subjects except within ‘design case study / methods’, ‘regional landscape planning / policy study’, and ‘other’. These results indicate a connection with the issues of practitioners, as research in landscape architecture may have responded to the loss of work surrounding the planning of cities and open parks. In addition, the results from Powers and Walker (2009) also suggest there was a response to the Brundtland Commission and its description of ‘sustainable development’ in 1987 (Gibson et al., 2005). This would imply that researchers in landscape architecture were responding to a larger social issue during this time period.

For the 2003-2007+ period, the results from Powers and Walker (2009) showed that there was a continued interest in ‘human and environment relationships’, while ‘urban design’ and ‘sustainability’ dropped off almost completely. However, there was also an increased interest in ‘landscape planning and ecology’, and a small increase in ‘history and culture’ for this time period (Powers & Walker, 2009). The results from Gobster et al. (2010) showed a large increase in ‘environmental management / sustainable design / urban forestry’, ‘regional landscape planning / policy study’, ‘landscape history / people / historic preservation’, and ‘LA education / research / profession’. These results depict
another change in focus - one towards planning, the environment, human behaviour, and the history of landscape architecture. Was this potential change in research emphasis an example of the profession responding to another social issue, or could it have been due to an issue facing the profession of landscape architecture? Baird & Szczygiel (2007) suggest that planning and policy were viewed by society as important avenues to address the larger problems of the time. Could an increased focus on planning and policy also account for the sudden shift away from research in sustainability such a short time after the Brundtland Commission?

5.4.4: Today (2015)

For 2007 and the near future, Baird & Szczygiel (2007) suggested that landscape architects will be focused on solving issues of sustainability and human health. This forecast has been reproduced to a certain extent today in 2015, as the ASLA’s website (www.asla.org) identifies ‘green infrastructure’, ‘sustainable sites’, and ‘health’ as key issues. The results from Meijering et al. (2015) suggest that for research in landscape architecture, ‘human dimensions of planning and design’, ‘green urban development’, ‘built environments and infrastructure’, and ‘global landscape issues’ are the most pressing issues. Unfortunately, the data used in this thesis research did not cover the perceptions of practitioners or what researchers in landscape architecture have been publishing in the past few years. While the results from the first-professional MLA curricula review did not identify knowledge domains at a more detailed level - such as ‘health’ - an inspection of the results could give insight as to whether future practitioners are being prepared to approach the larger social issues being addressed today.

The results from the curricula review showed that ‘design’ was by far the most important knowledge domain in a MLA degree. The knowledge domain ‘natural’ ranked very high as well. However, in light of ‘design’ and ‘natural’ being the only knowledge domains that were consistently identified as important within each source of data, this may indicate less of a response to current social issues and instead show that the ‘design’ and ‘natural’ domains have been, and continue to be important components of landscape
architecture. A more detailed investigation into course curricula content could determine whether what is being taught today prepares students who may be working on these types of issues in the future.

5.5: The multiple perspectives of landscape architects & their relationship to a specialized body of knowledge

Using systems thinking to re-assess the results of this thesis proved positive - there seems to be a connection between the changing focus of the profession over time and the relationship between actors in landscape architecture and knowledge. These results suggest that the changing focus of the profession may be responsible for the mixed results discussed in section 5.2 and the inability to identify a consistent specialized body of knowledge across the entire profession.

However, the description of professional development outlined by Abbott (1988) described two components within the “cultural machinery” of a profession - the problem solving process used by practitioners, and the academic knowledge created by researchers. This distinction implies that the two types of actors have different roles, but also affect the strength of the profession and its jurisdictional link to work. If that is the case, each actor within landscape architecture should have a connection to a shared specialized body of knowledge. Therefore, there must be an overlap of knowledge from each perspective.

What are the roles of practitioners and faculty within the profession and what kinds of work are they responsible for? What is the relationship between their work and a potential specialized body of knowledge?

