

AUXILIARY SPECIALIZATION OPPORTUNITIES IN LANDSCAPE ARCHITECTURE

nature of profession, current view, allied relationships, skills & knowledge, and future directions

by

GABRIELA WEBER

A REPORT

submitted in partial fulfillment of the requirements for a

MASTER OF LANDSCAPE ARCHITECTURE

Department of Landscape Architecture and Regional & Community Planning

College of Architecture, Planning and Design

KANSAS STATE UNIVERSITY

Manhattan, KS

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Approved by:

Major Professor
Howard Hahn

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ABSTRACT

Landscape architecture's scope of knowledge and professional practice is continuously broadening. Formalized certification and certification standards do not exist to date; as a result, limiting the depth of knowledge in landscape architects. Beyond competency in core skills like natural systems, site planning and design, and visualization graphics, the general knowledge base of most landscape architects spans a variety of disciplines. This ability to "see the bigger picture" offers certain strengths when "placemaking", interacting with allied professionals, and leading project teams; yet there are limited opportunities for landscape architects to formally develop a depth of expertise.

An extensive literature search identified forty-one knowledge domains that exist in landscape architecture. This report identifies fourteen domains that landscape architects need in current and future work supported with identified core skills and knowledge in the profession. This report seeks to update the Council of Landscape Architecture Registration Board's (CLARB) identification of knowledge domains by layering skills and knowledge found in sixty current job postings, literature search, and structured interviews. In addition, this report identifies future trends in the profession and marketplace and future dilemmas landscape architects must address in the next twenty years. Content analysis of certification programs offered to landscape architecture students at accredited schools was conducted. A certification precedent study was conducted to understand the range of certification standards that exist in order to propose a standardized certification program.

Thirteen themes are identified in the structured interviews that are incorporated into themes of this report. Overall, professionals feel that landscape architecture's strength as a generalist profession makes the profession unique from its allied professions. However, some professionals acknowledge that as a landscape architect progresses in his or her career, they tend toward areas of specialization. This report suggests that certifications be offered to graduate students and professionals, explains specialization in the profession, and identifies areas landscape architects need to increase their skills and knowledge in, to stay relevant.

Key words: Future dilemmas, Changes in profession and marketplace, Certification, Specialization, Skills & knowledge, Knowledge domains

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AUXILIARY SPECIALIZATION OPPORTUNITIES IN LANDSCAPE ARCHITECTURE

nature, current state, relationship with allied professionals, skills & knowledge, and future of the profession

BY GABRIELA WEBER

Auxiliary Specialization Opportunities in Landscape Architecture

(nature of profession, current view, allied relationships, skills & knowledge, and future directions)

A report submitted in partial fulfillment of the requirements for a
Master's Degree in Landscape Architecture
Department of Landscape Architecture and Regional & Community Planning
College of Architecture, Planning and Design
Kansas State University
Manhattan, Kansas

Committee:

Howard Hahn, Lorn Clement, Chip Winslow
Department of Landscape Architecture and Regional & Community Planning

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THE DEPARTMENT OF LANDSCAPE ARCHITECTURE AND REGIONAL & COMMUNITY PLANNING
THE COLLEGE of
ARCHITECTURE, PLANNING & DESIGN // K-STATE

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Landscape architecture's scope of knowledge and professional practice is continuously broadening. Formalized certification and certification standards do not exist to date; as a result, limiting the depth of knowledge in landscape architects. Beyond competency in core skills like natural systems, site planning and design, and visualization graphics, the general knowledge base of most landscape architects spans a variety of disciplines. This ability to "see the bigger picture" offers certain strengths when "placemaking", interacting with allied professionals, and leading project teams; yet there are limited opportunities for landscape architects to formally develop a depth of expertise.

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However, some professionals acknowledge that as a landscape architect progresses in his or her career, they tend toward areas of specialization. This report suggests that certifications be offered to graduate students and professionals, explains specialization in the profession, and identifies areas landscape architects need to increase their skills and knowledge in, to stay relevant.

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To my parents, who have always supported my endeavors and encouraged me to pursue my passions. To a wonderful support system of friends and family who provided words of encouragement and lifelong relationships. To my Master's Committee, Howard Hahn, Chip Winslow, and Lorn Clement, and #HowardsHomies for refining and pushing my ideas beyond my own capabilities.

The summation of the past twenty-five years of my life has led to the completion of this report. A mere piece in this journey called 'life', the contents of this report are a representation of my interests at a particular moment in time.

01 | INTRODUCTION





This chapter is an overview of the report's intent. It discusses inspiration for the topic, identifies a dilemma, identifies the opportunity to solve the dilemma, outlines research goals, identifies a targeted audience, explains the research's relevance to landscape architecture, states inquiries being researched and describes final products of the research.

INSPIRATION FOR TOPIC

Interest for this topic stems from my experience interning at a landscape architecture and planning firm for seven months and being a Master's of Landscape Architecture (MLA) student at Kansas State University (KSU). At KSU, students in the Landscape Architecture and Regional and Community Planning (LARCP) program are required to undertake a three or seven month internship; this is the first exposure to the inner workings of professional practice. While interning, the amount of work that was subcontracted to other design professionals was surprising to me. For example, a church campus stream restoration project required specialized skills and knowledge of a civil engineer and environmental biologist.

These skills and knowledge were either not within the expertise of the firm, or were performed so infrequently as to be an inefficient use of billable time within the firm. In my reflections as a student, I realized that I have learned a little about a lot. Meaning, the LARCP program offers foundational courses for landscape architectural practices, but not many opportunities exist to pursue deeper learning or specialized knowledge within the time constraints of the curriculum. Reviewing landscape architecture programs across the United States, few offer Ph.D. degrees within the discipline; a Master's degree is typically considered the terminal degree. I am not discrediting the education I have received. Through my studies, I have assimilated a design vocabulary and have learned to ask thought-provoking questions and substantiate ideas. However, I question whether the advantages of a

generalist education will offset potential opportunities to solve emerging dilemmas requiring specialized knowledge beyond basic licensure.

DILEMMA

The landscape architecture profession's scope of knowledge and practice domains are continuously broadening. Formalized certifications and certification standards for specialized expertise do not widely exist thereby limiting the depth of knowledge landscape architects have to compete in the marketplace. Beyond competency in core skills like natural systems, site planning and design, and visualization graphics, the general knowledge base of most landscape architects spans a variety of fields. This ability to "see the bigger picture" offers certain strengths when "placemaking", interacting with allied professionals, and leading project teams. At the same time, there are limited opportunities for landscape architects to formally develop a depth of expertise.

Academia supports the generalist nature of the landscape architecture profession by exposing students to a variety of fields, but at a depth constrained by available time in the curricula. On average, it takes 4-6 years to get a bachelor's degree in landscape architecture. Even then, topics taught in school may or may not be regularly used in professional practice and well comprehended by all students. It takes years for a young professional landscape architect to become a specialist in the field of landscape architecture. This expertise is typically self-initiated and developed or reinforced through project experience.

Competition from allied professions is increasing. Architects are billing themselves as planners and civil engineers and are taking on landscape architecture projects that they may not be as qualified to do (Landscape Forms 2010). Architects are applying themselves to landscape and site design to make their building more appealing and sellable. Even professional and student awards from the American Society of Landscape Architects (ASLA) are being awarded to people who do not practice landscape architecture. During a Landscape Forms discussion in 2010, Leonardo Alvarez from the firm EDAW [now AECOM] crunched numbers from the Department of Bureau and Labor Statistics (BLS) saying, "The landscape architecture profession is growing by 20% on a baseline of 26,000 practitioners while civil engineering is growing by 24% on a professional base of 250,000 people". He came to the rationalization that the influence of the landscape architecture profession will dissolve away or become an attachment to engineering or architecture. Faculty at Iowa State University (ISU) stated, "Whether it's site engineering, site ecology, site design etc., another field can perform the specific work better than a landscape architect" (Hohmann and Langhorst 9).

OPPORTUNITY

Respecting core generalist strengths beyond basic licensed competency, opportunities are needed to better prepare landscape architects to develop certified skills and knowledge to address emerging issues at local and global scales. The intent of this research is to assess the potential value and feasibility of formal specialization within the field of landscape architecture, identify potential

specialization areas relative to core skills and knowledge and future dilemmas and propose a mechanism for specialization. Broad topics that are discussed include: the nature of the profession, a current view of the profession, relationships to allied professionals, skills and knowledge, future directions in practice, opportunities for specialization, and recommended certifications.

RESEARCH GOALS

This report seeks to 1) identify knowledge domains and core skills and knowledge that comprise the foundation of the profession; 2) suggest general future trends in the profession and marketplace; 3) identify potential specific areas of specialization; 4) discuss mechanisms for specialization; 5) increase my personal comprehension of the complexity yet potential of the profession; and 6) propose opportunities to build credibility for landscape architects in relevant topics.

AUDIENCE

The targeted audience includes landscape architects in professional practice and academia. The report content is applicable to anyone who is committed to furthering the development of the profession and increasing their understanding of the potential of the profession.

RELEVANCE TO LANDSCAPE ARCHITECTURE

This report expands on the existing body of knowledge regarding strengths and future trends in landscape architecture. It seeks to increase depth of material written about the profession and update older literature. Even so, the report is a very broad examination. It is important to discuss future alternatives for expanding and developing the profession. Not a lot of research has been done to identify areas and mechanisms of potential specialization. With the increasing need for landscape architecture to stay relevant, it is vital that landscape architects maintain core skills and knowledge. Landscape architects must also seek opportunities for specialization as a means to make meaningful contributions to multi-disciplinary teams who address emerging socio-environmental issues. This will help landscape architects to stay competitive and relevant in the marketplace and assume a forefront position of future work.

RESEARCH INQUIRIES

The primary inquiry asks, *"How might the broad scope of landscape architecture work be categorized into a framework that creates opportunities for formalized specialization?"*

Supporting sub-inquiries to be explored include:

- What is the current nature of the profession?
- What are key knowledge domains that landscape architects apply to their work? When is this knowledge acquired?
- What are core skills and knowledge of landscape architects?

- What are the strengths and weaknesses of landscape architects?
- What certifications are offered in landscape architecture?
- In the next twenty years, what are projected general trends which might affect the education, research agenda, and practice of landscape architecture?
- What are possible future dilemmas landscape architects will need to address?
- What do leading landscape architecture professionals believe areas of specialization might be in the next twenty years?

FINAL OUTCOMES

This research identifies future general trends in landscape architecture practice, identifies future dilemmas landscape architects might address, identifies and defines knowledge domains landscape architecture encompasses, identifies core skills and knowledge, proposes ten certifications, and provides a format for certification standards.

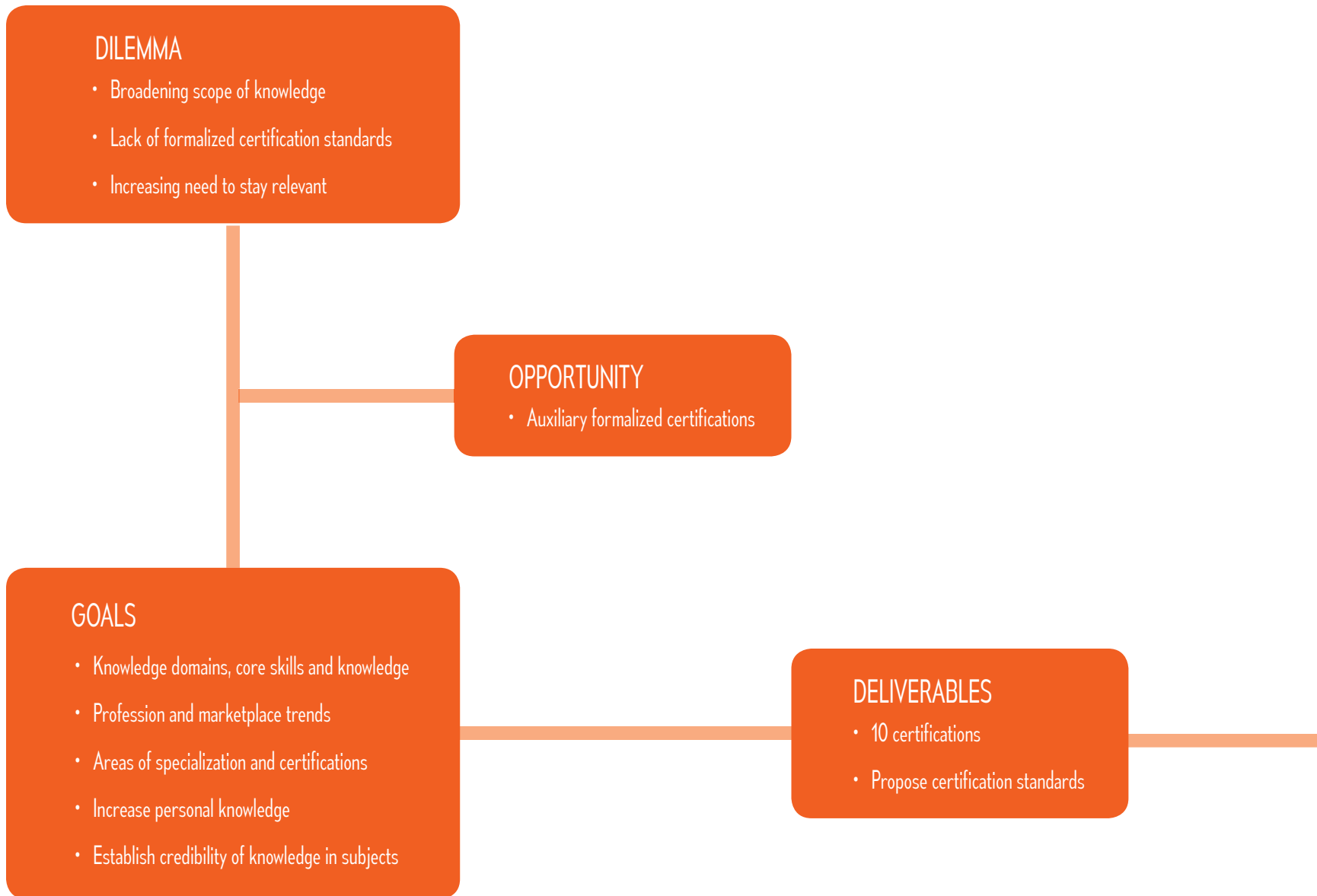


Figure 1.1 Research Inquiry

This research identifies a dilemma and proposes a possible solution for the dilemma (Weber 2015).

SUB INQUIRIES

- Current nature of profession?
- Key knowledge domains? Core skills and knowledge?
- Strengths and weaknesses of profession?
- Existing certifications?
- Projected trends over next 20 years?
- Future dilemmas?
- Possible areas of specialization?



HOW WILL THIS BE ACCOMPLISHED?




INQUIRY

How might the broad scope of landscape architecture work be categorized into a framework that creates opportunities for formalized specialization?

02 | OVERVIEW OF METHODS

A decorative horizontal bar with a mosaic pattern of grey, black, and white tiles, positioned below the title.



A compilation of research methods is used for this report. A synthesis of literature reveals six broad themes this research builds upon and that literature written about skills and knowledge of landscape architecture is outdated. This section explains the research process of data collection, analysis, and synthesis. Findings are organized by themes identified in literature in Chapter's 03, 04, 05, 06, 07, 08, and 09.

OVERARCHING METHODOLOGY RELATIONSHIPS

The research process required proper identification of reliable literature and professionals to interview. Content from seven structured interviews, sixty job postings, and literature sources provided a foundation of themes to build on and identified the Landscape Architecture Body of Knowledge Survey (LABOK) 2003 knowledge domain framework to update. Data from these methods was collected, analyzed, and synthesized to identify specialization opportunities in landscape architecture that build on core skills and knowledge. In addition, the 2014 American Society of Landscape Architects (ASLA) Denver conference topics were analyzed to distinguish emerging topics from future topics. A synthesis of future changes

in marketplace, future changes in the profession, and future dilemmas landscape architects must address are found in "Chapter 07: Future Directions of Landscape Architecture Practice". Specialization opportunities are identified in "Chapter 08: Opportunities for Specialization". "Chapter 09: Recommended Certifications" identifies ten recommended areas of specialization, backed by a synthesis of literature, and discusses the certification precedent study used to inform proposed certification standards. The relationship of methods is documented in Figure 2.1.

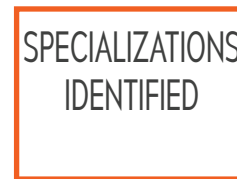
1. CONTENT



2. DATA COLLECTION & ANALYSIS



3. SYNTHESIS



4. OUTCOME



Figure 2.1 Relationship of Methods
Data was collected, analyzed, and synthesized to inform the final product (Weber 2015).

PURPOSE OF CONTENT COLLECTED

Each piece of content was selected for a particular reason. The aim was to propose an outcome that is well informed and well rounded in depth. A variety of sources was required to represent a wide scope of information, represent past, current, and future time frames, and to find answers to primary and supporting inquiries. Figure 2.2 explains why each piece of content was used and Figure 2.3. explains how each piece of content was analyzed.

METHOD

STRUCTURED
INTERVIEWS

JOB POSTINGS

LITERATURE
RESEARCH

ASLA
CONFERENCE
TOPICS

CERTIFICATION
PRECEDENT
STUDY

PURPOSE

- to gain insight into the future work of the profession from opinions of current influential professionals.
- to further my understanding of what it could mean to specialize in landscape architecture.
- update 2003 LABOK domain framework with current skills and knowledge from sixty job postings
- identify core skills and knowledge
- identify when skills and knowledge are acquired
- understand history of profession to predict future trends
- understand relationships with allied professionals to predict future changes
- identify strengths of landscape architecture
- to distinguish emerging trends from future trends.
- identify baseline standards of which to build proposed certification standards
- identify current certifications offered, schools that offer the certifications, number of times a particular certification is offered etc.

Figure 2.2 Purpose of Each Piece of Gathered Content

Each piece of content serves a specific purpose for this research (Weber 2015).

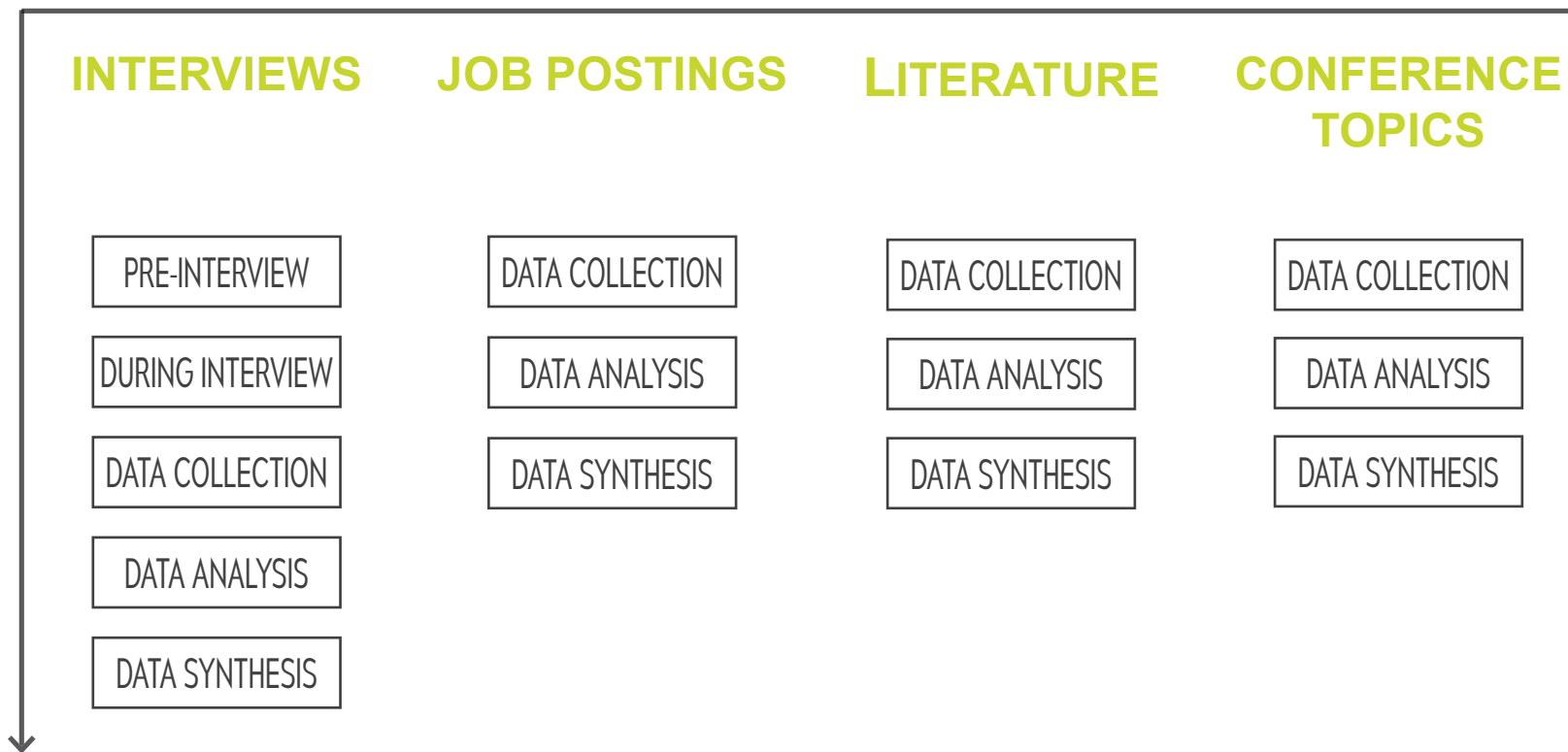


Figure 2.3 How Each Piece of Content Was Analyzed

Each piece of content required a specific way of collecting and analyzing data. Five pieces of content informed the 1) framework, 2) identification of specializations, and 3) proposed certification standards (Weber 2015).

**PRECEDENT
STUDY**

DATA COLLECTION

DATA ANALYSIS

DATA SYNTHESIS

**DOMAIN
FRAMEWORK**

DATA COLLECTION

DATA ANALYSIS

DATA SYNTHESIS

**SPECIALIZATIONS
IDENTIFIED**

DATA SYNTHESIS

**PROPOSED
STANDARDS**

DATA COLLECTION

DATA ANALYSIS

DATA SYNTHESIS

CONTENT

This section's content is organized by relationships identified in Figure 2.1. A description for each piece of content about how and where data was collected, analyzed, and synthesized, and what was found from the data is included.

Structured Interviews

Interviews with leading professionals were conducted to gain professional perspective's on the future of the profession. The interview process required Institutional Review Board (IRB) approval to ensure proper research protocols

were being followed. While waiting for IRB approval, eight interview questions were formulated to increase depth of material that the research required. Interview questions were created with a specific intent to expand on themes already identified in the literature review. A graphic indicating development of interview questions can be seen in Figure 2.4.

Figure 2.4 Development of Interview Questions
Interview questions were developed based on themes found during the literature search (Weber 2015).

BROAD THEMES

NATURE OF PROFESSION

CURRENT VIEW OF PROFESSION

RELATIONSHIP TO ALLIED PROFESSIONALS

SKILLS AND KNOWLEDGE

FUTURE DIRECTIONS OF LANDSCAPE ARCHITECTURE

OPPORTUNITIES FOR SPECIALIZATION

INTERVIEW QUESTIONS

Over the span of your career and leadership in the landscape architecture profession, what have been some of the major changes related to how landscape architecture is practiced? How have these changes influenced landscape architecture's interactions with architects, civil engineers, and planners?

In your opinion, what will be the core contributions of the landscape architecture profession to solve emerging dilemmas in the next twenty years? How do you think this will be accomplished?

Do you think it is advisable for a young landscape architect to specialize in a niche of landscape architecture right after completing school? Why or why not?

What specific skills and knowledge should be emphasized and taught in academia to better prepare young professionals to practice landscape architecture in the next twenty years?

What type of specialized knowledge do you think landscape architects need to know to be able to lead or compete with architects, civil engineers, and planners in the next twenty years?

Where do you think the majority of funding will come from for the work we will do in the next twenty years? What type of work will this produce?

Have you observed instances where landscape architects synthesize and pioneer new practice areas, only to relinquish the new territory to other professions who are more deeply trained in specialized disciplines? If so, please explain.

Do you think there is a difference in describing landscape architecture practice in terms of project type versus services offered? Should specialization opportunities be more closely tied to project types or services offered?

The Master's Committee guided selection criteria for interviews. Criteria required that interviewees have extensive professional experience, are leaders of the profession, have or currently work on a variety of projects in scale, location, type, for a variety of clients, and are knowledgeable about future issues and themes in landscape architecture. The collective group, of eighteen, represented all five regions of the United States and one international location. The selected group included males and females, professionals from academia, professional practice, and professional organizations. Correspondence between the researcher and each interviewee occurred via e-mail. Initial contact simply provided information about the researcher, the research topic, purpose, background, the interview process, and the expected role of each subject.

After IRB approval, a second e-mail was sent to each interviewee who expressed interest in the research. The second e-mail provided more detail about the research, a debriefing statement of the interview procedure (as required by IRB standards), eight interview questions, and a consent form asking for permission to use interviewees' first and last names in the research for substantiation purposes. A date and time was pre-arranged in the second correspondence e-mail by the researcher for interviewees who preferred to do a phone interview. When the day came to conduct the one-hour phone interview, the researcher called the interviewee and asked each interview question in order. As the interviewee answered each interview question, the researcher documented a summary of key points. At the end of the interview, the researcher thanked the interviewee for his or her time and informed them that a summary of the interview would be e-mailed to them for clarification purposes.

The researcher sent the second correspondence e-mail and waited for typed responses from interviewees who preferred typed responses. Interviewees indicated that if further clarification of content was necessary, the researcher could call them to talk. Typed responses and phone interview summaries were saved by the researcher on the computer.

After all of the responses were gathered, analysis of the content took a qualitative approach based on the Boyatzis (1998) qualitative method. This method indicates that data be collected, organized, coded, grouped into like categories, infer relationships and themes and interpret new information from the data (Figure 2.5).

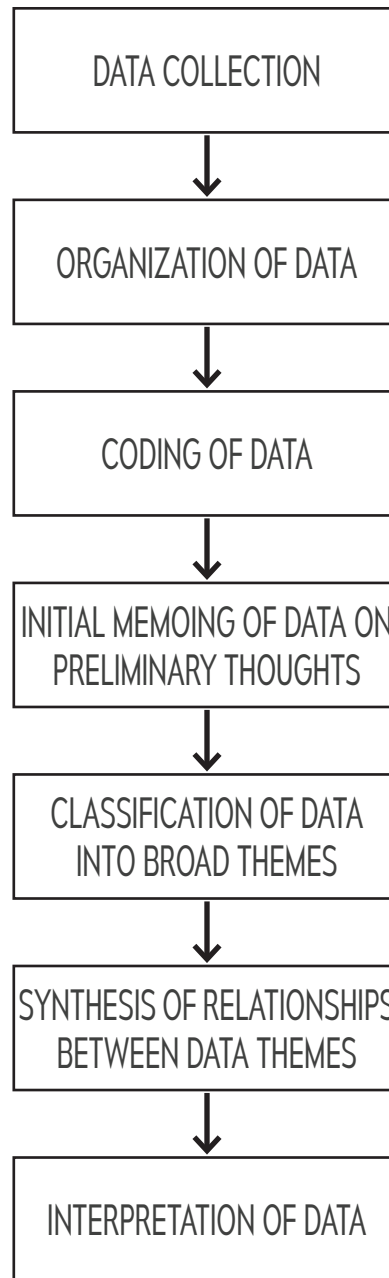


Figure 2.5 Qualitative Analysis Method

Due to the nature of the information, analysis required a qualitative approach over a quantitative approach (Weber 2015).

Eleven out of eighteen contacted people responded to the research inquiry. Three people expressed an interest in the research but for unknown reasons were unable to complete typed responses to the interview questions. Eight people did not respond to the research inquiry. Three people, who responded, preferred to participate in a phone interview while the other five people, who responded, preferred typed responses via e-mail. Full responses are included in Appendix C. An Excel table documenting those who participated in the research is located in Table 2.1. This table identifies each interviewee's job title and affiliated company or organization. A synthesis of interview responses reveals thirteen themes:

1. relationship with allied professionals
2. future directions/dilemmas facing landscape architecture
3. future changes in the profession
4. strengths as landscape architects
5. expectations of young professionals
6. pros/cons of specializing
7. needed skills and knowledge
8. possible areas of specialized knowledge

SUBJECT	JOB TITLE	PREFERS TYPED RESPONSES	PREFERS PHONE INTERVIEW
Kurt Culbertson	Chairman and CEO of Design Workshop	X	
Bruce Ferguson	Franklin Professor of Landscape Architecture at University of Georgia	X	
Mark Focht	First Deputy Commissioner for Philadelphia Parks & Recreation; Immediate Past-President of American Society of Landscape Architects		X
Rebecca Leonard	President of Design Workshop	X	
Jacinta McCann	Executive Vice President AECOM, President of Landscape Architecture Foundation		X
Steven Spears	Principal Design Workshop Austin		X
Frederick Steiner	Dean of the School of Architecture at The University of Texas Austin	X	

Table 2.1 Interview Participants

The following interviewees agreed to participate in the research. Each interviewee plays a key role in the progression of the future of landscape architecture (Weber 2015).

9. areas of decreasing work by landscape architects, describing specializations in terms of project type or services offered
10. funding sources for work.

Findings from each major theme are integrated throughout the report.

Job Postings

Skills and knowledge statements from sixty job postings were gathered from postings on local and national ASLA websites. Job postings reflect employers' current expectations of landscape architects. Content from job postings is layered onto the Council of Landscape Architecture Registration Board's (CLARB) LABOK survey, conducted in 2003. Job postings sought to update this existing material. To begin this method, work experience categories were developed based upon ASLA's job search criteria of 0-2 years of experience (entry level), 2-4 years of experience, 4-6 years of experience, 6-8 years of experience, 8-10 years of experience, and >10 years of experience. Ten job postings were gathered for each category of experience.

Once skills and knowledge statements were collected from job postings, analysis proceeded by categorizing the data as: *specialization in academia*, *specialization in professional practice*, *common knowledge*, and *core knowledge*. Criteria to determine *specialization in academia* included job postings with 0-4 years of experience. It can be inferred that 0-4 years of experience most closely relate to skills and knowledge possibly acquired while in school. Criteria to determine *specialization in professional*

practice included job postings with 4-10+ years of experience. The category 4-10+ years of experience best reflects knowledge gathered while in professional practice. *Core* knowledge was determined by assessing all of the ranges of work experience. Skills and knowledge repeatedly found across all levels of work experience from 0-10+ years of experience indicate core skills that possibly exist throughout one's entire professional career. The category to find *common* knowledge and skills stemmed from the "pre-skills" section of job postings from 0-10+ years of work experience. These skills are not always teachable and employers expect these skills to be already present in professionals.

Skills and knowledge identified during analysis of literature and job postings identified fourteen knowledge domains. Particular skills and knowledge show up either in entry-level, mid-level, or senior associate positions. Findings are discussed in "Chapter 06: Skills and Knowledge Findings".

Literature Search

A thorough literature review identified broad themes to research in the report. ASLA was the primary source and included the following outlets: information from local and national ASLA chapters, educational material posted online, the "Dirt" blog covering recent news/events, ASLA marketing materials, surveys of practitioners, and books sponsored by ASLA. In addition, a number of sources from academia informed this report including accredited landscape architecture school websites, journals, magazines, student publications, and a lecture by Matthew

Urbanski (1-29-15) presented at Kansas State University (KSU). Urbanski's lecture covered the importance of landscape in cities using examples from the landscape architecture firm, Michael Van Valkenburgh Associates. Numerous other literature sources were gathered from professional organizations such as the Council of Landscape Architectural Registration Boards (CLARB) and the bi-monthly report Design Intelligence, published by the Design Futures Council. Articles written by practitioners, articles produced by Landscape Forms, publications produced by various landscape architecture firms, dictionaries, and books provided additional insights into the profession.

Broad themes and specific sources are categorized and listed in Figure 2.6. After a thorough literature search, recurring themes and sub-themes surfaced which informed the direction of this research. The themes can be seen in Figure 2.7.

LITERATURE MAP

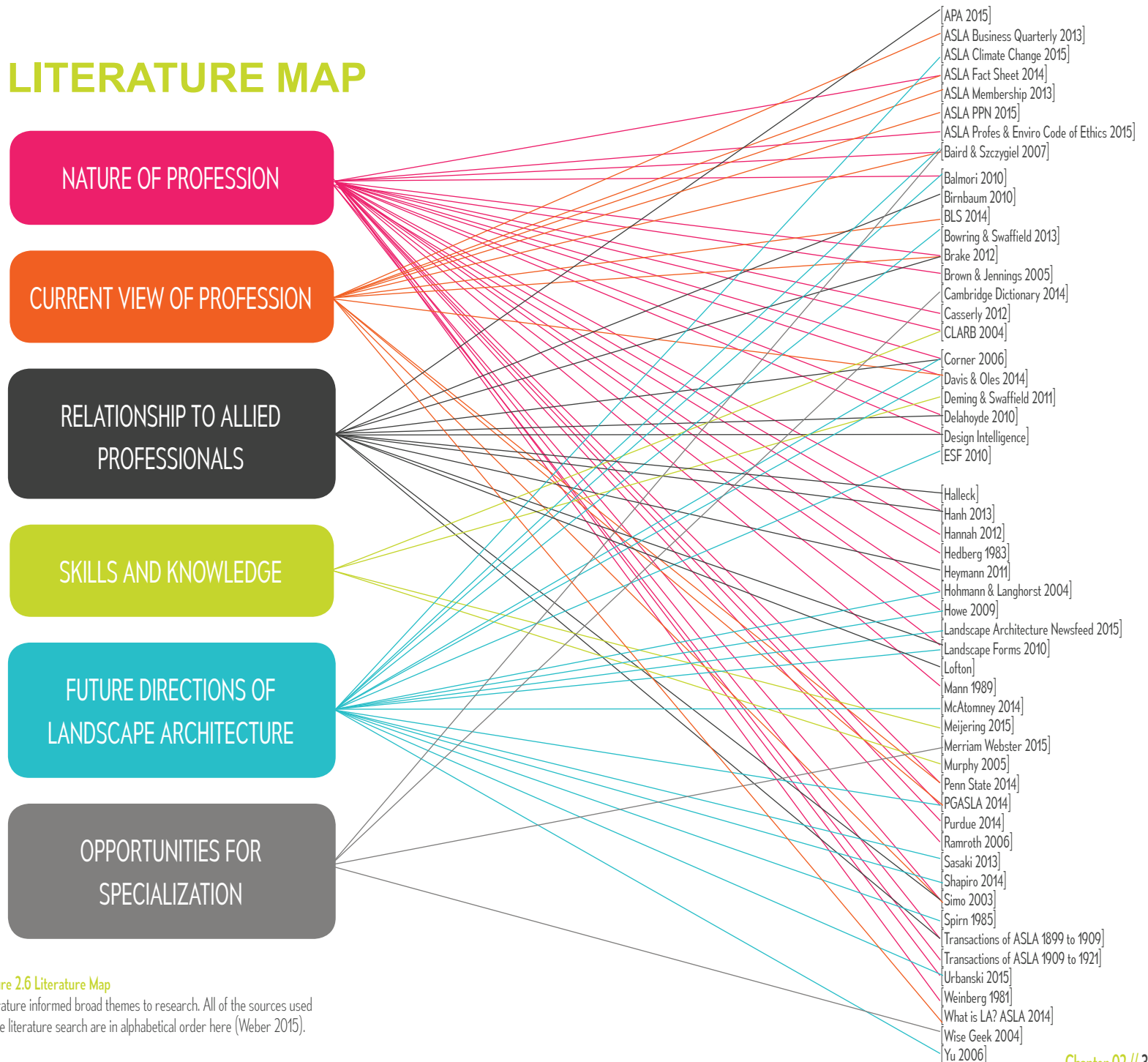


Figure 2.6 Literature Map
Literature informed broad themes to research. All of the sources used in the literature search are in alphabetical order here (Weber 2015).

