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## Arrive, explore, reflect: the development and evaluation of a web-based program to introduce high school students to landscape architecture

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**ARRIVE, EXPLORE, REFLECT:  
THE DEVELOPMENT AND EVALUATION OF A WEB-BASED PROGRAM TO  
INTRODUCE HIGH SCHOOL STUDENTS TO LANDSCAPE ARCHITECTURE**

A Thesis

Submitted to the Graduate Faculty of the  
Louisiana State University and  
Agricultural and Mechanical College  
in partial fulfillment of the  
requirements for the degree of  
Master of Landscape Architecture

in

The School of Landscape Architecture

By  
Courtney Bailey  
B.F.A., Northwestern State University, 1996  
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## **Abstract**

The profession of landscape architecture has struggled with public perception since the mid-nineteenth century. Community programs, coloring books, and educational toolkits are just some of the methods employed in the profession's attempt to improve public perception. Very little research has been conducted to test the efficiency of these educational attempts. The goal of this thesis is to create a Web-based program to effectively educate young members of the public.

The program uses five "mini lessons" to present information about landscape architecture to the student. Links to the World Wide Web are scattered throughout the program to supplement lesson material. A "chat" is available for those students interested in communicating with a professional landscape architect. To assess the effectiveness of the program, information is collected from answers submitted by student users from within the program. From a total of sixteen questions, twelve are modeled after Bloom's Taxonomy to provide an analysis of student comprehension. The remaining four questions allow the student to express opinions and suggestions for program improvement.

Although little literature exists that explores the evaluation of a Web-based educational landscape architecture program, surveyed literature does suggest its potential success. This study suggests that students can effectively learn about landscape architecture through use of such a program. This Web-based program can be used as an initial step in the development of more sophisticated Internet-based methods of educating high school students or the general public about the profession of landscape architecture.

## **Chapter One: Introduction**

### **Background**

The profession of landscape architecture is well aware of the need for increased, more effective promotional efforts to improve its public perception. The American Society of Landscape Architects (ASLA) and its state chapters have attempted to engage the public with various programs to create awareness of the profession. Public awareness of landscape architecture may result in increased employment of landscape architects and public consideration of landscape architecture as a career. A challenge is how to most effectively educate the public to increase awareness of the profession. One solution that many ASLA chapters have pursued is educating the public at a much younger age. These chapters have developed coloring books, educational toolkits, and cooperative programs as promotional media to increase awareness and involve youth in hypothetical landscape architecture projects.

### **Problem Statement**

The ASLA has recognized the communicative potential of the Internet. The ASLA has developed a national website ([www.asla.org](http://www.asla.org)), electronic newsletters, and has posted many of its publications online. However, the current ASLA website is lacking in educational material appropriate for adolescents. The high use of the Internet (or more specifically the World Wide Web) by American children for educational purposes, the Internet's versatility and accessibility, and the desire for the ASLA to reach a younger audience, suggest a need for a Web-based educational program for adolescents to learn about landscape architecture.

## **Scope**

This thesis focuses on the development and evaluation of an application to expose high school-aged adolescents (ages approximately 15-18) to landscape architecture.

Thirty-three students enrolled in the LSU University Laboratory School tested the program and were assumed to have a basic understanding of computer and Internet usage.

The program consists of a series of “mini-lessons” supplemented by World Wide Web (WWW) links and live chats with landscape architects. This program was preceded and followed with a questionnaire inquiring the students’ awareness and knowledge of landscape architecture, and their opinions of the program.

## **Objectives and Approach**

The main objectives of this thesis are the development and assessment of a Web-based program to educate young individuals about landscape architecture. The following outlines additional objectives and methods in the creation and evaluation of this program.

The first objective is to establish need for greater public awareness of landscape architecture. Existing literature and critical opinion discuss contributing factors to the public’s perception of landscape architecture and suggestions for its improvement. This discussion suggests both a professional interest in and need for improving public awareness.

The next objective is to examine the ASLA’s efforts in introducing landscape architecture to the public, specifically to young adults. By exploring various programs instigated by the ASLA and its chapters, the need for more accessible and evaluative programs becomes evident.

Understanding how Web-based programs affect an individual's ability to learn is another critical step in the program's development. Establishing the advantages and disadvantages of digital media will provide a clearer understanding of what should and should not be integrated into the program to maximize its effectiveness.

Another objective of this thesis is to determine basic learning strategies. The theories behind learning styles are explored to prepare for appropriate content organization and visual layout of the program. This information provides a better understanding of how the educational potential of a Web-based program is affected by learning style.

A primary study objective is the development of a Web-based program to educate high school students about landscape architecture. Through exploring brief lessons, respondents are presented with information concerning how people, places, time, communication, and ideas are affiliated with landscape architecture. Respondents may choose to enhance information provided with WWW links, graphics, and live chats with landscape architects.

One of the main objectives of this thesis is to evaluate the program through questionnaires, observations, and tracking software. Study participants will be asked to complete an initial questionnaire concerning personal information, landscape architecture awareness, and perception of landscape architecture. Another questionnaire at the end of the program will help to determine how students utilize the program, what they have learned from the program, and what general reactions they have to the program.

Student observation and tracking software will supply information not obtainable through questionnaires. Observations will note any behavior among the students that

may denote frustration, enjoyment, or boredom with program use. Tracking software will monitor student activity such as links visited, and frequency of visitation, and length of program usage.

Questionnaire evaluation and observation of students ultimately determine specifics of the application such as its ease of use, clarity of content, and perceived strengths and weaknesses. This information can be used for the possible development of a more refined program in the future.

The goal of this thesis is to determine the potential of a Web-based program in educating adolescents about landscape architecture. If successful, this application could serve as a model for similar educational programs for different age groups and various professions. Use of this program could eventually strengthen the profession of landscape architecture by leading children or their parents to employ a landscape architect or to consider landscape architecture as a career.

The following chapter discusses literature associated with the public's image of landscape architecture, previous attempts at increasing public awareness of landscape architecture, Web-based training, media and learning, and learning domains and modalities. Chapter three narrates the study methodology in greater detail. Chapter four analyzes the results of the study's questionnaires, observations, chat room, and tracking software. Chapter five draws conclusions and recommendations based on study results.

## **Chapter Two: Literature Review**

This thesis found no research directly pertaining to the development of a Web-based application to introduce high school students to landscape architecture. Therefore, it is necessary to survey a cross section of literature to understand various factors influencing this thesis study. The following literature review covers the public's perception of landscape architecture, the profession's attempts to educate adolescents, Web-based training, media and learning, and learning associated with Web-based training.

### **Landscape Architecture and the Public**

“... That which chiefly limits success in our profession is the fact that so few know that landscape architecture is a matter in which professional services is very desirable and payment for it is profitable.”

Frederick Law Olmsted, 1889 (qtd. in Wood, 1974, p. 5)

“Landscape architecture continues to fight defensive actions in that practitioners spend too much time explaining the profession.”

Patrick Miller, 1997 (Miller, 1997, p. 68)

As reflected in the preceding quotes, the relationship between the public and landscape architecture has been a topic of major concern spanning the duration of the profession. Improving public perception of the landscape architecture profession is essential to its success. The more that members of the public are aware of landscape architecture, the greater the possibility of their hiring a landscape architect or entering into the profession themselves. This ultimately strengthens the viability of the profession, increasing the need for more landscape architects and professors of landscape architecture.

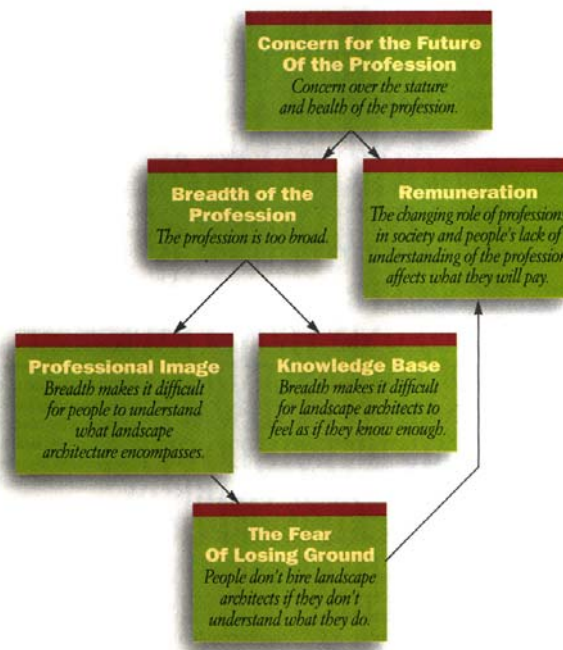
In a survey of Fellows of the ASLA in spring 1996, the “image of the profession” rated number one in “the most pressing issues facing the profession today” (Miller, 1997, p. 68). Concern over the public perception of landscape architecture has seemingly changed little since the profession’s inception in the mid nineteenth century. Considering the duration of this concern, there is a surprising lack of literature that empirically states how the public perceives the profession. However, there is literature that explores possible factors contributing to the public’s unclear perception of landscape architecture and methods to improve this perception. This literature establishes initial framework on which to focus for the development of a tool to educate public members about landscape architecture.

Some critics suggest that the profession’s self image and breadth of scope are to blame for the public’s difficulty in understanding landscape architecture. In December of 1999, practicing landscape architects submitted their opinions concerning what challenges the profession would face in the upcoming century. Most responses focused on the profession’s responsibility for environmental stewardship. “But before we can deal with that issue,” Kim A. O’Connell writes, “the profession must once and for all claim ownership of its importance and crystallize its self image” (O’Connell, 1999, p. 126). Landscape architects continually struggle with the issue of their significance both to society and to themselves (Marshall, 1986, p. 121). If landscape architects have difficulty clearly defining their importance to society, the public may likewise.

The diversity, or breadth of scope, of landscape architecture is another major factor in the public’s confusion concerning landscape architecture. Many landscape architecture programs offer such varied courses that the student of landscape architecture



becomes a “jack of all trades” rather than a specialist in a chosen area of landscape architecture. This general knowledge of many topics often results in the landscape architect searching to learn more in hopes of becoming specialized in a particular subject area. The landscape architect’s seemingly endless search for specialized knowledge contributes to his/her inability to define his/her self-image (Figure 2.1).



**Figure 2.1. Cycle of Most Significant Issues Facing Landscape Architecture. (Miller, 1997, p. 69)**

In his article “A Profession in Peril?” Patrick Miller suggests looking at architectural literature for ideas to improve landscape architecture education (p. 70) to help reduce confusion over the role of the landscape architect. One such article suggests three professional models that could be adapted for use by architecture: the engineering model, the legal model, and the medical model (p. 71). Through evaluating these models, Miller explains that a variation on the medical model would be most appropriate for the profession of landscape architecture (p. 86). Landscape architecture would have both

“general practitioners” and “specialists” in the profession, or a common degree from which a specialized degree can stem (Wells, 1998, p. 82). In this “general practitioner/specialist” model, a reevaluation of existing landscape architecture curricula would be necessary to ensure a solid, consistent foundation of knowledge throughout landscape architecture programs. Miller suggests that specialization could then occur with a certification process directed by an organization such as the ASLA (p. 88).

Others suggest that to improve the public’s perception of landscape architecture, a more direct approach with the public is needed. Christine Anne Wood suggests that the landscape architect use the “extended garden metaphor” to increase the public’s awareness of landscape architecture (Wood, 1992, p. 8). She argues that instead of resisting the public’s typical affiliation of landscape architecture with gardening, that the profession should embrace it (p. 7). By using the familiar garden icon, the profession could educate the public by discussing the “complex nature of the garden” and the “global earth garden” (p. 8).

Through surveyed literature, this thesis identifies and helps address the need to clarify the perception of landscape architecture in both the public and the profession itself. As the profession of landscape architecture attempts to educate the public, it may be required to define its responsibilities and role in society. The profession has endeavored to communicate with the public through several programs. The following section explores programs focused on the education of a younger public population.

### **Landscape Architecture and Youth Education**

In his article, “Implosion or Recession,” Jot Carpenter reports data demonstrating diminishing numbers of practicing landscape architects from 1997 through 2019 (p. 54).

The numerous influences of this projected decline in the workforce are not within the scope of this thesis. However, it is important to note that this study does encourage the profession to be prepared for a “worst-case scenario.” Recruiting landscape architects before college may assist in strengthening the work force.

Several state chapters of the ASLA have focused on educating school-aged children through the distribution of educational material in the school system. These chapters use this material as “... a vehicle to approach schools and to leave with students a reminder of the profession and its many components” (Hammatt, 2001, p. 16). The North Carolina state chapter of the ASLA has produced a coloring and activity book showing landscape architects participating in a playground’s redesign. “Chirpie” (Figure 2.2), the main character of the Illinois state chapter’s coloring book, accompanies his



**Figure 2.2. Illinois Chapter of ASLA Coloring Book.**

mother, a landscape architect, to discover her responsibilities at work (Speckhardt, 2002, p. 60). The Arkansas state chapter has also participated in educational efforts by creating a “toolkit” for 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup> graders that includes a coloring book, a Power Point presentation, and presentation board to bring to community schools (Trainor 2003). Ellen

L. Trainor, the Arkansas ASLA chapter president, stated that the educational toolkit was “highly effective” with children and teachers giving “positive feedback” (Trainor 2003). Although not available for further comment, Ms. Trainor does convey the idea that educational programs such as her educational toolkit can be used with great success.

Although not directly affiliated with the ASLA or the public school system, it is interesting to note that even the Boy Scouts of America (BSA) is involved in the promotion of the profession. The BSA awards a merit badge in landscape architecture (Figure 2.3) to those who complete such tasks as developing a planting plan, instructing others on reading a topographic map, or sketching a yard (Speckhardt, 2002, p. 65). As of 2002, approximately 55,000 badges had been awarded including 2,830 in 2000 alone (p. 65).



**Figure 2.3. Boy Scouts of America Landscape Architecture Merit Badge. (Speckhardt, 2002, p.65)**

These programs seem to show much merit in increasing awareness in children and inspiring them to imagine a career as a landscape architect. It may be of benefit to the profession to expose children of all ages to landscape architecture. However, with their approaching graduation, older children in high school face the reality of choosing a career path. High school students must be aware of the profession before they can consider it as an option.