5.5.1: Understanding the different actors in landscape architecture

Funtowicz & Ravetz (1993) identified different actors and the goals of their work by describing different levels of problem-solving strategies using degrees of uncertainty (of knowledge) and decision stakes (values) as a metric. In doing so, Funtowicz & Ravetz (1993) identified four different degrees of problem solving that addressed simple,
complicated, and complex problems - ‘curiosity-motivated’ (core science); ‘mission-oriented’ (applied science); ‘client serving’ (professional consultancy); and ‘issue-driven’ (post-normal science) (Figure 5.1).

Looking at Figure 5.1, traditional, or core science occurs at the intersection of the x and y axes. Because of this location, it can be said that core science takes place where values are low as “… there are no external interests at stake in curiosity-motivated research…” (Funtowicz & Ravetz, 1993; pg 745). Likewise, “… the research exercise is generally not undertaken unless there is confidence that the uncertainties are low…” (Funtowicz & Ravetz, 1993; pg 745). Core science was historically driven by a reductionist perspective investigating increasingly detailed questions (‘curiosity-motivated’) with outcomes that could only be understood by a small number of highly educated people (Funtowicz & Ravetz, 1993). The inherent assumption in the process of
traditional science was the belief that the solution to a larger, complex problem could be discovered by piecing together the results of discrete investigations into detailed questions (Funtowicz & Ravetz, 1993).

Applied science is very similar to traditional science in its method, but differs in its goal - it is ‘mission-oriented’. Knowledge uncertainties are still relatively low as they are controlled through “standard routines and procedures”, while values are also low because the research is separate from its value to a company or consumers from the perspective of the researcher (Funtowicz & Ravetz, 1993; pg 745). The distinction, however, is that applied science’s purpose is derived from a need, whether that need comes from a company, society, or somewhere else. Traditional science is driven by the curiosity inherent within a specific question, and it is disconnected from the needs of others. The knowledge produced in applied science typically serves an external interest to the research being conducted. Because of this external interest, the knowledge developed by applied science is often not publicly accessible because the knowledge could be the intellectual property of a larger corporation.

With professional consultancy, the level of uncertainty begins to change because “more complex aspects of the problem, such as reliability of the theories and information are relevant” (Funtowicz & Ravetz, 1993; pg 747). In response to this increase in knowledge uncertainty, personal judgement and experience become important as the knowledge from traditional or applied science may not translate directly when trying to solve a problem. Traditional and applied science are still nested within professional consultancy, but the approach towards problem solving changes - it is ‘client serving’. This means that values have increased, as a professional consultant conducts work for a client (Funtowicz & Ravetz, 1993). This client has both explicit and implicit values and expectations that need to be addressed. However, these values cannot always be expressed and reduced into a precise goal for the professional consultant. In addition, ethical considerations become apparent at this level. For example, a professional consultant may have to struggle with harming the environment in order to address the concerns of their client. In addition, the knowledge developed by professional
consultancy is not typically publicly available because it can be considered a competitive advantage when competing for work.

Finally, post-normal science occurs “when uncertainties are either of the epistemological or the ethical kind, or when decision stakes [values] reflect conflicting purposes among stakeholders” (Funtowicz & Ravetz, 1993; pg 750). In contrast to the previous three problem solving strategies, the uncertainty of knowledge becomes very large compared with the increasingly specific values of different stakeholders. It is at these levels of complexity that the problem solving strategy becomes ‘issue-driven’. Great examples of this type of problem are climate change and sustainability.

“In post-normal science, the manifold uncertainties in both products [applied science] and processes [traditional science] require that the relative importance of persons becomes enhanced. Hence the establishment of the legitimacy and competence of participants will inevitably involve broader societal and cultural institutions and movements.” (Funtowicz & Ravetz, 1993; pg 752)

To account for the large increase in the uncertainty of knowledge, Funtowicz & Ravetz (1993) argued that multiple perspectives (different actors) are needed to assess the quality of the knowledge being presented to address the problem at hand. With this approach, the values of each actor become explicit in the assessment process, and scientific perspectives become equal among the other perspectives brought in to address the problem.