BROAD THEMES

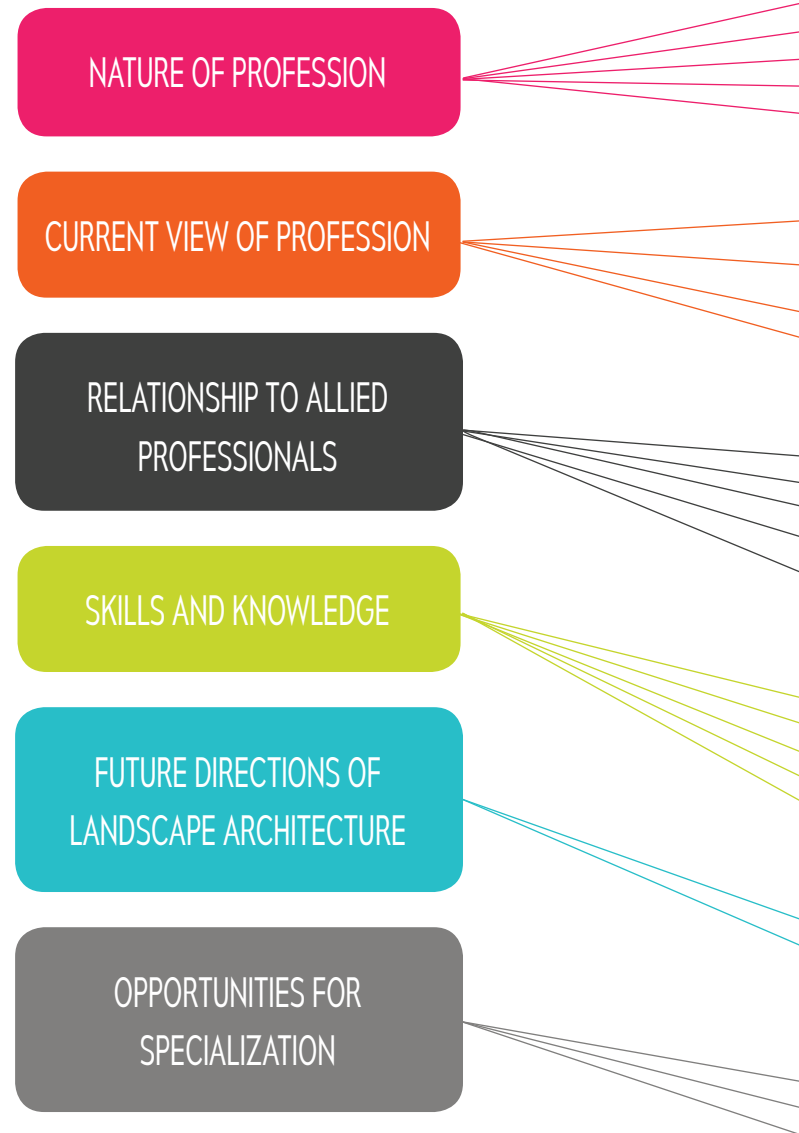
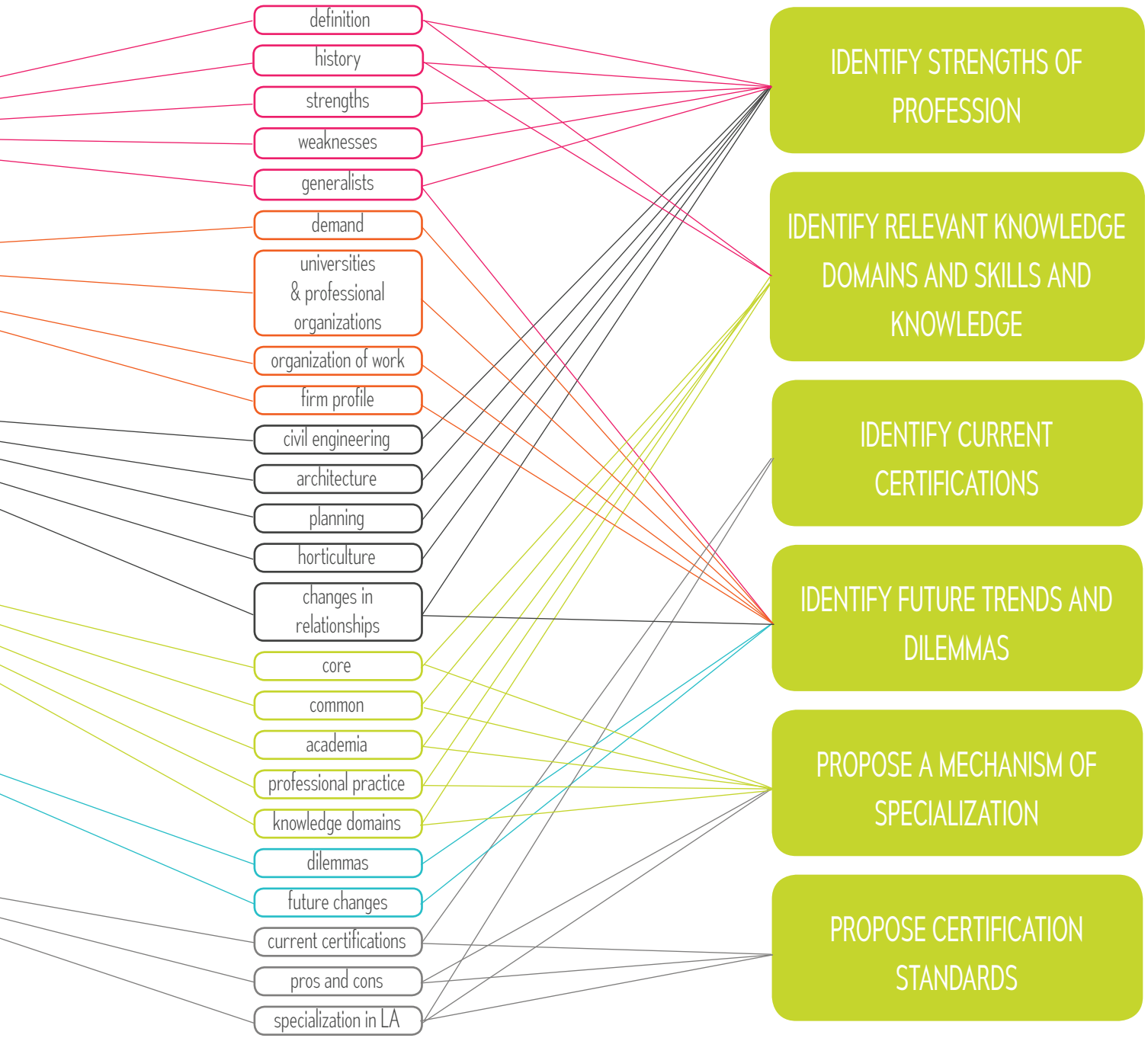


Figure 2.7 Broad Themes and Sub-Themes
Literature informed broad themes and sub-themes to research. Themes assisted in informing and supporting ideas and findings for final outcomes of the research (Weber 2015).

SUB-THEMES

OUTCOME



ASLA Conference Topic Analysis

The most recent ASLA conference took place in Denver in November 2014. All education sessions, field workshops, and lecture descriptions were collected. ASLA conference topics and descriptions were reviewed and analyzed to distinguish emerging trends (relevant now) from future trends (topics not discussed often or topics that literature and interviews did not discuss often). It was important to conduct this content analysis to compare and contrast findings in literature and interviews against recent discussions taking place at the national landscape architecture conference.

Traditional topics such as parks and recreation, residential design, planning and design, and professional practice development were discussed at ASLA. Current topics such as stormwater management, green infrastructure, native landscapes, and drought tolerant planting design were discussed. Topics that were not discussed as much or topics discussed in a new way were identified as possible future areas of landscape architecture.

Findings are used to support themes identified: "Chapter 07: Future Directions of Landscape Architecture Practice" and certification proposals in "Chapter 09: Recommended Certifications".

Certification Precedent Study

An inventory of certifications from sixty-eight accredited landscape architecture schools was conducted to determine a baseline by which to inform proposed certification standards. The researcher navigated to each accredited school's website and documented certifications offered to landscape architecture students. It was discovered that certifications could be offered by the school's college of design, department of landscape architecture, or by an entirely different department at the school.

A precedent study, of selected certifications, identified baseline certification standards which informed proposed certification standards in "Chapter 09: Recommended Certifications". The following recurring certification topics were studied: four historic preservation certificates, three food systems certificates, two urban design certificates, two historic landscapes certificates, and two sustainable design certificates. About fifty-five percent of the studied certifications were offered to landscape architecture students from outside of the university's college of design. The remaining certifications were offered in the university's college of design but not necessarily through the landscape architecture department. The following characteristics of these certifications were studied:

1. prerequisites for a certification program
2. requirements of the program
3. certification content
4. targeted audience
5. testing for competency

6. department that offers the certification
7. benefits of certification.

Findings from the precedent study are discussed in "Chapter 09: Recommended Certifications".

Framework Development

An objective of this research is to identify and define knowledge domains in landscape architecture supported with skills and knowledge statements. The research seeks to update CLARB's LABOK 2003 study, which identifies core competencies of the profession. The first half of LABOK identifies "knowledge statements" or what landscape architects know (substantive theory) and the second half identifies "competency statements" or what landscape architects do (procedural theory). This report is concerned with substantive theory; it is necessary to acknowledge both types of theory.

The LABOK study, a snapshot of landscape architecture at the time, was conducted in 2003 and needs to be updated. The following literature: IFLA, Murphy, JOLA, Swaffield, Meirjeing, Tobi, Morris et al., and LABOK, identify a total of forty-one knowledge domains for landscape architecture dating back to 2003. Knowledge domains from literature are synthesized to determine relevant knowledge domains for landscape architecture supported with skills and knowledge statements.

Skills and knowledge from job postings are grouped into four categories: 1) *academia*; 2) *professional practice*; 3) *core*; and 4) *common* knowledge. These skills and knowledge are applied to domains as a type of "check and balance" system to explain where skills and knowledge fit into broader knowledge domain categories. For example, each skill and knowledge statement was assessed and placed under one of the identified domain categories as found in literature.

The framework is a compilation of past and current skills and knowledge taken from sixty job postings and LABOK. The purpose of this method was to: identify 'baseline' landscape architectural skills and knowledge; identify when the 'baseline' is acquired; identify which 'baseline' skills and knowledge are core and which are more related to current trends; identify knowledge that is considered 'common' or learned prior to school and professional practice; and find skills and knowledge that are considered "specialized" to inform certification options. Proposed domain categories represent a snapshot of past and current skills and knowledge taken from sixty job postings to inform relevant domains to landscape architecture.

Identification of Specializations

LABOK's four categories of skills and knowledge 1) *academia*; 2) *professional practice*; 3) *core*; and 4) *common* knowledge, were updated with job postings to begin the process of identifying areas of specialization.

1) Specialization Acquired in Academia

According to LABOK, specialization in academia is most likely to occur while seeking an advanced degree, typically a Master's or Ph.D. Advanced degrees afford students, or professionals returning to school, the opportunity to pursue personal interests. By the time a young landscape architect enters professional practice, certain skills and knowledge must be able to be applied to work to solve problems. However, it is also possible that these skills and knowledge may not get used in professional practice if there is no demand.

Criteria to determine specialization in academia include job postings with 0-2 years of experience and 2-4 years of experience. These categories of work experience most relate to skills and knowledge possibly acquired while in school. In addition, skills and knowledge, stated by professionals in interviews, inform skills and knowledge that academia needs to teach to students.

2) Specialization Acquired in Professional Practice

Information from literature and interviews suggest possible areas to specialize in. Patterns in content or dilemmas that landscape architects will address in the next twenty years, inform possible topics of certification. In addition, 2014 Denver ASLA conference topics distinguish future topics from emerging topics in attempts to identify future areas of work. If a topic is discussed over and over and over at the conference, then it is most likely a current topic. However, if a topic is discussed maybe two or three times at the conference, it could be a future topic. Skills and

knowledge collected from interviews inform this section too. Specialization may begin in the early years of employment. Specialized knowledge may not have been acquired during formal education, therefore it is a personal endeavor to pursue self- or supplemental education, or gain specialized knowledge and skills through professional practice.

Criteria to determine specialization in professional practice include job postings with 4-6 years of experience, 6-8 years of experience, 8-10 years of experience, and >10 years of experience. These work experience categories best reflect knowledge gathered while in professional practice.

Landscape architecture is a generalist profession yet thrives on its relevancy to current topics. There are core skills and knowledge that the profession has, yet at a moment in time, one core skill may be a larger focus than another core skill. The research identifies ten certifications, for the future of landscape architecture work, that act as an extension of core skills and knowledge in the profession. These certifications are explained in "Chapter 09: Recommended Certifications".

3) Core Skills and Knowledge

Criteria to determine core skills and knowledge stems from organization of existing LABOK categories by the researcher: time of acquisition of skills and knowledge and level of understanding of skills and knowledge. Most landscape architectural base skills and knowledge are acquired during pursuit of the first degree in the discipline, which are added to throughout the landscape architect's career. This

knowledge does not diminish over time. Criteria for "level of understanding" require that skills and knowledge be applied, and better yet be mastered, to solve problems in professional practice.

Core skills and knowledge was determined by assessing all levels of work experience. Skills and knowledge repeatedly found from 0 to >10 years of experience indicate core skills and knowledge that exist throughout a landscape architect's entire career. It is possible that without maintaining these core skills and knowledge, the credibility of the profession is threatened.

4) Common Skills and Knowledge

LABOK criteria to define common identifies a measure of skills and knowledge which are 1) acquired prior to attending a university landscape architectural program or 2) landscape architects who demonstrate a general understanding of a particular subject based on personal experience. Application of common skills and knowledge requires a level of comprehension, or being able to talk about broader concepts and themes. Some common skills and knowledge may be evident to the general public.


Common knowledge and skills were identified by reviewing the "pre-skills" section of job postings for 0->10 years of work experience. Some of these skills are not formally taught and employers expect these skills to be already present in professionals upon hire.

Proposed Certification Standards

Ranges for each characteristic identified in the certification precedent study informed the proposed certification standards. Content found from specializations identified where specializations are applied to. Standards for certifications are discussed in "Chapter 09 Recommended Certifications".

03 | NATURE OF PROFESSION





This section looks at the initial purpose of landscape architecture, defines landscape architecture, outlines the development of landscape architecture in the United States, explains the expansion of work over time, identifies strengths and weaknesses of the profession, and explains how landscape architecture is a generalist profession. An understanding of the origins of the profession can inform possible future directions of the profession.

ADVOCATES FOR HUMAN USE AND ENJOYMENT

The purpose of the landscape architecture profession is multifaceted. The profession aims to create spaces for humans to use and enjoy while balancing socio-environmental relationships. The American Society of Landscape Architects (ASLA) states:

"Landscape architecture covers a huge spectrum, perhaps best understood by the profession's mantra: achieving a balance between the built and natural environments. It requires a multidisciplinary approach involving environmental science, art, ecology, and much more, leading to extraordinary results" (ASLA 2015).

Ever since landscape architecture's establishment, it has strived to create appealing spaces for the social landscape. In 1910, Charles W. Eliot's father, emeritus president of Harvard, claimed that landscape architecture is "primarily a fine art" that refines natural landscape beauty, creates beauty, and is assertive toward the health and comfort of people in urban areas (Simo 2003, 49). Agreed upon by notable landscape architects Douglas Baylis, William G. Carnes, William J. Johnson, Campbell E. Miller, Theodore Osmundson Jr., Hideo Sasaki, Sidney N. Shurcliff, and others, landscape architects have not ceased to figure out how to integrate natural and human processes together for the betterment of both parties (Transactions of ASLA 1909 to 1921, 55; Simo 2003, 141). Donald Parker, director of landscape architecture for Colonial Williamsburg, VA, explains landscape architecture to be "a

fine art, the reshaping of man's natural environment for human use and enjoyment" (Hedberg 1983, 1). "The social agenda conceived by Frederick Law Olmsted for the profession of landscape architecture focused on a sense of shared community and dedicated service to meeting the social, psychological and physical needs of society. Olmsted's early calls for service to society have persisted through the present day" (Brown and Jennings 2003, 1). Landscape architects must not oversimplify the role of landscape architecture in the grander scheme of things. Landscape architects have historically been viewed as professionals who make mistakes look pretty. Dustin Hillery, senior associate at Aedas, acknowledges the depth of landscape architecture by claiming landscape architects create spaces or a new public realm with the environment in mind (Howe 2009, 1).

Landscape architecture is a profession of service that continues to yield immeasurable satisfaction. "There is none which can give the practitioner better reason for being content with his own serviceableness to mankind, because successful results in your profession bring health, general well-being, and sweet and wholesome pleasures to mankind..." [We] have the satisfaction of always working towards good, towards enjoyments, towards enlargements of view, which better human nature and better the world" (Eliot 1922, 156-157).

It is comforting to know that no matter the difficult complex dilemmas landscape architects must address, landscape architects try to achieve a satisfying artful balance of socio-environmental processes.

LANDSCAPE ARCHITECTURE DEFINED

Established in 1899 in the United States, it is important to remember that landscape architecture is a relatively new profession compared to allied counterparts. Landscape architecture combines principles of art, science, and technology to analyze, research, plan, design, and manage natural and built environments. It creates a sustainable future for socio-environmental systems through conservation of natural resources and arrangement of land, space, and objects for useful, safe, efficient, healthful, and pleasant living environments (Purdue 2015; Newton 1981, xxi; ASLA Handbook of Professional Practice 1991, 19; ASLA Members Handbook 1).

In academia, landscape architecture expresses "creative, cultural, philosophical, and scientific knowledge bases" while professional practice expresses "site and urban design, community and regional planning, and resource conservation and stewardship" (Pennsylvania State University 2014, 1). With such a diverse and broad spread of work and abilities, landscape architects are equipped to handle problems at a variety of scales.

The medium that landscape architects work with is "always in the process of becoming" and the tool is design (Balmori 2010, 3, 117). This ever changing medium is an asset to landscape architecture and influences the process of doing landscape architecture and how it relates to evolving socio-environmental relationships to create more "complex life worlds" (Balmori 2010, 119; Corner 2006, 2).

Mission, Goals, and Ethics

ASLA's mission is to "lead, to educate, and to participate in the careful stewardship, wise planning, and artful design of our cultural and natural environments" (ASLA Fact Sheet 2014). There are two categories of ethics that landscape architects must adhere to 1) the Professional Code of Ethics and 2) Environmental Ethics. The ASLA Professional Code of Ethics (2015) states, "The profession of landscape architecture, so named in 1867, was built on the foundation of several principles—dedication to the public health, safety, and welfare and recognition and protection of the land and its resources". The ASLA Code of Environmental Ethics (2015) states that landscape architects "should make every effort within our sphere of influence to enhance, respect, and restore the life-sustaining integrity of the landscape for all living things". Landscape architects must seek to instill professional and environmental ethics in the future of the profession regardless of the types of dilemmas addressed.

HISTORY OF LANDSCAPE ARCHITECTURE

Landscape architecture was established in the United States in 1899. How has the profession changed or remained the same since implementation? What external events influenced the profession? The term "landscape architecture" has not always been welcomed or understood by both practitioners and those unfamiliar with the profession. The original name, "Landscape Gardener", came about during the Middle Ages (Transactions of ASLA 1899 to 1908). Some of the earliest

landscape architects, A.J. Downing, Beatrix Farrand, O.C. Simonds etc., identified themselves as landscape gardeners. The 1800s post-civil war era was a time of the industrial revolution, influx of immigrants, and electricity was invented. As the built environment flourished, landscape architecture was viewed as an escape from the man-made environment into a world filled with bliss and serenity (Simo 2003). Two dichotomies began to develop in the United States at this time. These dichotomies would eventually take the form of art or science based landscape architecture. This movement really encouraged designers to evaluate how people interact with spaces at a larger scale than ever before (Simo 2003). The term "landscape architecture" was used for the first time by Frederick Law Olmsted and Calvert Vaux in the 1860s while constructing Central Park. The term was given to professionals who participated in construction administration of the project; but even Olmsted was "uncomfortable with the term 'landscape architect'" because it was a vague title and the role of landscape architect was still being defined (Simo 2003, 27). "[Olmsted and Vaux] referred to themselves as 'landscape gardeners,' but this gave the impression of men who simply decorated a landscape. 'Landscape artists' was closer, but they were concerned with what was appropriate" (Hedberg 1983).

The work of landscape architects in the early 1900s centered on residential landscapes but at a larger scale than ever before. However, Frederick Law Olmsted went against this trend and had a huge influence on land and town planning projects. He served as manager of the Town Planning Division of United States Housing Corporation in 1918. Olmsted understood larger picture he was working on; he knew how to preserve natural beauty of the site without destroying it, and designed spaces for people (Simo 2003). Eventually, landscape architecture became known

for its niche in land development which had previously been cast aside by architects, engineers, and horticulturists (Simo 2003).

Landscape architecture has always had roots in residential design and the 1950s housing boom increased the demand for residential garden design than ever before (Baird and Szczygiel 2007, 11). Prominent residential landscape architects included Dan Kiley, Garret Eckbo and James Rose at Harvard, and Thomas Church. Meanwhile, Hideo Sasaki, founder of Sasaki Associates, conceived the large multidisciplinary business model to accommodate the influx of large complex projects. During this era, professionals were not happy with the title "landscape architect" because it did not seem to fit the job description. Titles that implied large scales of work were used: land planner and city planner (Simo 2003).

The 1960s was a time of political unrest when rioting, segregation, and protests were common. Inflation rates soared and issues of environmental mismanagement surfaced years after the Industrial Revolution. The National Environmental Policy Act (EPA) was passed in 1969. The 1970s had oil dilemmas, high unemployment and inflation rates, and the Watergate Scandal. There were three predominate views regarding the key roles of the landscape architect: artful design, social obligation, and environmental ethics (Simo 2003).

A discussion about whether landscape architecture should focus more on processes or product stemmed from the 1970s (this discussion has surfaced in recent years). In addition, ecological planning methods of the 1960s and 1970s, led by Ian McHarg, Angus Hills, and Philip Lewis valued environmental values over artistic design forms (Baird and Szczygiel 2007, 12). In contrast, Martha Schwartz and Peter

Walker valued design forms over environmental values in the 1970s. James Corner described these two differing opinions:

"A number of schools of landscape architecture...teach little visual art, design theory, or history, focusing instead upon natural science, environmental management, and techniques of ecological restoration. Although these aspects of landscape study are important, one cannot help but feel a concern for the loss of foundational traditions, especially landscape architecture's agency as a representational and productive art, as a cultural project" (Baird and Szczygiel 2007, 13).

Today landscape architects are seeing ideals from the 70s regarding environmental concerns surface again. Jacinta McCann, AECOM Vice President, acknowledges that when she was in school in the 70s, "there were concerns of diminishing natural resources and the energy crisis was a big deal... There was also a real sensitivity to water issues and drought concerns" (2015). As a result of emphasis on natural sciences and environmental ethics, there was a push for scientific research to ground the work landscape architects were doing (Simo 2003).

Landscape architects looked to environmental planning, planning and analysis, design and art, and technology and media in the 1980s. A professional study conducted by Scott Weinberg in 1981 found that the term "landscape architecture" was not 100% agreed upon by practitioners, government agencies, students, and faculty as being the best term used to describe landscape architecture services and values. McCann acknowledges that appreciation of plant material increased during this time followed by a huge push to use native plants (2015). The 1990s

created artful and ecologically sensitive landscapes. "Sustainable landscape design was entering the world of landscape as art, and grounding design further in the principles of ecological and cultural processes" (Baird and Szczygiel 13).

"Many people still do not understand the profession's claim to "landscape" when the materials are of brick and concrete or fiber optics and plastic. And they cannot fathom the claim to "architecture" when they see nothing resembling a structure that could shelter a human being" (Simo 27). "Say it again: landscape architecture. The words roll off the tongue as if their union were inevitable. But this is an arranged marriage" (Davis and Oles 2014, 2). Davis and Oles suggest that landscape architecture become 'landscape science' to better represent the profession and modern times. Rebecca Leonard, President of Design Workshop, states, "The Great Recession [of 2007-2009] faced a long period of austerity" where those who flourished on landscape architecture aesthetics were lost to firms who could solve complex socio-environmental issues (2015).

Mark Focht, First Deputy Commissioner for Philadelphia Parks & Recreation and Immediate Past-President of ASLA, states, "Landscape architecture is increasingly playing a bigger and more aggressive role in decision making regarding environmental, infrastructure, non-vehicular transportation infrastructure, green infrastructure, stormwater management, sustainability, and resiliency issues" (2015). Frederick Steiner, Dean of the School of Architecture at The University of Texas Austin, states, "The profession has become increasingly urban as the nation and the planet have grown more urban... There has also been an increase in the use of metrics to assess performance" (2015). "Enthusiasm and concern about

sustainability of the world's resources has resurfaced in the last 10-15 years. As a result, more recent focuses centered on resiliency has come to light because of climate change and natural disasters" (McCann 2015).

STRENGTHS OF THE PROFESSION

A number of recurring skills and knowledge were identified as core strengths of the profession through literature and interviews. "Landscape architecture has always involved an unusually diverse set of skills and modes of understanding. The first faculty, assembled at Harvard in 1898, included a landscape architect, a trained mechanical engineer, and a geologist" (Davis and Oles 2014, 6). Core strengths of the profession are not always apparent due to the diversity of the profession. LABOK states:

"We [landscape architects] must anticipate shifts and work with them.

With ever-expanding knowledge and technology, with ever more multifaceted information and understanding of our world, the "body of knowledge" that is expected of landscape architects, the core knowledge that helps define our profession, becomes somewhat daunting in its breadth, depth, and complexity" (2003).

Strengths identified in this report are not meant to be exclusive (see Figure 3.1) and can be expanded upon for future research.

Site Design

Landscape architects are well equipped to design sites. Landscape architects are able to take a small piece of land and relate it to a larger context through integration of multifaceted systems at a variety of scales. Terri-Ann Hahn, principal of Landscape Architectural Design Associates, claims:

"Successful site design requires a finesse that considers how the project relates to its surroundings, how people will move through the site and how the project will meet those regulatory requirements such as zoning regulations and stormwater requirements. Landscape architects are uniquely qualified to create successful and effective designs" (Hahn 2013).

The most common and well known application of site design is in the residential context; but landscape architects can apply this strength to any context. Steven Spears, Principal of Design Workshop in Austin, acknowledges that landscape architects have gotten away from site design. He sees more and more young professionals freeze while trying to design at site scale. Landscape architects cannot lose this strength (2015).

Land Planning and Design

Landscape architects have the ability to design and plan large plots of land. "The work of the landscape architect is not only making plans for land already

secured, but often includes advice as to the selection of the property at the very beginning" (Vaux 1906, 82). Even during the inception of landscape architecture, professionals realized the importance of their work at a larger scale. "In the early 1900s, landscape architecture was still a kind of specialized field in itself, focused on aspects of land development that had previously been managed (or ignored) by architects, engineers, and horticulturists" (Simo 2003, 56). In 2009, Mona Rizk, senior associate at Aedas states:

"Landscape architecture has gone from one phase to another and today you cannot do any master planning project or any kind of building anywhere without a landscape architect to advise on how to go and do things...the consequences of not including the landscape architect early on in a project can create an array of problems [such as] delays on the project because the site planning is not working due to the topography" (Howe 2009).

As recognized earlier, Olmsted worked as a town planner in the early 1900s. Land planning is at the core of what landscape architects have the ability to do.

Creativity

One of landscape architects' strongest assets is the ability to be creative and add a level of elegance and pleasure to a project while making it functional. In 1932, Ralph E. Griswold stated, "Our future as landscape architects depends altogether on the creative quality of our work" (Simo 2003). This "creative quality" allows firms

to distinguish themselves from other firms. "Landscape architects bring to such projects the creative ability to manipulate the palette of Fein and Gutman's so-called 'natural materials' with a technical acumen that engenders public confidence; this combination positions the innovators of the profession and discipline to continue in leadership roles in these areas" (Baird and Szczygiel 2007, 15). Construction professionals, corporate executives, and land developers agree that landscape architects are knowledgeable about construction methods and processes (Howe 2009). With this knowledge, landscape architects can become more creative on projects when a budget is tight-especially during the construction documentation design phase. A landscape architect can find alternate ways to better utilize space, achieve aesthetic beauty of space, and save money on development and maintenance fees (1909 to 1921 Transactions of ASLA). Because of this creativity ability, landscape architects can be involved in all aspects of a project from beginning to end.

Visioning

Landscape architects have the ability to vision. They can understand and interpret things in ways that other professions may not. They see the potential in everything.

Hahn states:

"A landscape architect can enrich the human experience for any project. Most projects benefit immensely from the vision used by landscape architects when planning a project. Architects and engineers provide the

essential organs for a design, but the landscape architect is the one that molds and models it into an identifiable place" (2013).

C. McKim Norton, New York's Regional Plan Association Vice President and Robert L. Parson of the Department of Earth Science for Northern Illinois University agreed that, "No specialist, technician or engineer has the social vision to develop a suitable plan" compared to a landscape architect (Simo 2003, 195). From the 1970s-1980s, land developers and corporation executives collaborated with landscape architects on projects more frequently than in the past. This could be because landscape architects have the ability to vision at a large scale. In 2012, Alan Brake stated, "Landscape architects are offering redemptive visions for neglected, damaged, and underutilized places" (2). Matthew Urbanski, principal of Michael Van Valkenburgh Associates, coined the term "landscape imagination" to describe this strength of landscape architects (2015). Urbanski claims that "landscape imagination" allows the profession to flourish and is the profession's strength. If landscape architects completely understand the medium that they work with, then they can understand the potential the medium has and be able to express it creatively.

Project Leaders

Landscape architects are well positioned to be project leaders because they know the inner workings of dynamic systems, work at many scales, and have an understanding of how projects come together. Weinberg stated in 1980, "it is my opinion that the broad based education that landscape architects have qualifies

them to be the coordinator of almost any type of project". "For design firms to succeed on all fronts-financially, artistically, technically-effective project management is essential" (Ramroth 2006, 39). Landscape architects could potentially function best as project managers because they are artistically and scientifically educated. Charles Birnbaum, President of the Cultural Landscape Foundation, states, "There's an increasing sense that landscape architects are really able to better manage complex urban change over time" (Delahoyde 2010) than people in other professions. "We [landscape architects] are the perfect leaders to bring together the technical experts needed to solve these challenges" (Leonard 2015). Tom Whitlock states, "[The client] said they wanted a landscape architect leading this project because of their sensitivity. They specifically said they did not want a civil engineer. There are landscape architects in these agencies who appreciate and understand what we [landscape architects] do. So I see the web of opportunity growing" (Leaders Assess the Profession Landscape Forms 2010, 7).

Problem Solvers

"Those of us that are attracted to landscape architecture are attracted to it because there are really complex problems that we [landscape architects] get to unwrap and address" (Focht 2015). The major problems that landscape architects address are related to socio-environmental relationships. A.J. Downing, the Father of Landscape Gardening, stated "Our work is so engrossing, and the problems we [landscape architects] have to solve so intimately related to the present" (Vaux 1906, 81). "Our training allows us to see opportunities where there are only problems, new life for

tired places and communities and solutions that fit with the context. A landscape architect can enrich the human experience for any project" (Hahn 2013).

Broad Thinkers

"There's something inherent in how we [landscape architects] are educated-we look at the bigger picture and systems. We have a very systems based approach" (Focht 2015). "We [landscape architects] can use our comprehensive design processes...to create a thoughtful plan for implementation" (Leonard 2015). Landscape architects know more about what their sister professions do than they know about us (Focht 2015). This large amount of information allows landscape architects to be flexible, adaptable, good story tellers and effective organizers.



Visioning



Project Leaders



Creativity



Land Planning and Design



Site Design



Problem Solvers



Broad Thinkers

Figure 3.1 Strengths

Strengths are exhibited in all aspects of a landscape architects' work (Weber 2015)

WEAKNESSES OF THE PROFESSION

Lack Knowledge in Natural Sciences

According to Scott Rykiel, of Mahan Rykiel Associates Technology, there is a lack of knowledge about the earth sciences in landscape architecture students. He acknowledges that supporting objective designs with scientific evidence is becoming, "...more and more of a necessity to ground ideas of remediation and sustainability of landscape" (Hannah 2012).

Public's Lack of Understanding

Patrick A Miller conducted a professional survey in 1997 where Raymond L. Freeman stated, "Many people do not understand the scope of landscape architecture" and James C. Stansbury stated, "landscape architecture continues to fight defensive actions in that practitioners spend too much time explaining the profession" (Simo 2003, 27). "The inability of the profession to convey its value to the public is not so much a function of poor communication as it is a result of the profession's discomfort with its ambiguous nature. Until landscape architecture knows what it is, no one else will, either" (Hohmann and Langhorst 2004, 12). "Practice types define activities, and activities do not provide a professional *raison d'être* [reason for existence]. As a result, no one, not even landscape architects, knows what landscape architecture really is" (Hohmann and Langhorst 2004, 5).