Children and young adults are typically unaware of landscape architecture as a lucrative and challenging career option (Speckhardt, 2001, p. 56). “We have to get the word out to young people as to what landscape architecture is all about. Internal recruitment goes on (in college), but we need external recruitment in high school,” says Dan W. Donelin, FASLA (p. 57). John L. Motloch states that when students at Ball State’s College of Architecture and Urban Planning are presented with the three options of architecture, landscape architecture, and urban planning, a significant number of students choose landscape architecture (p. 56). Motloch could not be reached for further explanation on why students chose landscape architecture, but his research encourages further thought concerning the reasons why more students chose landscape architecture. Of three suggested actions to increase the work force, Motloch states, “The first is to raise the level of awareness among high school students about landscape architecture as an urgently needed and exciting career path” (p. 57). These comments suggest a definite interest in landscape architecture in the young public when exposed to it.

Some ASLA state chapters and independent organizations have developed cooperative programs to expose high school students to landscape architecture. The Colorado Chapter of ASLA has developed the program “Landscape Architecture in Schools” which encourages chapter members to “adopt” high schools. By adopting a high school, the landscape architect promises to purchase a subscription of *Landscape Architecture* magazine for the school’s library, educate the school’s guidance counselor on the profession, and attend career days (Speckhardt, 2002, p. 63).

Gifted South Carolina high school students may choose to attend a two-month summer program at the Governor’s School of South Carolina at the College of

Charleston. Lolly Tai, a professor of landscape architecture at Temple University Ambler, incorporates landscape architecture, urban design, and architecture into the program's design class. While in the program, students have the opportunity to visit local firms of varying sizes to get a feel for different work environments. Based on their positive experience in this class, several of the participating students chose to study landscape architecture after graduating high school (p. 104).

Other programs like the national Learning for Life's Exploring program and the Portland Regional Arts and Cultural Council bring together landscape architects and students. These programs involve students working with landscape architects on either hypothetical or real design projects to give students a more thorough understanding of the profession's scope and responsibilities (p. 104).

In "LA Evangelists," Lisa Speckhardt identifies the lack of research in evaluating these programs. She writes, "What's missing is a way for the people participating in outreach efforts across the country to communicate – to find out what's working and what's not and how best to get kids excited about landscape architecture" (p. 62).

Analysis of literature demonstrates that although educating children of all ages can be beneficial, focusing on exposing older adolescents to landscape architecture may be of greater interest to the profession. However, this exposure would be of more benefit if educational efforts could be evaluated to determine their strengths and weaknesses. Web-based training (WBT) is a method of education that can easily be evaluated and could serve as a model for landscape architecture's future educational endeavors.

## **Web-Based Training**

Statistics establish that the Internet is quickly becoming the most widely used media among children in the United States. In a report by the Corporation for Public Broadcasting, results indicate that children spend approximately 3.1 hours per day watching television and 2.9 hours per day using digital media such as the Internet, video games, and computers. Nearly 66% of American children between the ages of 2 and 17 used the Internet in 2002. The study results also indicate that the children's utilization of the Internet is primarily for educational activities (Corporation for Public Broadcasting 2003).

Web-based training is a type of Internet-based learning that allows the student to utilize the World Wide Web for educational resources and to communicate with fellow students or instructors through chat rooms or emails (Connelly et al., No date.). WBT is often used by businesses to train their employees, by schools to provide children with supplemental information and missed homework assignments, by universities for online coursework, and by software developers for online tutorials.

In his article, "Using the Web for Learning: Advantages and Disadvantages," Kevin Kruse discusses the "pros" and "cons" of WBT (Kruse 2002). One of the many advantages of WBT is that there is no need to distribute physical material – material may be printed out at the student's leisure. An instructor can make instant changes to online material and add new material daily. Any WBT program has the potential to access databases with massive amounts of information, can be accessed at virtually any time, and can enable the user to communicate through chat rooms, e-mail, and discussion groups. Users on opposite sides of the globe can easily communicate with one another

while learning about the same topic. Provided that the student has the desire and time to learn, s/he can continue to explore the program and its additional resources. This exploration can be tracked with the use of specialized software. Specifics such as pages visited and length of visitation can easily be noted without the use of questionnaires or observations. Web-based training supports a variety of media types including video, images, and sound. Finally, WBT can make learning easier and fun for the students through customizable interfaces.

As with any media, there are also disadvantages to a WBT application and use of the Internet. Kruse mentions that WBT does not offer the personal human contact of the traditional classroom setting. This disadvantage can be overcome if the WBT's email and chat rooms are used as supplemental forms of communication. Another disadvantage is that student users must be familiar with computer and Internet use to fully utilize WBT. Students must also have access to a computer that is powerful enough to process the WBT program.

The development of a WBT application has many considerations. The North Central Regional Educational Laboratory warns about "using technology for technology's sake" and that clear, concise educational goals must be set prior to the development of any technological educational program (Connelly et al., No date). Special attention must be paid to the user – his/her manner of learning and his/her purpose of use (Juvina et al., No date).

A major flaw in many WBT applications is that they are mainly geared toward the dissemination of information. In a traditional learning environment, the immediate interaction between the teacher and the student is valuable. For an application to be as



effective as a traditional learning environment, it should demand some interaction from the student. “Students are motivated by interacting with programs when they can influence the outcome of the activity,” says Douglas H. Clements, an education professor at New York State University (Archer 1998).

### **Media and Learning**

There is a debate concerning whether media type affects an individual’s ability to learn. Some critics argue that assessing a program based on media type is useless, since media type is merely a method of delivering content. Others add that a program’s success is dependant more on factors such as the program content, program design, or the particular learning style of the individual. However, sources do exist which imply a definite improvement in learning through the use of digital media such as computers and the Internet.

Richard E. Clark is one of the many critics assessing educational potential of media types. He states that media are “mere vehicles that deliver instruction but do not influence student achievement any more than the truck that delivers our groceries causes changes in our nutrition” (Clark, 1983, p. 445). He argues that it is the method of instruction, not the media that influences learning.

Challenging Clark’s viewpoint on the weak relationship between media and learning is Robert B. Kozma. He states that if no direct relationship between learning and medium has been found, one can only *assume* that there is no relationship (Kozma, 1994, p. 7). He implies that this relationship has not yet been established, but may indeed exist. He continues by insisting that previous studies have failed to find this relationship due to their inability to specify learning’s cognitive, affective, or social processes and the

specifics of media that may influence these processes (p. 8). He states that with media such as the Internet, “students potentially have many more opportunities to connect new information to their current knowledge structures” (Kozma, No date).

Despite this debate over media’s link to learning, Jerald G. Schutte of California State University reported a definite improvement in students who had used an online course. He divided his statistics class into two sections, teaching the first half of the class “face-to face” and the second half of his class via the Web. On both the mid term and the final exam, the Web-based class tested significantly higher (McCollum, 1997, p. 23). The individuals utilizing this online course were at a slightly higher age than this thesis’s study group; however, Schutte’s study does demonstrate the potential of the Internet to be a more effective form of education.

### **Web-Based Training - Learning Domains and Learning Modalities**

The scope of children and learning is very broad. A child’s age, gender, ethnicity, nationality, personal background, and learning atmosphere are only a few of the factors that may affect his/her ability and manner of learning. Due to the extensive scope of learning, numerous educational perspectives have developed with differing focuses. The following briefly discusses the concept of learning modalities and learning domains and their appropriateness in WBT.

In his book *Web-based Training*, Colin Steed states that each learner differs in his abilities and preferences (p. 58). He continues by explaining that the more “input channels” used by the learner, the greater potential in the learner’s comprehension of information. Auditory, visual, tactile, and kinesthetic are examples of these “input channels,” or “modalities” (p. 58).

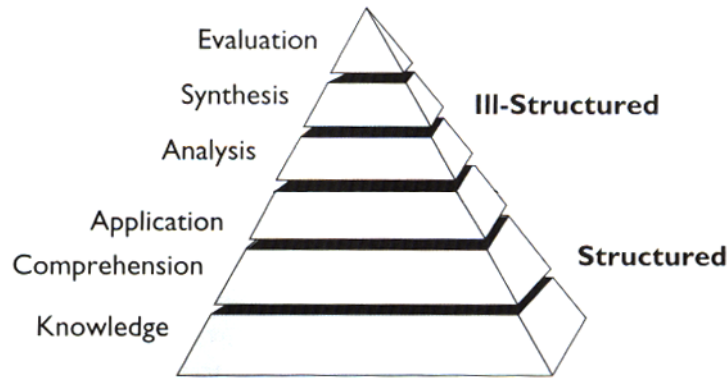
Auditory modality refers to the ability to process sounds and incorporate them into ones' knowledge. Visual, the most commonly used modality for education, utilizes text and graphics to convey information. Tactile and kinesthetic modalities use the sense of touch and the concept of movement to educate (p. 58). Both the visual and auditory modalities are most suitable for WBT through text, images/graphics, and sound files. Tactile and kinesthetic modalities face difficulties in WBT in that the learner cannot interact with tangible objects or other humans to enhance his/her learning experience.

Steed also suggests cognitive, affective, and psychomotor as the three main learning domains. The cognitive domain is affiliated with the basic “knowledge, skills and competencies” required for thorough understanding (p. 54). The affective domain extends to the “feelings, beliefs, and emotions” associated with learning (p. 52). Finally, the psychomotor domain includes the “use and acquisition of muscular and motor skills” necessary for learning (p. 57).

Margaret Driscoll argues in her book, *Web-based Training: Using Technology to Design Adult Learning Experiences*, that not all of these domains are appropriate for delivery via the Internet. She explains that both psychomotor and attitudinal (the equivalent of affective) skills can only be taught through WBT as supplements to person-to-person contact (p. 49). These skills specifically require human interaction for effective learning.

Cognitive skills, however, are appropriate for delivery over the Internet. She states that the format of the WWW is suitable for providing specific information in the form of text, numbers, and symbols. This cognitive domain can be divided into six “intellectual abilities and skills”, better known as “Bloom’s Taxonomy” (Figure 2.4) to

better specify cognitive objectives (p. 50). The identification of (1) knowledge, (2) comprehension, (3) application, (4) analysis, (5) synthesis, and (6) evaluation objectives is essential in evaluating cognitive skills.



**Figure 2.4. Bloom's Taxonomy - The Cognitive Domain.  
(Driscoll, 1998, p. 50)**

The first level of Bloom's Taxonomy, "knowledge," concerns the student's ability to recall basic information such as people, places, concepts, or events. The "comprehension" level challenges the student by having him/her relate "knowledge" to other information. "Application" is the student's ability to comprehend information such as guidelines, methods, or procedures and apply them. The next level of Bloom's Taxonomy, "analysis," concerns the student's ability to deconstruct a larger idea into its elemental parts. "Synthesis" is the inverse of "analysis" in that it tests the student's aptitude in forming a larger concept out of smaller ideas. "Evaluation," the final and most complex level of Bloom's Taxonomy, concerns the student's skill to apply judgment about the value of materials or methods for a given purpose.

## **Conclusions**

Analysis of literature surveyed suggests the need for greater focus in communicating with high school students about landscape architecture. The research by

prominent ASLA members and educators indicates that high school students respond favorably to being exposed to activities affiliated with landscape architecture, some choosing to continue these activities in a college-level curriculum. Although ASLA State Chapters have developed programs to expose these high school students to landscape architecture, there has been little effort in determining the effectiveness of these programs.

American adolescents spend a large amount of time on the computer and the Internet and are accustomed to both the great volume of information available on the Web and its interactive nature. Since this type of learning has become a standard to high school students, it would be valuable to present major concepts of landscape architecture in this format. ASLA has already taken steps to increase its Internet presence with features such as membership, online seminars, dissemination of information on a regular basis, and even the publishing of its major trade magazine, *Landscape Architecture*.

Surveyed literature emphasizes the unique qualities of Web-based training that greatly benefit the student if utilized properly. Interactive and entertaining graphics can engage the student while s/he learns. Provided that the website is maintained on a regular basis, the student can explore the profession's most current information. This maintenance could provide a challenge to ASLA due to limited manpower and funding. Students can use the Web-based program as a portal to communicate with individuals affiliated with the profession of landscape architecture, even across the globe. Since the Web-based program is on the Internet, curious students can access it twenty-four hours a day. Options for this type of program are only limited by its creator's imagination.

Due to the nature of computers, many types of information concerning a program's usage and educational value can easily be made apparent through data tracking software. Understanding how a student uses the program, what s/he thinks about the program, and what s/he has learned from the program are essential in analyzing its success as an educational tool.

Intense Internet usage by adolescents, the versatility of Web-based applications, and the ability to note program usage trends with specialized software, are attributes that support the development of a Web-based application for high school students as a potentially effective form of educational media. To keep up with the fast pace of society and its professions, there is no better time than now for ASLA to focus on the development of an educational Web-based program.

## **Chapter Three: Methodology**

As stated in the introduction, greater public awareness of landscape architecture is necessary to maintain and increase the employment of landscape architects and enrollment of landscape architects in college programs. The greatest opportunity to educate the public lies with educating high school-aged children, who are in the process of choosing a college career. This chapter outlines the method for the development and evaluation of a Web-based program to expose high school students to landscape architecture.

### **Description of Study**

The main focus of this study is to determine how high school students respond to an educational Web-based program about landscape architecture. In order to fully evaluate the educational value of this program, a multi-directional approach is necessary. The primary strategy of the program is to allow the student to educate himself through program usage. Tracking software collects trends in program usage to denote levels of interest in the program's different elements. The preferences, opinions, and demographic information of the student are recorded through the use of questionnaires. Observations of student behavior provide additional information not necessarily obtainable through questionnaires or tracking software. Results from student observations, questionnaire results, and tracking software are analyzed to understand how the student uses the program, what the student has learned from the program, and how s/he feels about the program.

## **Study Protocol**

The study was conducted in two sessions on February 13, 2004 at 8:00 AM and 11:30 AM in the Magnolia Lab of the Computer Aided Design and Geographic Information Systems (CADGIS) Research Laboratory at Louisiana State University in Baton Rouge, Louisiana. Study participants used Dell Precision 340 model computers with 2.4 GHz Pentium 4 processors. Participating students were assigned random computers to break up student groups, therefore encouraging focus on the program. Students were given very little verbal instruction as to not distract from the students' self-directed program usage or of their understanding of landscape architecture. Students were asked to explore the program as they felt necessary and to ask for personal assistance if needed.