“Thus post-normal science corresponds to an enriched systems theory, deriving analytical rigour from it, and providing it with experience and insights.” (Funtowicz & Ravetz, 1993; pg 751)

5.5.2: The perspectives of landscape architects and their work

The different problem solving strategies outlined by Funtowicz & Ravetz (1993), and their corresponding actors accurately describe the two main actors within landscape architecture - practitioners and faculty - and their work.
Faculty, in addition to being responsible for educating students, are also seen as responsible for conducting research (Chenoweth & Chidister, 1983; Milburn et al., 2003). This perception implies that faculty are responsible for conducting both traditional (‘curiosity-motivated’) and applied (‘mission-oriented’) science. In addition, faculty can also be seen as professional consultants (‘client serving’) if their knowledge is seen as crucial to addressing a specific problem for another professional consultant working on a larger problem for a client. Therefore, faculty are largely responsible for addressing simple problems, but may also be responsible for addressing complicated problems.

Practitioners can be described by professional consultancy (‘client serving’) as they are hired by clients to conduct work. Like faculty, practitioners can use their knowledge to address a problem for another professional consultant who is working on a larger problem (for example, a landscape architect working for an architect), or they can work for a client directly. In addition, some practitioners may also engage in either traditional and / or applied science. Therefore, practitioners are largely responsible for addressing complicated problems, but may also be responsible for addressing simple problems.

The hierarchy found when describing the different actors in landscape architecture does imply a sharing of knowledge. Traditional research investigates discrete questions and influences applied research, which, in turn, influences professional consultancy. At each level of increasing uncertainty and values, the earlier problem-solving strategies and their respective actors were still present and inform each other. In the case of professional consultancy (landscape architecture), traditional and applied research form its core and affect its ability to function.

The differences between actors within the profession may give a clue as to why there were such large discrepancies between the perceptions of practitioners and researchers found in the results of this thesis. As the problem-solving perspective moves from actor to actor, the potential for shared knowledge changes because each actor has a different relationship towards their work, and each actor produces different outcomes. None of the secondary data used in this thesis differentiated between the types of researchers. It could be that ‘Landscape Journal’ focused on subject matter that was more representative of
traditional research, while applied research studies in landscape architecture were published in different peer-reviewed journals. Therefore, while there may be a specialized body of knowledge for the profession, it may be obscured by each actor as they translate knowledge from other problem-solving strategies to solve their specific problems.

5.6: A question of today’s focus

In light of the changing focus of landscape architecture through its history and the different problem-solving strategies of actors within the profession that were discussed in the previous sections, how might today’s focus affect what knowledge is perceived to be important within a potential body of knowledge? Are there any implied assumptions within the new areas of focus that may create a problem for the profession?

Today, there appears to be a push towards addressing issues involving infrastructure, health, and ‘global landscape issues’ that include topics such as climate change and sustainability (Baird & Szczygiel, 2007; ASLA, 2015; Meijering et al., 2015). However, these issues are not within the traditional realm of problem-solving strategies of landscape architecture - they are complex problems in the realm of systems thinking and post-normal science (Funtowicz & Ravetz, 1993; Waltner-Toews et al., 2008).

Researchers - both traditional and applied - focus largely on simple problems, while professional consultants - landscape architecture practitioners - focus on complicated problems (Funtowicz & Ravetz, 1993). Understanding and addressing complex problems requires a completely different problem-solving strategy because of the high uncertainty in knowledge and the high level of values attached to the problem. This new strategy compels those participating in the process to transcend beyond their typical knowledge boundaries and their own perspectives in order to better understand the high uncertainty and decision stakes (values) that are inherent within the complex problem (Funtowicz & Ravetz, 1993; Waltner-Toews et al., 2008; Pohl, 2010). To do this, multiple perspectives from extended “peer-communities” are needed in addition to the perspectives of actors who address simple and complicated problems (Funtowicz & Ravetz, 1993; Waltner-Toews et al., 2008; Pohl, 2010).
Meijering et al. (2015) found that the ‘values and ethics’ knowledge domain was perceived to be the least important measured domain (0%) within stage three of their Delphi study. In other words, not a single participant in the last stage of their study felt ‘values and ethics’ was a priority to research in landscape architecture. How can landscape architects address complex problems when they do not think that understanding values are important?