Representation of Landscape

The history of landscape architecture discussed in "Chapter 03: Nature of the Profession" identifies a duality in the way landscape architects view the profession. One perspective views landscape architecture as an aesthetic form to be manipulated. The other perspective views landscape architecture as a scientific integrated set of natural processes. "Landscape has been burdened with the idea that it is about the placement of objects (flowers, plants, fountains, seats...). Clients may include a list of objects in their demands. And yet landscape is beyond the objects" (Balmori 2010, x1). Artists since the 16th century have tried to figure out if they should mimic or represent nature. Every art discipline must figure out how to address the understanding that nature is a fluctuating system of moving interconnected parts rather than understanding nature as isolated components (Balmori 2010).

Ignored Politics

Landscape architects have struggled to get heavily involved with politics. Politics will be of increasing importance to the profession especially because politics are layered into city dynamics; and a majority of current landscape architecture work is in the urban context.

"we [landscape architects] argue that the collective consciousness of landscape architecture has failed to explicitly recognize the political nature of its practice, particularly at it relates to social justice issues.

This lack of recognition has resulted in an apolitical service ideal espoused by the profession within the United States" (Collective Consciousness 2003, 1).

GENERALIST PROFESSIONS

After looking at the history and strengths and weaknesses of profession, it can be inferred that landscape architecture is inherently a generalist profession. This is evident when looking at two strengths: site design and land planning. To be able to work at both scales requires a broad spectrum of knowledge. Within the past decade, people have become more information filled and technology rich. With a constant influx of information, numbers, facts, and ideas coming at us every minute, it is easy to know a little bit about a lot—to be a generalist. Figure 3.2 explains the theory of the generalist profession. American culture typically values knowing about a lot of information to the extent that one can talk about any topic. This is reflected in work trends:

"We've become a society that's data rich and meaning poor. A rise in specialists in all areas- science, math, history, psychology- has left us [society] with tremendous content but how valuable is that knowledge without context? Context can only be provided by generalists whose breadth of knowledge can serve as the link between the hard-won scientific breakthroughs and the rest of the world" (Casserly 2012, 2).

"Generalists will thrive in a culture where it's becoming increasingly valuable to know a little bit about a lot" (Casserly 2012, 2). There is value in being a generalist. Generalists help bridge gaps between types of information and can easily adapt to a variety of situations. "Despite the corporate world's insistence on specialization, the workers most likely to come out on top are generalists- but not just because of their innate ability to adapt to new workplaces, job descriptions, or cultural shifts" (Casserly 2012, 2). Having stated that generalist professions are likely to flourish in American culture, the next section of the report looks at how landscape architecture fits into this concept and how landscape architecture can remain a generalist profession but still have opportunities for specialization.

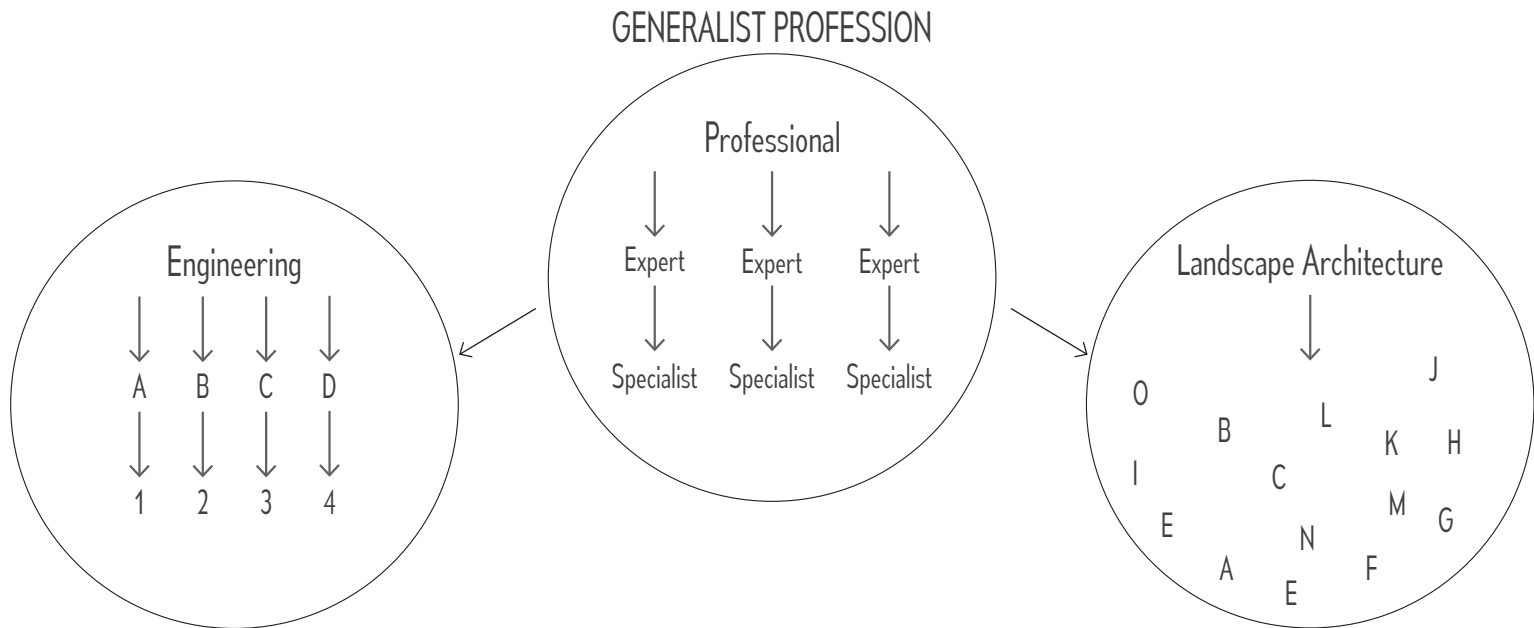


Figure 3.2 Theory of Generalist Profession

Engineering has four core areas of expertise; each with specialization options. Landscape architecture does not have defined areas of expertise or specialization. (Weber 2015).


LANDSCAPE ARCHITECTURE AS A GENERALIST PROFESSION

Landscape architecture, a generalist profession, has all the ingredients it needs to be successful especially when generalist professions are currently favored in society. In a 2004 Design Intelligence Report, Leonardo Alvarez stated, "... landscape architecture is the generalist profession among generalist professions... to be complete and competent landscape architect, knowledge and technical proficiency are required in more different subject areas than in any other design discipline" (10). "Landscape architecture is one of the most diversified of the design professions" (Prairie Gateway ASLA 2015, 2). Carrying a negative connotation, some do view landscape architecture as a disorganized profession that has spread

itself too thin: "Landscape architecture tries to encompass a variety of disciplines thereby creating blurred boundaries about what it is that landscape architects do. In addition, this overarching generalist profession defends itself and claims to be good at being broad." (Hohmann and Langhorst 2004, 8). Patrick Miller states that the diversity of the profession "presents problems in the fundamentally different ways in which certain segments of the profession view the landscape and approach design" (Collective Consciousness 2003, 1). So what does this mean for this research? Can landscape architects specialize? Should landscape architects specialize? Would specialization tear apart the generalist strength of the profession? The next chapter examines how specialization is defined in the context of the landscape architecture profession.

04 | CURRENT VIEW





This chapter looks at the current state of the profession. Knowing the current conditions of the profession can help predict where the profession is headed. This chapter looks at the demand of the profession, professional organizations, type of work landscape architects do, firm size, industry markets, and client locations.

DEMAND

According to the United States Bureau of Labor and Statistics (BLS), the landscape architecture profession is predicted to grow by 14% between years 2012-2020 in the United States. The current scope of work for landscape architects centers around government policies. Recent programs like "Greening America's Capitals" and New York's "Clean Water Act" have positioned landscape architects for action in urban environments (Brake 2012, 1). With the increasing need to address issues of climate change and rising sea levels, the role of the landscape architect becomes increasingly necessary.

UNIVERSITY STATISTICS AND PROFESSIONAL ORGANIZATIONS

The first school to offer a landscape architecture program was Harvard in 1900. There are now sixty-eight accredited landscape architecture programs that meet Landscape Architecture Accreditation Board Standards (LAAB) (ASLA Fact Sheet 2014). There are also multiple professional landscape architecture organizations. "The birth of the profession of landscape architecture in the United States is associated with the convening of its national organization, the American Society of Landscape Architects in 1899" (Baird and Szczygiel 2007, 2). Landscape Architecture Magazine (LAM) was founded eleven years later in 1910. In 1966, the Landscape Architecture Foundation (LAF) was established for research

purposes and now has a focus on measuring landscape performance. In 2013, the American Society of Landscape Architects (ASLA) had 15,203 members across forty-nine chapters composed of 64% male and 36% female with 16,000 licensed landscape architects. Thirty-five states require continuing education for professional development (ASLA Fact Sheet 2014).

ORGANIZATION OF WORK

Because the profession is still relatively new and broad, the work can be difficult to understand, describe, and showcase due to the spatial and temporal nature of the profession. As a result, there are many subjective ways of organizing the work that landscape architects perform. In 2012, ASLA developed eighteen Professional Practice Networks (PPN) with 12,273 members to categorize interest areas of landscape architects. The top three largest PPNs in 2012 were Sustainable Design and Development (19.22%), Urban Design (12.47%), and Residential (9.30%) (Figure 4.1). "Chapter 03: Nature of the Profession" notes landscape architecture's roots in residential design with parks and recreation coming in for a close tie. To see that the residential PPN membership is in the top third is no surprise. Sustainable Design and Development and Urban Design are thought to be indicators of current work trends landscape architecture addresses.

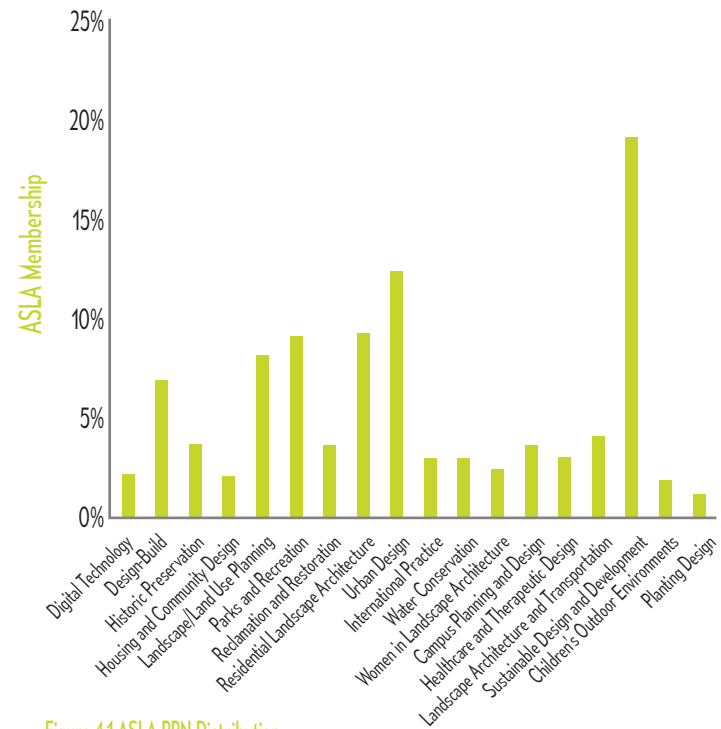


Figure 4.1 ASLA PPN Distribution

The 2012 top three highest number of members belongs to Sustainable Design and Development, Urban Design, and Residential (ASLA PPN 2012). Graphic by Weber 2015.

The LAF's Landscape Performance Series organizes work in the following categories: Civic and government facility; Community; Conference and retreat center; Courtyard and plaza ; Garden and arboretum; Golf course; Healthcare facility; Industrial park; Multifamily residence; Museum and cultural center; Nature preserve; Office; Other; Park and open space; Playground; Recreation trail; Resort and hotel; Retail; School and university; Single family residence; Stormwater management facility; Stream restoration; Streetscape; Transportation; Urban

agriculture; Waterfront redevelopment; Wetland creation and restoration; Working landscape; Youth and community center; and Zoo.

Landscape architecture firms generally organize work by the range of project types they offer. A sampling includes: SWA, an international landscape architecture, planning and urban design firm organizes work into Brownfields; City and town districts; Civic facilities; Commercial and mixed use; Communities; Corporate and workplace; Educational; Healthcare; Hospitality and resorts; Natural systems; Parks; Public realm; Residential; Sports and theme parks; Transit; and Waterfronts. TBG Partners, another landscape architecture and planning firm, organizes their work into Civic; Community; Corporate; Education; Envirographics; Healthcare; Hospitality; International; Mixed use and retail; Multifamily; and Recreation. Design Workshop, a landscape architecture and planning firm, makes an interesting distinction and categorizes their work into services offered and project type. Services include: Landscape architecture; Urban design; Master planning; Community planning; Regional planning; Tourism; Corridor planning and design; Park planning and design; Resort planning and design; Environmental design; Scenic assessment; Golf course design; Memorial design; Stakeholder facilitation and outreach; Public policy planning; Design guidelines; and Environmental graphics. Project types can be Urban design and civic places; Mixed use and retail; Resorts, hospitality and recreation; Community and regional planning; Parks and open space; New communities and housing; Transportation; Campuses and institutions; or Residential gardens.

Characterizing Landscape Architecture Work

During interviews, professionals were asked to answer "Do you think there is a difference in describing landscape architecture practice in terms of project type versus services offered? Should specialization opportunities be more closely tied to project types or services offered?" Findings from interviews revealed that specializations in professional practice can be characterized in three possible ways: 1) project type; 2) services offered; or 3) dilemmas. Specializations in landscape architecture can be discussed in terms of 1) project type such as plazas, streetscapes, parks, resorts, etc. According to Steven Spears, Principal of Design Workshop in Austin, project types can be thought of as "ad-ons" to core work of landscape architecture. Meaning, there are consistent core attributes for every project but the changing factors from project to project such as context, programming, user groups, weather conditions, etc. distinguish project type from project type. When talking to the public and clients, subjects agreed that discussing landscape architecture project types in the public realm are effective for communicating and explaining what it is landscape architects do. When talking to the public about landscape architecture, Mark Focht, First Deputy Commissioner for Philadelphia Parks & Recreation and Immediate Past-President of ASLA, stresses using project types "because that is what the public can relate to" (2015).

Specialization can also be discussed in terms of 2) services offered. According to Spears, services offered can be executed across multiple project types. For example, every site must be planned and designed so services in master planning or site design can be used to describe landscape architecture. It is best to discuss

services offered when interacting with more technical professions who are educated about what landscape architects do. In addition, services do not vary as often or as quickly compared to project types, which may eliminate confusion when trying to talk about landscape architecture. In fact, services offered can be seen in academic degrees such as "urban design" rather than project types like "plaza design". When discussing landscape architecture with allied professionals, Focht prefers to talk about services that we [landscape architects] offer or can bring to the table on a project (2015). Bruce Ferguson, Franklin Professor of Landscape Architecture at University of Georgia, prefers to discuss services offered because "project types in practice change from time to time" (2015) and Kurt Culbertson, Chairman and CEO of Design Workshop, shares a similar viewpoint.

Jacinta McCann, Vice President of AECOM, states that landscape architects can discuss specialization 3) "in the context of major issues or challenges that we [landscape architects] are facing and the point of view that the landscape architect brings to each challenge" (2015).

FIRM PROFILE

The most common size of a landscape architecture firm is a sole proprietorship where there is one person who takes full responsibility for all work. The least common firm size is 50-99 people (Figure 4.2).



Figure 4.2 Average Size of Firm

Landscape architecture tends to have smaller sized firms (ASLA Business Quarterly 2013) (Graphic by Weber 2015)

According to a 2006 Business Indicators Survey, traditional markets such as residential design, parks and recreation, and commercial design have stayed strong while stormwater management, green infrastructure, and security design have increased (Figure 4.3).

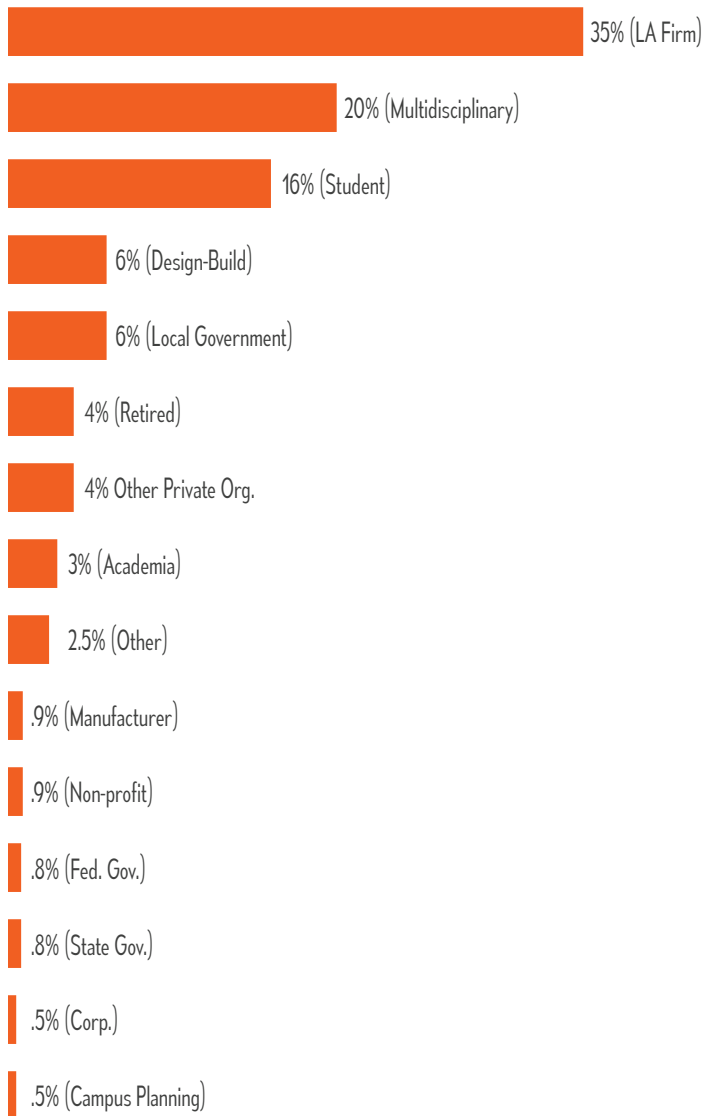


Figure 4.3 Industry Markets
(ASLA Membership 2013) (Graphic by Weber 2015)

Clients are dispersed throughout the United States but the majority are located in the southern and western regions (Figure 4.4).

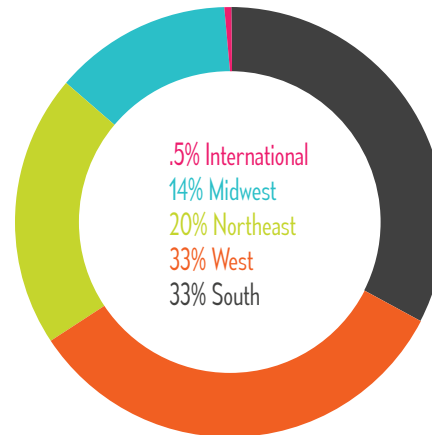


Figure 4.4 Client Locations
(ASLA Business Quarterly 2013) (Graphic by Weber 2015)

05 | ALLIED RELATIONSHIPS





Landscape architecture seems to be a fusion of multiple professions. At Kansas State University (KSU), post-baccalaureate students enter the Master's of Landscape Architecture (MLA) program with backgrounds in architecture, landscape management, natural resource management, regional and community planning, horticulture, agriculture, history, philosophy of religion, etc. People originating from other professions such as engineering, architecture and horticulture, often gravitate to landscape architecture because it has artistic qualities that other disciplines lack (Simo 2003, 46-47). Together, landscape architects, architects, and urban designers shape the built environment using basic principles of design. Every discipline slightly differs in their approach to shaping the built environment. Somehow landscape architects must all work together to accomplish our goals. This chapter explores how these relationships come to fruition.

It is important to note that there are limitations to the following data. Perceptions and thoughts from design professionals in this section are not intended to represent a larger whole. Meaning, information used in this section was found during an extensive literature search, interpreted by the researcher to include in this report at a particular moment in time. Professionals may have since changed their minds or some ideas may represent a smaller body than what actually exists.

The intent of doing a literature search for this section is to compare and contrast strengths of landscape architecture to allied professions. As collaboration on projects increases in frequency and intensity, it is vital that each design profession understands the strengths of the other design professions. One design profession

cannot always successfully function by itself and therefore needs the help of other professions. Collaborating with other design professionals allows everyone to meet goals and achieve a better outcome.

IMPORTANCE OF THE LANDSCAPE ARCHITECT

Terri-Ann Hahn, principal of Landscape Architects and Planners, acknowledges that "architects and engineers provide the essential organs for a design but the landscape architect is the one that molds and models it into an identifiable place. Landscape architects should never be the last one into the project - just to "pretty

up the plan" (2013, 1). Charles Waldheim, department head of Graduate School of Design (GSD) at Harvard, states, "There's an increasing sense that landscape architects are really able to better manage complex urban change over time . Landscape architecture now ends up being a place where the arts, questions of urbanism, and questions of ecology can connect" (Delahoyde 2010, 1). The next sections discuss interactions between allied professions and landscape architecture.

CIVIL ENGINEERING

Landscape architects and civil engineers design environments to enhance socio-environmental interactions. The way in which the design principles are interpreted and executed by each profession differ from the other profession. In 1932 the American Society of Landscape Architects (ASLA) president, Henry Vincent Hubbard, noted that landscape architects served the public while engineers functioned at a technical level. This public service recognition was huge during the Great Depression because people were desperate for pleasure and healing that would take their minds off of the suffering in the United States (Simo 2003, 98). James L. Greenleaf, ASLA president in 1925 who previously taught civil engineering at Columbia, believed that engineers are more technical and landscape architects have an appreciation for the natural beauty of the landscape and understand how to develop with this beauty (Simo 2003). Rebecca Leonard, President of Design Workshop, notes the working relationship between landscape architects and engineers saying, "Where a landscape architect is merely dealing with aesthetics, they are typically sub-consultants to architects or engineers... where they are

problem solving they are often the prime consultants with architects and engineers working for them (2015). James Corner (2006) discusses the pace at which civil engineers work saying, "developer-engineering corporations are constructing today's world with such pace, efficiency, and profit that all of the traditional design disciplines are marginalized as mere decorative practices" thereby cheapening the value of the design world (27). It is possible that the speed at which civil engineers work is influenced by the increasing pace at which the corporate world functions. The main idea to point out from Corner's argument is that at no point in time should efficiency of time take precedence over good design. Tom Whitlock, of Damon Farber Associates in Minneapolis, states that he worked on a project for the National Guard where the client did not want a civil engineer to lead the project but preferred a landscape architect because they are more sensitive [to site conditions] (Landscape Forms 2010). What is most important to understand about this profession is that civil engineers "apply scientific principles to the design and construction of public infrastructure such as roads, bridges and utilities" (ASLA Question and Answer 2015).

The value in the civil engineering-landscape architecture relationship is that engineers can bring a landscape architect's design to completion. Jacinta McCann, Vice President of AECOM, states, "The landscape architect is the tip of the spear. The landscape architect has to be out in front, looking for the next opportunity and not be worried about the delivery. The engineers will deliver" (2015).

ARCHITECTURE

Landscape architects inherently work at multiple scales and understand complex ideas and processes because of the nature of their work. However, other design professions may not be trained to think at such large scales. Architects think about design differently. According to ASLA, they "primarily design buildings and structures with specific uses, such as homes, offices, schools and factories" (Question and Answer 2015). Architects can integrate their buildings with the site but not to the level landscape architects can. Mark Rios, a licensed landscape architect and architect states, "Architects are trained to design objects. Landscape architects look at voids, space, and systems...They deal with bringing spaces together" (Birnbaum 2010, 1). Architects are trained to design objects serving aesthetic and functional purposes. Alan Brake, Executive Editor at The Architect's Newspaper, acknowledges landscape architecture's holistic approach to site design and compares this approach to architecture by saying, "Architecture has been caught in a kind of hangover from the pre-crash years. Much of the profession, not to mention architectural education, is still too obsessed with architecture-as-object" (Brake 2012). Terry Guen, of Terry Guen Design Associates in Chicago, says that campus project managers typically prefer to hire landscape architects over architects to lead their projects because architects "don't comprehend the integration that's needed to create sustainable solutions. So we [landscape architects] really need to hold our ground" (Leaders in Landscape Architecture Assess the Profession 2010, 6). David Heymann, who wrote *Landscape Is Our Sex*, makes a point to say that architects are playing on current trends of "site as source";

they are not capable of designing a site like a landscape architect... Nothing sells like a landscape...but is sellability a sound measure of an idea's value?" (Heymann 2011, 4-5, 16).

A major change in the way landscape architects and architects interact is the timing of interaction. In 1908, C. Howard Walker noted that landscape architects are often times an afterthought on projects. This flaw in the design collaboration process puts landscape architects at a disadvantage to their value, ability to practice to their potential, and do the site justice (Walker 103). Today, on the other hand, landscape architects are brought onto projects earlier in the design process.

PLANNING

According to the American Planning Association (APA), planning "works to improve the welfare of people and their communities by creating more convenient, equitable, healthful, efficient, and attractive places for present and future generations" (2015). From a landscape architecture viewpoint, urban planners "develop a broad, comprehensive overview of development for entire cities and regions... [and that] many landscape architects are still heavily involved in the field of urban planning" (ASLA Question and Answer 2015). Urban planners interact heavily with the public, communities, developers, and attend public meetings. They must have a thorough understanding of environmental regulations, building codes, and legal matters (Career QA 2015). They can be considered voices for the community and have the authority to make important decisions regarding layout of land and

how to use community resources. According to posts on a blog, "Archinect", a respondent indicates that "planners are trained to work in groups...They are not designers (typically)" (2011). Planners help coordinate efforts between architects and landscape architects in a real world environment (2014). PGASLA states that urban planners must know about zoning techniques and regulations to plan urban spaces. Planners do not focus as much on natural systems compared to landscape architects; rather, they are concerned with law, policy, and social dynamics of cities. They "work with the transportation system, the economy, the environment, urban design and physical facilities, and the culture and politics of a city to maintain (or restore) the quality of life in a city...Planners look five, twenty, and even fifty years into the future to anticipate the future consequences of current trends and activities. Urban planning is about considering the consequences of present actions on the future quality of life in the city." (University of Wisconsin Milwaukee 2015).

HORTICULTURE

According to the American Society for Horticultural Science (ASHS), horticulture is "the science and art of producing, improving, marketing, and using fruits, vegetables, flowers, and ornamental plants... incorporates both science and aesthetics" (2015). From a landscape architecture viewpoint, ASLA states that horticulturists "are trained in the science of growing and producing plants" (Question and Answer 2015). Horticulturists are more trained in planting design, horticultural practices, and plant identification (Kryssie 2014). The horticulturists have the ability to make planting designs, thought out by the landscape architect,

come alive. They are going to know best plants to use in a particular site, how to take care of those plants, and how to prepare a site for plants. Horticulturists execute design work but are more interested in plant propagation, cultivation, and management (Halleck 2015). It can be said that "The growers of nursery stock depend largely upon the landscape architects for the disposal of their productions" (Barry 1907, 89). "Mr. Nolen suggested that the nurserymen should have systematic information from the landscape architects as to the kind of stock they desired, and that the landscape architect should use his personal influence with clients to induce them to buy only a high quality of stock" (Barry 1907, 90). Horticulturists play a similar role to the civil engineer when it comes to interactions with a landscape architect. Both allied professions are vital for a landscape architect's idea to come to fruition; without them, a landscape architects' ideas may not reach their desired outcome.

Landscape architects must work with horticulturists to find practical planting solutions for a given site. Landscape architects can specify plants to use in a design, but if the plants are not fit for the site, the design concept is lost.

CHANGES IN RELATIONSHIPS

"First, as landscape architects, architects, and urban designers, we [landscape architects] give physical shape and form to the world—geometry and material are fundamental. We draw from strategy and from various disciplines that deploy strategic and organizational thinking not to


become master strategists per se but rather to find greater efficacy and potential for the physical reshaping of our world" (Corner 2006, 2).

Overall, allied professionals' perspectives about landscape architecture look promising. "Landscape architecture's impact on built and natural environments is richer than previous decades. Thus, allied professions pay more attention to us [landscape architects] and they appreciate the knowledge we [landscape architects] bring to the conversation as well as our leadership role" (Focht 2015). Likewise, "We [landscape architects] need to stop thinking of them [allied professionals] as the enemy because there is enough work out there for us [landscape architects] to do" (Focht 2015). "It is important to identify the value the landscape architect brings to a mix of different disciplines and make sure that happens seamlessly. There is a lot more blurring between disciplines today. I've seen more blurring the last 5-10 years" (McCann 2015).

SKILLS AND KNOWLEDGE

06 | FINDINGS





Skills and knowledge allow landscape architects to execute work. A particular level of depth in skills and knowledge insinuates a level of credibility that allows landscape architects to work. This chapter identifies core skills and knowledge, common knowledge, or specialized knowledge acquired during academia or professional practice. Findings support certification proposals in "Chapter 09: Recommended Certifications".

"Chapter 02: Overview of Methods" describes the process of gathering content to identify skills and knowledge in landscape architecture. To propose specialization opportunities, it is necessary to identify skills and knowledge acquired in school and skills and knowledge acquired in professional practice. As stated in "Chapter 03: Nature of the Profession", landscape architecture is a generalist profession but must also stay relevant to current trends and dilemmas. Core skills and knowledge build the foundation of the generalist profession but at any time, a core skill and knowledge may be of greater focus than another skill and knowledge.

SUBSTANTIVE VERSUS PROCEDURAL KNOWLEDGE

It is important to first identify and distinguish between types of knowledge that landscape architects have. Michael Murphy identifies two types of knowledge: substantive and procedural in his book *Landscape Architecture Theory: An Evolving Body of Thought*. Substantive knowledge is the context or concept of the design. It is the 'what' of the design. Procedural knowledge regards processes or methods that landscape architects use. It is the 'how' of the design process. The focus of this research is aimed at substantive knowledge rather than procedural knowledge, but both types of knowledge must be mentioned.

CORE SKILLS AND KNOWLEDGE

Skills and Knowledge Found in Literature

Core skills and knowledge identified by Landscape Architecture Body of Knowledge

Survey (LABOK) include:

- land information sources
- natural site conditions and ecosystems
- creativity and process including design theory and problem solving strategies
- aesthetic principles of design
- natural factors such as ecological relationships
- research methods such as data collection, interpretation, and application of results
- relationship between human and natural systems such as resource conservation, habitat restoration, and creation and urban ecology
- influence of context on design, planning, and management decisions
- communication and education methods including sharing knowledge and evaluating outcomes
- accessibility regulations
- elements of vehicular and pedestrian circulation systems and their design requirements
- grading and drainage

- erosion and sediment control
- roles of communication, including photographic and video documentation
- graphic presentation techniques, systems, and symbols
- environmental ethics
- resolving moral and ethical dilemmas
- social responsibility in design

Job Listings Representing All Levels of Experience

Content synthesis from job postings reveals skills and knowledge pertaining to site design, master planning, urban design, residential site design, and planting design occur in all levels of professional development. Specialized plant expertise requires in-depth knowledge of localized plant communities, which is typically gained during repeated project work. In addition, every landscape architect should be able to create planting plan construction documents at any level of experience.

Core Skills and Knowledge Summary

Identified core skills and knowledge will be used to inform topics for auxiliary specialization opportunities found in "Chapter 09: Recommended Certifications".

- land information sources
- natural site conditions and ecosystems
- creativity and process including design theory and problem

- solving strategies
- aesthetic principles of design
- natural factors such as ecological relationships
- research methods such as data collection, interpretation, and application of results
- relationship between human and natural systems such as resource conservation, habitat restoration, and creation and urban ecology
- influence of context on design, planning, and management decisions
- communication and education methods including sharing knowledge and evaluating outcomes
- accessibility regulations
- elements of vehicular and pedestrian circulation systems and their design requirements
- grading and drainage
- erosion and sediment control
- roles of communication, including photographic and video documentation
- graphic presentation techniques, systems, and symbols
- environmental ethics
- resolving moral and ethical dilemmas
- social responsibility in design
- site design

- master planning
- urban design
- residential site design
- planting design
- planting plan construction documents

COMMON SKILLS AND KNOWLEDGE

Skills and Knowledge Found in Literature

LABOK identified the following skills and knowledge as common understandings:

- history of landscape architecture and allied professions
- natural site conditions and ecosystems
- creativity and process including design theory and problem solving strategies
- aesthetic principles of design
- natural factors such as ecological relationships
- conservation of natural resources

Job Listings Representing All Levels of Experience

The "Pre-skills" section of job postings revealed common skills and knowledge as

- "having strong sense of design"
- Ability to work on multiple projects at once
- Meet deadlines

- Self-edit work
- Detail oriented
- Time management
- Eager to learn
- Motivated
- Organized
- Accept responsibility
- Strong work ethic
- Problem solver
- Energetic
- People skills
- Analytical
- Leadership qualities
- Team player
- Flexible
- Meet deadlines
- Salesperson

- natural factors such as ecological relationships
- conservation of natural resources
- "having strong sense of design"
- Ability to work on multiple projects at once
- Meet deadlines
- Self-edit work
- Detail oriented
- Time management
- Eager to learn
- Motivated
- Organized
- Accept responsibility
- Strong work ethic
- Problem solver
- Energetic
- People skills
- Analytical
- Leadership qualities
- Team player
- Flexible
- Meet deadlines
- Salesperson

Common Skills and Knowledge Summary

- history of landscape architecture and allied professions
- natural site conditions and ecosystems
- creativity and process including design theory and problem solving strategies
- aesthetic principles of design

SKILLS AND KNOWLEDGE ACQUIRED DURING ACADEMIC STUDIES

In addition to common and core skills taught in school and professional practice, identified above, academia also teaches students additional material.