## **Study Participants**

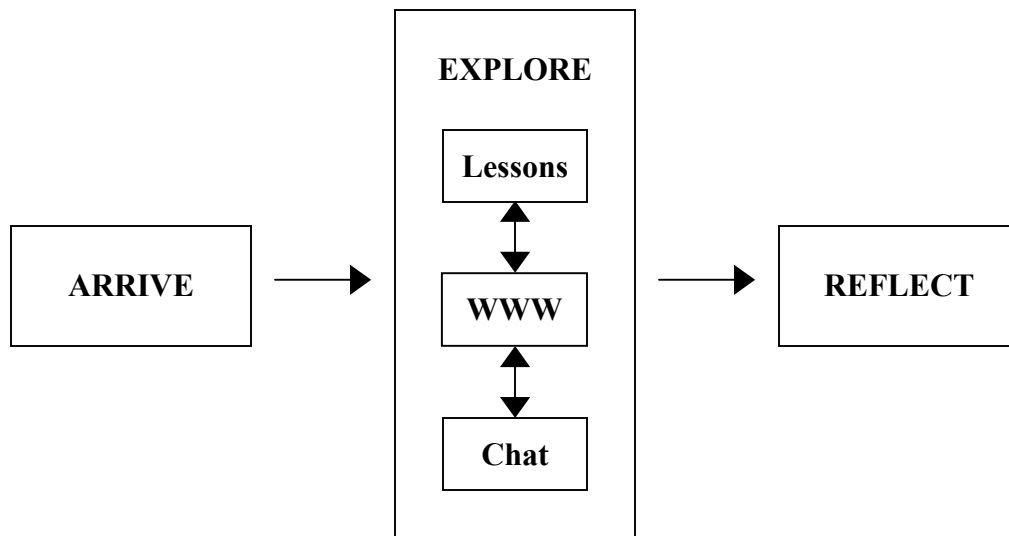
Study participants consisted of 33 high school students from Beverly Wilson's art class in the LSU University Laboratory School. Ms. Beverly is known for encouraging her students to think independently and creatively. Of the 33 participating students, 13 students were seniors, 14 were juniors, and six were sophomores. Twenty-two males and 11 females participated in the study. Of the study volunteers, 33 students were from the United States. Thirty of the participants were Caucasian, two were Asian/Pacific Islander, and one was African American. Twenty-eight study participants claimed to have prior knowledge of landscape architecture, while five admitted to having no knowledge of landscape architecture. These high school students were invited to participate in the study due to their availability, pending graduation, and ability to use computers and the Internet.



## The Program

Adobe Photoshop 7.0, Macromedia Dreamweaver MX, and Macromedia Flash MX were used to create script and images for the Web-based program. The program consists of a preliminary questionnaire, a series of five small lessons, and a final questionnaire. The lessons are supplemented with links to additional information via the WWW, graphics, and live chats with professional landscape architects. The entire program is established as a journey with three phases: “arrive,” “explore,” and “reflect” (Figure 3.1).

The initial phase of this program, “arrive,” consists of a questionnaire to gather demographics (e.g., age, grade, gender, ethnicity, and nationality). This questionnaire also requests information concerning the student’s awareness, interpretation, and origin of knowledge about landscape architecture.



**Figure 3.1. Flow Chart of Program Navigation**

In the second phase the student can “explore” five lessons, introduced by directions for program usage, a general definition of landscape architecture, and a brief

history of the profession of landscape architecture. The ensuing five lessons are separated into five categories: “people,” “places,” “time,” “communication,” and “ideas.” Content in each lesson briefly covers a variety of affiliated topics, often demonstrating how one lesson category is related to another.

These categories are isolated landscape architecture themes, but are a necessary step in the development of educational information. “People” explains how culture, physical and mental limitations, social status, and behavior of people relate to landscape architecture. Through a discussion of ecological considerations in a landscape architect’s design, “places” details topography, sunlight, the hydrologic cycle, and ecological preservation. In “time,” the passage of time in landscape architecture is explored through cemeteries, memorials, landscape preservation, and evolving landscapes. A landscape architect’s means of representing his/her design ideas through hand graphics, AutoCAD drawings, and 3D models is surveyed in “communication.” Finally, “ideas” teaches the student how design elements such as color, form, and texture develop a landscape architect’s design ideas.

In the final phase of the program, the student is asked to “reflect” by answering sixteen questions focused on assessing the student’s new knowledge of landscape architecture and his/her opinion of the program. Bloom’s Taxonomy is used as a guideline to create a total of twelve multiple-choice and open-ended questions assessing each of the six Bloom’s Taxonomy graduated levels of cognitive ability. The remaining four questions are exclusively concerned with the students’ experiences and opinions with the program. Study respondents answer the first three questions on a five point numerical scale. The last question is open-ended for any additional comments.

## **Assessment Methods**

This study uses various methods of assessment to evaluate the Web-based program. The questionnaires included in the program, tracking software, and observations are utilized to assess the program both qualitatively and quantitatively. The first questionnaire primarily obtains information about the student. Through use of this questionnaire, the student also specifies his/her awareness and knowledge of landscape architecture as well as the source of his/her knowledge.

After the student feels that s/he has thoroughly explored the program, s/he is directed to a final series of questions. These questions test the student's cognitive ability (questions 1-12) and his/her opinions about the program (questions 13-16). Each question appears singly. After the student has selected what s/he thinks is the correct answer and clicks on the "submit" button, the student is presented with the correct answer. This one-question-at-a-time method engages the student's attention and enhances his/her total educative experience by instantly providing him/her with the correct answer. The final set of questions in this series allows the student to express his/her opinions about the program.

Specialized tracking software is integrated into the Web-based program to monitor student activity such as links visited and length of program usage. This information is useful in determining issues of the program content. For example, if a specific link is visited drastically more than any other link, it may denote a topic highly attractive to study participants.

Student behavior is noted through personal observations. Facial expressions and interaction among students record student activity not perceivable through questionnaires

and the tracking software. This qualitative assessment method assists in creating a well-rounded body of evaluative information.

## **Chapter Four: Results**

Results from the Web-based program are organized in this chapter by questionnaire results, tracking reports, chat room discussion, student opinions, and student observation.

### **Diagnostic Questionnaire**

Awareness of landscape architecture among study participants was relatively high. Of the 33 students, 27 claimed to have heard of landscape architecture. Many students claimed to have heard about the profession from family/friends, commercials/television shows such as the Home and Garden Channel (HGTV), or school. Answers varied greatly when the students were asked, “What is landscape architecture?” Some students stated that landscape architects “make blueprints” or “draw designs.” Other students explained that landscape architects “decorate” or “touch up yards.” Several students associated landscape architecture with the outdoor design “around homes” or “buildings.” The words “garden,” “yard,” “lawn,” and “flower bed” were used most frequently among study respondents. For a complete listing of the diagnostic questionnaire results, refer to Appendix B, Table B.1.

### **Final Questionnaire**

Figure 4.1 displays the percentage of correct answers for questions one through ten. Questions eleven and twelve deal with “evaluation,” the most complex category of cognition, and do not necessarily have a correct answer. Questions one through ten are listed as follows.

Question #1: Who is commonly referred to as the “Father of Landscape Architecture?”

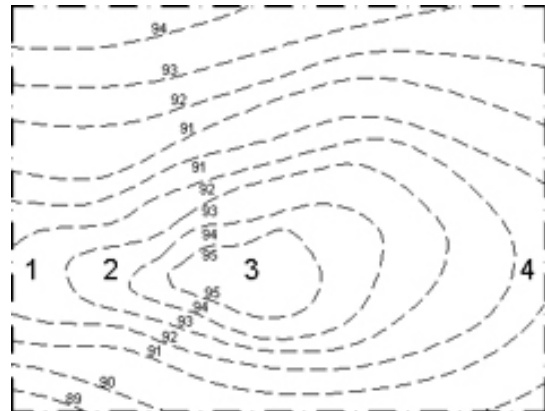
- A. Walter Hood
- B. Garrett Eckbo
- C. Frederick Law Olmsted
- D. Frank Lloyd Wright

Question #2: Of the following, select the best definition of a landscape architect.

- A. A landscape architect maintains lawns (mowing, trimming shrubs, etc.)
- B. A landscape architect designs exterior environments through design and problem-solving strategies.
- C. A landscape architect grows flowers, fruits, and vegetables.
- D. A landscape architect designs homes, hospitals, and office buildings.

Question #3: Select the map location number (1-4) which designates an elevation of 92-93 feet.

- A. 1
- B. 2
- C. 3
- D. 4



Question #4: Which graphic would give a client the best idea of what it would feel like to be within the design?

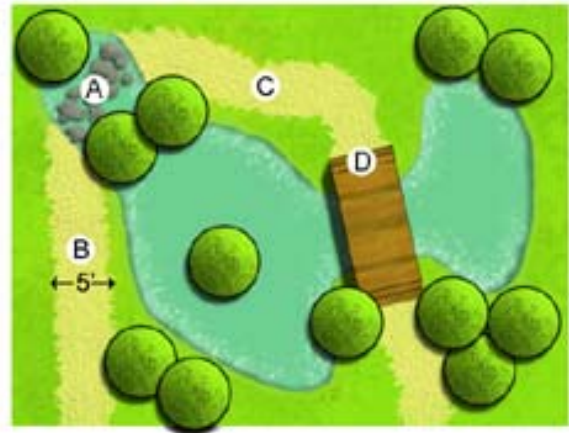
- A. An animation of a walk-through
- B. A black and white section drawing
- C. An image of a 3D model
- D. A drawing of a plan view

Question #5: A landscape architect is hired to design an entrance for a popular national restaurant chain. The same basic design must be used for all restaurants, only making adjustments based on the restaurant’s location in the United States. A good landscape architect would design the restaurant’s entrance in Louisiana with less shaded waiting areas than the same entrance in Michigan.

- A. True
- B. False

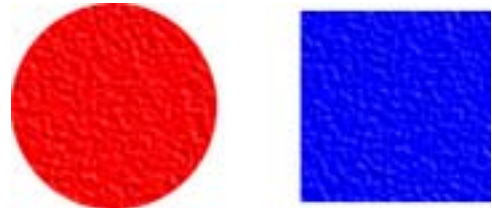
Question #6: Examine the following drawing of a park's design. What would not be of concern to a wheelchair-bound park visitor?

- A. The stepping stones
- B. The width of the path
- C. The sand path
- D. The bridge steps



Question #7: What best describes the following two objects?

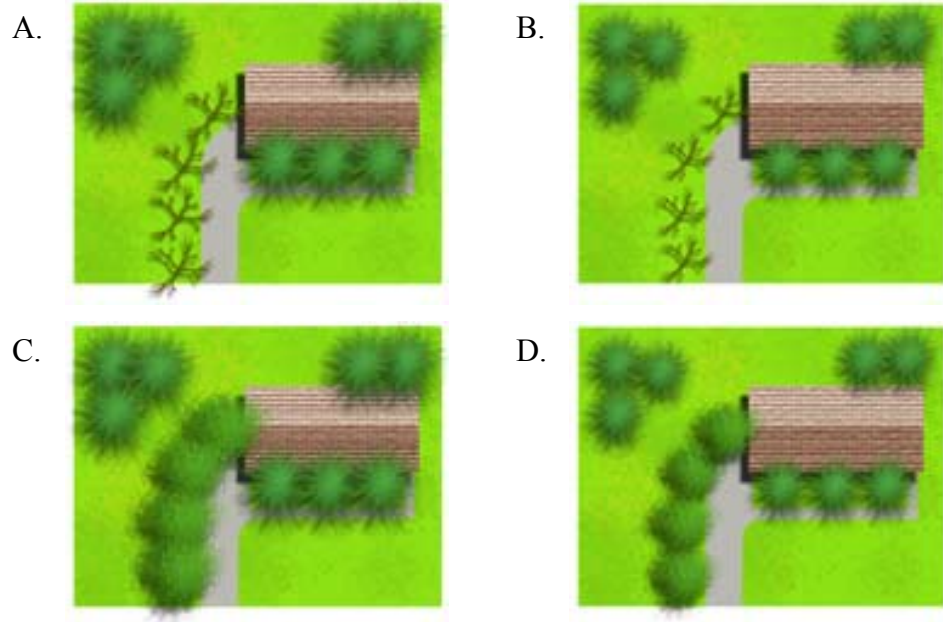
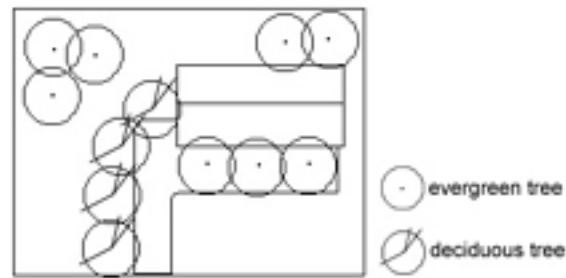
- A. Contrasting color and form
- B. Contrasting form and texture
- C. Contrasting texture, color and form
- D. Contrasting texture and color



Question#8: Water can be released through the leaves of vegetation. Which part of the hydraulic cycle is this?

- A. Transpiration
- B. Evaporation
- C. Infiltration
- D. Condensation

Question #9: What is the best depiction of what the following design would look like in winter in approximately 5 years?