A similar result was also found within the LABOK (2004) report. While knowledge areas involving ‘ethics’ and ‘social responsibility’ were measured within the knowledge domain ‘values and ethics in practice’, a knowledge area encompassing values was absent. In addition, the importance of knowledge areas involving ‘ethics’ and ‘social responsibility’ were measured to be of low importance to practice at the mastery level (solving novel problems).

These results are at odds with the high measured importance of addressing ‘global landscape issues’ and implies that landscape architecture, as a profession, may not be capable of understanding, let alone responding to the complex problems of today with the knowledge currently perceived as important to the profession.

“The profession, in the opinion of this study, is confronted by even more formidable challenges than it faced in the 1920s, for it is being, in effect, asked by others and by its own membership to assume leadership in the solution of complex environmental problems whose origins lie deeply imbedded in social and cultural attitudes and not simply in the failure to adhere to ecological standards which are subsumed within a larger context.” (Fein, 1972; pg 5-8)

Therefore, landscape architecture may find itself at another crossroads, if it hasn’t already. Does the profession want to help address some of society’s complex problems? If so, it will require a change in perspective throughout the entire profession from one that views a landscape architect as a leader of action, to one where a landscape architect is but one perspective among many. However, this potential change is based on the assumption that the profession can bring knowledge to this collaborative process that is not shared or better understood and applied by another discipline or allied profession.
5.7: Re-assessing academic knowledge within landscape architecture

5.7.1: The legitimacy of academic knowledge in landscape architecture

As discussed in chapter 2, Abbott (1988) argued that the foundation of a profession is its body of knowledge, and that a body of knowledge is, in turn, affected by academic knowledge and its three functions - legitimacy, research, and instruction. When looking through a systems thinking lens, the results of this research suggest the legitimacy function of academic knowledge may not be operating well in landscape architecture. Legitimacy serves two functions - it identifies a body of knowledge that is linked to cultural values, and it showcases the quality of knowledge being produced by the profession, thereby strengthening the link between a body of knowledge and cultural values (Abbott, 1988). The potential weakness of legitimacy in landscape architecture can be seen as a compounding issue, and begins with the profession’s body of knowledge.

Identifying a body of knowledge is complicated by the nature of landscape architecture and the different types of actors within the profession. It can be argued that there are three levels of knowledge production that influence the larger body of knowledge - traditional science, applied science, and professional consultancy (Funtowicz & Ravetz, 1993). Each of these levels have a different purpose, and each have certain restrictions based upon that purpose. Both applied science and professional consultancy are restricted in the sharing of their knowledge to the public - the knowledge of applied science is typically considered intellectual property of the corporations funding the research (for example), and the knowledge of professional consultancy may be considered a competitive advantage when competing for new work (Funtowicz & Ravetz, 1993). Therefore, traditional science is responsible for producing the majority of knowledge that can be accessed publicly - whether the knowledge is viewed through peer-reviewed journals, books, or presentations. Unfortunately, research production in landscape architecture has been found to be low relative to other disciplines and can have negative connotations associated with it, which further weakens the legitimacy function of academic knowledge (Milburn, Brown, & Paine, 2001).
The issues surrounding the profession’s body of knowledge also have a direct effect on the quality of knowledge, and therefore the connection between the profession’s knowledge and cultural values. Despite the profession’s willingness to change its focus to respond to society’s needs, these changes may have harmed the quality of knowledge being produced. By continuing to change the focus of the profession over time, researchers may not have been able to investigate questions relevant to the profession in any great depth because of pressure to respond to the changing needs of practitioners. This, in turn, would potentially affect the degree of abstraction (depth) knowledge in landscape architecture carries with it. If the degree of abstraction is low compared to the knowledge of other competing professions and their respective disciplines, landscape architecture may have a difficult time competing for work or providing consistent knowledge built upon sound foundations (Abbott, 1988).

5.7.2: Research and its function in landscape architecture

The change in perspective using systems thinking and post-normal science also affected the assessment of research and its functional strength. At first, the results from Powers & Walker (2009) and Gobster et al. (2010) suggested that research might not be functioning well because the knowledge domain ‘history’ was the most researched topic within articles published in ‘Landscape Journal’. This result was perplexing because it suggested that new connections between different types of knowledge for the profession was largely coming from its own history. However, when looking at the research conducted in the context of different time periods, it became apparent that research may have been simply responding to the changing focus of the profession.