Skills and Knowledge Found in Literature

LABOK identified the following skills and knowledge as being acquired in school rather than professional practice:

- historic preservation principles
- pattern of land use and built form
- social and cultural influences on design
- human factors like behavior, perception, psychological, and sensory response
- therapeutic aspects of design
- natural factors such as ecological relationships
- research methods such as data collection, interpretation, and application of results
- relationship between human and natural systems such as resource conservation, habitat restoration, and creation and urban ecology
- influence of context on design, planning, and management decisions
- communication and education methods including sharing knowledge and evaluating outcomes

- visual resource assessment
- agricultural and rural landscape analysis
- urban landscape
- planning principles including regional community and neighborhood planning
- water resource management
- wetland management
- floodplain management
- conservation of natural resources
- historic preservation
- ecological planning principles
- design needs for special populations
- roadway design principles
- biofiltration and other drainage methods
- determination of user values such as focus groups and surveys
- social responsibility in design

Job Listings for Entry- and Mid-level Landscape Architects

Findings from job postings reveal that employers' expectations for new graduates are expressed in hopeful and optimistic sounding terms. Announcements often contain phrases which include "eager", "motivated", or "express a desire to".

Tasks for landscape architects having 0-4 years of experience typically include: site design, master planning, urban design, and residential design. Entry level landscape architects should be able to take a design from schematic level to construction documentation, collect data, conduct site analysis and research. At this level, they minimally directly interact with consultants, architects, or clients, but participate in a considerable amount of team collaboration, and indirectly respond to clients' needs. With at least four years of experience, emerging landscape architects do not regularly conduct site analysis, but assume more responsibilities for the creation of base maps, work orders, material lists, and designs for production staff, and assist with project management. Developing professionals should expect to have an awareness of rules, regulations, ordinances, and codes but may not fully understand the details. They should also have working knowledge of construction administration duties and permitting processes. They should understand construction methods related to site grading, planting, masonry, woodworking, lighting, and irrigation etc.

Interview Opinions Related to Young Landscape Architects

Interviewees identified necessary skills and knowledge that landscape architecture graduates should have, which are not always taught by a firm. Rebecca Leonard, President of Design Workshop, identifies emotional intelligence, passion, rigor, and curiosity skills. Mark Focht, First Deputy Commissioner for Philadelphia Parks & Recreation and Immediate Past-President of ASLA, mentions strong written communication, good verbal communication skills, poise, and confidence. Bruce Ferguson, Franklin Professor of Landscape Architecture at University of

Georgia, also notes the importance of communication skills. Ferguson recognizes comprehensive reading skills, creativity, critical thinking, and good presentation skills learned in academia. Time and time again professionals could not emphasize enough how important communication and presentation skills are.

Skills and Knowledge Acquired in Academia Summary

- historic preservation principles
- pattern of land use and built form
- social and cultural influences on design
- human factors like behavior, perception, psychological, and sensory response
- therapeutic aspects of design
- natural factors such as ecological relationships
- research methods such as data collection, interpretation, and application of results
- relationship between human and natural systems such as resource conservation, habitat restoration, and creation and urban ecology
- influence of context on design, planning, and management decisions
- communication and education methods including sharing knowledge and evaluating outcomes
- visual resource assessment

- agricultural and rural landscape analysis
- urban landscape/design
- planning principles including regional community and neighborhood planning
- water resource management
- wetland management
- floodplain management
- conservation of natural resources
- historic preservation
- ecological planning principles
- design needs for special populations
- roadway design principles
- biofiltration and other drainage methods
- determination of user values such as focus groups and surveys
- social responsibility in design
- site design
- master planning
- residential design
- schematic to construction documents
- site analysis
- minimal client, consultant, and, architect interaction
- team collaboration
- create materials for production staff (base maps, work orders, material lists)

- assist with project management
- awareness of rules, regulations, ordinances, and codes
- working knowledge of construction administration duties and permitting processes
- understand construction methods
- emotional intelligence
- passion
- rigor
- curiosity
- strong written verbal, reading, presentation skills
- poise
- confidence
- creativity
- critical thinking

SKILLS AND KNOWLEDGE ACQUIRED IN PROFESSIONAL PRACTICE

Skills and Knowledge Found in Literature

Skills and knowledge typically acquired during professional practice as identified by

LABOK include:

- regional hazard design conditions
- political and regulatory approval process
- land and development economics

- emerging trends and issues
- government policies and laws that affect use and development of land
- accessibility regulations
- landscape maintenance techniques, materials, equipment, and practices
- noise weakening and mitigation techniques
- sustainable construction practices
- construction equipment and technologies
- erosion sediment and control
- utility systems
- irrigation systems
- lighting systems
- structural considerations
- quality control procedures for construction like delivery, storage testing, supervision, observation
- sequencing of design, approval, permit and construction activities
- life cycle cost analysis process
- geocoordinate systems and layout techniques and conventions
- specification types and components i.e. work orders, material lists designs, basemaps for a project
- general and supplemental conditions, special provisions and technical specifications and their organization
- construction administration and details

- construction contracts
- basic construction law
- consensus and team building
- techniques for conducting meetings
- roles of visual communication, including photographic and video documentation
- interpretive methods and techniques like information on displays and brochures
- public relations, outreach, image development
- organizational management principles such as leadership principles and landscape architecture career cycle

Job Listings for Associate or Principal Level Landscape Architects

Employers tend to use more action words and expect professionals to maintain a high level of responsibility. Language is more commanding and authoritative. Some job listings state that applications will be accepted from individuals outside the discipline of landscape architecture. It is not clear whether the job requirements point to deficiencies in landscape architecture education or experience opportunities, or if the landscape architect applicant pool is too small. It is unclear exactly why job listings of >10 years of experience seek applicants outside of the landscape architecture profession. Approximately ¼ of the total job postings allowed other applicants outside of the landscape architecture profession to apply for a landscape architecture position.

As landscape architects gain experience, they assume more administrative duties. Landscape architects with five or more years of experience should be able to lead projects, teams, meetings and begin to mentor junior staff; start coordinating among consultants, design team, and allied professionals. Professionals learn how to be capable and responsible managers. Professionals are responsible for commanding team leadership, interacting directly with clients to meet their needs, developing new client relationships, and retaining current clients. By six years of experience, professionals will create and plan work schedules for projects. They are expected to define the scope of services offered, prepare cost estimates, know what fees to charge, and manage budgets. By eight years of experience, a professional should be able to self-edit work and prepare and write contract proposals. Professionals with more than ten years of experience have opportunities to expand services into more specific types of work such as master planning, infill design, cultural attractions, planning design, stormwater design, amenity design, entertainment nodes, retail-mixed use, thematic resort design, and teaching. Principals with more than ten years of experience typically plan firm expansion and strategize employee recruitment.

Interview Opinions Related to Professional Practice

Interviewees indicated that emerging professionals should be adaptable and flexible, adjust accordingly to work trends, communicate with technical experts and the public, synthesize information from experts into a future vision, understand public policy and its relationship to the built world, and inform policy with real world design

experience. "Landscape architects need facts and figures backed up by sound research to compete with engineers. Landscape architects need strong listening and synthesizing skills to compete with planners. Landscape architects need a creative process, strong story-telling skills and passion to compete with architects" (Leonard 2015). Interviewees agree that entry level landscape architects must gain practical real world experience to understand how things are constructed, learn about all project types and project scales, and would benefit by working in another part of the world.

Interviewees identified skills and knowledge that can be easily learned or not easily learned. Leonard identifies skills and knowledge that firms can teach to young professionals: "design, planning, fine art, ecology, stakeholder facilitation, business, and finance" (2015). Steven Spears, Principal of Design Workshop in Austin, acknowledges that "core design principles, large and small scale design, [and] site design abilities" are vital to learn in school (2015). Focht thinks that young professionals should be able to communicate large complex ideas to both the public, who may know nothing about the topic, and to peers, who may be more advanced in knowledge. Ferguson notes that natural sciences, social sciences, and mathematics are useful to landscape architects. Site inventory analysis, knowledge of research methods, hand drawing skills, computer programs, Sustainable Sites Initiative (SITES), plant materials, and planting design are skills emphasized by Jacinta McCann, Vice President of AECOM, and Spears as important.

Skills and Knowledge in Practice Summary

- regional hazard design conditions,
- political and regulatory approval process,
- land and development economics,
- emerging trends and issues,
- government policies and laws that affect use and development of land,
- accessibility regulations,
- landscape maintenance techniques, materials, equipment, and practices,
- noise weakening and mitigation techniques,
- sustainable construction practices,
- construction equipment and technologies,
- erosion sediment and control,
- utility systems,
- irrigation systems,
- lighting systems,
- structural considerations,
- quality control procedures for construction like delivery, storage, testing, supervision, observation,
- sequencing of design, approval, permit and construction activities,
- life cycle cost analysis process,
- geocoordinate systems and layout techniques and conventions,
- specification types and components i.e. work orders, material lists, designs, basemaps for a project,
- general and supplemental conditions, special provisions and technical specifications and their organization,
- construction administration and details,
- construction contracts,
- basic construction law,
- consensus and team building,
- techniques for conducting meetings,
- roles of visual communication, including photographic and video documentation,
- interpretive methods and techniques like information on displays and brochures,
- public relations, outreach, image development,
- organizational management principles such as leadership principles and landscape architecture career cycle.
- lead projects, teams, meetings
- mentor junior staff
- coordinate among consultants, design team, and allied professionals
- interact directly with clients; build and maintain client relationships
- define scope of services
- prepare cost estimates, fees to charge, and manage budgets

- self-edit work
- write contract proposals
- employee recruitment
- adaptable
- communicate with technical experts and public
- impacts of policy on design
- core design principles
- natural and social sciences
- research methods
- site analysis
- plant materials and planting design

KNOWLEDGE DOMAIN FINDINGS

How do identified skills and knowledge fit into something that makes sense or is easier to talk about? "Chapter 02: Overview of Methods", identifies forty-one knowledge domains that encompass the profession (Table 6.1).

	Measuring LA Performance & Impact	Tools & Technologies; Computer Systems	Artistic Creativity	Historic Dimensions of Planning & Design	Policy & Governance	Aquatic Environments	Biophysical Dimensions of Planning & Design	Rural & Natural Environments	Integration of Site, Place, Region	Ecological Design & Aesthetics
Literature Source										
IFLA										
Murphy		X								
JOLA										
Swaffield									X	X
Meijering et. al.	X	X	X	X	X	X	X			
LABOK					X					

	Urban Design	Landscape Planning, Design, Management	Protected Areas Management	Cultural & Historic Landscape, Parks, Gardens	Green Urban Development	Built Environments & Infrastructure	Landscape Assessment	Site Analysis & Planning; Site Design & Engineering	Design & Implementation	Contract Administration
Literature Source										
IFLA		X	X	X		X	X	X	X	X
Murphy		X							X	
JOLA	X								X	
Swaffield										
Meijering et. al.					X	X				
LABOK		X						X		

Table 6.1 Existing Knowledge Domains
Literature synthesis of existing knowledge domains. (Table by Weber 2015).

Landscape Representation	Interpretation of Meaningful Form	Sustainability	Methods of Inquiry	Communication and Visualization	Design & Planning Theories & Methods	Human & Environmental Relationships	Landscape Planning & Ecology	History & Culture	Plant Design	Construction Materials & Implementation
									X	
		X	X	X	X	X	X	X	X	
X	X				X					
				X	X					
										X

Research & Teaching/ Design Education	Project Management	LA History	Professional Practice Methods	Values & Ethics	Natural, Cultural, Social Systems	Human Dimensions of Planning & Design	Global Landscape Issues	Collaboration with Architects & Planners	Construction Documentation & Administration
X	X								
		X	X		X			X	
X			X						
X				X		X	X		X
		X		X	X				

Gathered skills and knowledge statements are layered into the forty-one knowledge domains to filter out the most relevant domains (see Appendix D). The layering of skills and knowledge into knowledge domains are based on the researcher's analysis process and may not be agreed upon by all. However, the process of selecting and organizing the content can be followed by all. Again, this framework is meant to represent current and future skills and knowledge necessary for landscape architecture. Fourteen domains were identified and defined.

1. Communication and Visualization

This domain includes skills and knowledge to communicate design concepts to team, clients, and design professionals. Communication may be in the form of computer or hand graphics, presentations, written documents or statements, marketing material, and/or verbal communication. Skills and knowledge in technical writing, public speaking, written, verbal, and computer and/or hand graphic presentation and communication. Skills and knowledge applied to conflict resolution and management, conducting meetings, team building, and client interaction.

2. Construction Documentation and Administration

Construction documentation and administration demonstrates skills and knowledge that a landscape architect applies to the construction documentation phase of design. This includes skills and knowledge needed to put together construction

documents, interpret documents, and oversee the construction process. This also includes knowledge of particular processes and forms that must be undertaken in order to complete the construction process. Skills and knowledge are applied to change orders, submittals, design contracts, and material availability.

3. Cultural and Social Systems

This domain applies skills and knowledge to understanding how large social systems influence "meaning of place". Includes areas of study in understanding how these places become integrated into human culture over time. Encourages understanding about how other societies and cultures construct landscapes physically and mentally. Skills and knowledge applied to learning design techniques to engage multiple users.

4. Construction Materials and Implementation

This domain includes particular areas of knowledge that landscape architects use in their designs. This grouping of skills and knowledge distinguishes landscape architects from other design professions. Skills and knowledge are applied to areas of soil science and engineering, hydrology, plant materials, paving materials and systems, and design. Landscape architects must also know construction materials, and management strategies. Skills and knowledge must be acquired so that landscape architects can design for safety and security.

5. Design and Planning Theories and Methods

This domain applies skills and knowledge to understanding theories and methods of social, natural, and cultural systems. Skills and knowledge related to theories and methods of landscape architectural design practices are found here. Landscape architects must also understand how to design within budget constraints, evaluated methods to make decisions, and understand aesthetics of design.

6. Landscape Architecture History and Criticism

This domain applies knowledge of historical conditions, design aesthetic, and theories and practices to current design conditions. Knowledge and skills regarding history of the landscape architecture profession, nomenclature, terminologies, and notable landscape architects are found here. Skills and knowledge are applied to critiquing historical and current work, trends, and events. Landscape architects must understand the impacts of external influences on the profession such as art, economics, politics, and aesthetics. This domain includes an understanding of relationships between landscape architecture and allied professions.

7. Landscape Assessment and Analysis

This domain includes skills and knowledge needed to evaluate site conditions, analyze social and cultural impact on the environment, and techniques or methods to record existing conditions

8. Landscape Planning, Design, Management, and Implementation

This domain includes skills and knowledge of basic principles of design, components of a design, and design applications. An understanding of the relationship between design and planning and effects of time on design is located here. Identification of design opportunities and constraints and evaluation of design alternatives to determine the appropriate solution are skill and knowledge landscape architects need to execute work. Skills and knowledge applied to design architectural amenities, pedestrian amenities, signage and art pieces are here. Landscape architects must also understand and be able to design effective circulation systems.

9. Measuring Landscape Architecture Performance and Impact

Skills and knowledge needed to substantiate design ideas, talk with technical professions about design, and catalog progression of landscape performance are in this domain. Landscape architects must understand research methods such as data collection, interpretation, and application of results to execute work. In addition, communication of knowledge and education of knowledge is vital toward increasing awareness of the profession.

10. Natural Systems

Skills and knowledge applied to understanding materials and systems that differentiates landscape architects from allied design professions is here. Knowledge

of best management practices, conservation and maintenance of natural resources and understanding of natural systems at multiple scales is here. Skills and knowledge applied to understanding physical geographies and natural systems and the aesthetics and function of plant communities is here.

11. Policy and Governance

Skills and knowledge needed to make design ideas a reality are vital for the survival of the profession. An understanding of local and national laws governing the design profession and political processes is something all landscape architects need to know. In addition, an understanding of design impacts on public health, safety, and welfare influences design outcomes.

12. Professional Practice Methods, Values, and Ethics

This domain includes skills and knowledge related to individual and collective professional development. It involves standards for ethics in practice, professional methods for conducting business, and handling social interactions. It applies skills and knowledge related to licensure responsibilities, environmental and social ethics and continuing education components of the profession.

13. Social- Environmental Relationships

This domain is a grouping of skills and knowledge that studies the interaction of people in the built and natural environments. Skills and knowledge include areas of human health, safety, and welfare in the environment and how the environment impacts human condition.

14. Tools and Technologies; Computer Systems

Skills and knowledge applied to computer applications used in the design process for analysis, communication, and/or presentation. Skills and knowledge applied to the understanding of 3-D design and conceptualization is necessary.

Again, these domains represent findings in the research at a moment in time. This list can be altered for future research.

07 | FUTURE DIRECTIONS





This chapter identifies future dilemmas landscape architects should be prepared to address and future changes in the profession and marketplace. Content in this section is informed through a synthesized literature review, interviews with prominent leaders in landscape architecture, and synthesis of the American Society of Landscape Architects (ASLA) conference topics. When discussing future directions, this chapter attempts to distinguish between occurring emerging trends from future trends in the next twenty years. According to Architecture Newsfeed, "a trend is a general direction in which something is developing or changing" (2015).

DILEMMAS THAT LANDSCAPE ARCHITECTS MUST ADDRESS

ASLA Denver conference topics were analyzed in attempts to distinguish emerging from future trends. Emerging topics are topics that were discussed multiple times in multiple lectures. Future topics were discussed a maximum two or three times during the whole conference and used the language "future" in the lecture description. The following content summarizes findings from literature and interviews that focus on the future of landscape architecture.

Barbara Faga of AECOM in San Francisco states that opportunities are in infrastructure, water resources, healthy cities and transportation. She notes that "they're [projects] all going to be complicated and they're all going to have

political action attached to them. We [landscape architects] should be involved in these because that's where the work is and that's something we know about doing" (Landscape Forms 2010, 4). Landscape architects have the ability, and will be tasked, to address large complicated issues facing humans and the environment in urban environments.

Climate Change

Attempts will be made to rebuild landscapes that have been destroyed due to climate change and global warming. By 2100, the Intergovernmental Panel

on Climate Change (IPCC) projects sea level rise to increase by 19-23 inches. "Additional impacts could include increased spread of diseases; extensive species extinction; drought and wildfires; mass human, animal and plant migrations; and resource wars over shrinking amounts of potable water" (ASLA Climate Change 2015). Kurt Culbertson, Chairman and CEO of Design Workshop, believes climate change with regards to ecological urbanism will be a future dilemma facing landscape architecture. Frederick Steiner, Dean of the School of Architecture at The University of Texas Austin, agrees that landscape architects will be tasked to address issues of climate change through "mitigation and adaptation strategies especially in urban places" (2015). Jacinta McCann, Vice President of AECOM, also notes climate change as a future dilemma for landscape architecture. ASLA Denver had lectures on coastal landscapes with an emphasis on climate change. Lectures included: "Coastal Integration: Landscape architecture, Ecology, and Sea Level Rise", "Integrated Urban Waterfronts in an Era of Climate Change", and "The Future of Existing Conditions: A Multidisciplinary Approach to Resilient Coastal Design".

Landscape architects will play a substantial role in climate change mitigation to reduce sources of greenhouse gas emissions or create storage basins for the gases. They will work with regional and local political leaders, planning departments, and architects to reduce carbon footprints, increase development density, design complete streets, increase building energy efficiency and plan for greenspace in cities. Rebecca Leonard, President of Design Workshop, does not believe that global warming issues will be going away anytime soon (2015). In collaboration with parks

departments and environmental and conservation organizations, landscape architects will strive to manage existing vegetation in cities that can absorb carbon and gasses.

Resiliency

Mark Focht, First Deputy Commissioner for Philadelphia Parks & Recreation and Immediate Past-President of ASLA, states, "Sustainability has been passed on by resiliency. With the growing amount of natural disasters, resilience is on the forefront of people's minds" (2015). Focht goes on to say that landscape architects are not as educated as they should be on the topic of resiliency. Landscape architects need to lead solutions directed toward sustainability. Landscape architects will be tasked to contribute to the design of energy related projects crucial to meet human needs. ASLA lecture, "Dredge Landscapes: Sediment Flows, Earth Moving, and Dredge as Designed Landscapes", discussed roles of sediment in coastal resilience. "Earth, Wind, and Fire: Just Add Water and Stir Vigorously" discussed how landscape architects can apply resiliency planning strategies and decisions in the event of natural disasters.

The ASLA Conference discussed dilemmas related to the Alaskan oil pipeline and how to design in remote conditions to support this type of massive infrastructure. The landscape architecture profession will need to figure out how to accommodate energy needs of cities through design and create policies that support sustainable energy infrastructure.

Landscape architects are taking a role in transformative or adaptive reuse landscapes. This type of work begins with a landscape that previously functioned as something else but now exhibits potential for ecological restoration or repurposing. These landscapes attempt to regenerate natural processes within the urban fabric that has lost them. (Balmori 2010). Matthew Urbanski (2015) of Michael Van Valkenburgh Associates describes adaptive reuse as reinventing old things into new things; "What do you keep and what do you change?" Post-industrial landscapes have become of interest to landscape architects because they offer new opportunities. Some sites are sources for adaptive or transformative projects like Gasworks Park in Seattle or the Corn Silo project in Omaha. New spaces cannot always be created, but creative solutions can be derived for transformation. Landscape architects can bring beauty to sites that at one time functioned as sources of toxins, environmental degradation, and loss of biodiversity. As people move from rural to urban landscapes, will there be adaptive reuse of rural landscape elements in the next decade?

McCann says, "More recent focuses centered on resiliency have come to light because of climate change and natural disaster" (2015). She acknowledges that federal funding will be directed toward disaster resiliency. Leonard believes that dilemmas related to severe weather conditions will play a role in the future work of landscape architecture.

Social Landscape

Leonard claims that future population explosion will keep landscape architects employed. McCann suggests housing accommodations and changing demographics will be future dilemmas to address. Landscape architects will need to act as mediators between multiple parties who have varying opinions. Social connections will be reinforced and supported through landscape architecture design. Public spaces designed by landscape architects determine how and where people interact in cities. Most of all, these spaces need to welcome all users and encourage social equity. Through beauty and design, landscape architects can improve the lives of others thereby creating a more beautiful world to live in. The social landscape of cities is something that must not be cast aside. As more people become immersed in technology, the desire to create spaces to make social connections will increase.

Yu (2006), who wrote the *Art of Survival*, eloquently describes how landscape architects can begin to combat some of these dilemmas. He reasons that mankind has always tried to live in harmony with nature. "For thousands of years, people struggled with natural forces to survive, and as a result created the landscape that reflected the balanced relationship between man and nature" (46). His solution is that "...landscape architecture [needs] to go back to the land, go back to the vernacular relationship, to recover the survival skills in dealing with floods, droughts, soil erosion, field making, and food production and to more broadly regain the cultural identity" (29). Meaning, landscape architects need to look to nature for solutions to dilemmas in the built environment.

Urbanization

As people move from rural to urban landscapes, food sources must move as well. Landscape architects will share in the task of designing food systems that can support the human population. Currently 800 million people worldwide practice urban agriculture. In the United States 49 million people experience food insecurity while 23 million live in food deserts without access to fresh produce (ASLA Edible City 2015). Landscape architects can promote local and efficient food practices to design for maximum sufficiency. Landscape architects will work with planners to help combat food deserts in cities by rezoning land uses, and devising appropriate planning regulations to encourage urban agricultural practices. "Rural concerns are attracting landscape architects to farmland preservation, small town revitalization, landscape preservation, and energy resource development and conservation" (PGASLA 2015, 5). In addition, an ASLA lecture, "Innovation, Landscape, and Shrinking Cities: The Detroit Case", discussed future planning dilemmas for shrinking cities.

Landscape architects will continue to improve the quality of life for people through artistic and functional designs. Nineteenth century industrial water, sewage, and energy infrastructure requires updating and rerouting in cities across the country (Balmori 2010, 140). The addition of green spaces will add to the quality of life. Everything from creating more pedestrian friendly environments, to rethinking circulation routes, to applying creative problem solving to dilemmas are steps that landscape architects can advocate through design. By designing for health and safety of the public, landscape architects create a better way of living especially

for those who represent the margins of society. There is a sector of landscape architecture, therapeutic landscapes, that is aimed at improve the lives of those who suffering physically, mentally, and emotionally. Accessibility to landscape architecture work will be of utmost importance so that the public can reap the benefits of more inclusive design. Funding from the health sector will contribute to a lot of projects in the urban context (Leonard 2015).

As people become more mobile, access to transportation becomes a key ingredient to characteristics of cities. "A sense of landscape-belonging is for many people still tied to feelings of permanence and stability. It has generally been connected with home places where they have grown up or where they live or work" (ESF 2010, 8). This contrasts greatly with the multimodal and fast paced lifestyle everyone lives today. "Transported, imported and remembered perceptions of landscape are becoming more common as larger numbers of people routinely migrate or commute across large areas or live in more than one place" (ESF 2010, 8). Design, in a time of mobility, must accommodate fast-paced life that is continually in transformation. Landscapes are interpreted as a series of flows and transitions rather than a final experience. Transportation may be experienced at a human scale through walking or biking, or through public provision by buses, trains, and cars. Landscape architects will work with political leaders to encourage different types of transportation and funding for transportation.

Leonard states that "divisive national and global politics ought to keep us [landscape architects] busy for the next generation or two" (2015). "The movement of people

from rural to urban areas is a global change" affecting the future of landscape architecture work" (McCann 2015).

Infrastructure

In the 1990s, "Engineers gained control of large infrastructure projects during the days of the Works Progress Administration (WPA), even though landscape architects had earlier worked at this scale from the time of Olmsted's Muddy River Plan" (Baird and Szczygiel 2007, 14). It is time to partner with engineers on large infrastructure projects. If landscape architects can gain control of infrastructure projects, they can increase control of open-space design and the development of cities. Ed Freer, of JJR thinks landscape architects are uniquely positioned to move into leading roles on such infrastructure projects saying, "We're [landscape architects] holistic thinkers. We deal with transportation, water management and open spaces to increase value in communities" (Landscape Forms 2010, 4). "Legislation now before Congress, including HR 3734, the Urban Revitalization Livable Communities Act; HR 4202, the Green Infrastructure for Clean Water Act; and new efforts to re-fund the Wind and Water Conservation Fund, would potentially fund infrastructure initiatives with significant opportunities for landscape architects" (Landscape Forms 2010, 4).

Focht believes "infrastructure, non-vehicular infrastructure, transportation infrastructure, green infrastructure, and stormwater management will be huge [in the future] (2015). McCann and Steven Spears, Principal of Design

Workshop in Austin, believe that urban infrastructure is a future dilemma. Spears states, "I think infrastructure will be a major component of future landscape architecture... Everything has a lifecycle to it and we are seeing that lifecycle of 15-20 year old infrastructure systems coming to an end" (2015). He also sees a push for designing infrastructure systems that support a variety of users and uses especially in the streets public right of way. McCann thinks that federal funding will go to green infrastructure work and maintenance or rehabilitation of existing urban infrastructure. She also thinks the private sector will fund changes in vehicular infrastructure.

ASLA discussed large scale infrastructure systems and resource preservation in "Oil in the Fields: Mapping, Fracking, and Landscape Architecture in North Dakota". "The Trans-Alaska Pipeline: Mega-Infrastructure on Unstable Ground" covered large scale remote infrastructure systems.

Water Resources

Kurt Culbertson believes landscape architects will help solve problems related to water shortages. McCann also agrees that water and water resources are future dilemmas. ASLA Climate Change predicts that there will be "resource wars over shrinking amounts of potable water" (2015).

Landscape Architecture and Agriculture Practices

The ASLA lecture "The Landscape Architect's Role in Shaping the Future of Agriculture" discussed how landscape architects will learn about sustainable agriculture practices and merge them with landscape practices. "Old School Green Infrastructure from A to Z: Acequias to Zuni Bowls" talked about historical green infrastructure farming and treatment techniques applied to design.

FUTURE CHANGES IN LANDSCAPE ARCHITECTURE PRACTICE

For landscape architects to experience a positive momentum of growth, they need to be prepared for future changes in practice.

Urbanization

Due to more people moving to urban areas, landscape architectural work will continue to increase in the urban context. Steiner notes that over half of the world's population now lives in urban areas and landscape architects will address urban concerns.

Globalization of Marketplace

Culbertson says that a major change, since 1976, is globalization of marketplace. Work is extending world-wide into Europe, Middle-East, and China (2015). Steiner

says that China and Korea are becoming hot spots for work. Doug Smith of EDSA stated, "Second world countries offer great opportunities for our services because they have the political and financial structure to carry out development, but are sorely lacking the expertise that we [landscape architects] bring to the table as master planners and landscape architects and the ability we have to bring together teams of experts to address all the issues" (Landscape Forms 2010, 5).

Technology

There will be an increased use in three-dimensional modeling software, AutoCAD, Sketch-up, Vectorworks, Revit, and 3D printers, (Architecture Newsfeed 2015). Spears says that the presence of technology has done away with hand graphics, trace overlays, and hand built models. Culbertson believes that the use of technology in the design process plays a more important role in daily practice than ever before. The Denver ASLA conference discussed "3D Printing: The Rebirth of Physical Model Making" as a new method of model making.

Establish Ourselves as Necessity

Landscape architects need to stay relevant to marketplace demands. One way to stay relevant is to address pressing dilemmas.

"Landscape architectural expertise can establish itself as a necessity rather than a luxury through responding to public concerns...design of

open spaces, parks and walkable communities, that respond to issues like obesity; or creating performative landscapes to remediate soil toxicity in response to diagnoses of cancer in residents bordering toxic sites. Design for play that reconnects children to elements of nature can be instrumental in the prevention of nature-deficit disorder" (Baird and Szczygiel 2007, 15).

Terry Guen said, "Leaders of the profession, including the Landscape Architecture Foundation (LAF), should be working on building sustainability metrics and making the case for landscape architecture" (Landscape Forms 2010, 10). Focht urges that "Landscape architects should be more aggressive and be promoting themselves and the good things the profession can do. They [landscape architects] should not accept anything less than a leadership role" (2015).

Reinvent Processes and Methods of Doing Landscape Architecture

Landscape architects need to begin to understand the site as a process and not an object. Diana Balmori is "moving away from landscape architecture by shifting the stress on the site as object to the site as process, transforming landscape creating from an art of space to an art of movement" (Balmori 2010, xii). For design inspiration, Balmori looks to understanding natural processes and incorporates that into her work rather than mimicking the landscape. Processes of urbanization over time are more necessary for shaping urban relationships than spatial forms of urbanism. Meaning, placement of physical structures may not produce new patterns

of socialization. Landscape architects must shift away from focusing on objects of urban form and focus on qualities of space. Landscape architects need to study how things work in space and time (Corner 2006, 29). "We [landscape architects] have ceased to see the city as an industrial entity existing outside of nature; we need to reverse our strategy of nature in the city and instead pursue a strategy of the city in nature. While in the past we simply inserted a park here and there, now we will work to make the city as porous as possible..." (Spirn 1985).

The service landscape provides to cities is different today than in the nineteenth century. Landscapes are not merely parks in cities or about greening cities. "A related shift is a reorientation of design goals from program to performance" (Harvard Design 2013, 1). Designers are integrating art and programming into designs earlier on rather than waiting till the end of the project to incorporate them...landscape architects must come up with better solutions to increase longevity of design to withstand the test of time and natural forces (Sasaki 2013).

Collaboration with Other Professionals as Leaders

Landscape architects need to continue collaborating with other professionals who can do more technical work that landscape architects can do on their own. James Corner identified this trend of collaboration in 2006 and "it has changed the way we [landscape architects] now work with each other as well as other professionals". Collaboration helps landscape architects realize the "limitedness of ideas and the powerful role of collective interactions" (Balmori 2010). It is even more important

that landscape architects take initiative to create connections and collaborate on projects because other professions may not always see the value in collaborating. Terry Guen of Terry Guen Design Associates, Chicago, stated, "We [landscape architects] go to campuses and a lot of the managers of those projects ask for the landscape architect because they know the architects are not performing -- they don't comprehend the integration that's needed to create sustainable solutions. So we really need to hold our ground" (Landscape Forms 2010, 6). It will be exciting to see who landscape architects partner with. Matthew Urbanski says that landscape architects need to facilitate unlikely relationships (2015). What if landscape architects and doctors worked together? Scientists? Physicists? The options are limitless. Spears believes because "projects are becoming more complex, that collaboration will become more and more necessary" (2015). McCann suggests that landscape architects need to not only be ready to collaborate with engineers, planners, and architects, but also "be unique, be at the front, and be ready to lead" (2015).

Public Engagement

In addition to advocating for the profession and increasing public awareness, landscape architects need to be more proactive in the public realm. Christopher Hume, urban design columnist for the Toronto Star, and John King, urban design critic for the San Francisco Chronicle, agreed that landscape architects are not getting involved enough in the public realm. To imagine a city without people is unrealistic. People are in cities and if landscape architects are working in cities,

they will work with people. "...landscape work at city scale also requires the engagement of a diverse public, which will in turn make possible a new relationship between human beings and nature" (Balmori 2010, 140). Sasaki suggested that landscape architects engage the public through design feedback or critiques, to generate ideas and site analyses. Corner (2006) sees the social landscape as a primary key ingredient to landscape architectural work. "We [landscape architects] have yet to understand cultural, social, political, and economic environments as embedded in and symmetrical with the natural world" (30). Landscape architects need to focus their efforts on people, politics, and preference studies in addition to understanding natural processes. Landscape architects need to understand the "social landscape" (30).

Political Movement

Landscape architects need to become more involved with politics of cities. "Landscape architecture no longer has connections to power and politics that historically defined its periods of greatest production, innovation, and prestige" (Hohmann and Langhorst 2004, 5). Hillery states "...commitment to landscape also needs to go beyond the individual developer and instead be taken at a city level" (Howe 2009, 2). "Civic Landscape: Integrating Design into Local Government and Public Infrastructure" taught landscape architects to work with political leaders and understand political and economic processes for design.

Imagination and Creativity

"The collective imagination, informed and stimulated by the experiences of the material world, must continue to be the primary motivation of any creative endeavor" (Corner 2006, 32). Landscape architects need to reimagine what public spaces are or can become. They are more than just a recreational space. They hold social, cultural, geographic, ecological, and historic value (32). Urbanski described landscape architecture work in terms of the "landscape imagination" at a lecture at KSU.

Design Competitions

Design competitions provide wonderful opportunities to increase awareness about the profession and expose people to the vast abilities of landscape architects. Landscape architects need to compete harder and more often (ASLA Dirt Blog 2014, 2).