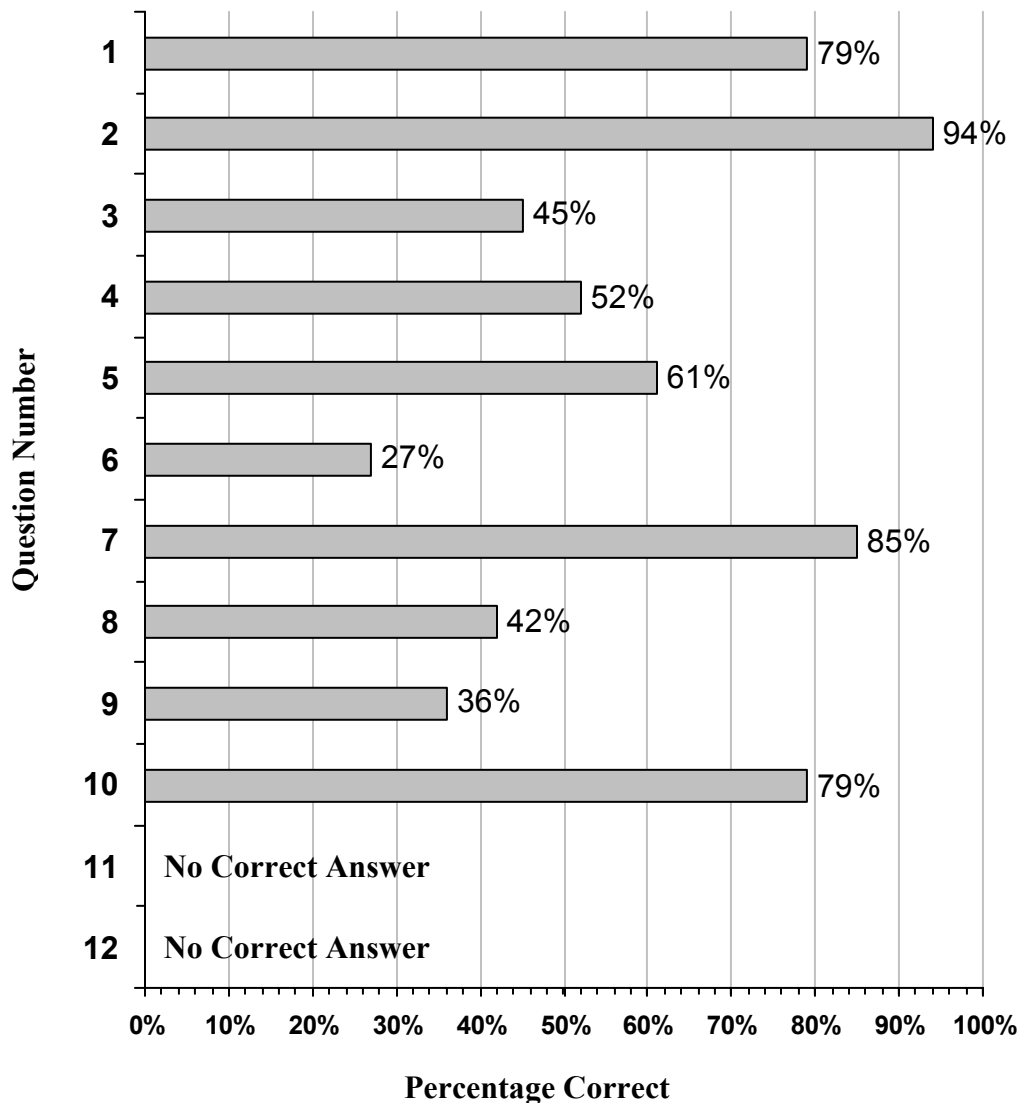
Question #10: The following image shows where people have continually walked over grass, where there is no sidewalk. What would you suggest doing?

- A. Nothing. It is fine as it is.
- B. First look at the existing design of the space to better understand why people are walking here. Make adjustments based on this research.
- C. Block off this area on which people are walking. People should obey the rules.
- D. Construct a sidewalk over this area since people are walking there already.





The percentage of correct responses varied greatly from one question to another. With 12<sup>th</sup>, 11<sup>th</sup>, and 10<sup>th</sup> grade results combined, question #2 received the highest amount of correct answers at 94%. Question #7 (85%), #1 (79%), and #10 (79%) were among the second highest percentages of correct answers. Questions #5 (61%) and #4 (52%) ranked in the middle-range for percentage of correct answers for all combined grades. Receiving the lowest percentage of correct answers were questions #3 (45%), #8 (42%), #9 (36%), and #6 (27%).

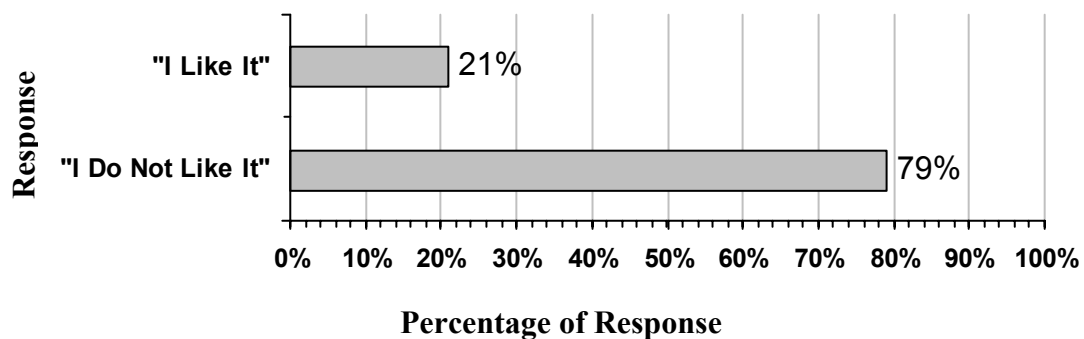


**Figure 4.1. Percentage of Correct Responses in Final Questionnaire**

Respondents rated relatively evenly from one grade to the next. The average student answered questions 1-10 correctly 60% of the time. The tenth grade achieved the highest percent of correct answers at 63.2%. Following the sophomores with 59.2% were the seniors and the juniors with 58.5%. The only questions receiving 100% correct answers were question #2 and #7 by the sophomore class.

The results from question #11 and #12 are listed in Figures 4.2 and 4.3. Seventy-nine percent of respondents stated that they “did not like” the image in question #11. When prompted to elaborate on their preference, the most commonly used phrases were “no wheelchair access” and “unattractive.” The 21% of student respondents who stated that they “did like” the image explained that it was “clean” or “functional.”

Question #11: Examine the image below and evaluate the design of the sidewalk. Remember to consider both the function (how it will be used) and the aesthetic (the visual appeal) of the sidewalk. Please provide your evaluation in the box provided.

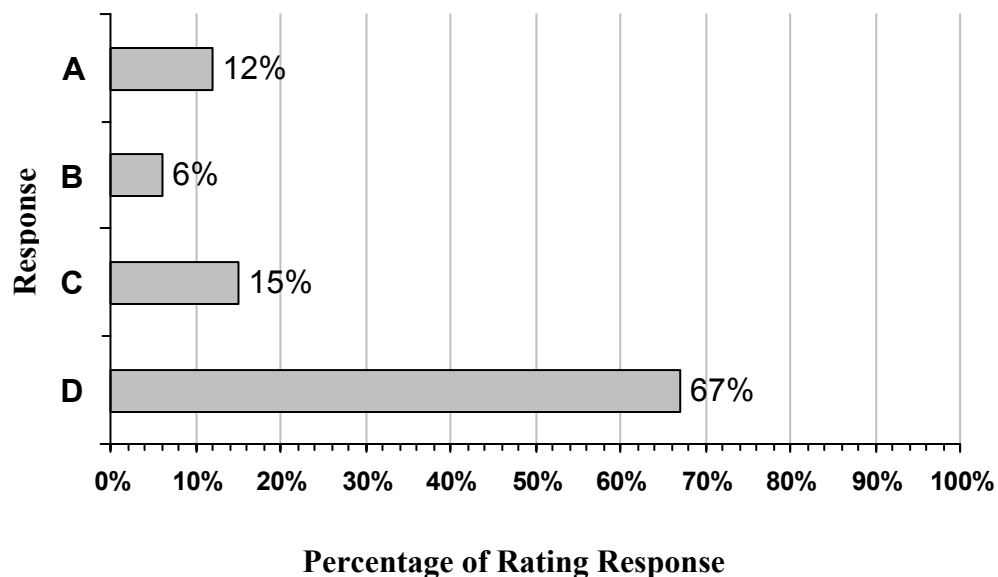


**Figure 4.2. Student Response to Question #11**

Figure 4.3 displays the results from Question #12. Sixty-seven percent of study participants chose “D.” Fifteen percent of respondents selected “C,” 12% chose “A,” and only six percent selected “B.”

Question #12: A piece of wetland property has been approved for development as a national park. The first proposed design develops approximately 80% of the existing property. Should the proposed design be built?

- A. The proposed design should be built - it would bring in more money by employing people in its construction and increasing the number of park visitors.
- B. The proposed design should not be built - because we have enough parks.
- C. The proposed design should be built - it provides more area for visitors to relax and learn about nature.
- D. The proposed design should not be built - it destroys a large part of the wetland.



**Figure 4.3. Student Response to Question #12**

### **Tracking Reports**

Figure 4.4 displays the total number of selected images and links. The most frequently visited link was “Watch Landscape Architecture Videos Link” with nine

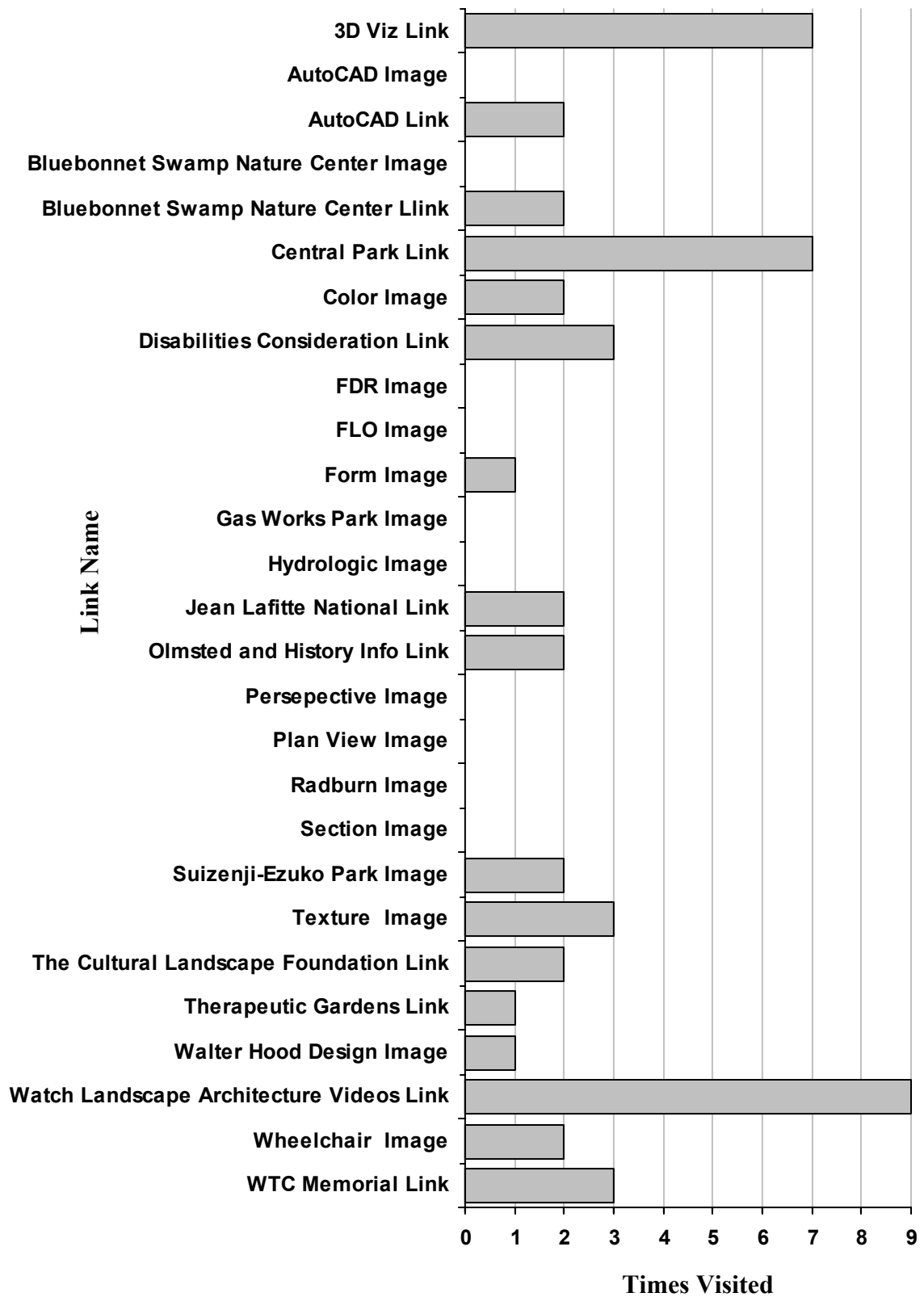


Figure 4.4. Frequency of Link Visitation / Image Selection

visitations. “3D Viz Link” and “Central Park Link” came in second place with seven visitations each. “Disabilities Consideration Link,” “Texture Image,” and “World Trade Center Memorial Link” each received three visitations. “AutoCAD Link,” “Bluebonnet Swamp Nature Center Link,” “Color Image,” “Jean Lafitte National Park Link,” “Olmsted History and Info Link,” “Suizenji-Ezuko Park Image,” “The Cultural Landscape Foundation Link,” and the “Wheelchair Image” achieved two visitations each. “Form Image,” “Therapeutic Gardens Link,” and “Walter Hood Design Image” received one visitation each.

In general, students spent an average of 20 minutes exploring the program. Seniors took approximately 20.8 minutes using the program, juniors finished the program in 19.6 minutes, and sophomores took 19.5 minutes with the program. The shortest amount of time spent exploring the program was 11 minutes and the longest time was 32 minutes.

### **Chat Room Discussion**

Two alumni from Louisiana State University “chatted” with the study’s high school students. The first chat session had only a few participating students. The second session, however, involved a majority of the students. A summary of chat room activity is listed below. Comments and responses made by chat room hosts are listed in bold type.

Session 1:

**“Good morning! I am Aspasia, a friend and classmate of Courtney. I came in U.S. from Greece, 3.5 years ago to study Landscape Architecture. Last August I got my degree and currently I am looking for jobs all over U.S while I am working here in Baton Rouge. I will be very happy to answer your questions today.... and wish you all luck!”**

“Hello Aspasia, how much money would u make a year if u had a job?”

**“Well, an entry-level landscape architect (0-2 years of experience) can make 33,000-40,000. The depending on experience and location the money goes up.”**

“Are you in Greece right now?”

**“No.... I am not in Greece right now. I am in Baton Rouge, working. The last time I went in Greece was this past August, for the wedding of one of my best friends. You should not miss the Olympic games this year, that take place in Athens, Greece!”**

Session 2:

**“Hi, I am a Landscape Architecture graduate from LSU. I have worked in Ft Lauderdale, Florida, and in Beijing, China... now I am working here in Baton Rouge. Feel free to ask questions about the profession, traveling...”**

“Hey how is the landscaping in china?”