Unfortunately, the results of studies discussed in chapter 2 and the results of each data set used in this thesis have shown that research may still not be functioning well, as its direction of inquiry appears to be guided by practitioners and their needs. This is worrying for a few reasons. First, as the focus of the profession changes, researchers may be pressured to respond with new investigations into related knowledge domains instead of investigating novel questions that are guided by prior academic research. This
changing focus may have an effect on the quality (depth) of understanding for knowledge in landscape architecture because researchers are not able to build upon prior research. Whether this is due to the demands of practitioners or the profession as a whole is unknown. This is a difficult requirement because of the low number of landscape architecture faculty actually conducting academic research (Milburn & Brown, 2003a; Gobster et al., 2010). The severity of these issues are also compounded by the mixed understanding of what research means within landscape architecture, and the perception that conducting / publishing academic research is not important (Milburn et al., 2003; Milburn & Brown, 2003). Together, these issues may have created a positive feedback loop that has reinforced and strengthened the perception that research in landscape architecture is not important. Each actor within landscape architecture has a crucial role to play, and these roles ultimately affect the strength and health of the profession (Abbott, 1988; Funtowicz & Ravetz, 1993).

To gain a better understanding of whether research is functioning well within landscape architecture according to Abbott’s (1988) description of research and its functions, a more exhaustive investigation into the subject matter of peer-reviewed articles published by landscape architecture faculty will need to be conducted - one that investigates the authors, their type of research, and the total number of articles published across different journals. This could be done by investigating the CVs of landscape architecture faculty online. By not being solely focused on publications within ‘Landscape Journal’, a more comprehensive and accurate picture of research in landscape architecture could be developed, and a more precise assessment of research and its functions could be conducted.

5.7.3: Instruction and its function in landscape architecture

Finally, using a systems thinking and post-normal science lens also added some clarity to the strength of instruction in landscape architecture, as the changing focus of the profession identified earlier in this chapter may also have a direct effect on university curricula. If the profession has been changing focus numerous times throughout its
history, each change in focus would potentially affect which knowledge domains were considered to be important at a particular time. This can be seen in the changing importance among knowledge domains in education across the results from Fein (1972), LABOK (2004), and MLA curricula (2015). In addition, if a particular change in focus required knowledge not typically associated with landscape architecture, it could be argued that this new knowledge would eventually be gained and incorporated into the profession at some level. This can be seen as an additive process, where new knowledge is continually added over time and may be expected to be part of university curricula by practitioners and accreditation boards.

The issue with this process is that the function of instruction is to present a cohesive, albeit artificially complete picture of knowledge for students to learn (Abbott, 1988). How can university programs educate future landscape architects when knowledge domains are constantly changing in importance, and the total number of knowledge domains continues to increase as the profession changes focus over time to address different issues?

5.8: Is there a specialized body of knowledge in landscape architecture?

What does all of this mean? Is there an answer to the question of this thesis? Yes there is, although the inherent complexity of this question made it difficult to identify a singular specialized body of knowledge in landscape architecture using the results gathered for this thesis research. Exploring the relationship between a profession and its work was an initial step towards understanding the complexity between knowledge and landscape architecture. However, by using a systems thinking and post-normal science lens, a greater understanding of the relationship between actors in landscape architecture, their knowledge, and their work was achieved. With this expanded understanding, potential reasons for the mixed results from this study became more apparent.

The list of ten knowledge domains identified through an analysis of the results from Fein (1972), LABOK (2004), Powers & Walker (2009), Gobster et al. (2010), and a MLA curricula review (2015) showed that there was a large diversity to the profession’s
knowledge base. Upon closer inspection, there were only two knowledge domains that were consistently identified to be important within each data set - ‘design’ and ‘natural’. Other knowledge domains were also found to be somewhat consistent across each data set. For example, the knowledge domain ‘social’ was found to be missing from only one data set, while ‘construction’ was missing from two. However, when looking at the importance of each knowledge domain within the scope of practice, research, and education separately, the rank of each domain was found to be quite varied. These mixed results raised further questions rather than clarifying what knowledge domains are part of a specialized body of knowledge in landscape architecture.