Engage in Research

Guen suggests that landscape architects and professional organizations should be building sustainability metrics and making a case to build respect for the profession across the entire profession. "There is optimism that the time is approaching when there will be a greater understanding of what the landscape architect does and why their work is important" (Howe 2009, 3). Landscape architects need to engage

in more research. The LAF has made progress in this area as it is a research organization; but more so in the realm of measuring and documenting landscape performance to give metrics to qualitative designs. "The diversity of landscape research arises from complex and far-reaching interconnections between culture and landscape on the one hand and physical environments and ecological systems on the other" (ESF 2010, 4). "Properly integrated landscape research will focus on the plural human meanings inherent to landscape as well as on its ecological and environmental importance" (5). Steiner claims there is an increased use of metrics to assess performance such as Sustainable Sites Initiative (SITES) and Leadership in Energy & Environmental Design (LEED). Because of this, landscape architects will be in greater collaboration with technical professions. Culbertson believes that landscape architects need to be skilled in rigorous research to be equipped to address issues relate to resilience, climate change, and water shortages.

Increase Knowledge of Hard Sciences

Landscape architects' strengths lie in site design and land planning because they understand larger complicated concepts and relationships. However they must not forget or ignore materials inherent to the profession. Landscape architects need to increase skills and knowledge in the hard sciences especially as demand increases for measuring landscape performance and metrics. To be able to lead multi-disciplinary teams on infrastructure projects, landscape architects need to build credibility in the hard sciences, materials, and processes of infrastructure. Dennis Carmichael said "I advised some young people we had to let go who are now

going back to school to go back for hydrology, go back for any of the hard sciences that are quantifiable, measurable, so when you're competing with civil engineers it's a fair fight and you can win" (Landscape Forms 2010, 9). What do landscape architects choose to hone in on? How can landscape architects possibly know an in depth amount of hard sciences on top of what they already need to know? "Rather than stretching our intellectual resources across the natural, physical, and social sciences, we [landscape architects] should establish our own integrated science, with its own specific methods, concepts, and techniques" (Davis and Oles 2014, 10).

"... if landscape architecture is going to have reason to continue as a separate profession in the years ahead, it can only be because it has special areas of competence that are not so much emphasized by the other design professions ... this special competence should involve knowledge of the materials and processes which constitute the natural environment - i.e., plants, trees, streams, soils" (Baird and Szczygiel 2007, 12).

There is increasing demand for increased knowledge and skills in the hard sciences.

Funding Sources

According to interviewed professionals, funding for public health and funding from the public-private sector are not going away any time soon. The private sector will be a primary funding source for landscape architecture work such as roadways, new or existing buildings. The public sector and nonprofit organizations will fund some

landscape architecture work. The federal sector will fund disaster resiliency and green infrastructure work especially rehabilitation of existing infrastructure.

OPPORTUNITIES FOR **08** | SPECIALIZATION





This chapter defines the profession of landscape architecture and how it should be favorably discussed. It seeks to identify and explain potential specialization opportunities in landscape architecture.

UNDERSTANDING PROFESSIONS

A profession is a group of individuals who have gone through a process of specialized education, obtained skills and knowledge through academia, gone through training either on the job or training programs and have a set of ethics. Their skills and knowledge assets are then translated into social and economic rewards (Baird and Szczygiel 2007, 4; Merriam Webster 2015; Cyprus 2004). Baird and Szczygiel add that a profession has supporting professional organizations at local and national levels and there is some measure of licensure to test competency (2007, 2). By these standards, landscape architecture is a profession. There are sixty-eight accredited programs that offer over one-hundred degrees in landscape

architecture. Professional organizations include the American Society of Landscape Architects (national and local chapters), the Landscape Architecture Foundation, the Cultural Landscape Foundation (CLF), and the Certified Landscape Architecture Registration Boards which offer licensure exams. This report has identified *core* skills and knowledge, *common* skills and knowledge, skills and knowledge acquired in *school* and skills and knowledge acquired in *professional practice*. Professional and ethical standards of landscape architecture practice have been previously presented in "Chapter 03: Nature of the Profession". There is no reason to question whether or not landscape architecture is a legitimate profession; it is a profession. However, there is concern that "If a profession is unable to clearly establish legitimacy as experts within well-defined parameters among its ranks, it remains paralyzed to do

so with outside professions or the public. This was the fate of landscape architecture from the very first day of organization" (Baird and Szczygiel 2007, 8). The intent of this report is to explore specialization opportunities as a means for landscape architects to "establish legitimacy as experts" in focused areas that complement their generalist contributions.

ARGUMENTS FOR AND AGAINST AUXILIARY SPECIALIZATIONS

Defining Specialization

This chapter qualifies what it means to specialize in the landscape architecture profession. To argue that landscape architects need to have specialization opportunities, it is necessary to first define "specialization." Specialization is "the limiting of one's study or work to one particular area, or a particular area of knowledge, and allows a profession to stay competitive and continue to make a profit for a particular time" (Cambridge Dictionary 2015; Baird and Szczygiel 2007, 3).

Advantages of Specialization

According to interviewees, there are advantages to specialization within landscape architecture. Steven Spears, Principal of Design Workshop in Austin, claims that landscape architects are "like an amoeba or the space between, all of the other types of professions" (2015). Because of this fluidity, he believes landscape architects do need to specialize "a little bit" (2015). He emphasizes the importance

of understanding broad concepts and themes but also having enough specialization in knowledge to know how systems will actually be implemented and talk about that implementation.

Interviewees believe that specialization increases deeper understanding of design on various levels, can enhance personal and career goals, and typically occurs in topics of construction, planning, water, soils, or plants. Specialization is more appropriate after 4-5 years of being out of school when it becomes more evident where a landscape architect's passion resides.

Disadvantages of Specialization

Acknowledging the disadvantages of specialization in landscape architecture is important in order to propose an appropriate mechanism for specialization. A concern expressed by Swaffield was that specialization could lead to fragmentation of the profession. Meaning, if emphasis is given to certain aspects of the profession, "common ground" may not be taught to every landscape architect thereby losing foundational skills and knowledge that make the profession unique (2002).

Interviewees identified that specialization opportunities need to be directed at specific target audiences. This was mentioned in "Chapter 06: Skills and Knowledge Findings" under section "Expectations for Young Professionals". Rebecca Leonard, President of Design Workshop, does not recommend that young landscape architects specialize. She says, "The challenges ahead are going to require that we [landscape architects] be nimble as a profession" (2015). Meaning, landscape

architects need to be adaptable to the ever changing nature of the dilemmas the profession addresses. Mark Focht, First Deputy Commissioner for Philadelphia Parks & Recreation and Immediate Past-President of ASLA, acknowledges that specialization opportunities differ for an undergraduate student, graduate student, and practitioner. He believes that an undergraduate student is most likely not ready to specialize whereas a graduate student or someone who has had professional experience, is more ready to specialize in a niche of landscape architecture (2015). Focht believes undergraduate students should have real world experience before specializing. Focht's concern is that if undergraduates specialize too early on, they may leave the profession early. Bruce Ferguson, Franklin Professor of Landscape Architecture at University of Georgia, has a similar viewpoint, indicating that young landscape architects can specialize "within a few years after graduation, as long as the niche is identified from what is actually seen to be demanded in practice" (2015). Landscape Architecture Accreditation Board (LAAB) recommends specialization in undergraduate curricula as a response to the increasing diversity in practice (Baird and Szczygiel 2007, 17). Kurt Culbertson, Chairman and CEO of Design Workshop, does not believe specialization to be a good idea because "The profession is so broad and there are so many possibilities that a student can't possibly be exposed to all of the options in undergraduate or graduate school". Culbertson stated that if students are not well rounded, they will not be successful practitioners (2015). Culbertson stressed that specializing too early on could lead to irrelevancy in the workplace especially since project types and challenges are always changing (2015).

Frederick Steiner, Dean of the School of Architecture at The University of Texas Austin, believes specialization opportunities lie within one's own interests saying,

specialization "depend[s] on the individual's personal and career goals. Generally, depth in certain areas such as, construction, planning, water, soils, or plants helps one advance professionally" (2015). Jacinta McCann, Vice President of AECOM, estimates that it takes "somewhere between 4-5 years to be confident in all stages of a project from design to construction..., it becomes clearer to find where your passion lies in about 4-5 years" (2015). Leonard states that if landscape architects were to specialize (which she is not in favor of in the first place), the best way to specialize would be through project types. She says, "[project types] would still allow the landscape architect to think at multiple scales and from policy to built-work, if only for a narrow set of project types" (2015).

SHOULD LANDSCAPE ARCHITECTS SPECIALIZE?

Interviewees acknowledged that specialization makes one less adaptable to changes and could go against the strength of landscape architecture as a generalist profession. Some landscape architects may be too inexperienced to know what they want to specialize in and specialization may encourage someone to leave the profession early. The breadth of the profession may not be understood at an early age therefore one cannot easily identify a niche to specialize in, and could lead to irrelevancy in the marketplace. It is important to acknowledge disadvantages of specializing, but disadvantages must not hinder the idea of specializing. The advantages of specializing to stay relevant in the workplace, to build credibility, and to be equipped to lead multi-disciplinary teams outweighs the disadvantages.

It appears as though the idea of specialization may do the profession a disservice. However, it must be noted that perhaps the interviewees' understanding and my understanding of specialization differs. It is possible that interviewees are interpreting specialization to be a lifelong endeavor—something that becomes a narrowed focus that would be difficult to disengage from. I, however, propose that specialization in landscape architecture take on an auxiliary form that evolves as the profession evolves. Meaning, that if one were to specialize in an aspect of landscape architecture, they could do so but only for a shortened amount of time as appropriate. How beneficial it would be to accumulate specialized knowledge to serve a purpose and time that build on identified core skills and knowledge that define the landscape architecture profession? Future research could better describe to interviewees that specialization is not meant to be a terminal endeavor.

AUXILIARY FORMALIZED SPECIALIZATION PROPOSAL

Peter Walker believes that landscape architects should focus on "generalist training as common ground and then allow landscape architects to follow their desired directions into specializations if they so choose" (Baird and Szczygiel 2007, 18). I concur with Walker, that landscape architects must not lose core skills and knowledge inherent to the profession; that would be taking a step backwards in professional development. I am not arguing that landscape architects should specialize in one area of focus for the entire duration of their career. That would be disadvantageous, since landscape architects would not be able to easily weather fluctuating market conditions. They would not be as easily able to jump into different

projects to help their colleges, nor would they be as effective team leaders if they do not have a holistic comprehensive sense of design.

It is apparent that landscape architects need to do a better job of educating themselves on current issues and topics that often exist for a temporary amount of time. I am advocating that landscape architects need to first learn core skills and knowledge of the profession as identified in "Chapter 06: Skills and Knowledge Findings" and then hone those core skills and knowledge that reflect current times.

A realistic outlet for specialization would be through certification programs. Certifications can be easily changed and updated from year to year to reflect current market conditions. They can also be implemented across schools and/or organizations worldwide and standardized to maintain consistency. Certifications are offered to landscape architecture students and professionals already, although certifications may not reflect current trends or market conditions. Certifications can be opportunities for professionals to receive continuing education credit. This leads to the next topic: opportunities for specialization.

OPPORTUNITIES FOR SPECIALIZATION

Interview subjects identified thirteen areas where landscape architects could improve or potentially gain specialized knowledge:


1. Dedicate more time to research and metrics to better compete with engineers

2. Develop strong listening and synthesizing skills to compete with planners
3. Strengthen the creative process, effectively tell stories and have passion to compete with architects.
4. Increase knowledge of plant palettes and planting design
5. Collaborate with other professionals who can fill areas that we lack knowledge in
6. Sustainability
7. Resiliency
8. Green infrastructure
9. Hold our ground in our overall understanding of the environment
10. Develop skills that already existing the profession such as creativity and critical thinking skills
11. Develop leadership skills
12. Increase knowledge in the materials and systems we work with such as ecology, plants, soils, and water
13. Develop presentation, communication and writing abilities

Now that possible areas of specialization have been identified, how do we as landscape architects begin to talk about the complexity of landscape architecture?

RECOMMENDED 09 | CERTIFICATIONS





This chapter explains the rationale behind ten proposed certification topics, explains course details of each proposed certification, discusses certification format, identifies baseline certification standards, and describes an implementation plan for certification programs.

REVIEW OF CURRENT CERTIFICATION OFFERINGS

The certification precedent study served three purposes: 1) to identify types of certifications offered to landscape architecture students; 2) to quantify certifications; and 3) to establish a baseline of certification standards. Identification of certifications is in Appendix E.

In addition to landscape architecture degrees, fourteen out of sixty-eight (twenty-one percent) accredited landscape architecture schools offer supplemental certifications to landscape architecture students. A total of forty-three certifications exist and there are thirty-three different certification topics offered among these fourteen universities. Of these fourteen schools, an average of three certifications

are offered to landscape architecture students. University of Georgia, Temple University, and Texas A&M offer more than five certifications to landscape architecture students. Certifications offered to landscape architecture students are offered through other departments within the university, within the college of design at that university, or directly through the landscape architecture program.

Certification topics that are offered by more than two universities include food systems, sustainable design, historic landscapes, historic preservation, urban design, transportation planning, and GIS. The following criteria of each certification program was studied: pre-requisite requirements, requisite credit hours, audience, testing for competency, who offers certification and potential benefits of getting the certificate (see Appendix F).

Great Plains IDEA Organization Precedent Study

An existing educational delivery system, the Great Plains Interactive Distance Education Alliance (IDEA), was reviewed to ascertain whether something similar might be adopted as a means to offer certifications at a regional or national level.

IDEA is a partnership of twenty public universities that offers over twenty online degrees to students. This collaboration pools together resources so that less common degrees can be offered; offerings must have a critical mass of students, faculty, and money to stay afloat. The targeted audience includes undergraduates, graduates, and professionals who have a college degree. Each university, who is part of IDEA, has a local office on campus.

Students enroll in a school participating in the degree collaborative, and the particular school of the student's choosing sets the admission standards. For example, if Iowa State University, South Dakota State University, and Kansas State University collaborate to offer a degree in animal science, then a student may enroll in any of the three schools of his or her choosing. Students still have access to representative faculty from each collaborative school. The school they enroll in serves as their "home" where they report, pay tuition, check grades, graduate from, etc. A payment standard for each course is set by IDEA and not by the university.

Coordination between universities happens through conference calls and in-person meetings occurring a few times a year. It is the faculty's job to develop and update the curricula and not IDEA's duty. All courses and curricula are reviewed by each collaborative school to ensure high standards.

Courses are taught by faculty from each university on a schedule set by the collaborative team. A faculty member approved to teach at their home institution is automatically allowed to teach and represent other institutions through the course offering. Faculty can rotate out among universities in the collaborative effort or even faculty within each school. In one semester, a student may be taught by faculty from multiple schools.

Students gain hands-on experience through course requirements as set by each collaborative group. In a conversation with Doctor Huston Gibson, a Regional and Community Planning Faculty member at Kansas State University (KSU) who is part of IDEA, he mentioned that hands-on experience for the online Community Development Master's Degree offered through IDEA typically includes interviews, focus groups, surveys, site visits, community involvement and other field work (personal communication, March 27, 2015). Interactions between students in courses occur through Zoom video conferencing or online discussion boards. Dr. Gibson finds that online discussion boards seem to be the best method for discussions.

Based on experience teaching the Community Development Master's Degree through IDEA, Dr. Gibson notes that students enroll because they need a degree to build credentials, are working in the community development sector and need some sort of formalized training to continue their work, or want to switch degrees completely. Dr. Gibson notes that trends change in the marketplace and students are seeking ways to absorb these changes while staying professionally responsible.

Dr. Gibson values the collaborative effort because it is flexible. He acknowledges that an entire set of faculty members is required to put a whole program together. But, the collaborative effort allows representatives from each school to determine the inner workings of the program. And because each faculty member is tied to a larger institutional body, all of a sudden, the faculty input has doubled or quadrupled in size thereby making the program even better. Dr. Gibson mentioned that an upcoming meeting agenda with the Community Development program collaborative will discuss what is going on in different courses related to student recruitment, enrollment, assessment of Master's reports, retreats, quality control issues, etc. (2015).

Dr. Gibson noted that fees can be a major issue. He estimated that if there were more than five schools in collaboration with each other, the issue of fee splitting could become unmanageable. He also explained that there are two primary incentives for payment: actual teaching, and student enrollment numbers. Faculty who teach a course get paid a larger amount of money than other faculty who only participate in college course planning; payment goes to the school they represent. When a student enrolls through a collaborative school, payment goes to that school. A school receives more money based on the number of faculty that teach courses versus how many students enroll through the school. Therefore, there is a larger incentive to teach courses to get paid more money. Fees are also split up between other outlets such as the IDEA office at each school, each school's online administrative offices, etc.

Dr. Gibson explained that his collaborative effort set a maximum enrollment of six credit hours per semester which is equivalent to two classes. The reason is to make sure students succeed in their courses on top of other life involvements.

Proposed Certification Standards

Due to time constraints, not all forty-three certifications were studied. Certifications were chosen for the precedent study if the topics were offered to landscape architecture students by at least two universities. This allowed a variety of universities to be represented while maintaining some level of consistency in subject matter. A total of seventeen certification programs were studied. Variations between certification requirements were tabulated and analyzed to arrive at reasonable standards by which to base proposed certification standards. Certification standards also take into account Great Plains IDEA standards. The following is a list of proposed certification standards for this research:

1a. Pre-requisites for Graduate Students

- Current graduate student or have a graduate degree
- Fill out initial application form to certification program
- If completing a Master's or Thesis project, the topic must relate to the certification
- Recommendation from one faculty member
- Minimum 3.0 GPA at time of application
- Submit letter of interest

1b. Pre-requisites for Practicing Professionals

- Have a landscape architecture degree
- Fill out initial application form to certification program
- Recommendation from employer
- Submit letter of interest

2. Requisites

- At least 12-18 credits
- No more than 6 credits taken per semester (semesters include fall, spring, and summer)

3. Audience

- Graduate student landscape architect or professional landscape architect with a college degree
- Audience can be located all over the world
- Subject matter is specifically catered to a landscape architect

4. Testing Competency

- Maintain "B" average (3.0) in certification courses

5. Context of Certification

- Online offering
- Taught by landscape architecture faculty from accredited landscape architecture schools

6. Benefits of the Certificate

- Receive certificate at graduation
- Support professional career goals
- Receive hands-on experience
- Increase level of credibility on important topics in the profession

Each proposed certification program must meet Landscape Architecture Accreditation Board (LAAB) standards, local institution standards, state standards, and Great Plains IDEA standards.

Proposed Topics and Certifications

As an example of appropriate courses, actual courses offered by Kansas State University and other universities were compiled to form a hypothetical curriculum for each certification. An explanation for the anticipated future demand for each topic is described based on the following factors: identification by interviewees and literature as necessary to landscape architecture work in twenty years, minimal to no certifications exist for the proposed topic, the topic was discussed at the 2014 ASLA Denver Conference and each certification builds on identified core skills and knowledge of the profession. Each certification offering has an "applied learning" component, is between 12-18 credit hours, and entails cross-disciplinary learning.

1. Plant Systems and Sustainable Practices Certification

In job postings, employers desire that professionals have skills and knowledge related to planting design and implementation with an emphasis on planting plan construction documents and localized plant communities. Skills and knowledge related to this area occurred in all levels of work experience—from entry level positions to principal positions. Frederick Steiner, Dean of the School of Architecture at The University of Texas Austin, notes that development of skills and plant knowledge, or increased knowledge depth, could help a young professional advance professionally. Steven Spears, Principal of Design Workshop in Austin, notes that an emphasis on understanding planting design as an artistic material will be important in future work. He later notes that "We [landscape architects] need more people with planting design knowledge. We have to know plants; it's something we have gotten away from" (2015). Steiner agrees that specialization in plants in terms of environmental skills and knowledge is important but also claims that planting design knowledge also resides in professions outside of landscape architecture (2015). Jacinta McCann, Vice President of AECOM, also sees knowledge gaps in plant material saying, "Landscape architects, in a lot of schools, aren't well versed in plant material and planting design. I think the basic tools of landscape architecture include plants and plant communities. This particular knowledge is very important. Clients expect landscape architects to know about plant material" (2015). Landscape architects can begin to see that there is and will be a need for skills and knowledge in planting design. A synthesis of literature revealed that the area of climate change is going to be a continuing future dilemma landscape architects must address. Landscape architects can begin to design plant

communities to address issues of climate change, i.e. creating planting designs that address reducing greenhouse gasses, minimizing the urban heat island effect, using plants to reduce the spread of diseases, buffer changes in water levels, etc. In addition, literature revealed that landscape architects will need to increase their knowledge of hard sciences to be equipped to address dilemmas of the future.

The 2014 ASLA Denver Conference discussed planting design in terms of native landscapes, sustainability, and water management strategies. There is one planting design certification offered at Boston Architectural College, and it falls under the "landscape planning, design, management, implementation" knowledge domain. The proposed planting certification goes beyond aesthetics of planting design to teach students about the function and science of plants in landscape architecture. Last, increased depth of skills and knowledge in the area of plants is a core skill of landscape architects; it distinguishes landscape architects from allied professionals.

Certification description: Certificate enrollees will learn how to create planting designs catered to a particular context to serve multiple uses; learn the relationship between sustainability and water management practices to planting design; learn proper plant maintenance techniques; learn how to communicate with clients about planting design beyond an aesthetic level and how to effectively make planting design changes when project budget cuts occur; learn about the dynamic relationship that exists between humans and plants; and learn about the effects of climate change on plants.

Field trips are required. Enrollees will be expected to interact with landscape contractors, horticulturists, and nurserymen per required assignments. Enrollees

will identify one planting design per week to write about (including photo documentation). Enrollees will study planting design characteristics, aesthetics, composition, maintenance techniques, impacts on social and environmental contexts, and suggested improvements to planting design.

Relationship to the Built Environment

- HORT 256 - Human Dimensions of Horticulture: "Introduction to horticulture applied in schools, psychiatric and medical hospitals, corrections, vocational rehabilitation centers, elderly programs, and consumer horticulture settings. Networking the art and science of horticulture with architecture, business, social sciences, health care, horticulture, and education" (KSU Course Catalog, 2014-2015).
- OEB 59- Plants and Human Affairs: "An introduction to the uses of plants by humans. Topics include the form, structure and genetics of plants related to their use as sources of food, shelter, fiber, flavors, beverages, drugs, and medicines. Plant structure and reproduction are studied in lecture and laboratory with a particular focus on relationships between the plant's structural, chemical, or physiological attributes and the utility plant" (Harvard Courses of Instruction, 2014-2015).

Sustainable Practices

- HORT 405 - Water Issues in the Lawn and Landscape: "This course will examine critical water issues related to irrigation in

urbanizing watersheds, with an emphasis on water quality and quantity. Factors impacting water scarcity and quality will be discussed. Successful completion of this course will help students understand the interrelatedness of incorrect irrigation practices and water quality/quantity, and will equip them to help protect water resources through application of science based irrigation practices" (KSU Course Catalog, 2014-2015).

- OEB 120 - Plants and Climate: "How plants are affected by climate - both spatially across the globe and as climate changes over time - is relevant to understanding patterns of plant evolution, ecosystem structure, and the impact of humans on our planet. This course examines how variation in rainfall, temperature, atmospheric humidity and CO₂ affects the growth and productivity of plants. Topics include photosynthesis, respiration, transpiration, and vascular transport; experimental approaches and measurement techniques will also be covered" (Harvard Courses of Instruction, 2014-2015).
- HORT 508 - "Sustainable Landscape Maintenance Practices: "Understanding and implementing maintenance requirements for the care of young trees, shrubs and herbaceous plants that focus on practices that address environmental issues related to the management of residential and commercial landscapes. Students will learn how to analyze and apply landscape maintenance practices while creating an attractive landscape in balance with

the local climate that requires minimal resource inputs, such as human energy, fertilizers, pesticides and water" (KSU Course Catalog, 2014-2015).

Designer- Client Relationship

- HORT 580 - Advanced Horticultural Design: "Emphasis is on horticultural design projects with clients, working with the design process, design articulation and communication with the clients" (KSU Course Catalog, 2014-2015).

With this certification, enrollees will develop a deeper understanding of how plants can impact the built environment. Students will learn how to engage in dialogue with clients to explain the impacts of planting design on natural, social, and built systems.

2. Soil Science and Design Certification

Spears discussed a project that Design Workshop is involved with that requires collaboration with four soil consultants (2015). Their design entails soil remediation of the site and the landscape architects must be able to intelligently talk to the soil specialists about the project. Steiner believes that increased depth of knowledge in soils can help a landscape architect advance professionally and that landscape architects need to increase our knowledge in this area to stay relevant with allied professions (2015). McCann says that our knowledge of soils and soil mechanics distinguishes landscape architects from other design professions (2015). Literature suggests that landscape architects learn how to use soil systems to improve health

conditions in built environments. Soil is a "special area of competence" that other design professions do not know as much about (Baird and Szczygiel 2007, 12). A soil certification for landscape architects does not exist in academia. The 2014 ASLA Denver Conference addressed the topic of soils in terms of knowing characteristics, types, management, properties, etc. There were discussions on soils in the contexts of arid environments and derelict vacant lots in urban areas.

Certification description: Soils are a vital material used in landscape architecture. Enrollees will learn chemical, physical and biological properties of soil; management of soil; current issues related to soils; and external influences on soil quality and design. Enrollees will learn how to identify "disturbed" soils, test soils, and learn the concepts of remediating unhealthy soil conditions. Enrollees will be able to apply their knowledge of soils to green infrastructure systems, planting design, site analysis, and communicate with soil experts.

Enrollees will gain hands-on experience as they are required to study local soils in their environments. They will be tasked with soil identification, analysis of soil condition at a site of their choosing and must write about their analysis and findings. They must collaborate with a soil expert on this project.

Soil Properties

- AGRON 305- Soils: "Fundamental chemical, physical, and biological properties of soils; their formation, fertility, and management" (KSU Course Catalog, 2014-2015).
- AGRON 746- Physical Properties of Soils: "The properties of soils as affected by their physical environment, including

water content, water potential, temperature, aeration, flocculation-dispersion, and soil compaction" (KSU Course Catalog, 2014-2015).

Best Practices

- AGRON 635- Soil Conservation and Management: "Principles, mechanics, and prediction of water and wind erosion. Influence of soil erosion on soil productivity and environmental quality. Conservation management technologies for erosion control and sustaining soil productivity. Legislation and land-use planning for soil conservation" (KSU Course Catalog, 2014-2015).
- ATM 558 - Soil Erosion and Sediment Pollution Control: "Planning and analysis of production systems with respect to regulatory, environmental, and resource management. Water and wind erosion; estimating soil loss; estimating runoff rate and volume; laying out and checking terraces, waterways and farm ponds; agricultural surveying; and conservation planning" (KSU Course Catalog, 2014-2015).

Soil Applications

- CE 322 - Soil and Foundation Construction: "The origin, distribution, and predictable variation of soil; soil testing and mechanics as applied to practical problems; soil investigations; foundation types, application, and construction; ground water,

drainage, and dewatering; earth moving including stable cuts in embankments" (KSU Course Catalog, 2014-2015).

Enrollees will gain a thorough understanding of soil properties and their application to landscape architectural systems (i.e. planting design, green infrastructure, site conditions, hardscape materials, etc.). Enrollees will learn how to design soil systems using sustainable practices.

3. Advanced Visualization Certification

It is vital that landscape architects continue to refine graphic communication skills and knowledge. Spears notes that the evolution of hand graphics to digital graphics is one of the biggest changes in the way landscape architecture is practiced.

He acknowledges that hand graphics, trace overlays, and hand built models are dwindling away as the computer takes a more prominent role in design (2015).

A change in communication tools means that landscape architects must equip themselves to adjust to these changes but must not forget fundamental skills and knowledge. Steiner states that young landscape architects need to develop better graphic communication skills. Graphic language brings a level of understanding to a project among people of all backgrounds, which is highly valuable especially as increased collaboration among disciplines occurs. Instances where differences in vocabulary exist, an image or a model can bridge gaps in understanding among clients, designers, the public, and allied professions. A rendering or an "experience" can communicate more meaning than a string of words. Bruce Ferguson, Franklin

Professor of Landscape Architecture at University of Georgia, believes that landscape architecture academia needs to emphasize broad communication skills such as reading, writing, speaking, and drawing (2015).

A demand for improved graphic communication is needed; but in what form or outlet? Literature reveals that 3D modeling and animation is going to become more and more heavily used in the design professions. As a result, more landscape architects need to learn 3D software programs to stay relevant. Architecture Newsfeed identifies AutoCAD, Sketch-up, Vectorworks, Revit, and 3D printers as upcoming software to know (2015). In fact, skills and knowledge in the following programs were mentioned by employers as being preferred or required in a number of job postings: Sketch-Up (thirty postings), Revit (ten postings), Rhino (seven postings), 3DS Max (five postings), general "3D modeling" (four postings), Microstation (four postings), and Civil 3D (one posting). Technology will have a huge influence on the way process and methods of practicing landscape architecture change. 3D technology affords landscape architects the opportunity to be creative and explore ideas quickly and realistically. There are a couple of certifications offered in AutoCAD and GIS however; there are no 3D digital certification offerings. At the 2014 ASLA Denver Conference, 3D printing and modeling were discussed as a method for creating real life models. Another conference topic discussed how to merge 3D digital systems with hand graphics. This future area seeks to build on core skills and knowledge of hand graphics by merging it with technology. It does not seek to replace hand graphics.

Certification description: Technology is becoming more integrated into the design process for research, analysis, synthesis, and/or production. At the same time, landscape architects must not ignore the importance of touch or hands-on interaction during the design process. This certification explores how to strategically merge hand graphics in a digital world using overlay techniques, processes, and methods. Enrollees will focus on 3-D graphic outputs. They will study the history of graphic design and hand drawing techniques in landscape architecture applied to current conditions. They will take a 3-D animation course that teaches them relevant software techniques to be utilized in the design process. They will choose a 3-D modeling software to explore during the certification process that they see valuable toward pursuing interests and also expanding the field of landscape architecture. They will have the opportunity to learn about the impacts of color in graphic communication.

Students will choose a 3-D modeling software to learn and will apply hand graphic techniques to the software output. They will be given a small site to model and must merge hand graphics onto the model to produce presentation style quality renderings. Hand graphic techniques will change weekly to encourage creativity and promote diversity of work.

History and Principles of (hand and digital) Graphic Design

- ART 600 - Advanced Drawing: "Upper-level drawing, development, and personal motivation. Lectures and problems directed toward an understanding of the historical development of drawing as well as investigations of contemporary studies"

(KSU Course Catalog, 2014-2015).

- ART 601 - Graphic Design History/Theory/Criticism: "Study of significant works from late nineteenth century to the present to provide understanding of the development and character of graphic design, artists, and designers" (KSU Course Catalog, 2014-2015).

3-D Techniques

- ART 616 - 3D Animation in Graphic Design: "Specialized training in the 3D realm, modeling, lighting, motion graphic design" (KSU Course Catalog, 2014-2015).
- ART 623 - Advanced Concepts in Computer Art and Design: "Studio exploration of computers as a tool/medium for art disciplines" (KSU Course Catalog, 2014-2015).

Color Theory

- ART 679 - Color Experiments, Theory and Application: "Explores the interaction of color through a variety of exercises, both practical and experimental. Emphasis on visual perception and the relative use of color. Color's potential in illusionist structures and visual communication, color systems" (KSU Course Catalog, 2014-2015).

After certification is obtained, enrollees will have an understanding about the progression and history of hand graphics to digital graphics. Students will apply basic design principles to merge hand and digital graphics using 3-D technology.

4. Project Management and Leadership Development Certification

Being a generalist is a core strength of landscape architecture. Landscape architects have a wide breadth of knowledge and awareness that make them ideal project managers. Kurt Culbertson, Chairman and CEO of Design Workshop, agrees that landscape architecture's greatest value is the generalist nature of the profession (2015). Mark Focht, First Deputy Commissioner for Philadelphia Parks & Recreation and Immediate Past-President of ASLA, claims that landscape architects education trains them to think broadly and act as coordinators and landscape architects understand more about what allied professionals do than what allied professionals typically understand about landscape architects. Focht sees landscape architects stepping into leadership roles to solve complex problems (2015). Spears sees landscape architects as a mediator between other professions thereby having a large sphere of influence due to abilities to think broadly and holistically. According to literature, landscape architects are positioned to be project leaders who understand complex systems, are a generalist of scales, and understand how projects come together. Landscape architects can gather the right people at the right time for a project. Spears states, "We [landscape architects] know enough about allied professions to know when they need to come on to a project and when they need to come off" (2015). No certifications exist for project management in landscape architecture. If this is a core strength, these skills need to be developed early on.

Certification description: Because landscape architecture's strength lies in its generalist nature, landscape architects are positioned to be effective project managers. This certification teaches enrollees the fundamentals of leading and coordinating team projects. They will learn how to manage and take risks and understand ethics in the industry and what to do when ethical dilemmas arise. Team collaboration techniques will be taught.

Enrollees will be given a project to manage, which addresses a major dilemma, and then propose a feasible solution through teamwork. Landscape architects are valued for their contribution to imagination and creativity on projects. Teams will engage in a variety of creative activities to promote ideation, develop critical thinking skills, and strive for uniqueness.

Risk Management

- AGEC 680 - Risk Management: "Analytical concepts and quantitative tools to make better decisions in risky situations. Identifying various types of risk an operation faces, measuring the degree of risk, and exploring ways to manage risk. Includes portfolio analysis, futures and options, contracting, and insurance. Emphasis on computer applications. Topics are focused on agriculture but are applicable to other industries and household decisions" (KSU Course Catalog, 2014-2015).

Ethics

- CE 703 - Responsibility in Engineering: "Codes & Professionalism: Course designed to help engineers, scientists, and technical

managers to: understand fundamental "canons" of professional societies, establish or revitalize personal ethical standards using these canons, realize when situations are ethical dilemmas, and to develop a process to solving dilemmas. Key activities are: interviewing peers, analyzing current environment for potential challenges, developing ethics workshops, and writing individual code of ethics" (KSU Course Catalog, 2014-2015).

- CE 704 - Responsibility in Engineering Leadership & Diversity: "Course designed to help engineers, scientists, and technical managers to: understand leadership approaches that promote high ethical conduct, and to understand the ethical value and challenges associated with a diverse workplace. Key activities are: interviewing peers; analyzing current environment for potential challenges; developing a workshop related to ethics, leadership and diversity; and writing individual code of ethics" (KSU Course Catalog, 2014-2015).

Leadership

- LEAD 405 Leadership in Practice Ethical Reasoning: "Students will engage in a leadership practicum to understand the process of facilitating change in self, others and systems. The course is designed to develop the capacity to exercise leadership to make progress on personal and community issues" (KSU Course Catalog, 2014-2015).
- LEAD 320: Theories of Leadership: "This course is organized

to provide students with in-depth examination of traditional leadership theories and an exploration of current leadership scholarship. The curriculum is designed to prepare students to become leaders and followers with a strong grounding and conceptual understanding of leadership theories as well as an understanding of the application of the theories" (KSU Course Catalog, 2014-2015).