“Brian, interesting stuff with this architecture. How did u get into doing this kind of stuff. What are the ups and downs of being a Landscape Architect?”

“Do you have to be smart to be a landscape architect?”

“Have you worked in any other countries?”

“Have you designed anything that we would know of? Like a park, a stadium, etc.?”

**“Well, Most of the projects that I am working on now will become high profile stuff - 1700 acre State Park, a Town Square in downtown BR, BREC Headquarters, LSU Football Operations BLDG, etc.”**

“How much can an average landscape architect expect to make from graduation?”

“How does one get started? What classes and majors help one become a landscapist?”

**“Art classes help alot, photography, art history, geology, science, earth science... really every subject helps because every project that your work on is different, different context, client, etc- which will require a knowledge of many different subjects...”**

“When did you realize you wanted to be in this profession.... and why?”

**“I realized sophomore year in college- I came to a realization that I wanted to spend my life helping people...and there is a tremendous amount of service to the public and the environment in this**

**profession..."**

"How much money do you make?"

**"depends on where you work- I make 28G's because i am just out of college- but avg. starting salary is 35Gs"**

"Where are the best places to study for this profession?"

**"JAPAN, CHINA, EUROPE... Schools- Harvard, Berkley, Penn State, LSU, Virginia"**

"This profession seems over the line. Seems like a lot of work. Is it?"

**Sometimes, it is over the line, but it is definitely worth it."**

"How much school did you go through, and what courses did you have to take?"

**"The program takes 5 years- hard but well worth it... I took lots of art, construction, plants, history, science... absolutely no regrets"**

**Now, as a high school student....Art classes help alot, photography, art history, geology, science, earth science... really every subject helps because every project that your work on is different, different context, client, etc- which will require a knowledge of many different subjects..."**

"When you are designing a landscape what all do you have to consider as far as pleasing the people who will be there."

**"You have to consider your client, - a corporation, a person, a committee, a city, the public... client needs, function- what activities will take place in the space, how does it fit in culturally, historically,..."**

"What kind of classes do you have to take in college for this?"

**"Art classes help alot, photography, art history, geology, science, earth science... really every subject helps because every project that your work on is different, different context, client, etc- which will require a knowledge of many different subjects..."**

"How does the landscape in China differ from that in Baton Rouge?"

**"Many differences- the way people do business, the plants, the cultural, historical differences, a whole different thought process concerning design"**

"What exactly have you done in all those places?"

**"Well, In FL, I was intern at EDSA- a large firm which worked on large scale resort planning, urban design..."**

**In China- I got most of my experience designing Water Parks (Theme Parks) Resorts, Golf Course communities... It was really cool..."**

**"How much money does the average landscape arch. make out of college?"  
"30-35Gs out of college"**

**"What do you have to do in college to become a landscape architect?"  
"The program takes 5 years- hard but well worth it... I took lots of art, construction, plants, history, science... absolutely no regrets"**

**Now, as a high school student....Art classes help alot, photography, art history, geology, science, earth science... really every subject helps because every project that your work on is different, different context, client, etc- which will require a knowledge of many different subjects..."**

**"How often do you work?"  
"I work M-F 8-5 unless there is a major project due- then I work late nights and weekends... not too shabby though"**

**"How long from start to finish did it take to graduate in this career?"  
"The program takes 5 years- hard but well worth it... I took lots of art, construction, plants, history, science... absolutely no regrets"**

**Now, as a high school student....Art classes help alot, photography, art history, geology, science, earth science... really every subject helps because every project that your work on is different, different context, client, etc- which will require a knowledge of many different subjects...."**

**"Do you ever grow fruit in a landscape?"  
"Yes- all types of plants."**

**"I saw you work long hard hours plus a little bit longer college career. I'm guessing you're not in this job for the money."  
"I could not see myself doing anything else...ABSOLUTELY WORTH IT."**

**The program takes 5 years- hard but well worth it... I took lots of art, construction, plants, history, science... absolutely no regrets**

**Now, as a high school student....Art classes help alot, photography, art history, geology, science, earth science... really every subject helps because every project that your work on is different, different context, client, etc- which will require a knowledge of many different subjects..."**



“What type of things could you expect to be building out of college? Does this involve making sporting fields like football, baseball, and golf courses?”

**“Yes- sports fields, complexes, golf course design... all included - out of school it depends on the individual as to how successful you will be... if you are a great designer... then you will design... some people need more experience before they handle projects.”**

“Thanks for answering our questions”

**“You are welcome,...”**

Participating students asked questions primarily concerned with a landscape architect’s income. Other interests related to how landscape architecture differs in other countries and with which types of projects the chat room hosts had been involved. Many students were curious about what types of college courses were needed to obtain a landscape architecture degree, which schools were considered “good” to study landscape architecture, and what a typical work day was for a landscape architect.

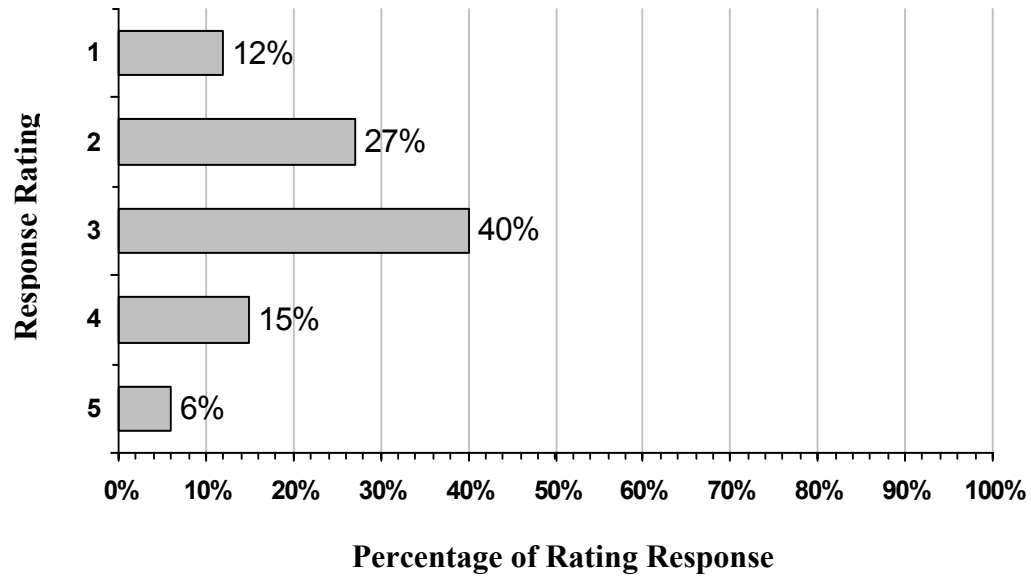
### **Student Opinion**

Questions #13, #14, #15, and #16 gauge the student’s consideration of landscape architecture as a career, how much the student feels s/he has learned from the program, the student’s level of program enjoyment, and any additional comments for program improvement.

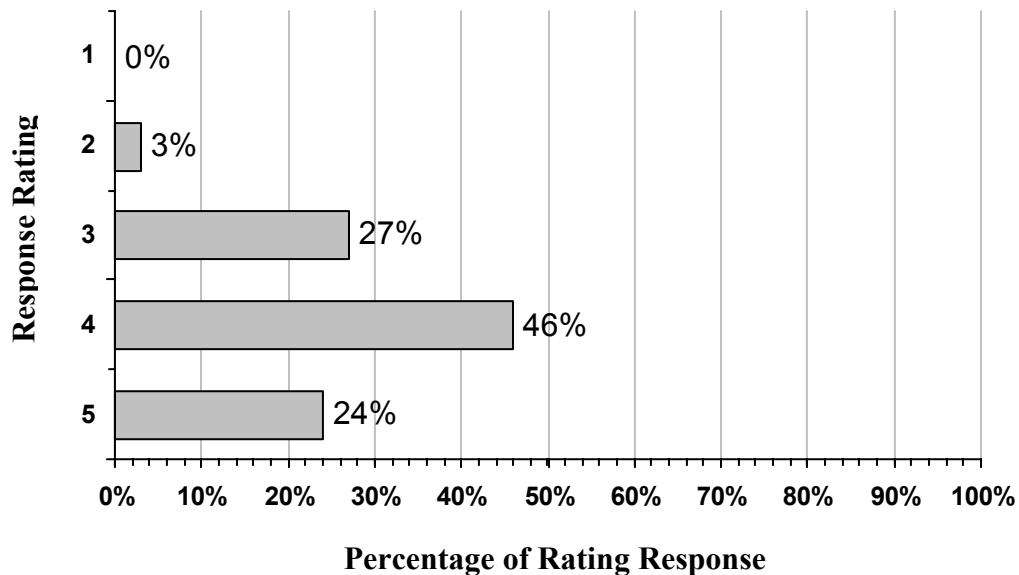
Figure 4.5 reveals students response to “Would you now consider landscape architecture as a career?” Overall, the highest percentage of response was at 40% for response “3.” Rating response “2” was the second highest percentage with 27%, followed by response “4” with 15%, “1” with 12% and “5” with 6%.

Question #14 reflects student opinion on how much they felt like they had learned from the program. As displayed in Figure 4.6, “4” received the highest overall rating at

46%. Response rating “3” achieved 27% followed by “5” at 24%, “2” at 3%, and “1” at 0%.



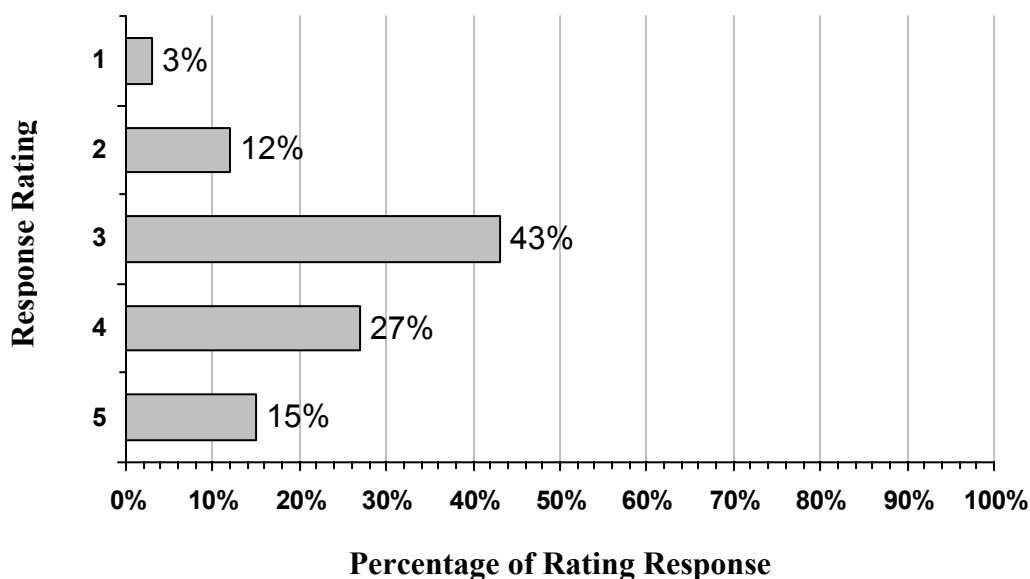
**Figure 4.5. Student Response to Question #13: “Would you now consider landscape architecture as a career?” (1 = Not at All, 5 = Absolutely)**



**Figure 4.6. Student Response to Question #14: “How much did this program teach you about landscape architecture?” (1 = Very Little, 5 = Very Much)**

When asked, “How much did you enjoy using this program?” the majority of study respondents chose a rating of “3” at 43%. Figure 4.7 reveals that “4” was the second most commonly chosen rating at 27% followed by “5” at 15%, “2” at 12% and “1” at 3%.

The final question allowed the respondent to openly express his/her ideas for program improvement. Appendix E details student comments. The most common suggestion for program improvement was for more animations, videos, and interactive graphics. Although many students noted that the text was well organized and easily understood, several students desired less text and/or less information in general. Other suggestions included a demo version of AutoCAD with which students could experiment, an opportunity for students to make “simulated design of landscapes,” interactive games, and a quicker chat room.



**Figure 4.7. Student Response to Question #15: “How much did you enjoy using this program?” (1 = Very Little, 5 = Very Much)**

## **Student Observation**

The observation of students during program usage yielded findings not obtainable through the questionnaires and tracking software. The “arrive” screen was on the computer monitors as students entered the computer lab. Immediately upon sitting at their computers, students began filling out the initial questionnaire despite verbal instruction not to do so. Students were asked to not speak to one another during program usage, but many students commented to one another throughout each session. The students’ verbal activity increased dramatically with usage of the chat room. Very few students raised their hands for assistance during the session. One student was confused by question #6, and needed clarification of answers provided for that question. Several students finished the program in less time than expected. These students either returned to the chat room (and needed assistance to do so), checked their email, or played computer games on the Internet as allowed by their instructor.

## Chapter Five: Analysis and Discussion

The main objective of this thesis was to develop and evaluate a Web-based program to educate high school students about landscape architecture. Since the testing of students from numerous high schools would have been unlikely due to time and funding constraints, two groups of students from a local Baton Rouge high school explored and assessed the program. Although the study results may not be representative of the average student population, generalizations can be made about the program and its influence on students. This program is an initial step in the creation of a strong Web-based educational tool for the profession of landscape architecture.



**Figure 5.1. Study Participants Exploring Web-based Program**

### **Diagnostic Questionnaire**

Student response from the first questionnaire paralleled findings in the literature review. Students generally had a limited understanding or a misinterpretation of the profession of landscape architecture. This could be due in large part to the students' lack

of contact with a landscape architect or the profession in general. Students reported “hearing” about landscape architecture from family, friends, television, and school. These sources may have taught the student about landscape architecture, but in a limited manner.

Students generally identified landscape architecture with items such as the garden or the flowerbed. These are things that students have been exposed to in the past and are most capable of drawing an association with landscape architecture. It may be most beneficial to begin teaching students about landscape architecture through something with which they are already familiar. As Christine Anne Wood suggests in her thesis, the “extended garden metaphor” could be used to increase the public’s awareness of landscape architecture (Wood, 1992, p. 8). This basic understanding of the profession could then be extended to include larger scale projects or designs not necessarily dominated by vegetative matter.