A potential reason for these discrepancies arose when looking at the data sets within the context of time - landscape architecture as a profession may have a history of working to address some of society’s larger issues as they have changed over time. However, the profession may also have a history of abruptly changing its focus to address the loss of work that was historically relevant to landscape architecture. The relatively rapid change of focus between the issues of society and the issues of the profession might have been partly responsible for the difficulty in identifying a specialized body of knowledge in landscape architecture, and may have caused harm to the strength of academic knowledge and its three functions - legitimacy, research, and instruction.

In addition, a restricted understanding of the different actors within landscape architecture, their knowledge, and the different aspects of their work could also be a factor influencing the ability to identify a specialized body of knowledge. Each actor within landscape architecture plays an important role in how the profession functions, and can influence the knowledge and work of the profession (Figure 5.2). By not understanding the different roles of landscape architects, their importance, and the scope of their work, the profession might have negatively affected the jurisdictional link between landscape architecture and its work.
Figure 5.2: The components that influence the perceived relationship between a profession and its work.
Chapter 6: Conclusions & Recommendations

6.1: Reflection

Despite the growing scholarship investigating research and its place within landscape architecture, there are still mixed perceptions of its importance within the profession. An examination of professionalization - a body of literature discussing how a profession comes into being - led to Abbott (1988) and his work on professional development. In it, Abbott (1988) argued that a specialized body of knowledge is the foundation of a profession, and that academic knowledge serves an important purpose.

This thesis research asked the question: Is there a specialized body of knowledge in landscape architecture, and if so, what is it? Despite using a sequential transformative mixed methods strategy with five data sets covering multiple perspectives and a time period of over forty years, a unified specialized body of knowledge could not be identified within landscape architecture. It was discovered that while this study was diverse in scope, it could not account for the complex nature of the question under investigation. However, by using a systems thinking and a post-normal science lens to look at the results from a different perspective, the functional strength of academic knowledge within the profession was able to be assessed. This assessment highlighted the importance of academic knowledge to landscape architecture, and points to numerous avenues for future development within the profession, as well as in future studies.

“All of this points to more - not less - emphasis in the total professional training on ecology, botany, micro-climatology, and such related subjects as construction. Also, it is not means to alter the fundamental contribution of the landscape architect as one who gives physical form to a whole range of projects - from the individual garden and site plan to that of the new town or region. But it does require new concepts of design that permit individual creativity based to the fullest extent possible on scientific data. Artistic ability, or design creativity, is one factor by which individual practitioners differentiate their efforts. Hence, it is unlikely that any two solutions to a problem will be identical; however, all solutions to be valid must satisfy certain scientific needs and criteria. Or, phrased differently, not all landscape architects will be equally gifted artists, but all must be fairly “equal” with respect to their grasp of scientific knowledge.” (Fein, 1972; pg 5-11)
6.2: Recommendations

6.2.1: Avenues for research

The issues identified by the assessment of research, while not conclusive, identify avenues of advancement in light of research’s purpose within academic knowledge. These avenues focus squarely on research leading itself and its investigations instead of allowing the changing focus of the profession to decide what to study. Traditional research, in particular, should be asking new questions that attempt to expand the boundaries of knowledge within landscape architecture, along with increasing the depth of knowledge already within the boundaries. Applied research should strive to translate the knowledge of traditional research into real-world products and applications that can be utilized by practitioners and users alike.

6.2.2: Avenues for practice

The most crucial recommendation for practice in light of the results of this thesis is to better understand the different actors within landscape architecture and the roles they play within the profession. Each actor plays an important part in a functioning profession, and each one can affect the strength of the profession’s jurisdictional link to its work. The largest piece within this understanding is that research is a critical component within the profession and has a tremendous effect on practice, albeit in an indirect way. It does not exist solely to serve the changing focus of practitioners and the work they do.