Social Interactions

- SOCWK 200 - Basic Skills for Working with People: "Course develops basic skill components for the helping professions. Students learn fundamentals of interpersonal communication" (KSU Course Catalog, 2014-2015).

This certification gives enrollees the skills and knowledge to become leaders on projects. Enrollees will learn how to talk to technical experts, non-technical experts, and the general public about the business of landscape architecture. They will also learn how to address ethical dilemmas and how to make decisions in risky situations.

5. Geodesign Applications in Landscape Architecture Certification

ESRI President Jack Dangermond noted that geodesign is the "landscape architect's methodology" at the 2013 ASLA Boston Conference (Land8 2014). There is one Geodesign certificate offered at Texas A&M but more certificates should be

offered at the national scale (although some Geodesign degrees are emerging). A discussion at the ASLA conference focused on landscape architects using geodesign technologies and leading with geodesign abilities. This topic stood out from other discussion about technology at ASLA and could be used more often in future work. Literature from Land8 suggests that landscape architects must lead in the area of geodesign as well. Landscape architects' knowledge of large complex systems, aesthetics, and functional aspects of planning and design will be applied to geodesign methodologies. Geodesign will allow landscape architects to explore spatial relationships at a variety of scales and options to find the best possible solution.

Certification description: This certification teaches enrollees how to engage the public, stakeholders, the government, etc. in design planning processes to identify relevant dilemmas. Data will be collected, processed, and analyzed through Geodesign, which enables geocentric, iterative feedback to inform potential solutions. Projects will be a regional scale. Design theories and issues related to land planning and land uses will be discussed. Enrollees will learn the processes and benefits of using geodesign in landscape architecture. They will produce graphics using geodesign software to argue for sustainable solutions.

Engaging Others

- CDPLN 625 - Participatory Action Research Methods (PAR): "A graduate level course to develop participatory action research knowledge and skills through real-world applications. PAR is a method of collecting information by community members in

collaboration with a researcher that respects, places community central to, and reflects the experiences and culture of the people most directly impacted by the issue under consideration" (KSU Course Catalog, 2014-2015).

History of Land Use and Land Development

- CDPLN 655 - Land Development Planning: "An examination of the process of land development in the United States, and its impacts from the perspective of developers, financial institutions, community planners, and city administrators. Focus is on the understanding of the land development process in meeting community goals, and shaping land development to meet community expectations for the improvement of the community" (KSU Course Catalog, 2014-2015).
- GEOG 720 - Geography of Land Use: "Critical factors affecting land use, scarcity, and management examined in a regional, national, and global context; land use classification system and variation of land use patterns" (KSU Course Catalog, 2014-2015).

Advanced GIS Software Application

- GEOG 608 - Geographic Information Systems: "Advanced principles of and applications for geographic information systems (GIS). Examines the nature and accuracy of geo-referenced data and methods of data capture, storage, retrieval, modeling,

and digital map display. Students will use modern GIS software packages and digital geographic data from physical and/or cultural sources to explore software procedures and techniques of spatial analysis, decision support, and geographic visualization" (KSU Course Catalog, 2014-2015).

- GEODZ 511- Geodesign History, Theory, Principles: "This course consists of lectures, readings in course literature, small group discussion forums, and individual topic investigation. In this course students will explore the questions, challenges, and the values of the geodesign framework. The course provides a comprehensive overview of the geodesign process, including designing in geographic space, issue identification, process evaluation, fast iteration and alternative scenario generation, multidisciplinary collaboration, and the role of science-and value-based decision making. The course culminates in a final project in which students independently research the physical and social characteristics, data, and teaming-expertise required to deploy a study for their topic, and report on how their proposed geodesign framework enables creative change for that location" (Temple University, 2015).
- GEODZ 822 - Geodesign Models I: Decision and Evaluation: "The Geodesign Framework directs design thinking regarding a specific issue or project as well as determining how best to conduct a specified study. The Framework is comprised of six

families of models, which form the basis for a design study's analysis and project approach. In this course students develop fluency in two of the Framework's families of models: Evaluation and Decision, while understanding how those contribute to the entire Framework methodology. The course provides a detailed exploration of Evaluation and Decision models and delves into the role each model plays in defining the geodesign process. In GEODZ 822 students learn how these two domains of models determine the design method by defining how the decisions are made, and by whom, and what evaluations and visualization are necessary in making an informed decision. Students learn that final designs are decision-driven not data-driven. The course teaches students how to ask questions, assess attractiveness, vulnerability, and risks of particular factors in Evaluation models, as they are defined by the cultural, political, and administrative values of the stakeholders in the Decision models, which themselves are defined by the design consequences of Impact models. This course also explores how designing at different geographic scales might change the questions and methods of Evaluation and Decision modeling" (Temple University, 2015).

Enrollees will learn to propose design solutions using sound evidence and visual displays through GIS Geodesign technology. This certification gives landscape architects leverage to analyze existing conditions, propose legitimate solutions, and engage with clients, the public, and/or allied professions.

6. Landscape Research and Metrics in Professional Practice Certification

Steiner notes a major change in the landscape architecture profession is the increasing demand to use metrics to assess performance. As a result of this change, there has been increasingly closer collaboration with allied professions. He also believes that metrics will be a core contribution landscape architects will make to solve emerging dilemmas in the next twenty years (2015). Rebecca Leonard, President of Design Workshop, states "we [landscape architects] need to invest more time to research and metrics to compete with engineers" (2015). Skills and knowledge applied to research and metrics will go hand-in-hand as landscape architects increase their knowledge of hard sciences. A certification that teaches landscape architects how to apply research, metrics, and methods to design does not exist. Discussions at the 2014 ASLA Denver conference Conference topics discussed included application of metrics to stormwater management and urban waterfronts; but metrics can be applied in all aspects of landscape architecture. Research and metrics can and should be pursued by academic institutions and practitioners.

Certification description: Theories, methods, processes, and applications of incorporating metrics into the design process will be addressed. Enrollees will study the benefits of studying, measuring, and documenting landscape performance. Enrollees will learn to apply mathematics to the design process. They will learn how to mix quantitative and qualitative information to communicate a design. They will choose one case study per week from the Landscape Architecture Foundation,

understand the case study process, and identify quantitative data used to describe landscape performance. In addition, enrollees will learn how to use metrics as one means to assess design among other technical professions such as architects and engineers. As a final exercise, enrollees will complete a hypothetical case study to measure landscape performance.

Methods

- GEOG 701 - Seminar in Qualitative and Mixed Methods Research: "Qualitative research techniques and integration of qualitative with basic statistical research techniques (mixed methods). Consideration of ethics, data collection, and data analysis" (KSU Course Catalog, 2014-2015).
- STAT 325 - Introduction to Statistics: "A project-oriented first course in probability and statistics with emphasis on computer analysis of data. Examples selected primarily from social sciences, natural sciences, education and popular culture. Descriptive statistics, probability, sampling, tests of hypothesis and confidence intervals for means and proportions, design and analysis of simple comparative studies, chi-square test for association, correlation and linear regression" (KSU Course Catalog, 2014-2015).

Applications

- (researcher's suggestion for course)- Enrollees will have weekly conference calls with professionals from the Landscape

Architecture Foundation to discuss current issues and dilemmas with using research and metrics in landscape architecture.

Enrollees will learn how to talk about metrics and use metrics to their advantage in design. Professionals and students will do precedent studies and discuss elements to research and measure in the landscape, identify objectives for doing so, and learn how to communicate their findings (Weber, 2015).

- GEOG 700 - Quantitative Analysis in Geography: "Quantitative methods employed in modern geographical research. Applications of both statistical and mathematical approaches will be treated. Emphasis will be placed on interpretation and evaluation of techniques employed in spatial analysis" (KSU Course Catalog, 2014-2015).

Enrollees will be proficient in application of research and metrics in the field of landscape architecture. They will understand how research and metrics have been used to increase understanding of landscape design. This understanding will inspire and inform their future design decisions.

7. Infrastructure and Ecosystem Services Certification

Focht believes landscape architects have a stronger influence in areas of infrastructure, non-vehicular transportation infrastructure, and green infrastructure (2015). McCann believes landscape architects will contribute to

emerging dilemmas in urban infrastructure in the next twenty years (2015). Spears emphasizes knowing infrastructural systems at all scales. Landscape architects need to know concepts and theories behind infrastructure systems as well as how the systems are actually implemented (2015). Steiner thinks infrastructure "will be a major component of future landscape architecture" because it is in "bad shape" (2015). Infrastructure systems are failing and they need to be rebuilt. However, landscape architects are learning to study and apply natural systems to function as infrastructural systems in built environments. Public and private sector funding will drive a majority of work in infrastructure, thereby creating demand for landscape architects and other professions in this area. Literature indicates that infrastructure will be complex, large-scale, and multifaceted systems in which landscape architects can make significant contributions.

2014 ASLA Denver Conference lectures described infrastructure in terms of large-scale public systems that need addressing. Green infrastructure has been a current focus for landscape architects but soon enough landscape architects will start to see a shift in the focus of infrastructure. Landscape architects will need to propose creative infrastructure systems that mimic natural processes, support a variety of users and uses, and function at multiple scales. Since one of landscape architects' strengths is land planning and design, landscape architects should be well equipped to handle this work. Out of all of the proposed certifications, it appears as though an infrastructure certification needs to be implemented as soon as possible. The work is out there, there is demand, and landscape architects need to be at the forefront of this work as soon as possible.

Certification description: Enrollees will learn about different urban infrastructure systems that landscape architects will need to design. They will learn about the impacts of infrastructure on landscape and vice versa. Infrastructure theory and future forecasting will be discussed as well as anticipated challenges to designing infrastructure systems. Enrollees will study how land use and policy decisions impact infrastructure. Discussions about how infrastructure design can help mitigate socio-environmental issues will be covered. As a final exercise, enrollees will choose an infrastructural system (i.e. transportation, green infrastructure, drainage pipes, sewer systems etc.) to prepare an in-depth alternative analysis to be summarized in a paper. They will cover the history of the infrastructural system, landscape architectural influences on that infrastructure system, precedent studies, and the future potentials for that infrastructure.

Theory, Economics, and Design

- PLAN 720 - Infrastructure and Plan Implementation: "Examination of infrastructure systems, the transportation process, land-use, and development standards; consideration of policy options and strategies; review of financing options and regulatory requirements associated with the various infrastructure elements. The course also reviews social and other issues that affect and are affected by infrastructure related decisions" (KSU Course Catalog, 2014-2015).
- LARCH 504 | Landscape Urbanism: "Application of landscape ecological theory to the design of urban environments. Focus is on the strategic design of urban infrastructure, including

underground drainage systems, roads, parks, and transit systems, and on understanding the cumulative performance of urban sites" (University of Washington - Seattle Course Descriptions, 2014-2015).

Sustainable Practices

- ARCH 519- Sustainability in the Environment: "Infrastructures, Urban Landscapes, and Buildings: This course will focus on the urban environment: infrastructures, landscapes and buildings, and their many interdependencies within the context of natural and human ecologies. In pursuit of a renewed focus on inter-departmental collaborative teaching and application, the seminar is an inter-disciplinary forum for dealing with contemporary issues facing urban environments such as; increasing density, land use, energy and resource scarcity, CO2 emissions reduction, ecosystem restoration, climate adaptation / resiliency, food deserts, environmental quality (indoor and outdoor), public health / environmental justice, mobility, and the economic viability of sustainability alternatives" (University of Southern California-Catalogue, 2014-2015).

Ecosystem Services

- GSD 3241- Theories of Landscape as Urbanism, Landscape as Infrastructure: Paradigms, Practices, Prospects: "Responding to contemporary urban patterns, ecological pressures and

decaying infrastructures, this course brings together a series of influential thinkers and researchers from the design commons across North America to discuss different methods, models and measures of large scale, long range design for the 21st century. Foreshadowing the preeminence of ecology in cities and infrastructures, the motive of the course is to construct a clear, multivalent discourse on the field of landscape as it becomes the locus of intellectual, ecological and economic change of significance, globally" (Harvard Courses of Instruction, 2014-2015).

- LAR 5330 - Sites and Systems: "Recent trends in landscape architecture can be framed as moving from how things look to how they perform. The interest in ecosystem services or green infrastructure indicates how concerns are moving from issues of form to issues of flow. In studying the co-dependent relationship of urban metabolism and morphology, this seminar asks how far engineered solutions provided by technical infrastructure can be reevaluated as assets of the public realm" (University of Virginia Undergraduate Record, 2014-2015).

Enrollees will learn how to design natural systems to replace built infrastructure systems. An understanding of natural system relationships and processes will be applied to address socio-environmental dilemmas in the urban context.

8. Agricultural Landscapes Certification

Rural agricultural practices and landscape architecture can merge together to adapt to urban environments to meet demands of society. This merging of professions is happening with food systems, however I predict it will happen with other systems such as water management, material production, plant propagation, and animal production or uses. The 2014 ASLA Conference in Denver discussed how landscape architects and agriculturalists can come together to design productive landscapes in urban contexts.

Certification description: Enrollees will learn the history of agricultural practices, theories, challenges, and successes to understand current agricultural practices. They will study food production techniques in urban areas to understand how landscape architecture and agriculture can cross paths to solve dilemmas. In addition, GIS will be used to analyze, manage, and design large scale land development and natural resource systems. Enrollees will also learn how agriculture can be studied to solve dilemmas such as energy, materials, and movement of resources. They will learn how to apply agricultural practices to material production and application of materials. Enrollees will also study how rural communities are changing and what that means for landscape architecture in the next twenty years. Brainstorming sessions will seek ways for landscape architects and agriculturalists to come together to solve dilemmas of water resources, climate change, and the growing population.

History of Agriculture

- HORT 790- Sustainable Agriculture: "Historical perspectives of the sustainable agriculture movement in the United States and world-wide will be examined and critiqued. Components of sustainable agriculture such as agroecosystem theory, permaculture, energy use efficiency, and organic standards will be compared and evaluated. Students will demonstrate their understanding and application of the material by conducting research on a topic within sustainable agriculture and presenting the topic to the rest of the class" (KSU Course Catalog, 2014-2015).

Urban Agriculture

- HORT 791 -Urban Agriculture: "Students will become familiar with a wide variety of urban agriculture types and production systems utilized in urban settings. The course will include background readings, case studies, guest speakers, student-facilitated class discussions, and lectures" (KSU Course Catalog, 2014-2015).

Resource Management

- AGRON 655- Site Specific Agriculture: "Introduction to spatial analysis and management of agricultural and environmental resources using geographic information systems (GIS) technology. Emphasis on collecting, displaying, and analyzing spatial or georeferenced soil, crop, or other land surface data"

(KSU Course Catalog, 2014-2015).

- ATM 160 - Engineered Systems and Technology in Agriculture: "An introductory course designed for non-engineering majors. This course introduces engineering principles and problem solving associated with energy resources and power systems for agriculture, machinery systems, natural resources and environmental management, and food and fiber processing and storage" (KSU Course Catalog, 2014-2015).

Changes to the Rural Sector

- SOCIO 533 - Rural Society: "A survey of United States rural society, including change in agricultural structure, rural demographic shifts, growth of the rural service sector, rural class structure, decline and transformation of rural communities, and linkages to urban society. Examination of selected rural institutions such as education and religion" (KSU Course Catalog, 2014-2015).

With this certificate, enrollees will be able to address future dilemmas using integrated strategies of landscape architecture and agriculture practices.

9. Social Landscapes Certification

An important factor in cities is the social landscape. As people move into cities, landscape architects will play a bigger role in designing for the health, safety, and

welfare of people. Literature reveals that landscape architects will continue to design environments to improve health of people but also maintain and update existing healthy environments. McCann and Leonard note changes to the human realm, which will impact the work landscape architects do. For example, the anticipated housing boom, increase in the number of people over the age of fifty, and a desire for a more active lifestyle will influence work landscape architects take on. As globalization of the marketplace accelerating technology occurs, societies are globally connected but locally disconnecting. Landscape architects will be in demand to design tightly knit social fabrics and develop new communities. After reviewing this literature, I think collaboration between landscape architects and geographers will be huge in the next twenty years. Landscape architects will need to partner with geographers to understand socio-environmental relationships especially in an urban realm. There is not a certification aimed toward the human realm of landscape architecture. Some discussions at 2014 Denver ASLA Conference focused on re-designing cities to be more walkable environments. Another discussion centered on how to engage the public in the design process and how to design for people. This topic, will be vital toward the survival and relevancy of landscape architecture in the future.

Certification description: Enrollees will study how people have impacted or changed landscape dynamics, environmental preferences, and philosophies about the environment. They will study the relationship between climate change and human activities. This certification will teach theories of social interactions and the dynamics of social groups and apply it to design. The social landscape of city dynamics will be studied to identify challenges and opportunities for social interaction.

Enrollees will research and study case studies demonstrating successfully designed "social landscapes". Each week, they will be required to document observed social dynamics through photography, sketching, and writing.

Impacts on Environment

- GEOG 200 - Human Geography: "A geographical assessment of the way human activities shape landscapes throughout the world. The course is especially appropriate for students interested in the social and behavioral sciences" (KSU Course Catalog, 2014-2015).
- GEOG 760 - Human Impact on the Environment: "Assessment of human impacts on the natural environment. Surveys changing human impacts on and attitudes towards the environment, and details alteration of water systems, the atmosphere, landforms, plants, and animals" (KSU Course Catalog, 2014-2015).
- GEOG 780 - Cultural Geography: "A study of the forms of human occupancy of landscapes, with consideration of innovations in the use of landscape, the origins and the dispersals of these innovations, and human attitudes toward the natural environment" (KSU Course Catalog, 2014-2015).

Interactions and Behaviors

- SOCIO 450 - Introduction to Social Interaction: "A survey of theories of social interaction and social psychology with special attention to research on principles of interpersonal relations

in social situations, group formation, maintenance, and change" (KSU Course Catalog, 2014-2015).

Urban Conditions

- SOCIO 531 - Urban Sociology: "Growth, development, and structure of the city as determined by geographical, ecological, and social factors; relation of rural and urban communities; problems of the city and various approaches to their solution" (KSU Course Catalog, 2014-2015).
- SOCIO 536 - Environmental Sociology: "The interrelations among human societies, social institutions, and the biophysical environment. Emphasis on the reciprocal links among technological change, economic structure, and the ecological basis of human societies" (KSU Course Catalog, 2014-2015).

Enrollees will increase their understanding about human systems. They will develop awareness for how humans interact with the environment, each other, and built systems.

10. Water Resources Design and Management Certification

Faga notes that issues related to water resources are going to be a big topic for landscape architecture (2010). A concern among many is related to supply and demand of water resources and whether or not there will be enough water to support future populations. Landscape architects can devise creative solutions for

managing and conserving water resources. Both Culbertson (2015) and McCann (2015) believe water issues will be a source of work for landscape architects in the next twenty years. Water is a partially renewable resource and landscape architects need to take action now to apply skills and knowledge toward proper management of water related systems in built environments. There are no certifications related to water and landscape architecture. Landscape architects will be charged with developing solutions for better water management and use in built environments. Water is and will always be an aesthetic resource and a functional resource; landscape architects must balance both of these dynamic characteristics of water. Water in urban contexts such as rivers, runoff and harvesting will be future topics.

Certification description: Enrollees will study the role of landscape architects related to water rights, water law, conservation and management of large scale water systems. They will discuss water related issues in environmental and social contexts. They will learn how to design water systems for aesthetic and functional uses that mimic solutions found in nature. Enrollees will be expected to solve issues related to water design and/or management through landscape architecture processes and methods. They will gain an appreciation for natural resources and respect the temporal nature of landscape systems.

Guest speakers in civil engineering, hydrology, conservation and other professions describe their experiences with water practices and how landscape architects fit into the collaborative picture.

Sustainable Practices

- PMC 575 Water Management for Natural Water Resource Managers: "A study of the management of water resources for public and commercial uses. The course investigates the use of rivers, lakes, reservoirs, and marine resources. Management considerations, including agency policy formation, legal rights, use conflicts, and use valuation are covered" (KSU Course Catalog, 2014-2015).
- ATM 661 - Watershed Management: "Principles of watershed sources, fate, and transport of pollutants, with focus on issues of the prairie agroecosystem. Impacts of watershed protection and restoration strategies on water and environmental quality" (KSU Course Catalog, 2014-2015).

Man-made Systems

- BAE 660 - Natural Resource Engineering: "Design and operative problems on the fundamentals of irrigation/water application system design and management. Field water balances; sources of water and water quality; pipeline, pump, and system hydraulic design; design of irrigation/water application systems; filtration systems and water treatment" (KSU Course Catalog, 2014-2015).
- CE 550 - Water Resources Engineering: "Introduction to: surface water hydrology, design of water handling structures, flood protection, pipe flow hydraulics, pump selection, and flow in soils" (KSU Course Catalog, 2014-2015).

Geography

- GEOG 725 - Geography of Water Resources: "Interpretation and analysis of the physical geography of water and water as a resource. Evaluation of water, emphasizing quality, hazards, institutions, and selected domestic and global issues" (KSU Course Catalog, 2014-2015).

Cultural and Social Influences

- GRAD 740 - Water and Society: "Interdisciplinary Foundation: Interdisciplinary course focused on the natural and human elements of water resource systems; introduction to traditional disciplinary procedures, theory, and models; cross-disciplinary approaches to understand and quantify dynamic system relationships; case study for integrated problem solving, management and policy" (KSU Course Catalog, 2014-2015).

This certification develops skills and knowledge about properties of water and how to apply design principles and sustainable practices to water systems.

CERTIFICATION PHASING PLAN

A baseline for certification program standards has been identified, future dilemmas and changes in landscape architecture have been identified, and a realistic program has been identified that could support these certifications. This section discusses the phased strategy plan.

Seven steps must occur to ensure a successful certification program implementation (Figure 9.1). The following steps illustrate how certifications might unfold at Kansas State University as part of the Great Plains Idea Collaborative. Similar certification approaches could be applied elsewhere.

Step 1- Research and Concept Development

Phase one is the preliminary stages of project development undertaken by me, the researcher, at Kansas State University. This phase requires thorough development of a master's report proposal and identification of a critical dilemma, goals, thesis inquiry, and outcome. This phase allows the research to develop knowledge and competency about the topic in order to be able to complete a final proposal.

Step 2a- Support

Support from the Great Plains IDEA Cabinet and appropriate Board of Directors is sought before faculty collaboration is completed.

Step 2b- Collaboration

Phase two occurs after the research proposal concept has been completed. KSU Landscape Architecture and Regional and Community Planning (LARCP) faculty must be identified to determine if anyone is interested and qualified to teach courses catered to specific certifications. Using the Great Plains IDEA organization structure, interested KSU LARCP faculty reach out to faculty at other landscape architecture programs which to collaborate.

Step 3- Program Development

The collaborative group devises standards for each certification program (this can be difficult because each school representative brings each schools standards to the table which differ from other schools standards). The collaborative group delegates share responsibilities among faculty through organized committees. Existing certifications offered from each university remain because the online certification offerings act as an extension to existing certifications.

Step 4- Approval

Certification programs are proposed to the Great Plains IDEA organization where IDEA approves or disapproves each certification program. Revisions to the program are made during this stage.

Step 5- Marketing

The collaborative group creates and distributes marketing material. The program is offered to students from all over the world.

Step 6- Funding

Funding is gathered as enrollees register for courses through collaborative schools. Each enrollee pays for courses through their "home" school and that school gets funding.

Step 7- Maintenance

Each certification program must be updated either 1) every five years in accordance with LAAB standards and/or 2) in accordance with IDEA standards every year. This is also an opportunity for faculty to update or change program topics and standards. Teacher Evaluations (TEVALs) will be required for each certification course to get feedback on course content. Faculty assessments will be required for each certification to critique faculty teaching methods.

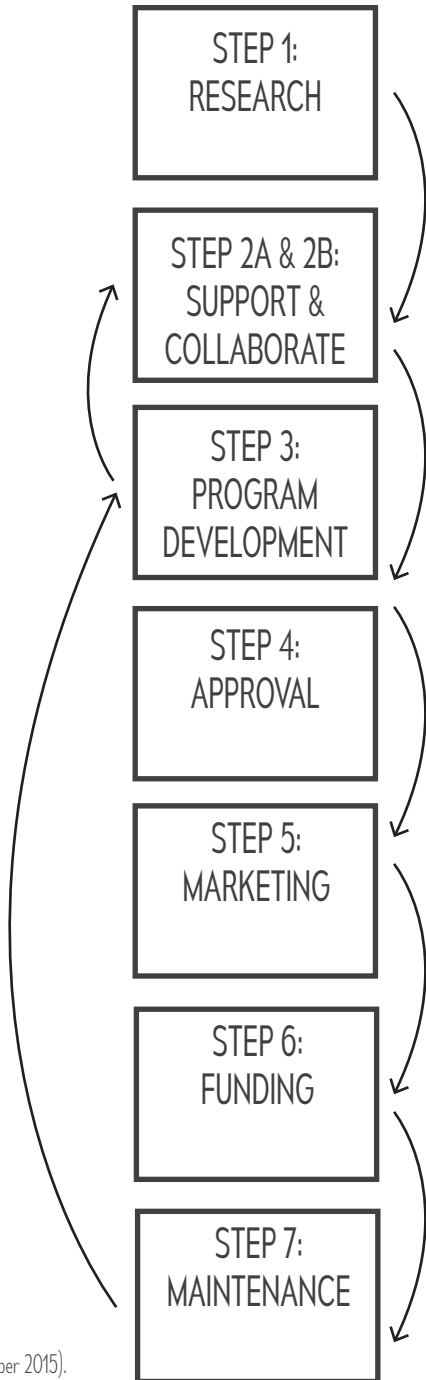


Figure 9.1 Implementation Plan

Certification programs must be maintained. This implementation plan is a reiterative process (Weber 2015).

CONCLUSIONS AND **10** | FUTURE DIALOGUE





A summary of contents found throughout the report are reiterated in this chapter. Limitations of the research are discussed and areas for future research are identified.

REPORT SUMMARY

Strengths

Landscape architectures' strengths distinguish the profession from allied professions. Strengths include being leaders, collaborators, having a comprehensive design process knowledge, storytelling skills, broad thinking, working at multiple scales (site to land planning), creativity, visioning, and problem solving.

Future General Trends in Practice

The future of landscape architecture is exciting! A majority of work will take place in the urban context with an emphasis in developing countries. Work in the suburban context must not be overshadowed by the urbanization movement. The use of technology in the design, research, analysis, and production processes is not going away. In fact, 3-D modeling, merging hand graphics with digital technology, and geodesign is going to become more prominent. Landscape architects will view the city in nature rather than viewing nature in the city. Processes and methods of doing landscape architecture will be reinvented. There will be an increase in dynamic cross-disciplinary collaboration opportunities compared to prior work. Skills and

knowledge related to creativity and imagination will be further developed, more landscape architects will engage in design competitions, and landscape architects will support design decisions with research and metrics-particularly in the areas of stormwater management, resiliency, methods, technologies for research/metrics, and scientific theories. It is vital that landscape architects increase their knowledge of the hard sciences to better understand natural systems and the materials inherent to the profession. Since most of the work will occur in the urban context, landscape architects need to have stronger engagement with policy decision-makers. Lastly, landscape architects will likely assume even more leadership roles among allied professions.

Future General Dilemmas Landscape Architects Must Address

Opportunities for landscape architects in the next twenty years exist in the infrastructure realm; especially bridges, drainage systems, green infrastructure at eco-district scale, street systems to accommodate multiple user groups and uses, and rehabilitation of existing buildings. It is important to recognize that infrastructure systems will be at a very large scale and that built infrastructure systems will slowly be replaced with natural system processes and infrastructure especially as some cities grow and others get smaller. As mature infrastructure systems near the end of their life expectancy, cities of all sizes face derelict infrastructure that must be redesigned, replaced, or repurposed. Funding from the federal government and private sector will drive a majority of this work. Due to changing demographics such as an aging population, an overall population increase,

and shifts in housing preferences, landscape architects will need to find creative solutions. Dilemmas in the urban context will be a primary concern such as food security, quality of life, and globalization of the marketplace. Landscape architects will be tasked with leading teams of people to solve these dilemmas. Issues related to climate change such as mitigation and adaptation strategies, renewable energy, disaster resiliency, coastal resiliency, fracking, global warming, and landscape disturbances will increase the demand for work. A majority of funding for this work will come from the federal government. Landscape architects will invest heavily into the "social landscape" to create social connectedness, regain cultural identity, spiritual connection to earth, and provide healthy and safe environments for people. Rural landscape work will increase especially as landscape architects begin to partner with agricultural professions.

Core Skills and Knowledge

This section will not restate the core skills and knowledge the profession because the list is so extensive. However, the significant point is that landscape architects need a firm foundation in over thirty categories of knowledge- spread across fourteen knowledge domains. As a profession, landscape architects must hone in on particular skills and knowledge at particular moments in time to be able to address dilemmas in the world. Certification programs can be a viable option to meet this need and provide flexibility and adaptability over time.

Research Inquiry

In summary, this report sought to begin to answer "How might the broad scope of landscape architecture work be categorized into a framework that creates opportunities of specialization for landscape architects?" At the end of this research, I have concluded that this is not a simple task. The profession is so complicated and there are lots of moving parts in this professional puzzle. However, this report sought to identify strengths of landscape architects that first emerged at the modern inception of the profession in the 1800s and still exist today. In addition, this report attempted to identify core skills and knowledge that must not be ignored when proposing new opportunities for specialization. Identification of these core skills and knowledge ensured that the proposal would supplement, but not replace the basic foundational structure that makes the profession what it is. Rather, certifications will provide extended opportunities to meet a future in flux by developing specialized expertise to address specific challenges. Last, an attempt was made to define potential certification areas and propose curricula and organizational methods for delivery to both graduate students and practicing professionals seeking "life-long" learning.

What is the right balance between maintaining the generalist strength of the profession, and developing specialized expertise to extend core strengths to meet upcoming challenges? In some cases, specialized expertise offered by landscape architects may lead to direct competition with experts in allied professions who have devoted extensive education (often PhD degrees) and years of highly focused experience on narrow subjects. Arguments could be made however, that the

diverse training of landscape architects enable them to recognize key issues and then synthesize solutions in the context of the bigger picture. Landscape architects combine the aesthetic eye of the architect, the technical pragmatism of the engineer, and the environment sensitivity of the ecologist. With this generalist nature ingrained into the profession, there is no reason to fear that landscape architects will become too specialized. It is not possible. The dynamics are too complex, the projects are too complicated, the skills and knowledge are too diverse.

LIMITATIONS TO RESEARCH

Content

There is a need to expand upon this topic due to the minimal amount of literature sources on this topic. This research topic is not as common of a topic compared to that of stormwater management, for example. Finding current literature on the topic proved difficult at times. This area of research would benefit greatly if there was more primary data gathered from the field, by which others could publish secondary data from. Existing primary and secondary literature on skills and knowledge in landscape architecture needs to be updated. The Landscape Architecture Body of Knowledge Survey (LABOK) is an example of a primary literature source needing an update.

The idea to conduct interviews was inspired after discovering the lack of primary data on this topic. Due to time constraints, eighteen professionals were selected to interview. This pool could be expanded to include twenty-five or thirty interview

subjects. In addition, it would have been ideal if all eighteen interview subjects responded to the interview questions. Since not all subjects answered the interview questions, not all opinions or ideas from all regions of the United States were represented. Respondents did not represent the East or the South regions.

Content collected from job postings, ASLA conference topics, reviewing landscape architecture programs of study via the internet, precedent studies of existing certification programs and online certification offering methods, and interviews represents a snapshot of the current profession of landscape architecture, with projected glimpses into the future. The collection of content was limited by the researcher's academic timeframe.

Methods

Methods relied upon resources available through the internet, printed studies/reports, and interviews with prominent academics and practitioners. Quantitative methods included compilation of data comparison tables and tabulations of degree offerings and other indices. The interview portion of the research was more qualitative in nature since the interview pool was rather small. After content was collected, it was quantitatively and/or qualitatively analyzed. It must be noted that interview analysis comes from the researcher's process and perspective. The audience can draw their own conclusions based upon reading the original responses to the interview questions, if they so desire.

Outcome

It is acknowledged that gaining specialized expertise in landscape architecture already occurs during the normal practice of the profession or through informal means. The depth of this experience varies on the rigor pursued by the individual and the project types or opportunities grasped. Extra time and effort is required in professional practice to document and communicate this gained knowledge, or in some cases, the knowledge is withheld for proprietary purposes. The proposed certifications presented in the report is one formalized way for the profession, as a whole, to advance the need for extended educational opportunities leading to specialized knowledge. Even so, certificates establish a minimum threshold of knowledge relative to agreed upon standards. Furthermore, this research identifies potential future areas of focus for landscape architects around which the profession can coalesce to set priorities and pool resources. The state of the profession and its relationship to allied professions is continually changing to adapt to emerging trends. Widespread certifications, endorsed by the ASLA and other organizations, can help keep landscape architects at the forefront in leadership positions.

FUTURE RESEARCH

The gathered data in this research is worth expanding upon. The most valued advancement would be introducing this topic to the national audience of landscape architects for expanding the discussion, receiving input from a wider range of academics and practitioners who may have different viewpoints, and validating (or

modifying) the recommendations. These steps would foster cooperation between academia (as the preparers) and practitioners (as the doers) toward a common goal of keeping the profession relevant in a changing context, and increasing influence among the allied professions. There are many existing landscape architecture organizations and professional practice networks who could devote thought, organizational resources and review, and funding to advancing the idea of certifications to supplement landscape architecture degrees. This could also be a mechanism for knowledge and skills acquired in professional practice to be cycled back to academia to shorten the learning curve of young landscape architects and keep content linked to the marketplace. For practitioners, the coursework involved with certifications would provide extended exposure to experts and resources in disciplines outside of landscape architecture. Certification courses could be a very synergistic environment.

CONCLUSIONS

The future of landscape architecture remains promising. The number of accredited landscape architecture schools is continually increasing. Demand for services is growing due to public and private funding sources and an increased awareness of what the profession offers by the general public. The profession is feeling the increasing momentum of opportunities coming our way. How will landscape architects choose to respond? Landscape architects need to step in as educated professionals and take responsibility of future socio-environmental dilemmas.