### **Final Questionnaire**

The final questionnaire yielded favorable results. Question #2 received the highest amount of correct responses at 94%. This response was extremely encouraging

Question #2: Of the following, select the best definition of a landscape architect.

- A. A landscape architect maintains lawns (mowing, trimming shrubs, etc.)
- B. A landscape architect designs exterior environments through design and problem-solving strategies.
- C. A landscape architect grows flowers, fruits, and vegetables.
- D. A landscape architect designs homes, hospitals, and office buildings.

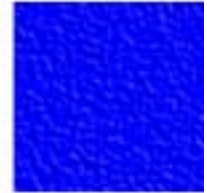
since the question tested the student’s understanding of what a landscape architect does.

Very few students chose the incorrect answers which stated that landscape architects only

farm, garden, or conduct lawn maintenance. This is a promising result when compared to the explanations given by study respondents in the diagnostic questionnaire. Students were, if anything, able to have a clearer understanding of what a landscape architect does upon experiencing the Web-based program.

Question #7: What best describes the following two objects?

- A. Contrasting color and form
- B. Contrasting form and texture
- C. Contrasting texture, color and form
- D. Contrasting texture and color



The question with the second highest percentage of correct answers was question #7. This question had the student recall basic design elements such as color, form, and texture. Student results rated very high with this question at 85%. It is important to note that this high percent of correct answers could be attributed to the fact that the participating class was an art class - students may have not learned this information from the program. Students may have benefited more from an example of form, color, and texture directly related to landscape architecture elements. A detail image of a landscape could draw more of an association between design elements and their relationship to a designed landscape.

Question #1: Who is commonly referred to as the “Father of Landscape Architecture?”

- A. Walter Hood
- B. Garrett Eckbo
- C. Frederick Law Olmsted
- D. Frank Lloyd Wright

The third highest percentage of correct answers was both question #1 and question #10 at 79%. Question #1 asked the student who was the “Father of Landscape Architecture.” Frederick Law Olmsted, the correct answer, was mentioned several times throughout the program’s text and may have contributed to the high percentage of correct answers. The student’s ability to recall Frederick Law Olmsted as the founding father of the profession is significant in that it reinforces understanding within the student that landscape architecture is an established profession dating back to the mid nineteenth century in America.

Question #10: The following image shows where people have continually walked over grass, where there is no sidewalk. What would you suggest doing?

- A. Nothing. It is fine as it is.
- B. First look at the existing design of the space to better understand why people are walking here. Make adjustments based on this research.
- C. Block off this area on which people are walking. People should obey the rules.
- D. Construct a sidewalk over this area since people are walking there already.



Question #10 tested the student’s ability to assess a design challenge typical to a landscape architect. As reflected in the relatively high percentage of correct answers, the majority of students were able to perceive human behavior in the landscape and appropriate methods to resolve design challenges. However, the student’s ability to answer this question correctly cannot be attributed solely to the program. Through experiencing this question, students had the opportunity to understand that landscape



architecture is not only associated with the aesthetic placement of plants and flowers, but that it can aid in the solution of design challenges with people in the landscape.

Question #5: A landscape architect is hired to design an entrance for a popular national restaurant chain. The same basic design must be used for all restaurants, only making adjustments based on the restaurant's location in the United States. A good landscape architect would design the restaurant's entrance in Louisiana with less shaded waiting areas than the same entrance in Michigan.

- A. True
- B. False

The next highest percentage of correct answers was question #5 at 61%. Question #5 assessed the student's skill in determining environmental factors influencing design in landscape architecture. Students rushing through the questionnaire could have easily misinterpreted the question due to its wording. This question encourages the student to understand how different geographic locations can influence design decisions. The exploration of sunlight in the "places" lesson had included a short movie clip demonstrating the movement of the sun. However, this graphic did not relate sun movement in relation to people or vegetation. This connection should have been made more apparent to the student within the lesson through the use of a more informative graphic.

Question #4: Which graphic would give a client the best idea of what it would feel like to be within the design?

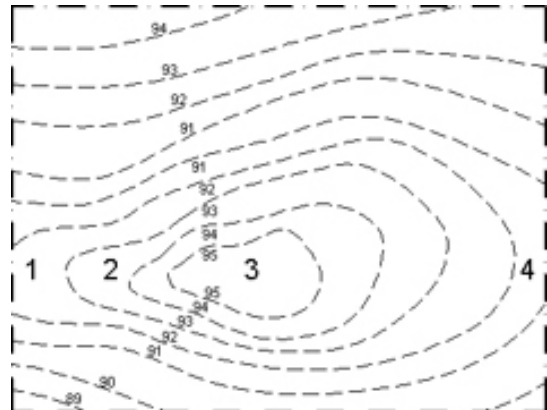
- A. An animation of a walk-through
- B. A black and white section drawing
- C. An image of a 3D model
- D. A drawing of a plan view

Question #4 resulted in 52% of correct responses. This question asked the student which of the four listed graphic types would give the most realistic feeling of what it

would feel like to be within the design. This question had an unexpectedly low correct response percentage. As discussed in the literature review, students are adept at computers and the Internet. Through the students' frequent use of technology such as computer and video games, one can assume that these students would have an adequate understanding of space dimension. The wording of the question and/or its answer alternatives may have contributed to the low percentage of correct answers. For instance, "An animation of a walk through" may have been less confusing if worded, "A walk through animation." This question may have been able to increase student comprehension if it had an example of each type of graphic specified.

Question #3: Select the map location number (1-4) which designates an elevation of 92-93 feet.

- A. 1
- B. 2
- C. 3
- D. 4



At 45%, question #3 ranks relatively low. This question asked the student to look at a topographic map and indicate the elevation of a particular area. The majority of students were unable to correctly identify area "1" at an elevation of 92-93 feet. As with question #4, students may have benefited from a 3D version of the graphic. This low correct response percentage may have been the result of an uninteresting lesson on topography in "places." Additionally, an individual's difficulty in thinking in the third dimension may have also contributed to the low scores. A short movie demonstrating

topography and related matters such as hydrology may have increased interest in the topic and resulted in a higher correct response rate.

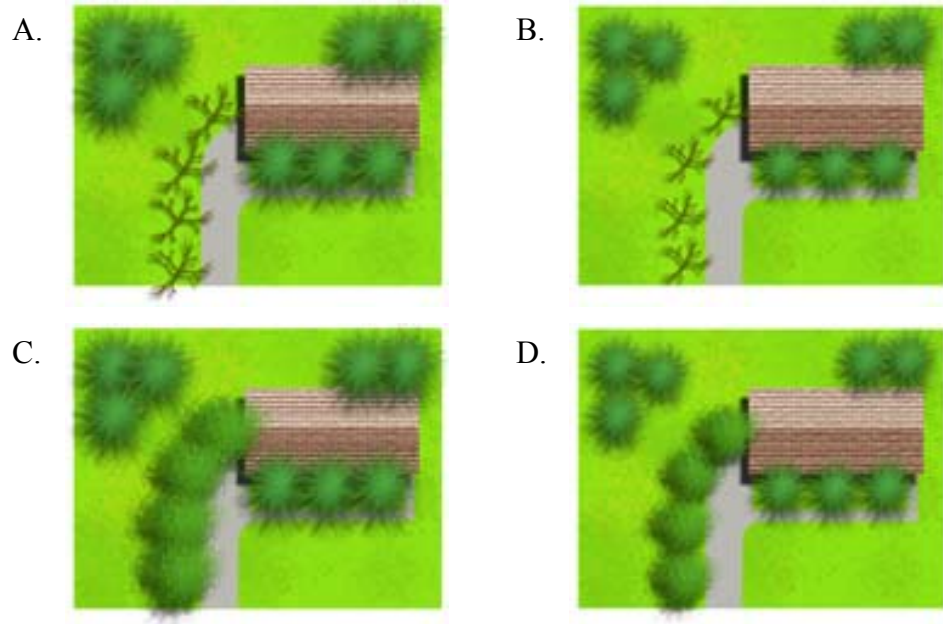
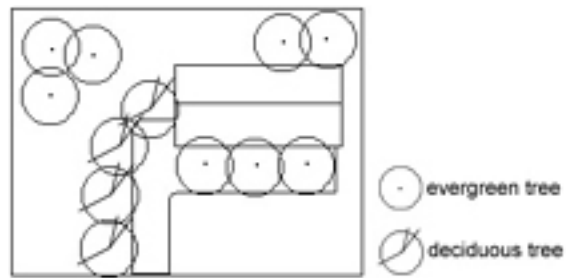
Question#8: Water can be released through the leaves of vegetation. Which part of the hydraulic cycle is this?

- A. Transpiration
- B. Evaporation
- C. Infiltration
- D. Condensation

With a correct response rate of 42%, question #8 asked students to recall a specific phase of the hydrologic cycle. The intent of this question was to reinforce the landscape's role in ecology. This question may have also been enhanced with a short movie demonstrating the hydrologic cycle. Since both questions covered topics explored in "places," it may not be a coincidence that both question #8 and question #3 received low correct response ratings. The "places" lesson was the longest, most detailed of any of the five lessons. Students may have scanned the information within the lesson quickly from fear of running out of time or from loss of interest in the program.

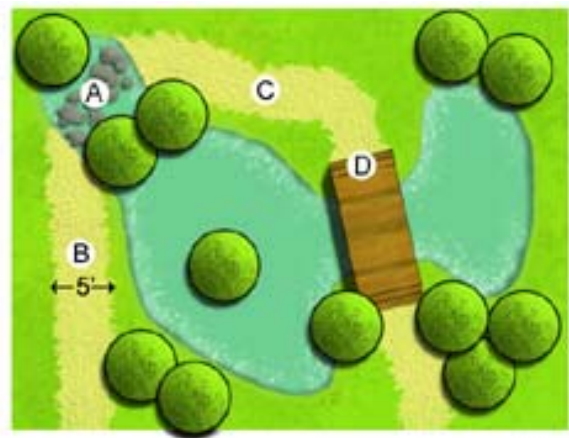
The two questions with the lowest percentages of correct responses were questions #9 and #6. Question #9 asked the student to identify a landscape in winter after five years of growth. Students responded correctly 36% of the time. Personal observations noted that students were confused by the question's answer alternatives. Students were able to recognize deciduous plant material in winter, but were not as capable of noting plant growth. Vegetation graphics representing five-year growth were subtly larger than graphics representing younger plant material. A graphic with more exaggerated plant growth would have increased the number of correct responses.

Question #9: What is the best depiction of what the following design would look like in winter in approximately 5 years?



Question #6: Examine the following drawing of a park's design. What would not be of concern to a wheelchair-bound park visitor?

- A. The stepping stones
- B. The width of the path
- C. The sand path
- D. The bridge steps



Question #6 ranked as the lowest percentage of correct response for any question at 27%. This low percentage of correct responses was due to confusion in the question's graphic and answer alternatives, as noted in student observations and student comments. Answer alternatives were not listed with corresponding "A," "B," "C," and "D" as noted on the graphic. The question, "Examine the following drawing of a park's design. What would *not* be of concern to a wheelchair-bound park visitor," may have appeared confusing to the student. "What would not be of concern" is not necessarily an appropriate statement. A wheelchair-bound park visitor would realistically be concerned with all aspects of the park that had any influence on his/her ability to navigate within the park. The question may have been more readable had it stated, "Examine the following drawing of a park's design. Which area (A, B, C, or D) would least hinder a wheelchair-bound park visitor's ability to travel along the path?" The dimensions on the path may have also been difficult for the student to read. A label noting a "5-foot path width" would have caused less confusion. Students had not been introduced to dimensioning and may have not been able to interpret the provided path label.

Question #11: Examine the image below and evaluate the design of the sidewalk. Remember to consider both the function (how it will be used) and the aesthetic (the visual appeal) of the sidewalk. Please provide your evaluation in the box provided.



Although questions #11 and #12 were level 6/evaluative questions that had no correct answer, it is interesting to note student response. Question #11 presented the student with an image of a pedestrian/vehicular bridge over a canal and asked him/her to evaluate it. Students stated 79% that they “did not like” the image because of its appearance and unsuitability for disabled individuals. This was a very favorable result since it demonstrated the student’s ability to correlate the designed landscape with human activity. Even when students stated that they “did like” the image, a majority of those students did mention that it was not appropriate for handicapped individuals. The question proved successful, as its intention was to distinguish if students were capable of noting the bridge’s deficiency in accommodating various levels of pedestrian physical ability. As with many questions, however, the student’s ability to recognize concepts such as this cannot be credited exclusively to information learned from the program.

Question #12: A piece of wetland property has been approved for development as a national park. The first proposed design develops approximately 80% of the existing property. Should the proposed design be built?

- A. The proposed design should be built - it would bring in more money by employing people in its construction and increasing the number of park visitors.
- B. The proposed design should not be built - because we have enough parks.
- C. The proposed design should be built - it provides more area for visitors to relax and learn about nature.
- D. The proposed design should not be built - it destroys a large part of the wetland.

Question #12 prompted the student to evaluate the development opportunity for a wetland. The proposed development would call for the destruction of 80% of a wetland property. Student response was 67% for alternative “D.” This was a favorable response as it stated, “The proposed design should not be built - it destroys a large part of the

wetland.” This exhibited the student’s sensitivity to environmental issues. This high percentage may be the result of the question using a “wetland” as an example. All participating students were from Louisiana and were most likely previously aware of the importance of preserving a wetland.

### **Tracking Reports**

Tracking reports revealed a strong tendency for students to explore information presented in a multimedia format. This supports findings discussed in the literature review that suggest the use of multimedia for entertainment and education to engage the user of a Web-based program. The “Central Park Link” rated high in comparison to other links. Students may have already been familiar with Central Park and were curious as to how exactly landscape architects were involved with the project. Total visitation could increase with predominantly interactive/multimedia links of familiar people, places, and concepts.

Not all images were obviously formatted for enlargement. Unlike text links that were underlined and of a different color from the main body of text, enlargeable images showed no indication of their ability to be opened in a larger window, unless otherwise noted within the text. This could account for the total lack of visitation of several of the enlargeable images within the program.