6.2.3: Avenues for education

The educational system within landscape architecture needs to reflect on its function within the profession. As described in chapter 5, the changing focus of the profession may lead to negative consequences in light of the increasing number of subjects being identified as important to landscape architecture. In order to avoid such a pitfall, education should work towards identifying the core knowledge from landscape architecture’s body of knowledge, and teach that knowledge explicitly within the problem-solving framework of the profession.
Since landscape architecture is a form of professional consultancy, its purpose is to translate theoretical and applied knowledge into a practical application for a client through experiential knowledge. This purpose is dependent on practitioners having a foundation of disciplinary knowledge. Instead of focusing on teaching design throughout a program, break design down into its components - diagnosis, inference, treatment - and build towards a comprehensive - i.e., design - studio where students can demonstrate their mastery of each component within the problem solving process.

University curricula are but one part of a landscape architect’s life-long learning process, but it must serve as the foundation for the profession that can be built upon. It should teach the role of each actor within landscape architecture and explicitly show the important relationship between actors.

6.3: Avenues for future research

There are numerous potential avenues for future research within the scope of knowledge and the profession of landscape architecture. The first avenue would be a deeper inspection into the publications of landscape architecture researchers. The inspection of articles within ‘Landscape Journal’ served as a great way to explore the issue of knowledge from a researcher’s perspective, but there are numerous avenues available where a landscape architect can publish the results of their investigations. Inspecting the CVs of landscape architecture faculty would be a great way to investigate the broader scope of publications within the profession. In addition, distinguishing between traditional and applied research would allow a greater understanding of the different types of research within landscape architecture. These kinds of studies would bring further clarity to the strength of research within the profession and would be able to further assess whether it is functioning well.

The second avenue for future research would be further investigation into the historical context of landscape architecture and its relationship to work from multiple perspectives - i.e., practice and research. This could bring further clarity to the purpose of landscape architecture by identifying consistent threads throughout its history with
respect to knowledge.

The third avenue for future research would be a deeper inspection of university curricula in landscape architecture programs. One of the limitations of this study when investigating MLA curricula was the lack of depth in the method of analysis. A future study could investigate course descriptions, in addition to the course weights within a university program to gain a greater understanding of which knowledge domains are taught today and whether instruction is actually functioning well.

Finally, a large scale survey using the Fein (1972) report as a model is needed to gain an accurate picture of the profession today and where it wants to go in the future. In particular, this survey should gauge the perceptions of as many landscape architects as possible to make the results generalizable to the entire profession. This would mean a survey that not only identifies and measures the perceptions of different actors within landscape architecture, but also measures the perceptions of allied professionals to understand their perspectives. However, the most crucial aspect to conducting a study of this magnitude in light of the LABOK report would be that it is carried out by those who have extensive training in research methods. This does not mean that the perspectives of other landscape architects could not inform the shape of a future study - this is a complex problem and should be addressed by acknowledging the uncertainty and values of those taking part. It merely suggests that if landscape architecture associations intend to use the results of the study to inform policy that affect the profession, it should be conducted and held to the highest level of quality and scrutiny possible for a study of this scale and type.
6.4: Questions for landscape architecture

“Purposes are deduced from behaviour, not from rhetoric or stated goals.” (Meadows, 2008, pg 14)

What does this thesis research mean for landscape architecture? In effect, it emphasizes the need for the profession to reflect on its purpose, how it functions, and where it wants to be in the future. It also stresses the need to understand the role that each actor within the profession plays, and how each actor influences the overall strength of the profession and its ability to do work. But most importantly, this thesis research suggests that the profession should ask itself two crucial questions: Why should a client choose a landscape architect to conduct work over another profession? What knowledge does a landscape architect possess that isn't also understood to an equal or greater degree by another profession / discipline?

The perceived dualism between academic knowledge and practice is not an “either / or” situation - if it exists at all. Instead, academic knowledge and practice can be seen as two perspectives within each landscape architect that guides them when they are conducting their work. At certain points along their careers, landscape architects may find themselves closer to academic knowledge or practice. Or they might fluctuate between the two at a more rapid pace during a specific project. But each landscape architect must understand that both are crucial components within themselves, and within the profession. Neglecting one perspective, such as academic knowledge, can have a profound influence on the relationship a landscape architect has with their work, as well as their ability to conduct work in the future.
References