This is the time for the profession to take risks. Landscape architects need to reinvent what landscape architects know, expand on what landscape architects do know and step out of their comfort zone. Landscape architects have all the resources to be positive leaders for change; the question is "Will landscape architects choose to stay relevant or on the cutting edge of skills and knowledge to be equipped to step into leadership roles?" The profession needs landscape architects who have a generalist perspective as well as landscape architects who are on the cutting edge of issues in the profession. I look forward to the next twenty years.

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I APPENDICES





APPENDIX A- GLOSSARY

Allied profession - Other professionals that landscape architects regularly work with and who landscape architects initially evolved from. This includes civil engineers, horticulturists, architects and planners.

Breadth- The accumulation of continuously compounding skills and knowledge, type of work, scale of work, materials that landscape architects work with and people that landscape architects interact with since landscape architecture's implementation in the 1800s.

Generalist profession- A profession that requires people to be knowledgeable across a variety of subjects and know a little bit about a lot of information.

General public- Anyone who does not have formalized understandings of the landscape architecture profession.

Landscape architecture- Landscape architecture combines principles of art, science, and technology to analyze, research, plan, design, and manage natural and built environments creating a sustainable future for socio-environmental systems through conservation of natural resources; arrangement of land, space, and objects for useful, safe, efficient, healthful, and pleasant living environments (Purdue 2015; Newton 1981, xxi; ASLA Handbook of Professional Practice 1991, 19; ASLA Members Handbook 1).

Procedural knowledge- regards processes or methods that landscape architects use. It is the 'how' of the design process.

Profession- profession is a group of individuals who have gone through a process of specialized education, obtained skills and knowledge through academia, gone through training either on the job or training programs and have a set of ethics. Their skills and knowledge assets are then translated into social and economic rewards (Baird & Szczygiel 2007, 4; Merriam Webster; Cyprus 2004).

Specialization- Specialization is "the limiting of one's study or work to one particular area, or a particular area of knowledge and allows a profession to stay competitive and continue to make a profit" (Cambridge Dictionary; Baird & Szczygiel 2007, 3).

Substantive knowledge- is the context or concept of the design. It is the 'what' of the design.

Transformative or adaptive reuse landscapes- This type of work entails a landscape that previously functioned as something else but now exhibits ecological processes.

Trend- "a trend is a general direction in which something is developing or changing" (architecture newsfeed).

APPENDIX B- ACRONYMS

APA- American Planning Association

ASHS American Society for Horticultural Science

ASLA- The American Society of Landscape Architects

BLS - The Bureau of Labor and Statistics

CLARB - The Council of Landscape Architecture Registration Boards

CLF- The Cultural Landscape Foundation

EPA- The Environmental Protection Agency

IPCC - The Intergovernmental Panel on Climate Change

IRB - The Institutional Review Board

ISU- Iowa State University

KSU - Kansas State University

LAAB - Landscape Architecture Accreditation Board

LABOK - Landscape Architecture Body of Knowledge

LAF - The Landscape Architecture Foundation

LAM- Landscape Architecture Magazine

LARCP - Landscape Architecture and Regional & Community Planning

LEED- Leadership in Energy & Environmental Design

MLA- Master's of Landscape Architecture

PPN - Professional Practice Networks

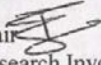
SITES- Sustainable Sites Initiative

WPA - Works Progress Administration

APPENDIX C- INTERVIEW DATA

TO: Howard Hahn
LARCP
102B Seaton

Proposal Number: 7527

FROM: Rick Scheidt, Chair 
Committee on Research Involving Human Subjects

DATE: 01/28/2015

RE: Proposal Entitled, "Understanding Specialization Opportunities in Landscape Architecture"

The Committee on Research Involving Human Subjects / Institutional Review Board (IRB) for Kansas State University has reviewed the proposal identified above and has determined that it is EXEMPT from further IRB review. This exemption applies only to the proposal - as written - and currently on file with the IRB. Any change potentially affecting human subjects must be approved by the IRB prior to implementation and may disqualify the proposal from exemption.


Based upon information provided to the IRB, this activity is exempt under the criteria set forth in the Federal Policy for the Protection of Human Subjects, **45 CFR §46.101, paragraph b, category: 2, subsection: ii.**

Certain research is exempt from the requirements of HHS/OHRP regulations. A determination that research is exempt does not imply that investigators have no ethical responsibilities to subjects in such research; it means only that the regulatory requirements related to IRB review, informed consent, and assurance of compliance do not apply to the research.

Any unanticipated problems involving risk to subjects or to others must be reported immediately to the Chair of the Committee on Research Involving Human Subjects, the University Research Compliance Office, and if the subjects are KSU students, to the Director of the Student Health Center.

your copy

TO: Howard Hahn
LARCP
102B Seaton

FROM: Rick Scheidt, Chair 
Committee on Research Involving Human Subjects

DATE: 02/05/2015

RE: Proposal #7527.1, entitled "Understanding Specialization Opportunities in Landscape Architecture."

A MINOR MODIFICATION OF PREVIOUSLY APPROVED PROPOSAL #7527,
ENTITLED, "Understanding Specialization Opportunities in Landscape Architecture"

The Committee on Research Involving Human Subjects at Kansas State University has approved the proposal identified above as a minor modification of a previously approved proposal, and has determined that it is exempt from further review. This exemption applies only to the most recent proposal currently on file with the IRB. Any additional changes affecting human subjects must be approved by the IRB prior to implementation and may disqualify the proposal from exemption.

Unanticipated adverse events or problems involving risk to subjects or to others must be reported immediately to the IRB Chair, and / or the URCO.

It is important that your human subjects project is consistent with submissions to funding/contract entities. It is your responsibility to initiate notification procedures to any funding/contract entity of changes in your project that affects the use of human subjects.

KURT CULBERTSON

–Chairman/CEO Design Workshop in Aspen, Colorado

1. Over the span of your career and leadership in the landscape architecture profession, what have been some of the major changes related to how landscape architecture is practiced? How have these changes influenced landscape architecture's interactions with architects, civil engineers, and planners?

The primary changes in the profession since I entered the field in 1976 are the importance technology plays in daily practice and the globalization of the marketplace. Neither in my view have materials impacted our interaction with architects, engineers, and planners other than to dramatically increase the pace of work. Technology has provided tremendous productivity boost but also accelerated the pace of work dramatically.

Secondly with practice becoming global there is no "quiet time" as you can often be on the phone or online with Europe and Middle East or the Far East/China early into the morning or late into the evening.

We are competing with firms and practitioners from all over the world now. We better be good at what we do.

2. In your opinion, what will be the core contributions of the landscape architecture profession to solve emerging dilemmas in the next twenty years? How do you think this will be accomplished?

I believe that landscape architects will contribute to ecological urbanism as opposed

to landscape urbanism) – not to integrate nature and cities in the next twenty years. This will include issues of resilience, climate change, water shortages, etc.

This will be accomplished as a continuation of current trends accompanied by rigorous research.

3. Do you think it is advisable for a young landscape architect to specialize in a niche of landscape architecture right after completing school? Why or why not?

I do not think this is a good idea. The profession is so broad and there are so many possibilities that a student can't possibly be exposed to all of the options which in undergraduate or graduate school. And I believe that to be an exceptional professional, you need to first be well rounded as one will encounter a wide range of projects in one's career. Secondly, over the course of a 40 year professional career, some project types will die out and decline as a market and even disappear. New project types and challenges will emerge. If one is well-rounded they can adapt to changing conditions and new challenges. Specialize too early and you risk becoming a dinosaur and irrelevant.

4. What specific skills and knowledge should be emphasized and taught in academia to better prepare young professionals to practice landscape architecture in the next twenty years?

Students need to be taught both creative and critical thinking skills. Often academic

KURT CULBERTSON –*Chairman/CEO Design Workshop in Aspen, Colorado*

programs gravitate toward one or the other. Yet design requires the ability to use both sides of the brain. One must have a solid foundation in design and planning process(es). One must understand how to do both site inventory analysis. Form-giving skills are essentially. Writing skills are essential. A basic understanding of research methods is useful. Programs should provide some basis skills in hand drawing. While photorealistic simulations are valuable presentation techniques they are not the only way to visualize and think about design.

Knowledge of particular programs like Autocad or GIS are valuable but not essential. Private practice can teach you software programs. It's much more difficult for us to teach you to think if you don't come with creative and critical thinking skills.

5. What type of specialized knowledge do you think landscape architects need to know to be able to lead or compete with architects, civil engineers, and planners in the next twenty years?

We don't always compete with architects, engineers, and planners. Many landscape architects are also planners (we, for example, consider ourselves to be both planners and urban designers). I'd say we just need to keep getting better and what we already know how to do. More rigorous critical thinking to accompany or creative efforts would be valuable. We now hire for leadership skills. Getting students out of the studio and into the larger society can help with this a lot. Focus on developing leadership skills.

6. Have you observed instances where landscape architects synthesize and pioneer new practice areas, only to relinquish the new territory to other professions who are more deeply trained in specialized disciplines? If so, please explain.

For much of my career, landscape architects planned major urban developments (master planned communities and new towns). While I cannot say that the profession pioneered the field (architecture also has a long tradition in this field), with the advent of New Urbanism, architects have reclaimed ground here. Few landscape architects have the skill set to also practice effectively as urban designers. Those that do perform well, but when projects become extremely dense they become architecturally driven and architects must play a key role as collaborators. Many landscape architects view architects (and civil engineers as the enemy). This is a silly and counterproductive point of view and reflects more on their own ineffectiveness than the difficulty in dealing with these other professionals. Engineers are learning more and more about green infrastructure (which is great) but I won't say that landscape architects have relinquished this territory.

7. Do you think there is a difference in describing landscape architecture practice in terms of project type versus services offered? Should specialization opportunities be more closely tied to project types or services offered?

I define landscape architecture as "any modification or conservation of any surface of the planet" so I think the field is quite large. I don't see a particular benefit in

KURT CULBERTSON –*Chairman/CEO Design Workshop in Aspen, Colorado*

describing the profession by project types (though we do describe to clients the types of projects we work on). There are project types we do today that didn't exist 40 years ago. So a project type definition of the profession seems obsolete from the very beginning. I would speak more to services or bodies of knowledge than to project types.

You seem obsessed with specialization (as if it a foregone conclusion that one should and will become specialized). Seems like a very 19th century view of the work (see Frederick Taylor). Landscape architect's greatest value (perhaps more than any other profession) is our ability to synthesize diverse and complex bodies of knowledge. Specialize (particularly too soon in your career) and you probably won't be very good at synthesis and that would be a shame (and a bad career move).

8. Where do you think the majority of funding will come from for the work we will do in the next twenty years? What type of work will this produce?

The majority of the funding for our work in this country (and in the majority of the world) will come from the private sector. In China (and other communist countries) the reserve may be true. The private sector in the United States is dramatically larger than the government sector and as a result I believe that most of our work will come on projects that deal with the built environment. No doubt there will be a great deal of work that also comes from the public sector (planning, parks, etc.) and

many firms will find the bulk of their practice there but the largest fee volume will lie with private sector projects.

Do you wish to further discuss your answers on the phone?

(Please circle a response. Note that this step is not required)

YES or NO Happy to talk further.

MARK FOCHT –*First Deputy Commissioner for Philadelphia Parks & Recreation; Immediate Past-President of American Society of Landscape Architects*

1. Over the span of your career and leadership in the landscape architecture profession, what have been some of the major changes related to how landscape architecture is practiced? How have these changes influenced landscape architecture's interactions with architects, civil engineers, and planners?

I've been practicing for 30 years. I worked in private sector for 10 years and the non-profit/ public sector for the last 17 years. I also taught as adjunct faculty for 21 years. Landscape architecture is increasingly playing a bigger and more aggressive role in decision making regarding environmental, infrastructure, non-vehicular transportation infrastructure, green infrastructure, storm water management, sustainability, and resiliency issues.

Landscape architecture's impact on built and natural environments is richer than previous decades. Thus, allied professions pay more attention to us and they appreciate the knowledge that we bring to the conversation as well as our leadership role. This has allowed allied professionals to be more open and accepting when collaborating with landscape architects.

Too often we think allied professionals don't understand us or can't partner with us. I, for the past year, tried to get landscape architects to stop moaning about our small numbers compared to the size of allied professionals. Sometimes it's all

psychological. If we think we are having a small impact, we will have a small impact. If we think we can't lead, we will not lead.

Landscape architects should be more aggressive. They should be promoting themselves and good things the profession can do. They should not accept anything less than a leadership role.

2. In your opinion, what will be the core contributions of the landscape architecture profession to solve emerging dilemmas in the next twenty years? How do you think this will be accomplished?

Inherently landscape architects are trained to be facilitators or consensus builders. There's something inherent in how we are educated- we look at the bigger picture and systems. We have a very systems based approach. We understand engineering and architecture even though we don't practice it. We are more trained and in tune with our sister professions than they are with us. Core contributions that we will make, that we are already making now but in an increasing amount, is a leadership role in solving complex problems.

This will be accomplished through training and educating ourselves in practice. Several years ago, landscape architecture was focused on sustainability issues. Sustainability has now been passed on by resiliency. With the growing amount of natural disasters, resilience is on the forefront of people's minds. Resiliency may

MARK FOCHT *–First Deputy Commissioner for Philadelphia Parks & Recreation; Immediate Past-President of American Society of Landscape Architects*

be a fad or something that's in passing but we have not been true to ourselves by educating ourselves about resiliency and taking leadership roles early on in the conversation. That's where we should be in the next decade or so.

Those of us that are attracted to landscape architecture are attracted to it because there are really complex problems that we get to unwrap and address.

3. Do you think it is advisable for a young landscape architect to specialize in a niche of landscape architecture right after completing school? Why or why not?

No, I do not believe a young landscape architect should specialize early on. There are two perspectives, however. It's different if you're talking undergraduate or graduate students. Undergraduate students should work for design firms- not design build- and really understand how things are built, grasp construction documentation, and get out in the field. Then when or if the opportunity arises to transition to a government, non-profit or academic job, you know how the 'real world functions'. Because our profession is always evolving, it always addresses the 'next big thing'. Every trend has a core foundation or basis in the basic principles of design, communications, planning, and client relationships. It's really important for young professionals to work for a design firm and get practical experience. Most young professionals in their early twenties do not know what they want to do when they grow up. If they focus on one area of landscape architecture too early on, there is a concern that they may leave the profession early on. Graduate students have

more life experience and have more of an idea of what they want to focus on and there's nothing wrong about pursuing an area of specialization.

It's also really important that landscape architects become licensed as soon as possible. We gain respect and grow power through licensure.

4. What specific skills and knowledge should be emphasized and taught in academia to better prepare young professionals to practice landscape architecture in the next twenty years?

Core skills in landscape architecture that students should achieve, accomplish, and perfect are written and verbal communications. The number one and number two characteristics that practitioners look for in young professionals is their verbal and written communication. A firm can teach a new hire how to do things and how the office works but there isn't time to teach someone how to be a good communicator. Practice presentations and step forward in leadership roles. In addition, poise and confidence are really importance for success both for each individual as well as the profession as a whole. You have to be able to communicate challenging dilemmas to people who need to be educated about it and to our peers who may be more advanced in the knowledge base. You have to talk to them in a way in which they will respect your opinion.

MARK FOCHT *—First Deputy Commissioner for Philadelphia Parks & Recreation; Immediate Past-President of American Society of Landscape Architects*

5. What type of specialized knowledge do you think landscape architects need to know to be able to lead or compete with architects, civil engineers, and planners in the next twenty years?

There is a trio of knowledge: sustainability, resiliency, and green infrastructure. They are closely related to each other. Most of the profession of landscape architecture is comfortable enough with these topics to a point where landscape architects can drive the conversation. They are overlaid and they relate to almost every issue we address. For example, when working with an architect or civil engineer to design a shopping center, we need to be able to talk about SITES, LEED, resiliency etc. There is an overarching understanding of the environment that we have that other professions don't bring to the conversation and it's our foot in the door; especially now where the public is more demanding and more conscious of society's impact on the environment. The public is positioning landscape architects to be leaders because we can answer those questions about how to interact with the environment in a sustainable way.

6. Have you observed instances where landscape architects synthesize and pioneer new practice areas, only to relinquish the new territory to other professions who are more deeply trained in specialized disciplines? If so, please explain.

Certainly there are engineering, architecture and landscape firms that talk

smack about each other. However, at the national level this isn't the case. Last year, I was invited to address the board of the National Society of Professional Engineers. They've never invited a landscape architect to their board meeting before. They wanted to hear what landscape architects were doing and how we do what we do. There's a growing awareness and respect for our profession among allied professionals.

The perception of competition is not on a national level so I encourage landscape architects to move past the idea of competition and rather to the role of collaboration. We need to stop thinking of them as the enemy because there is enough work out there for us to do. We need to acknowledge and respect what they know and they will acknowledge and respect what we know.

7. Do you think there is a difference in describing landscape architecture practice in terms of project type versus services offered? Should specialization opportunities be more closely tied to project types or services offered?

If talking to the public, its best to talk about project types because that's what the public can relate to. Landscape architects almost need to relate to project types to understand the breadth of the profession. When talking to our sister professionals about landscape architecture, talk about skill sets that we bring to a dialogue. It's best to offer our knowledge to a subject area when talking to sister professions and peers.

MARK FOCHT *–First Deputy Commissioner for Philadelphia Parks & Recreation; Immediate Past-President of American Society of Landscape Architects*

8. Where do you think the majority of funding will come from for the work we will do in the next twenty years? What type of work will this produce?

I don't think it's going to be any different from today. About 80% of the work done by landscape architects around the country is from the private sector. The remaining 20% work in a combination of other types. The major driver of our work will always be private sector work. Funding for that work doesn't necessarily come from the private sector. If working for a firm that works for developers, funding is determined by the sector. If work is conducted by the City of Philadelphia, it's mostly likely funded by public dollars. I don't see in the future that there will be much of a radical change in where funding comes from for the work that we do.

I always tell students, if looking to work for a private sector firm, always know who the client base of the firm is. The broader and more diverse the client base, the higher chance the firm will be able to more easily weather changes in economic cycles. If the firm's client based is 70% in one area, the firm will rise and fall with the strengths and health of that particular industry.

Do you wish to further discuss your answers on the phone?

(Please circle a response. Note that this step is not required)

YES or NO

(N/A Phone Interview)

FREDERICK STEINER – *Dean of the School of Architecture at The University of Texas Austin*

1. Over the span of your career and leadership in the landscape architecture profession, what have been some of the major changes related to how landscape architecture is practiced? How have these changes influenced landscape architecture's interactions with architects, civil engineers, and planners?

The profession has become increasingly urban as the nation and the planet have grown more urban. Over half the world's population now lives in urban regions. The field has needed to adjust in order to better address urban-based issues and concerns. As a result, there has been an increase of academic landscape architecture programs in cities (i.e. New York, Chicago, the Washington D.C. area Los Angeles, Austin, Saint Louis, and Cincinnati). Meanwhile, practice and education has become more global, e.g., especially in China and Korea.

There has also been an increase on the use of metrics to assess performance, e.g. LEED and the Sustainable Sites Initiative (SITES). All these changes require landscape architects to work more closely with engineers, planners, and architects, as well as environmental scientists.

2. In your opinion, what will be the core contributions of the landscape architecture profession to solve emerging dilemmas in the next twenty years? How do you think this will be accomplished?

Landscape architects will need to address the consequences of climate change. They

can accomplish this through developing strategies for mitigation and adaptation, especially in urban places. SITES might be helpful in this regard.

3. Do you think it is advisable for a young landscape architect to specialize in a niche of landscape architecture right after completing school? Why or why not?

That would depend on the individual's personal and career goals. Generally, depth in certain areas (such as, construction, planning, water, soils, or plants) helps one advance professionally.

4. What specific skills and knowledge should be emphasized and taught in academia to better prepare young professionals to practice landscape architecture in the next twenty years?

Critical thinking, design, good writing, SITES

5. What type of specialized knowledge do you think landscape architects need to know to be able to lead or compete with architects, civil engineers, and planners in the next twenty years?

More knowledge about the environment: ecology, plants, soils, and water. The other fields know relatively little about these areas. Strong presentation, communication, and writing skills are always assets for leadership.

FREDERICK STEINER – *Dean of the School of Architecture at The University of Texas Austin*

6. Have you observed instances where landscape architects synthesize and pioneer new practice areas, only to relinquish the new territory to other professions who are more deeply trained in specialized disciplines? If so, please explain.

SITES and Geodesign are possible current examples. Historically: highway design, campus planning, environmental planning, planting design, cemetery design, golf-course design, EIS, GIS, new community planning

7. Do you think there is a difference in describing landscape architecture practice in terms of project type versus services offered? Should specialization opportunities be more closely tied to project types or services offered?

Both are find depending on the circumstance

8. Where do you think the majority of funding will come from for the work we will do in the next twenty years? What type of work will this produce?

I think the biggest possible change is in the nonprofit sector. Public and private funding will probably more or less stay the same in terms of percentages but will hopefully grow in terms of amounts. Meanwhile, land trusts, conservancies, foundations, housing authorities, Friends of... organizations, environmentally oriented foundations, and watershed associations are likely to grow as both a percentages of work and as more significant funders. The resulting work will probably need to address broader public interest design considerations.

Do you wish to further discuss your answers on the phone?

(Please circle a response. Note that this step is not required)

YES or NO

STEVEN SPEARS –Chairman/CEO Design Workshop in Austin, Texas

1. Over the span of your career and leadership in the landscape architecture profession, what have been some of the major changes related to how landscape architecture is practiced? How have these changes influenced landscape architecture's interactions with architects, civil engineers, and planners?

I entered the profession in 1999 when technology was really taking off. People were still doing a significant amount of hand drawing. The design process was still very much driven by trace and overlays; models were built by hand and not by the computer like they are today. The transformation of what technology allows us to do is expansive. I don't think people have a good understanding of the design process because computers help dictate design. Some designers spend more time on producing presentation style renderings to cover up a bad design when they should be spending more time on the actual design.

2. In your opinion, what will be the core contributions of the landscape architecture profession to solve emerging dilemmas in the next twenty years? How do you think this will be accomplished?

Projects are becoming more complex. An urban project requires a much more sophisticated level of collaboration than a greenfield, for example. Design Workshop is working on a redevelopment project in Houston that involves soil remediation of the site. We had three or four consultants on the project to handle soil remediation aspects of the project. Collaboration will become more and more necessary due to

the increasing complexity of projects.

3. Do you think it is advisable for a young landscape architect to specialize in a niche of landscape architecture right after completing school? Why or why not?

Landscape architects have to continue to be mediators between architects, engineers and other design professionals. We are like an amoeba, or the space between, all of the other types of professions. We have many opportunities and flexibility to have a large sphere of influence on other professions because we think broad and holistically.

Specializing has to come into play just a little bit. For example, if we are going to have a conversation about the future of stormwater management design and construction, we have to know about stormwater management design and construction processes and methods to be able to talk about that. We need to talk not only conceptually how green infrastructure works but specifically how it works.

Landscape architects must be a generalist of scales. Meaning, we cannot be a specialist as a boutique landscape architect at site scale only. It is vital to think about scale at micro and macro levels. If working on a green infrastructure project, you're likely to work on a site specific scale but must also understand how the system works at a larger scale too.

STEVEN SPEARS –*Chairman/CEO Design Workshop in Austin, Texas*

4. What specific skills and knowledge should be emphasized and taught in academia to better prepare young professionals to practice landscape architecture in the next twenty years?

I feel that, we as a profession, have lost a piece of the conscious design process. We should be stronger in this area; particularly understanding the creative design process, compositional elements of design and design solutions in order to get the best results. For example, you may have a project that is sustainable and meets LEED stands but it may not look good because aesthetics were not considered.

This past November, I spoke at ASLA on planting design and I talked about planting design in terms of compositional elements and how that can be a tool to achieve good principles of design. Lisa from Oehme Van Sweden talked about design levels of planting design and Gary Smith talked about the artistic representation of planting design. The environmental enthusiasts gravitated toward the conversation because that's the big trendy theme today. The artistic perspective of thinking about planting design as a material hadn't really been talked or thought about before by practitioners.

Site design is a different discussion. We have a lot of good designers who are really creative on everything 1:50 or 1:100 scale but when tasked with designing something at 1:10 site scale, they freeze. It's not that people are getting taught less about design principles, it's just that the landscape architecture profession is getting

so diverse, it's impossible to teach students everything. What gets covered in a 5 year school curriculum?

Regarding technology, something's got to give. Technology wasn't part of the DNA of the profession back a decade ago, but it is now. One of the things that Ball State's undergrad program did when I was there, but they don't do any more is a final design studio requiring students to build a full mock-up of a piece of furniture. Schools don't get to that level of design anymore because there isn't time for it. Design Workshop designs most of our furniture on our projects; we rarely pick out furniture from a catalogue. We get to this level of design.

5. What type of specialized knowledge do you think landscape architects need to know to be able to lead or compete with architects, civil engineers, and planners in the next twenty years?

What I've seen at Design Workshop and other firms is that planting design isn't considered until the very end of a project. We need more people with planting design knowledge. Regarding collaboration, we need to collaborate with people who know soils that support our proposed planting designs. We have to know plants; it's something we have gotten away from. Getting the importance of collaboration into our thought process is a necessity.

STEVEN SPEARS –Chairman/CEO Design Workshop in Austin, Texas

6. Have you observed instances where landscape architects synthesize and pioneer new practice areas, only to relinquish the new territory to other professions who are more deeply trained in specialized disciplines? If so, please explain.

It seems like the more complex the project, the more knowledge you need to have. At Design Workshop, landscape architects assemble teams of people together who represent all varieties of knowledge platforms. Landscape architects are still taking on the role of master planning. We know enough about allied professions to know when they need to come on to a project and when they need to come off. We might not know the details of what each person's role will be, but at least we know they are needed. We are still the "go to" professionals when there's a very complex project at hand. Complex projects led by engineers is not really understood. Architects can lead complex projects at times but not to the extent a landscape architect can lead.

7. Do you think there is a difference in describing landscape architecture practice in terms of project type versus services offered? Should specialization opportunities be more closely tied to project types or services offered?

No, there isn't a difference to me. Oftentimes basic services for landscape architecture are crossed over multiple project types. A grading plan, planting plan, material schedule, dimensioning and layout plan, and construction observation services are always present and used. When talking about project type, we need to think about it as components of work that are 'ad-ons'. For example, when we

design a park, the first thing we do is go through a park programming exercise and ask "what should programmatically happen both permanently and event related in the park?" This question wouldn't necessarily be asked if designing a streetscape or a trail. Project types are kind of like AutoCAD's plug-ins and extension package options. With urban design and master planning there's a methodology to try to abide by but it can turn into a project. Landscape architecture is so encompassing this is a way to explain services versus project types.

8. Where do you think the majority of funding will come from for the work we will do in the next twenty years? What type of work will this produce?

I think infrastructure will be a major component of future landscape architecture. Infrastructure in the United States is generally in bad shape; bridges collapse, drainage systems fail. How can we make infrastructure more sustainable? The Greenstreets Chinatown project in Washington D.C. has a dilemma and the dilemma is that our infrastructure is starting to fail. A lot of it comes from WWII era, it was done in isolation of other infrastructure systems, or it was done by previous generation of engineers. Everything has a lifecycle to it and we are seeing that life cycle of 15-20 year old infrastructure systems coming to an end. We need to start looking at streets and the public right of way as having multiple functions such as greenstreets and complete streets. We need to start identifying that infrastructure projects have a purpose for all users whether it be commerce, environmental systems, habitat for migrating birds, stormwater infrastructure, moving bikes,

STEVEN SPEARS –*Chairman/CEO Design Workshop in Austin, Texas*

cars, people, and rail. Those are all user groups we need to design and think about holistically. If we don't, we end up with a situation in which we have isolated elements.

Infrastructure funding and public-private partnerships especially parks will be powerful future items at hand. Almost every park Design Workshop is working with across the country has a public-private partnership associated with it.

The future sounds promising for landscape architecture. It's an organization that continues to increase in popularity because people see the value in what we can bring to the table; especially as demographics are changing. My age group and your age group are changing the values of society today. My parents do not prefer to ride public transit. I'd ride it, you'd ride it. I don't want to live in the suburbs like my parents. A lot of things that are desirable to the public are things landscape architects work on. We are starting to do more vertical development than horizontal. It is an exciting future!

Do you wish to further discuss your answers on the phone?

(Please circle a response. Note that this step is not required)

YES or NO

N/A Phone Interview

JACINTA MCCANN *–Executive Vice President AECOM, President of Landscape Architecture Foundation*

1. Over the span of your career and leadership in the landscape architecture profession, what have been some of the major changes related to how landscape architecture is practiced? How have these changes influenced landscape architecture's interactions with architects, civil engineers, and planners?

I entered the workforce in 1981. I would say the fundamentals of landscape architecture really haven't change; techniques and issues have changed that have been galvanizing society. When I was going to school in Australia in the 1970's, the environmental movement was very strong. There were concerns of diminishing natural resources and the energy crisis was a big deal. There was also a real sensitivity to water issues and drought concerns.

In the early 1980's when I started to practice, there was a development in the appreciation of plant material and the value in establishing stronger ecologies using native plant material. As a result, there was an expansion of native plant materials being propagated.

Moving forward, a major influence to the way landscape architecture is practiced stems from technology; this can be from several angles. One angle is that technology can be a tool used to practice landscape architecture in the context of drawings, modeling etc. Technology has enabled the speed or examination of ideas and it has enabled the design process to be more creative in many ways. Within the last 10 to

15 years the knowledge base, due to Internet access, has expanded dramatically. Landscape architects can research, compare ideas, and share ideas in a different way. This has had an enormous impact on the way designers practice now. An idea that someone thought of somewhere in the world can be spread around the world extremely quickly due to the internet.

Enthusiasm and concern about sustainability of the world's resources has resurfaced in the last 10-15 years. As a result, more recent focuses centered on resiliency have come to light because of climate change and natural disasters. We can really encourage landscape architects to take a much more performative based approach to what they are doing. I think we can provide a renewed platform of common interests between engineers and landscape architects. Engineers are educated more toward management and drainage and landscape architects who are approaching projects from a grading and construction standpoint.

The best designers use technology in creative ways. Someone who is not an accomplished designer can do a very poor job of utilizing images pulled from the Internet. There have been great designers who existed before technology. It is easy to become fooled by graphic representation. A good looking design may not actually be a good design. The old approach of sketching by hand is still relevant. It takes time to develop and pick an idea. That investment of time is still needed and should

JACINTA MCCANN *–Executive Vice President AECOM, President of Landscape Architecture Foundation*

be integrated into technology. If someone is a good designer, they will use technology in effective ways.

2. In your opinion, what will be the core contributions of the landscape architecture profession to solve emerging dilemmas in the next twenty years?

How do you think this will be accomplished?

I would come at this by looking at major issues facing the world today such as water, water resources, climate change, housing, urban infrastructure, and demographics. I think landscape architects can be, and should be, very focused on cities and urban infrastructure. Meaning, we should be looking at different dimensions of cities and how people's lives can be positively impacted by the environments they are living in. The movement of people from rural to urban areas is a global change. We need to be able to deal with and think about these urban challenges at a city level, engage with other disciplines such as engineering, planning, and architecture, and coordinate ways to address these issues. Landscape architects need to be unique, be at the front, and be ready to lead.

3. Do you think it is advisable for a young landscape architect to specialize in a niche of landscape architecture right after completing school? Why or why not?

There are a couple of ways to look at this. There's the practitioner route, working as a landscape architect on projects that will help improve the world due to proposed

strategy planning techniques. There is a teaching route which is very important and critical. Research is another route.

I might be a little old fashioned, but I think when a landscape architect graduates, it is great to be in an environment where you can experience a variety of project types and scales. When getting out of school, there are some landscape architects who know they will never work on built work because they have other areas of interest. If you are a landscape architect interested in designing and seeing projects get built, then working in a firm with that environment is important. I think it takes somewhere between 4-5 years to be confident in all stages of a project from design to construction. I think it is valuable to work in all of the design phases.

People do tend to specialize after being in the profession. In my experience, it becomes clearer to find where your passion lies in about 4-5 years. For some people it may be larger scale work, smaller scale work, writing, or being able to articulate strategy and planning, etc. Ultimately everyone discovers a scale that works best for them.

One other thing that I think is valuable, which may not be for everyone, is going to another place in the world and experiencing practice in another environment. This is a good way to test your knowledge at that particular time. Working in another

JACINTA MCCANN *–Executive Vice President AECOM, President of Landscape Architecture Foundation*

cultural setting really makes you question why you do things. I always encourage people to consider working in another environment in their professional career.

4. What specific skills and knowledge should be emphasized and taught in academia to better prepare young professionals to practice landscape architecture in the next twenty years?

This answer is from a practitioner's standpoint, someone who works in a practice where we have landscape architects working on design and projects that will go into construction. In the future people will be able to easily find the answer to whatever question they may have due to resources of technology such as the internet. I think we should be asking what do you do with that gathered knowledge? How do you make sure you really understand the implications of detailing? That you understand reasons associated with choices of material? That you understand the nature of specifications?

Where I see gaps right now are in plant material. Landscape architects, in a lot of schools, aren't well versed in plant material and planting design. I think the basic tools of landscape architecture include plants and plant communities. This particular knowledge is very important. Clients expect landscape architects to know about plant material. The knowledge of natural sciences related to planting design such as soil, soil mechanics, drainage, structures, etc. give landscape architects an important

working knowledge or area of specialization that distinguishes us from other types of designers.

Another gap in skills or knowledge is communication or being able to present ideas clearly. The writing skills for a lot of landscape architects currently coming out of school are not where they should be. If I ask a landscape architect to write a letter, I don't usually see a grammatically strong or well written letter.

5. What type of specialized knowledge do you think landscape architects need to know to be able to lead or compete with architects, civil engineers, and planners in the next twenty years?

If landscape architects behave like they are in the lead, they are more likely to end up in the lead. I think a lot of landscape architects, who are really nice sincere people and do good work, are not as good as architects or engineers at putting themselves forward in conversations and leadership and taking risks associated with that.

At AECOM, there is a lot of respect between the disciplines. Particularly after people work with each other and see what each other can bring and what each other needs to bring to the table to accomplish a successful project. I think if a landscape architect behaves as a minor sub-consultant on a team, they will be the minor sub-consultant on the team. If the landscape architect behaves proactively and

JACINTA MCCANN *–Executive Vice President AECOM, President of Landscape Architecture Foundation*

contributes as much as other professionals on the team, you have a seat at the table where everyone respects you.