### **Chat Room Discussion**

Results from the chat room discussion revealed a strong interest in a landscape architect’s income. Students also asked very relevant, insightful questions about which courses are taken in a landscape architecture curriculum, which schools are “good” to study landscape architecture, and with what projects landscape architects had been

involved. A few study respondents utilized the chat room inappropriately (e.g., discussion of non landscape architecture topics, use of inappropriate words, etc.), but overall the chat room proved to be a very successful medium for students to voice questions, concerns, and opinions about the profession of landscape architecture.

The particular format of the chat room caused some frustration for both the chat room hosts and the student users. As students replied to a previously posted comment, their response became hidden within a link. This caused the same questions to be asked numerous times since students were not able to easily view past questions or comments. Chat room hosts frequently “copy and pasted” their original response to similar questions to increase response time.

Students were noticeably discouraged by the speed of the chat room. Students would have to submit their question and continually select the “refresh” button until a response appeared from the chat room host. Students would benefit from a “real-time” chat session similar in format and speed to “instant messenger” software commonly used on the Internet today.

### **Student Opinion**

In general, study participants expressed an average to slightly above average (2.8 out of a possible 5.0) possibility of considering landscape architecture as a career. In the diagnostic questionnaire, many students had a limited or mistaken understanding of the profession. Students were presented with a wealth of information in a relatively short amount of time. Having had little time to comprehend this large amount of new information may have caused students to hesitate in commenting one way or the other about considering landscape architecture as a career.



**Table 5.2. Average Student Response to Questions #13, #14, and #15 (0.0-5.0)**

	Overall	12th grade	11th grade	10th grade
Question #13	2.8	2.9	2.6	3.0
Question #14	4.0	3.7	3.9	4.3
Question #15	3.5	3.3	3.3	3.8

The study group rated a 4.0 out of a possible 5.0 for amount learned about landscape architecture. As noted in the diagnostic questionnaire, students commonly demonstrated an unclear understanding of the profession. Students apparently felt as though they had learned something about landscape architecture as a result of program exploration. The ability of the Web-based program to improve a student's understanding of landscape architecture is paramount to the success of the program.

At a rating of 3.5 out of a possible 5.0, students enjoyed the program at an above average level. This figure could have been higher if there were less confusion concerning questions, if there had been increased multimedia and interactive graphics, if the program had been less extensive in content, and if study participants had shown an initial interest in landscape architecture.

Results were separated by grade to assess program appropriateness for each grade participating in the study. The 10<sup>th</sup> grade rated highest in correct responses for questions 1-10 (63.2%). Table 5.1 displays that the 10th grade also rated highest in questions #13 (3.0), #14 (4.3), and #15 (3.8). This could be the result of a sophomore's lack of knowledge concerning postgraduate plans and heightened interest in any potential career.

### **Student Observation**

An observation of study participants noted high levels of interaction among the individuals. This may have been a result of the test being conducted on a Friday.

Students had been walked to the CADGIS lab at LSU from their school, approximately a fifteen-minute walk. Students had also been brought to an unfamiliar place. This “field trip” setting may have caused a lack of focus during program exploration.

Students were anxious to start the program and immediately began to explore it as soon as they sat at their computers. The study participants commented openly and to each other about the chat room and the short movies within the lessons. After program completion, students occupied themselves with returning to the chat room, speaking to one another, or checking their email and playing Internet games. Overall, students seemed to need constant stimulation during the program as well as before and after program usage. Any program utilizing technology has a lot to compete with for a student’s attention. The Internet, games, and movies of today have created a high level of expectancy among students using any type of technology.

### **Limitations**

Results from the study may not be applicable to all student populations. Study respondents for this thesis were predominantly Caucasian, male, from Louisiana, and knowledgeable about the Internet. The thesis sample group was relatively small (33 total participants) with an uneven distribution of students from each grade.

Students participated in this thesis study as a part of their art class responsibility. Not all students may have had an interest in landscape architecture or may have already chosen a career to pursue after graduation. Had students explored the program strictly on a voluntary basis, study results may have been very different.

The literature review explored the theory that not all individuals may learn as well as others for a given media type. Certain students may have been more responsive to

auditory or tactile stimuli. Although it is the very nature of a Web-based program to be primarily a visual method of conveying information, integration of more varied media types could have mitigated learning differences within the lessons. For example, the use of audio accompanying movie clips could provide the auditory stimuli needed by specific students. Tactile learning is more difficult via the Internet, but can be introduced on a somewhat superficial level by having the student move objects on the screen to design a landscape, customize the user interface, etc.

It cannot be assumed that all correct answers in the study were the result of the students' exploration of the program. Each student has had unique life experiences and interest that may influence his answers.

## **Chapter Six: Conclusions**

### **Summary**

As long as landscape architecture has been a profession in the United States, it has had to struggle with its public perception. An improvement in public perception increases the opportunities for both the employment of landscape architects and the recruitment of students in landscape architecture curriculums. Initiatives have been taken to improve the public's perception of the profession, but have lacked accompanying research to validate their effectiveness. Through the results of several evaluative methods, this study justifies the use of a Web-based program as a potentially effective media for landscape architecture education. Although additional research is necessary to develop a more effective educational Web-based tool, this study provides the preliminary steps in its development.

### **Recommendations for Further Study**

Based on the results from program evaluation, several suggestions can be made for the improvement of the program. A major area to consider for program improvement is the addition of multimedia and interactive graphics. These graphic types are effective at capturing the attention of program users and educating them through entertainment. Based on student comments, it is apparent that study participants did not prefer to read lengthy, informative passages. This can be mitigated through the intensive use of engaging graphics throughout the program.

As seen in final questionnaire results, students repeatedly expressed the desire to experiment with design. The ability to build a “virtual design” would be an excellent opportunity for students to experience what it feels like to design. The student could be

presented with a site, a design challenge, and a large assortment of elements from which to choose to create a design. This would enable the student to assemble various elements learned from the program (e.g., ecology, art, technology) and apply them to a design.

Another student suggested having a demonstrational version of AutoCAD to explore within the Web-based program. It would be difficult for the student to use AutoCAD due to its complexity, but perhaps a simplified version of the program could be developed for student use. More opportunities such as these should be integrated into the program's design for the student to have a better idea of what a landscape architect may experience in his/her daily activities.

If the program were used in a timed setting, certain modifications should be made. Due to the great variation in student time spent on program exploration, there should be a type of "buffer" to compensate for time differences. Students should be presented immediately with something to capture their attention while waiting for program instructions to be given. This initial activity could be an interactive form of educational entertainment to occupy his/her time until s/he can proceed with program exploration. Additionally, an interactive activity focused on landscape architecture should be available to those students who finish the program in less time than others.

Alternate assessment methods should be considered in the future development of a Web-based module. This assessment could prove very valuable to the program's content or determining what a student has learned from program exploration. For example, a more comprehensive diagnostic test could evaluate a student's general interests or talents. Based on this information, the student could be presented with a customized program about landscape architecture with emphasis on his/her interests and

talents. In terms of determining student knowledge after utilizing the program, a more comprehensive “pre” and “post” testing should be integrated into the program to specify information learned from the program. Additionally, alternative methods of supplying student feedback from questionnaires should be considered. Should the student be presented with the correct answer immediately or should the student be supplied with a list of both his/her responses and correct answers upon program competition?

Based on student questions in the program’s chat room, greater emphasis should be placed on the non-material benefits of a landscape architecture career. Student questions repeatedly focused on a landscape architect’s salary. More attention should be given to the travel opportunities and the ability to learn about other cultures in the profession of landscape architecture. Students should also be taught about the level of job enjoyment among landscape architects. *Cool Careers for Dummies* by Marty Nemko and Paul and Sarah Edwards, includes landscape architecture in its list of “supercool” careers. These non-material benefits of a career in the landscape architecture field could be presented to the student through elements such as interviews with landscape architects, excerpts from *Cool Careers for Dummies*, or brief narratives by landscape architects about their travels.

The program’s format could serve as a model for virtually any profession desiring to educate students. Students who show an initial interest in landscape architecture or interest in any potential career would be the best candidates for program exploration. The program could also be used as an introductory tool for a school’s visit by a landscape architect during a career day. Students would become familiar with the profession before

the arrival of the landscape architect and be prepared with any questions that s/he may have about the profession.

As evidenced by this study, a Web-based program has much potential in effectively educating students about landscape architecture. The profession of landscape architecture has come a long way since its American beginnings nearly two centuries ago, but stills struggles with public perception. Technology use is a standard in today's society, especially among youth, and an effective means to disseminate information. The ASLA is at a prime point to expand its current educational efforts and assess their effectiveness. Although this thesis was merely a first step in the creation and evaluation of such an effort, it provides a valuable foundation on which to build future educational Web-based endeavors.

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## Appendix A: The Web-Based Program

**ARRIVE >**

Tell us a little about yourself...

The information you provide will help to analyze the effectiveness of this program. You will receive no grade based on your answers. Please answer these questions honestly, to the best of your ability, and in the spaces provided. This information will remain confidential, and will be in no way traceable to you.

Age:

Grade:

Gender:

Ethnicity:

Nationality:


Have you ever heard of landscape architecture?:

If so, where?

What do you think a landscape architect does?

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Figure A.1. Arrive



PEOPLE : PLACES : TIME : COMMUNICATION : IDEAS
CHAT

## EXPLORE +


### How do I EXPLORE?

You can learn more about landscape architecture with this program in 3 ways...

- 1: Learn about different elements of landscape architecture such as PEOPLE, PLACES, TIME, COMMUNICATION, and IDEAS by clicking on the words in the gray bar at the top of this window. Most lesson images can be enlarged by clicking on them.
- 2: Obtain more information on mentioned topics from the World Wide Web by clicking on links throughout the text.
- 3: Join a live discussion with a landscape architect by clicking on the CHAT link to the right of the gray bar at the top of this window.

### What is landscape architecture?


You may think that landscape architecture is only about planting flowers in a yard, but it involves much more. Landscape architecture can involve designing and/or planning something as small as a yard or something as large as a city. There are examples of landscape architecture everywhere including parks, school yards, sports fields, and parking lots.




A landscape architect understands not only the plants for a space, but additional elements such as the people, ecology, and history that are related to that space. A landscape architect would consider how these influences affect the space in the past, the present, and the future to create both an aesthetically and functionally appropriate design.

### When did landscape architecture begin?

Although not an official profession in America until the late nineteenth century (1800's), aspects of landscape architecture exist from the dwellings of early man to the agricultural fields of colonial America.



Ever heard of [Central Park](#) in New York? Would you believe that a landscape architect was a major force in its design and development? His name was Frederick Law Olmsted, Sr. Frederick Law Olmsted is known today as the "Father of American Landscape Architecture."



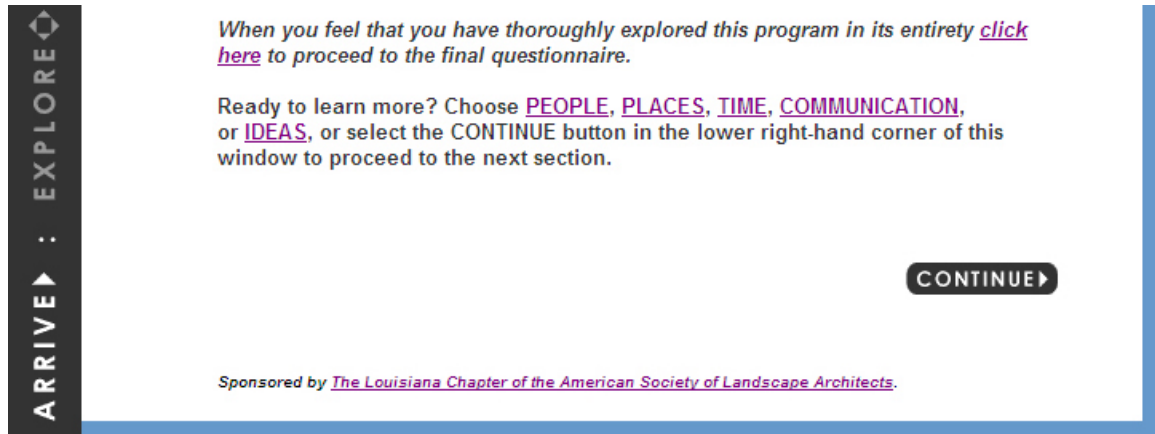
The Sheep Meadow, Central Park

[Click here](#) for more info about Frederick Law Olmsted and the history of landscape architecture.

To learn more about a career in landscape architecture, to take a landscape architecture interest test, to watch landscape architecture videos, or to check out a cartoon, [click here](#).

HOME
REFLECT

Figure A.2. Explore - Introduction: Part 1



**Figure A.3. Explore - Introduction: Part 2**



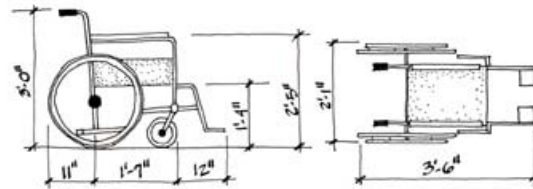


## PEOPLE

What do people have to do with landscape architecture? Quite a bit! When a landscape architect creates a design, s/he must consider *who* will use that space and *how* it will be used.

A landscape architect designs for all types of people. Some individuals require special considerations as a result of physical or mental ability, culture, social status, or behavior.

A wheelchair-bound person is dependent on a wheelchair for daily activities. Every place that individual goes must be able to accommodate a wheelchair. For example, a landscape architect would design pathways to



be wide enough and of appropriate material for wheelchair use. These pathways should not be too steep so that the individual can easily maneuver the wheelchair. Notice in the above image that a typical wheelchair is approximately 2 feet wide. By designing a pathway 5-6 feet wide, the landscape architect allows for two wheelchair-bound pedestrians to pass one another on the same path. [Click here](#) for other disabilities to consider in a landscape architect's design.

[Therapeutic gardens](#), gardens for mental and/or physical rehabilitation, are another example of how a landscape architect designs for the needs of specific people. An individual suffering from Alzheimer's disease may benefit from a walk in a garden with a closed path - a path with only one, connecting route so that s/he doesn't wander outside of the garden.



Cultural differences are a major consideration in a landscape architect's designs. If a landscape architect were hired to create a park in Japan, it may look and function very differently from a park in the United States.

Cultural differences can even be found within the United States. For instance, areas of Houston, Texas have a large Hispanic population. If a public park were constructed for use by this population, particular attention should be paid to the customs and traditions of

this Hispanic culture. [Click here](#) if you want to learn more about landscape architecture and culture.