AECOM has close to 100,000 people. I very rarely feel like I am in a position in the room around the table on a project with my colleagues where I am not valued. In fact, my engineering colleagues understand that landscape architects are able to differentiate and communicate with clients in a very helpful way especially at the beginning of projects to help build strategy for projects. I enjoy working with the other disciplines especially architects and engineers. Everyone design professional their own style of how they work and communicate. You've got to be a hard worker. You've got to have something of value to add to the dialogue.

6. Have you observed instances where landscape architects synthesize and pioneer new practice areas, only to relinquish the new territory to other professions who are more deeply trained in specialized disciplines? If so, please explain.

Take green infrastructure as an example. The reality is that the actual design of systems involved is the engineers work. The landscape architect designs the cover or big picture and collaborates with the engineer so the engineering part of green infrastructure is very important. The way in which the value of the landscape architect is retained, in green infrastructure for example, is being able to help accomplish the "buy-in" from all the different agencies involved, the ability

to coalesce different points of view, and be able to enable the design using a very different approach to stormwater management. The landscape architect is the tip of the spear. The landscape architect has to be out in front, looking for the next opportunity and not be worried about the delivery. The engineers will deliver.

I think there are always going to be architects who think they can do a site design without needing a landscape architect; in some cases they can.

It is important to identify the value the landscape architect brings to a mix of different disciplines and make sure that happens seamlessly. There is a lot more blurring between disciplines today. I've seen more blurring in the last 5-10 years. At AECOM, there are a number of people who have landscape architecture and architecture degrees as well as civil engineers who have a landscape architecture degree.

I think one area of specialized knowledge is urban design. Urban design is a discipline where people tend to arrive at urban design from an architecture, planning, or landscape architecture background. Everybody claims urban design as their own- which is true, they can all do it. But each profession comes to urban design with slightly different points of view. I really like to see landscape architects, architects, and planners coexisting as urban designers. I think you get the best results that way.

JACINTA MCCANN *–Executive Vice President AECOM, President of Landscape Architecture Foundation*

7. Do you think there is a difference in describing landscape architecture practice in terms of project type versus services offered? Should specialization opportunities be more closely tied to project types or services offered?

That's an interesting question and again it depends on the audience. I like to talk about landscape architecture in the context of major issues or challenges that we are facing and the point of view that the landscape architect brings to each challenge. If you imagine sitting in front of a client for a project, the reason they want to talk to you is because they have a problem that needs to be solved or something they need to build or create. Clients are often concerned about particular issues such as environmental, social, or disaster resilience. I think it is good to describe landscape architecture in the context of relevant issues facing us today. We can talk about how a landscape architect can transform place, create a place, create better cities, create infrastructure or plan for infrastructure.

If you are talking to someone about what a landscape architect can do, again the description depends on the audience. With technical audiences like architects and engineers, who already have an appreciation for what landscape architects can do, I would talk to them with more emphasis on the planning and design processes and types of skills we can bring to projects. With an architecture firm, there may be a conversation about some of the initial analysis work we can do through analysis of sea level rise, feasibility and analysis studies, analysis through the design processes into construction, community outreach, technical visualizations etc.

For general audiences, a fairly simple definition of landscape architecture is a good approach. I would frame that around the public realm or the way in which we can make cities more livable and make healthier cities. Sometimes it is best to explain by way of example when talking to the public.

8. Where do you think the majority of funding will come from for the work we will do in the next twenty years? What type of work will this produce?

Federal funding in America is being directed to disaster resiliency and is going to be a continuing trend. Federal funding for green infrastructure is becoming stronger and funding for infrastructure, whether it is green infrastructure or maintenance and rehabilitation of existing urban infrastructure, is going to be important. There are really alarming statistics about crumbling road and bridge systems that America has. There is going to have to be significant money spent on the rehabilitation of urban infrastructure and work for landscape architects will come with that.

There is a debate going on right now regarding private sector work. Over the next 20 years in America people are debating how many more new high rise buildings will be built versus rehabbing existing buildings to meet changing demands and needs. I think there is a whole area of funding, still in the realm of infrastructure, that will potentially go to vehicles. Vehicles are going to change dramatically in the way they are engineered, what they run on, etc. and that will have implications on the capacity of roads. This creates a lot of work for landscape architects. There's always going to

JACINTA MCCANN *–Executive Vice President AECOM, President of Landscape Architecture Foundation*

be opportunities on a local level but this is a broader view of the possible direction of landscape architecture.

Do you wish to further discuss your answers on the phone?

(Please circle a response. Note that this step is not required)

YES or NO

(N/A Phone Interview)

BRUCE FERGUSON *—Franklin Professor of Landscape Architecture at University of Georgia*

1. Over the span of your career and leadership in the landscape architecture profession, what have been some of the major changes related to how landscape architecture is practiced? How have these changes influenced landscape architecture's interactions with architects, civil engineers, and planners?

No opinion.

2. In your opinion, what will be the core contributions of the landscape architecture profession to solve emerging dilemmas in the next twenty years? How do you think this will be accomplished?

No opinion.

3. Do you think it is advisable for a young landscape architect to specialize in a niche of landscape architecture right after completing school? Why or why not?

Yes, within a few years after graduation, as long as the niche is identified from what is actually seen to be demanded in practice, and is not a theoretical or wishful figment.

4. What specific skills and knowledge should be emphasized and taught in academia to better prepare young professionals to practice landscape architecture in the next twenty years?

1. Broad knowledge (natural sciences, social sciences, mathematics, art).
2. Broad communication (reading, writing, speaking, drawing).

5. What type of specialized knowledge do you think landscape architects need to know to be able to lead or compete with architects, civil engineers, and planners in the next twenty years?

I disagree with the question's assumption. Landscape architects should not aspire to lead or compete with related professionals; they should try instead to communicate and collaborate with them and with the larger society. The knowledge necessary to do this is listed in my response to question number 4.

6. Have you observed instances where landscape architects synthesize and pioneer new practice areas, only to relinquish the new territory to other professions who are more deeply trained in specialized disciplines? If so, please explain.

No opinion.

BRUCE FERGUSON *–Franklin Professor of Landscape Architecture at University of Georgia*

7. Do you think there is a difference in describing landscape architecture practice in terms of project type versus services offered? Should specialization opportunities be more closely tied to project types or services offered?

Specialization should be based primarily on services offered, as long as type of specialization is identified as described in my responses to question number 5. Project types in practice change from time to time; the fundamental types of services design needs, do not.

8. Where do you think the majority of funding will come from for the work we will do in the next twenty years? What type of work will this produce?

No opinion.

Do you wish to further discuss your answers on the phone?

(Please circle a response. Note that this step is not required)

YES or NO

REBECCA LEONARD *–President of Design Workshop in Houston and Austin Offices*

1. Over the span of your career and leadership in the landscape architecture profession, what have been some of the major changes related to how landscape architecture is practiced? How have these changes influenced landscape architecture's interactions with architects, civil engineers, and planners?

The Great Recession forced a long period of austerity. Landscape architects who characterized their work as mainly aesthetic suffered greatly. LAs who characterized their work as problem solving and creating solutions to social, environmental and economic ills survived and even thrived during this period. In the scenario where an LA is merely dealing with aesthetics, they are typically sub-consultants to architects or engineers. In the scenario where they are problem solving, they are often the prime consultants with architects and engineers working for them. Our Blue Hole Regional Park and Houston Arboretum and Nature Center projects are examples of this type of leadership I have expressed.

2. In your opinion, what will be the core contributions of the landscape architecture profession to solve emerging dilemmas in the next twenty years? How do you think this will be accomplished?

Population explosion, post-peak oil, global warming, severe weather conditions and divisive national and global politics ought to keep our profession busy for the next generation or two. We are the perfect leaders to bring together the technical experts needed to solve these challenges and the public that will have fears

and concerns about the future. We can use our comprehensive design process, storytelling skills and collaborative nature to educate the stakeholders, test ideas and create a thoughtful plan for implementation.

3. Do you think it is advisable for a young landscape architect to specialize in a niche of landscape architecture right after completing school? Why or why not?

I would not specialize. I would make sure that you continue to hone your skills and build your knowledge base in all facets of the profession. The challenges ahead are going to require that we be nimble as a profession. Can you quickly jump in and be helpful in a severe drought condition? Can you quickly jump in and be helpful if hurricanes, sea level rise and flooding become the norm? Can you communicate with the technical experts AND the public? Can you synthesize the information coming from a rather large body of experts into a vision for the future that is productive and inspiring? Can you understand public policy and its ramifications on the built world? Can you inform policy with real world design experience? If you answer, "no" to any of these, are you really doing everything you can do to help solve these pressing global problems?

4. What specific skills and knowledge should be emphasized and taught in academia to better prepare young professionals to practice landscape architecture in the next twenty years?

Design, planning, fine art, ecology, stakeholder facilitation, business and finance are

REBECCA LEONARD *–President of Design Workshop in Houston and Austin Offices*

important things to study. In addition, equipping students with emotional intelligence, passion, rigor and curiosity are essential to their long-term success in the field.

5. What type of specialized knowledge do you think landscape architects need to know to be able to lead or compete with architects, civil engineers, and planners in the next twenty years?

Landscape architects need facts and figures backed up by sound research to compete with engineers. Landscape architects need strong listening and synthesizing skills to compete with planners. Landscape architects need a creative process, strong story-telling skills and passion to compete with architects.

6. Have you observed instances where landscape architects synthesize and pioneer new practice areas, only to relinquish the new territory to other professions who are more deeply trained in specialized disciplines? If so, please explain.

In the past, there have been cases where we have lost some territory (parks and parkways seem like an example of territory formerly owned by LAs, but now led by recreation specialists and engineer), but there are some more recent examples that are at risk. Resiliency at a landscape scale for one. I think LAs were at the forefront of defining that movement, but risk losing ground to engineers and conservationists. We are seeking ways of keeping our leadership position on that topic.

7. Do you think there is a difference in describing landscape architecture practice in terms of project type versus services offered? Should specialization opportunities be more closely tied to project types or services offered?

As I've stated before, I am not a fan of specialization because of the broad set of needs to which our profession will respond over time. If one must specialize, I suppose the most legitimate way would be by project type. This would still allow the landscape architect to think at multiple scales and from policy to built-work, if only for a narrow set of project types. But, as I have alluded to before, it limits our profession's ability to transfer lessons learned in one project type to another. An example of this is that Design Workshop started out as a niche firm working mainly in mountain resort communities. In the 1980's when reinvestment in walkable urban environments was an emerging trend, the approaches used in compact resort destinations were directly transferable to urban environments. Design Workshop was quickly able to jump into urban markets and provide valuable experience.

8. Where do you think the majority of funding will come from for the work we will do in the next twenty years? What type of work will this produce?

I don't know about "majority of funding", but certainly a new funding partner for landscape architecture projects is the public health advocate. We are seeing public health dollars go towards walkable urban areas, parks and trail networks and urban forests.

REBECCA LEONARD *–President of Design Workshop in Houston and Austin Offices*

Do you wish to further discuss your answers on the phone?

(Please circle a response. Note that this step is not required)

YES or NO If you would like to clarify any of my answers, please don't hesitate to call me. Thanks!

APPENDIX D- KNOWLEDGE DOMAINS, SKILLS, AND KNOWLEDGE DATA

Appendix D includes skills, knowledge, and domain data collected from literature, job postings, and interview responses.

Appendix D: knowledge domains, skills, and knowledge data

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Domains	LABOK	Job Postings	Interviews	Existing Certifications	Proposed Certifications	KSU LARCP Courses
Communication & Visualization	determination of user values such as focus groups and surveys	team collaboration; 3	stakeholder facilitation		Advanced Graphics	
	consensus and team building	be able to sell a design/ idea; 1	communicate large complex ideas to both the public, who may know nothing about the topic, and to peers, who may be more advanced in knowledge			
	roles of visual communication, including photographic and video documentation	coordinate with team members; 2	hand drawing skills			
	interpretive methods and techniques like information on displays and brochures	assist with project management; 5	written communication			
	public relations, outreach, image development	anticipate & respond to client needs and develop client relationships; 2	verbal communication			
		team collaboration; 2	presentation skills			
		project management and team leadership abilities; 35				
		meet client needs; 1				
		interact & collaborate with client, consultants, allied professionals; 20				
		involved in local professional organization; 1				
		continuing education participation; 1				
		acquire new clients and develop existing relationships; 2				
		develop and cultivate new business; 2				
		recruit & retain employees; 1				
		oversee & mentor junior designers; 6				
		strong presentation skills and graphics; 16				
		oral skills; 29				
		written skills; 23				
		hand graphics; 25				
		computer graphics; 20				
		strong graphics; 15				

Domains	LABOK	Job Postings	Interviews	Existing Certifications	Proposed Certifications	KSU LARCP Courses
construction documentation and administration	quality control procedures for construction like delivery, storage, testing, supervision, observation	planting plan; 1				
	sequencing of design, approval, permit & construction activities	knowledge of construction budget & project schedules; 1				
	life cycle cost analysis process	oversee construction & planting installation; 1				
	geocoordinate systems & layout techniques & conventions	manage landscape construction activities; 1				
	specification types & components i.e. work orders, material lists, designs, basemaps for a project	knowledge of permit process; 1				
	general & supplemental conditions, special provisions & technical specifications & their organization	knowledge of cost estimates; 2				
	construction administration & details	create & manage business development plan or work plans/schedules for projects; 3				
	construction contracts	quality control procedures for construction like delivery, storage, testing, supervision, observation; 9				
	basic construction law	specification types & components i.e. work orders, material lists, designs, basemaps for a project; 1				
		construction administration & details; 6				
		construction contracts; 2				
		planting plan				
		permit process; 2				
		technical design knowledge; 5				
		implement & manage budgets; 2				
		prepare cost estimates & administrative tasks; 1				
		scope of services & fees; 2				
		construction details & technical specs; 28				
		construction documentation; 16				
cultural and social systems	social and cultural influence on design		social sciences	cultural landscape management	social landscape	

Domains	LABOK	Job Postings	Interviews	Existing Certifications	Proposed Certifications	KSU LARCP Courses
construction materials and implementation	biofiltration & other drainage methods	local horticulture knowledge; 4	plant materials		Plants	
	landscape maintenance techniques, materials, equipment, & practices	lighting construction methods; 1			Soils	
	erosion sediment & control	local horticulture knowledge; 11				
	construction equipment & technologies	construction methods; 1				
		construction materials i.e. hardscape, planting, water features, wood; 6				
design and planning theories and methods	human factors like behavior, perception, psychological, & sensory response	strong design skills; strong sense of design principles and methods; 22	design and processes	Hort. Therapy	Landscape Architecture and Agriculture	
	therapeutic aspects of design		planning design and processes	Sust.		
	natural factors such as ecological relationships		core design principles	Leadership in Sust.		
	research methods such as data collection, interpretation, & application of results		knowledge of research methods			
	relationship between human & natural systems such as resource conservation, habitat restoration, & creation & urban ecology					
	influence of context on design, planning, & management decisions					
	communication & education methods including sharing knowledge & evaluating outcomes					
	creativity & process including design theory & problem solving strategies					
	aesthetic principles of design					
	natural factors such as ecological relationships					
landscape architecture history and criticism	historic preservation principles		fine art	Landscape Studies		

Domains	LABOK	Job Postings	Interviews	Existing Certifications	Proposed Certifications	KSU LARCP Courses
	history of landscape architecture & allied professions			LA		
				Heritage Conserv.		
				Historic Preservation		
				Historic Landscapes		
landscape assessment and analysis	visual resource assessment	site analysis; 4	site inventory analysis			
	agricultural & rural landscape analysis					
landscape planning, design, management, implementation	urban landscape	urban landscape; 3	design both at large and small scales	Ecological Design		
	planning principles including regional community & neighborhood planning	community masterplanning; 1	site design abilities	Wetland Science & Mgmt		
	water resource management	residential work including high end; 1	planting design	Transportation Planning		
	wetland management	site design including streets, parks, plazas; 2		Urban Design		
	floodplain management	teaching experience; 1		Urban & Regional Design		
	conservation of natural resources	planning design; 4		Landscape Design		
	historic preservation	cultural attractions; 1		Sust. Comm. Plan. and Design		
	ecological planning principles	community masterplanning; 4		Native Perennial Garden Design		
	design needs for special populations	site design including streets, parks, plazas; 1		Sust. Urbanism		
	roadway design principles	large scale developments and condominium developments; 1		Planting Design		
	accessibility regulations	infill design; 1		Sust. Cities		
	noise weakening & mitigation techniques	stormwater design; 1		Sust. Design		
	sustainable construction practices	retail/mixed-use; 1				
	utility systems	thematic/resorts; 3				

Domains	LABOK	Job Postings	Interviews	Existing Certifications	Proposed Certifications	KSU LARCP Courses
	irrigation systems	amenity design; 1				
	lighting systems	urban landscape; 8				
	structural considerations	residential work including high end; 4				
		commercial design; 1				
		entertainment center; 1				
		irrigation systems; 2				
		lighting systems; 1				
		planting plan; 1				
		woodwork systems; 1				
		conceptual design; 9				
		planting design; 5				
		experience all phases of design—sd to cd; 9				
		masonry systems; 1				
		grading & drainage; 12				
measuring landscape architecture performance and impact			SITES		Research and Metrics	
			LEED			
natural systems	natural site conditions & ecosystems		ecology	Conserv. & Sust.	Water Resources	
	conservation of natural resources		natural sciences	Enviro. Sust.		
				Food Systems		
				Landscape Plants		
policy and governance	political and regulatory approval process	government policies & laws that affect use & development of land; 3				
	land & development economics	knowledge of construction, zoning, ordinances, industry standards, and building codes				

Domains	LABOK	Job Postings	Interviews	Existing Certifications	Proposed Certifications	KSU LARCP Courses
	emerging trends & issues	government policies & laws that affect use & development of land; 5				
	government policies & laws that affect use & development of land	knowledge of construction, zoning, ordinances, industry standards, and building codes				
professional practice methods, values, ethics	social responsibility in design		business and finance	Enviro. Ethics	Project Management	
	techniques for conducting meetings		emotional intelligence	Nonprofit Mgmt		
	organizational management principles such as leadership principles & landscape architecture career cycle		passion	Facility Mgmt		
			rigor			
			curiosity			
			poise			
			confidence			
			reading			
			creative skills			
			critical thinking			
social–environmental relationships	pattern of land use & built form			Enviro. Hazard	Infrastructure	
	regional hazard design conditions			Health Systems & Design		
tools and technologies; computer systems		AutoCAD; 46	computer programs	AutoCAD	Geodesign	
		Adobe Creative Suite; 33		GIS		

Domains	LABOK	Job Postings	Interviews	Existing Certifications	Proposed Certifications	KSU LARCP Courses
		Microsoft Office; 26	Geodesign			
		Sketch-Up; 44				
		Revit; 12				
		Photoshop; 16				
		Dynascape Manage; 1				
		3DS Max; 5				
		GIS; 11				
		Rhino; 7				
		BIM Systems; 1				
		3D modeling; 4				
		Microstation experience; 4				
		Master Spec; 1				
		InDesign; 8				
		Illustrator; 5				
		Google Earth Pro; 1				
		Land F/X; 2				
		Vectorworks; 1				
		Grasshopper; 1				
		GPS; 1				
		Quickbooks; 2				
		Web design; 1				
		Excel; 1				
		Civil 3D; 1				
		Lumion; 1				

APPENDIX E- CURRENT CERTIFICATION OFFERINGS

Appendix E: current certification offerings

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	AutoCAD	GIS	Ecological Design	Wetland Science & Mgmt	Transportation Planning	Urban Design	Urban & Regional Design	Landscape Studies	LA
Schools									
Auburn U.									
Arizona State U.									
U. of Arizona									
U. of Arkansas									
California Polytechnic State U., San Luis Obispo									
California State Polytechnic U., Pomona									
U. of California, Berkeley									
U. of California, Davis									
U. of Southern California									X
Colorado State U.									
U. of Colorado, Denver	X								
U. of Connecticut									
Florida International U.									
U. of Florida		X							
U. of Georgia		X							
U. of Idaho									
Illinois Institute of Technology									
U. of Illinois									
Ball State U.									
Purdue U.									
Iowa State U.									
Kansas State U. *									
U. of Kentucky									
Louisiana State U.									
Morgan State U. *									
U. of Maryland									
Boston Architectural College									

Appendix E: continued

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	Sust. Design	Food Systems	Planting Design	Native Perennial Garden Design	Landscape Plants	Hort. Therapy	Nonprofit Mgmt	Geodesign	Enviro. Hazard	Facility Mgmt	Health Systems & Design	Total sum of certifications per school
Schools												
Auburn U.												
Arizona State U.												
U. of Arizona												
U. of Arkansas												
California Polytechnic State U., San Luis Obispo												
California State Polytechnic U., Pomona												
U. of California, Berkeley												
U. of California, Davis												
U. of Southern California												3
Colorado State U.												
U. of Colorado, Denver												1
U. of Connecticut												
Florida International U.												
U. of Florida	X											3
U. of Georgia		X										6
U. of Idaho												
Illinois Institute of Technology												
U. of Illinois												
Ball State U.												
Purdue U.												
Iowa State U.												
Kansas State U. *												
U. of Kentucky												
Louisiana State U.												
Morgan State U. *												
U. of Maryland												
Boston Architectural College	X		X									4

	AutoCAD	GIS	Ecological Design	Wetland Science & Mgmt	Transportation Planning	Urban Design	Urban & Regional Design	Landscape Studies	LA
Harvard U.									
U. of Massachusetts									
Michigan State U.									
U. of Michigan									
U. of Minnesota **									
Mississippi State U.									
Washington U.									
U. of Nebraska									
U. of Nevada									
Rutgers, The State U. of New Jersey									
U. of New Mexico							X		
Cornell U. ****									
State U. of New York									
The City College of New York									
North Carolina A&T State U.									
North Carolina State U.						X			
North Dakota State U.									
Ohio State U.									
Oklahoma State U.									
U. of Oklahoma									
U. of Oregon			X						
Pennsylvania State U.									
Philadelphia U.									
Temple U.					X				
U. of Pennsylvania						X		X	

	Sust. Design	Food Systems	Planting Design	Native Perennial Garden Design	Landscape Plants	Hort. Therapy	Nonprofit Mgmt	Geodesign	Enviro. Hazard	Facility Mgmt	Health Systems & Design	Total sum of certifications per school
Harvard U.												
U. of Massachusetts												1
Michigan State U.												
U. of Michigan												
U. of Minnesota **												
Mississippi State U.												
Washington U.												
U. of Nebraska												
U. of Nevada												
Rutgers, The State U. of New Jersey												
U. of New Mexico												2
Cornell U. ****												
State U. of New York												
The City College of New York												
North Carolina A&T State U.												
North Carolina State U.												1
North Dakota State U.												
Ohio State U.												
Oklahoma State U.												
U. of Oklahoma												
U. of Oregon		X					X					4
Pennsylvania State U.								X				1
Philadelphia U.												
Temple U.		X		X	X	X						8
U. of Pennsylvania												2

	AutoCAD	GIS	Ecological Design	Wetland Science & Mgmt	Transportation Planning	Urban Design	Urban & Regional Design	Landscape Studies	LA
Polytechnic U. of Puerto Rico									
Rhode Island School of Design									
U. of Rhode Island									
Clemson U.									
U. of Tennessee									
Texas A&M U.					X				
Texas Tech U.									
The U. of Texas, Arlington									
U. of Texas, Austin									
Utah State U.									
U. of Virginia									
Virginia Polytechnic Institute & State U.									
U. of Washington				X					
Washington State U. ***									
West Virginia U.									
U. of Wisconsin, Madison									
Total Numbers	1	2	1	1	2	2	1	1	1
Total Percentages	2%	4%	2%	2%	4%	4%	2%	2%	2%

	Sust. Design	Food Systems	Planting Design	Native Perennial Garden Design	Landscape Plants	Hort. Therapy	Nonprofit Mgmt	Geodesign	Enviro. Hazard	Facility Mgmt	Health Systems & Design	Total sum of certifications per school	
Polytechnic U. of Puerto Rico													
Rhode Island School of Design													
U. of Rhode Island													
Clemson U.													
U. of Tennessee													
Texas A&M U.									X	X	X	6	
Texas Tech U.													
The U. of Texas, Arlington													
U. of Texas, Austin													
Utah State U.													
U. of Virginia													
Virginia Polytechnic Institute & State U.													
U. of Washington												1	
Washington State U. ***													
West Virginia U.												3.071428571	average number of certifications per school that offers certifications
U. of Wisconsin, Madison												33	different types of certifications
Total Numbers	2	3	1	1	1	1	1	1	1	1	1	43	total certifications
Total Percentages	4%	7%	2%	2%	2%	2%	2%	2%	2%	2%	2%	96%	percentage of each type of degree

Appendix E: continued

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54 do not offer certifications	0.205882353	21%	number of schools that offer certifications
		1.264705882	average number of times the same certification is offered

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* offers 5 yr MLA degree
** offers 1 yr MSLA
*** offers 3 yr MSLA degree
**** offers 1 yr MPS (M Prof. Studies) to advance career options related to planning, designing, and/or managing natural and built environments

APPENDIX F- CERTIFICATION PRECEDENT STUDY

	Prerequisites	Requisites	What is learned
Historic Preservation (4)			
U. of Florida	be a graduate student, initial application form	Master's students take 12 credits. Ph.D. students take 15 credits. Complete 9 credits off-campus in the summer at Preservation Institute: Nantucket or equivalent. Complete application that says certification requirements were fulfilled	breadth of topics in preservation as well as the fundamental characteristics of the field.
U. of Georgia	be a graduate student, have a graduate degree	18 credits	develop awareness of the contribution of historic resources to the quality of environments and life; build understanding of historic preservation needs problems, opportunities, and role citizens play in protection and ongoing role of historic resources; prepare students to volunteer and/or lead preservation efforts,
U. of New Mexico	be a graduate student, have a graduate degree; letter of interest, two letters of recommendation, resume, transcripts	18 credits	Combines historic preservation with contemporary planning and design approaches for engaging history, culture and place. History, theory, and professional practice of preservation, and regionalism; preservation technology, government cultural resource management practices; Critical Regionalism, New Urbanism, Smart Growth and Sustainability planning approaches; Adaptive re-use of and additions to historical buildings; Heritage tourism and cultural landscape planning; The roles of public history, art and annual celebrations in fostering community identity
Texas A&M U.	be a graduate student at Texas A&M; thesis/report must have a historic preservation focus; fill out certification application form	15 credits and 3 credits must be outside of student's major; include thesis/report with historic preservation focus	Theory and practice, other coursework related to preservation
Food Systems (3)			
U. of Georgia		18 credits	Environment and production, food and nutrition and culture, policy and decision making
U. of Oregon	graduate student, fill out certification application form	18 credits; take two courses outside of student's major;	allows students to develop a richer intellectual foundation than would be possible or practical outside the program; introduction to food studies; gain hands on experience through internship type work
Temple U.	recommendation from one faculty member	12 credits	investigate the complexities of food systems through an interdisciplinary approach that includes horticulture, planning, and public health. Students explore the relationship of farmland preservation, food production practices, and supply alternatives that improve local economies, reduce energy consumption, lower environmental impact, and ensure widespread access to affordable and healthy food.
GIS (2)			
U. of Florida	be a graduate student	no undergrad courses may be used to meet certification requirements	GIS fundamentals; geomatics; geostatistics; remote sensing and image processing; spatial analysis, modeling and decision making

Audience	Context in which certification is offered	Benefits of getting certificate	
Masters and Ph.D. students majoring in architecture, building construction, interior design, landscape architecture, urban and regional planning, museum studies, anthropology and tourism	Interdisciplinary across College of Design, Construction and Planning (landscape architecture is in this college)	transcript record; receive certificate	
any graduate student at UGA, individuals who have a master's degree	College of Environment + Design (landscape architecture is here)	receive certificate	
graduate students who have degree or are enrolled in architecture, planning, landscape architecture, history, American studies, anthropology, architectural history, communications and journalism, environmental studies or other related field; professionals with graduate degree	School of Architecture and Planning interdisciplinary program "Historic Preservation + Regionalism" (landscape architecture in this school)	receive certificate	
Students in any graduate degree program at Texas A&M U.	awarded certificate must be signed by the head of student's academic department and the dean of the college.	Center for Heritage Conservation through College of Architecture (landscape architecture is here)	receive certification; support career goals
all students	N/A	Department of Geography (landscape is in the College of Environment + Design)	
all UO graduate students	N/A	extension through UO Food Studies Program (landscape architecture is in School of Architecture and Allied Arts)	receive certification; hands on experience
undergraduate degree students; non-degree students	maintain minimum 2.0 GPA	Temple University- Ambler Campus School of Environmental Design (landscape is here)	
Graduates in any program in the School of Forest Resources & Conservation	N/A	School of Forest Resources & Conservation: Geomatics Program (Landscape Architecture is in the College of Design, Construction and Planning)	knowledge of GIS allows students to start at high salaries than non-GIS peers; receive certificate; recognized on transcripts

	Prerequisites	Requisites	What is learned
U. of Georgia	4 prereq courses competence in math through elementary calculus; elementary computer programming; elementary statistics; cartography; fill out application form	15 credits; post-baccalaureate students returning to get a certificate must take prerequisite courses if taken five years prior to the award date of certificate	Core courses teach structure and conceptual framework of GIS and electives allow students to further their interests related to GIS
	4 prereq courses competence in math through elementary calculus; elementary computer programming; elementary statistics; cartography; fill out application form	17 credits; post-baccalaureate students returning to get a certificate must take prerequisite courses if taken five years prior to the award date of certificate ; internship or GIS research project	Core courses teach structure and conceptual framework of GIS and electives allow students to further their interests related to GIS; internship or research project
Transportation Planning (2)			
Temple U.	grad student	12 credits	1) knowledge of the key contemporary transportation and travel behavior challenges facing transportation planners and engineers; 2) critical thinking skills to address these challenges and analyze important debates in the field; and 3) familiarity with and basic competence in transportation planning methodologies.
	professional, submit a standard form and copy of school transcript; take 9 credits as professionals then after completion of credits, apply for certification program,	12 credits	1) knowledge of the key contemporary transportation and travel behavior challenges facing transportation planners and engineers; 2) critical thinking skills to address these challenges and analyze important debates in the field; and 3) familiarity with and basic competence in transportation planning methodologies.
Texas A&M U.	grad student; apply for certificate program along with abstract of how their thesis relates to the certification; must have a 3.0 or better when applying	15 credits; thesis/report must focus on transportation	comprehensive, multi-disciplinary education and transportation planning. Multimodal Systems Planning, Transportation and Urban Design, Transportation and Public Policy, and Transit Management.
Urban Design (2)			
North Carolina State U.	graduate student, meet department prerequisites	15 credits	existing and emerging planning and design issues, challenges, and opportunities facing small to large communities and cities.
U. of Pennsylvania	enrolled in PennDesign in Architecture, City and Regional Planning, Historic Preservation, or Landscape Architecture, meet department prerequisites; academic standing, portfolio submittal and interview with program director	5 courses of credits	fundamental principles of urban design, how urban design is produced and implemented, the history and theory of urban design and an interdisciplinary studio emphasizing design as research.

Audience	Context in which certification is offered	Benefits of getting certificate	
undergraduate	maintain 3.0 GPA in courses related to certification;	Department of Geography (landscape is in the College of Environment + Design)	receive certificate in conjunction with undergraduate degree from UGA
graduate	Earn B or higher in classes relating to certification;	Department of Geography (landscape is in the College of Environment + Design)	receive certificate in conjunction with graduate degree from UGA
graduate students	N/A	Ambler, Harrisburg and Center City campuses. Department of Community & Regional Planning (landscape is in the School of Environmental Design)	
professions who have a degree	N/A	Ambler, Harrisburg and Center City campuses. Department of Community & Regional Planning (landscape is in the School of Environmental Design)	
Any graduate student at Texas A&M	N/A	in partnership with the Texas A&M College of Architecture (landscape architecture is here), the Texas A&M Transportation Institute, the Department of Civil Engineering, and the Bush School of Government and Public Service	receive certificate in conjunction with degree
Graduate student	N/A	interdisciplinary with Department of Landscape Architecture & Department of Architecture in the College of Design)	
students already enrolled at PennDesign in Architecture, City and Regional Planning, Historic Preservation, or Landscape Architecture	N/A	interdisciplinary with Department of Landscape Architecture & City and Regional Planning at Penn Design	

	Prerequisites	Requisites	What is learned
Historic Landscapes (2)			
U. of Georgia	be a graduate student, have a graduate degree	18 credits	concept of landscape stewardship, teach awareness that historic and cultural landscapes make to the quality of environments, foster understanding of historic and cultural landscapes and opportunities to protect landscapes,
Boston Architectural College	Meet BAC admission requirements	29.5 credits	prepares students to work in the areas of landscape design history, preservation, and the environment at the community, state, and national levels
Sust. Design (2)			
U. of Florida	initial application form and thesis/report approval form	12 credits, thesis/report (Must be related to sust design); take one course outside of major and one outside DCP	"sustainable architecture, sustainable construction, sustainable interior design, sustainable landscape architecture or sustainable urban planning; •Preventing environmental degradation •Restoring already degraded environments •Providing healthy living environments •Mitigating environmental impacts of construction •Enhancing community environments •Theories of sustainable design "
Boston Architectural College	Have a bachelor's degree, application form, resume, application fee, statement of purpose, prior education,	6 courses	Sustainable Design as a Way of Thinking, Urgent & Hopeful Future of Sustainable Design, four sustainable design electives

Audience	Context in which certification is offered	Benefits of getting certificate	
any graduate student at UGA, individuals who have a master's degree	N/A	College of Environment + Design (landscape architecture is here)	
students in BAC	Maintain 2.7 GPA or better in certification courses	The Landscape Institute which is an affiliate of Boston Architectural College (which landscape is apart of)	Certificate at completion of degree
students seeking graduate degrees in DCP; masters students in architecture, building construction, historic preservation, interior design, landscape architecture, and urban and regional planning	maintain minimum "B" in each course of certificate	Interdisciplinary across College of Design, Construction and Planning (landscape architecture is in this college)	
graduate students, professionals	Maintain "B" average	Sustainable Design Institute affiliated with Boston Architectural College (which landscape is part of)	receive certificate

KANSAS STATE UNIVERSITY

2015

Master of Landscape Architecture

Department of Landscape Architecture and Regional & Community Planning
College of Architecture, Planning and Design