Figure A.4. Explore - People: Part 1

Not everyone is of the same social group. Income may determine an individual's placement within a society. Through his research, Walter Hood, a landscape architect in California, understood the special needs of financially challenged, though socially active, residents in West Oakland, California. He created numerous designs for a park to accommodate their social activities, gardening, and local vending.

The *manner* in which a place is used is as important to the design as *who* will use it. Some places may not be used as they were intended. For example, people may not use a space because they feel unsafe within it. On the other hand, spaces may be used, but in a way that is not expected. Litter and graffiti are just two examples of this type of unexpected use. Through intensive research, a landscape architect designs to expect the unexpected.



When you feel that you have thoroughly explored this program in its entirety [click here](#) to proceed to the final questionnaire.

Choose [PLACES](#), [TIME](#), [COMMUNICATION](#), or [IDEAS](#), or select the CONTINUE button in the lower right-hand corner of this window to proceed to the next section.

[CONTINUE ►](#)

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Figure A.5. Explore - People: Part 2



PEOPLE : PLACES : TIME : COMMUNICATION : IDEAS
 CHAT

## PLACES

Every place is unique. Think about your home, for example. You probably know where the water runs when it rains, what kind of animals cross onto your property, or maybe what kind of plants grow in your yard.

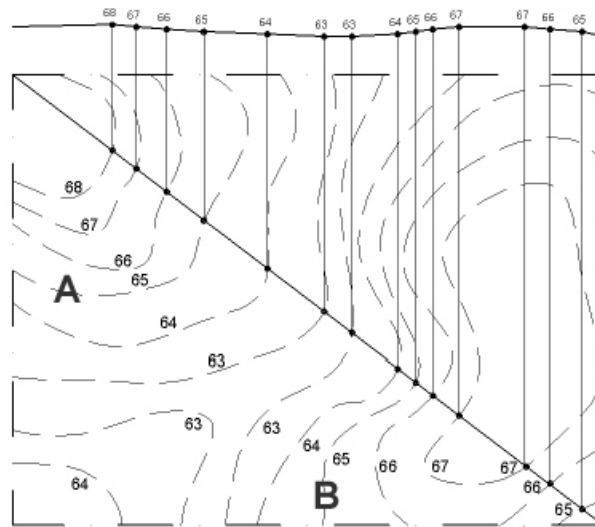
Rainwater, animals, and plants are all a part of the land's ecology. In school you have probably studied how elements work together to support one another in an ecosystem. A landscape architect becomes aware of the unique ecology of a site by creating a site inventory and site analysis. A *site inventory* records the elements of a landscape such as plants, animals, topography, hydrology, geology and ecology. A *site analysis* evaluates these elements. The following are just a few of the ecological topics covered by a site inventory and site analysis.

Sunlight is obviously an important element in a landscape. The movement of the sun in the landscape determines what type of vegetation grows in what areas. The position of the sun in the sky also establishes the season. It is important for a landscape architect to calculate where sunlight and shadows are in the landscape to know where to place appropriate vegetation and landscape structures (sidewalks, decks, etc.). Click on the button in the lower right-hand corner of the image to see an animation of a shadow study.



**Figure A.6. Explore - Places: Part 1**

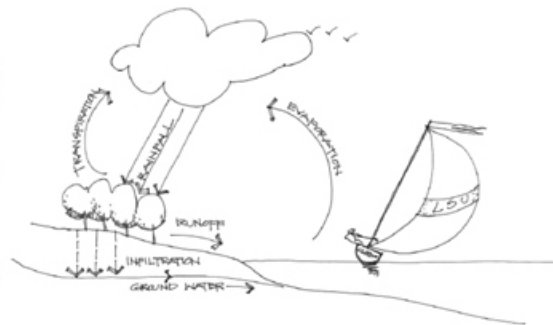




Topography is the study of land formations. It is extremely important for a landscape architect to be aware of topography since certain plants, and therefore animals, only thrive at specific elevations. Drainage is also influenced by topography. For example, water flows downhill. Flatter topography is typically more suitable for the placement of a building. But in order for rainwater to flow away from buildings

or landscape structures, a landscape architect may need to change existing topography in the design. The above image is a typical topographic map. Each dashed line, called a *contour line*, represents an elevation above sea level in feet. Each contour line is labeled on the uphill side. For instance, line "A" is at an elevation of 65. Line "B" is also at an elevation of 65. Above the map is a [section](#) of the topography. Place your mouse over the image to see a shaded version of the topography: darker areas are at a lower elevation while lighter areas are at a higher elevation.

The hydrologic (water) cycle is an important process in the landscape's ecology. We all know how important water is to plants, animals, and humans. As rainwater falls from the sky, it may become transpiration, runoff, or infiltration. Leaves from plants release water in the form of *transpiration*. *Runoff* is the




water that travels across land to an area of lower elevation. *Infiltration* is the water that seeps into the earth to form groundwater. Most water eventually evaporates into the atmosphere. Runoff is of particular concern in the hydrologic cycle. As more asphalt and concrete is placed on the earth's surface, less water infiltrates into the earth, increasing runoff. Less water is able to reach the roots of plants and underground water tables, and also leads to flooding in other areas.

**Figure A.7. Explore - Places: Part 2**



ARRIVE▶ : EXPLORE◀ : REFLECT◀  
HOME



A landscape architect can create a design that helps mitigate, or lessen, the damage that man does to the earth. S/he can also design a landscape that allows people to learn about a place while protecting it.

Louisiana is rich in natural resources such as wetlands and wildlife. It is important for individuals to experience these resources while learning to respect and protect them. A prime example can be found in [Bluebonnet Swamp Nature Center](#) in Baton Rouge, Louisiana. Among its many protective measures, it has a series of elevated boardwalks which allow visitors to observe the delicate swamp ecosystem without damaging it.

*When you feel that you have thoroughly explored this program in its entirety [click here](#) to proceed to the final questionnaire.*

Choose [PEOPLE](#), [TIME](#), [COMMUNICATION](#), or [IDEAS](#), or select the CONTINUE button in the lower right-hand corner of this window to proceed to the next section.

CONTINUE▶

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Figure A.8. Explore - Places: Part 3



PEOPLE : PLACES : TIME : COMMUNICATION : IDEAS CHAT

## TIME

Landscape architecture deals with the passage of time. As days, weeks, and years pass, landscapes change. Some of these changes are expected and welcome, other changes potentially destroy very important landscapes.



Reminders of the past can be found in nearly every place on earth. Evidence of significant people, places, or events needs to be preserved so that future generations can experience them. A landscape architect can assist in developing a design that allows people to encounter these valuable records of both man-made and natural history without damaging them.

Cemeteries and memorials are two important examples of how landscape

architects are involved in TIME. Both cemeteries and memorials are visited by thousands of people each year. It is crucial for a landscape architect to design these spaces to relate both to the memory of something past and to individuals wanting to learn about it. [Click here](#) to learn about the World Trade Center Site Memorial Competition.



A park can help preserve the ecology of a site, but we can also look at a park to observe the preservation of a man-made, cultural history. [Jean Lafitte National Park](#)

is an important record of Acadian/American culture and history in Louisiana's Mississippi Delta region. Jean Lafitte's Chalmette Battlefield and National Cemetery is the site of the 1815 Battle of New Orleans and the final resting place for soldiers from the Civil War, Spanish-American War, World Wars I and II, and Vietnam.



Time can affect a landscape in interesting ways. After a landscape's design is installed, it continually changes as plants grow or die from season to season. *Evergreen* vegetation retains its leaves and color year-round. *Deciduous* plants are more dynamic plant material since they often change color from one season to the next or lose their leaves in cooler weather. A landscape architect knows what changes to expect and prepares a design to accommodate these changes.

HOME

: REFLECT

Figure A.9. Explore - Time: Part 1

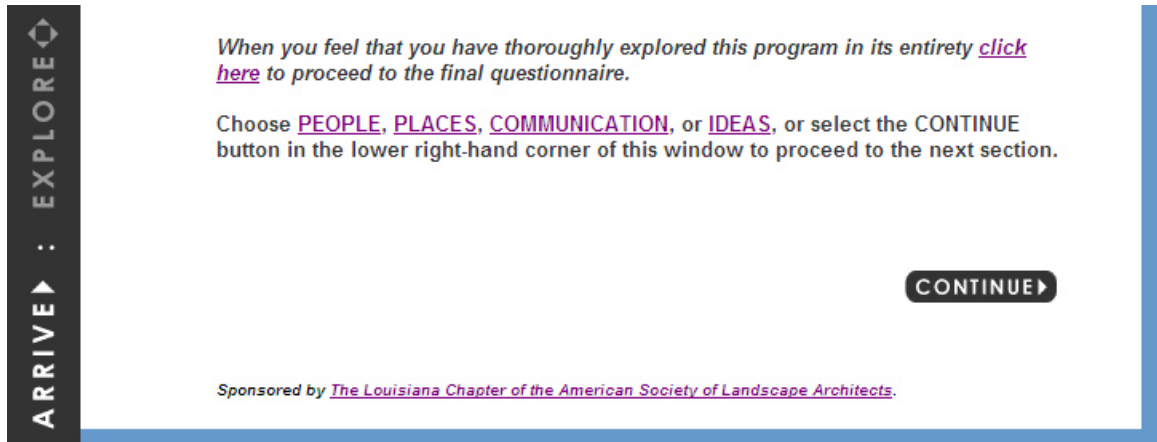


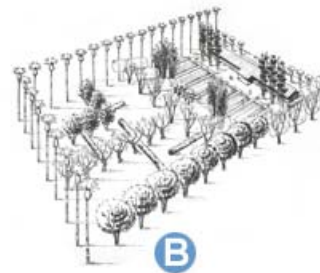
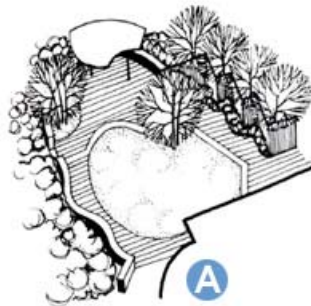
Figure A.10. Explore - Time: Part 2





## COMMUNICATION

A landscape architect must be able to communicate design intent. This communication is important both in the design process and in presenting the final design in a way that a client (or customer) will best understand it. With developments in technology, landscape architects are using more innovative methods such as computer generated models, photo manipulation (with programs such as Adobe Photoshop), or geographic information systems (GIS) to express design ideas. However, some prefer to use more traditional methods of graphic communication such as hand drawing or painting.



Since the beginning of the landscape architecture profession, landscape architects have had to present design ideas. Thomas Church, a leading landscape architect in the mid-twentieth century, often presented design ideas in simple black and white (A). Garrett Eckbo, another prominent landscape architect in the mid-twentieth century also presented many designs in black and white, but in a noticeably different style (B).

Landscape architects use plan view, perspective, and section/elevation drawings to convey design ideas. The following are examples of each:



- A *plan view* is a two dimensional (2D) view of a site, as if someone is in an airplane, looking down at the design.

- A *perspective* is a three dimensional (3D) view of a site often used to give the viewer an idea of what the designed space will look like. Objects further away appear smaller than objects that are closer.

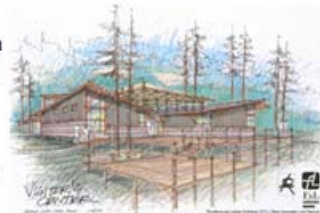
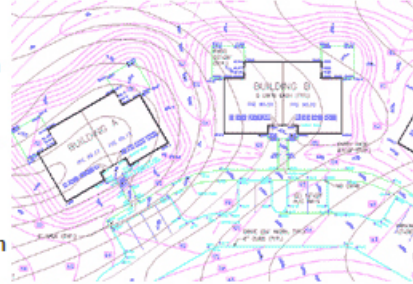


Figure A.11. Explore - Communication: Part 1



• A section/elevation drawing is like "slicing" through the surface or ground plane of a design to make the landforms more apparent. Visit [PLACES](#) for more information on landforms.

AutoCAD is a software program which allows the user to draw plans or models on a computer. A landscape architect can use AutoCAD to show a builder in detail how to construct something such as a retaining wall. The builder would receive a large sheet of paper with the AutoCAD drawing of the retaining wall and its measurements. AutoCAD allows the landscape architect to easily "zoom in" on areas of the drawing to show even more detail. [Click here](#) to learn more about AutoCAD.



Landscape architects can now easily move a step beyond simply using AutoCAD to express their design ideas. An AutoCAD file of a drawing can be brought into another program such as 3D Viz, a three dimensional modeling program. This allows the landscape architect to build the design on the computer - without the cost and labor of actually doing so. A client can view a "walk-through" to get a more realistic idea of the design. Click on the button in the bottom right-hand corner of the image to

view a "walk-through." [Click here](#) to see some additional images created with 3D Viz.

*When you feel that you have thoroughly explored this program in its entirety [click here](#) to proceed to the final questionnaire.*

Choose [PEOPLE](#), [PLACES](#), [TIME](#), or [IDEAS](#), or select the CONTINUE button in the lower right-hand corner of this window to proceed to the next section.

CONTINUE ▶

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Figure A.12. Explore - Communication: Part 2



PEOPLE : PLACES : TIME : COMMUNICATION : IDEAS : CHAT

## IDEAS

As mentioned in COMMUNICATION, a landscape architect expresses design ideas with graphics. But how does a landscape architect actually come up with design ideas? It starts with a combination of design elements such as color, form, and texture.

The landscape has a unique ability to change its color as its passes from season to season. It also possesses a huge variety of color from one plant to another. You are most likely familiar with the many colors of flowers. You may think, however, that all leaves are just green. Look a little closer - you will see gray-greens, blue-greens, and yellow-greens!



Form is another design element in landscape architecture. Having the same form, or shape, in a landscape may not be very exciting. To ensure a visually interesting landscape, the landscape architect may choose plants and other design materials of contrasting form. For example, bamboo placed in a bed of river stone provides a contrast in form. The very tall, straight bamboo is very different from the small, round river stone.



Figure A.13. Explore - Ideas: Part 1



Man has the ability to change the form of most objects. However, by doing so, the object's unique beauty is compromised. In the image below, the natural beauty of a live oak becomes apparent. The branches of the tree on the left have been cut off repeatedly while the branches of the right tree have been left to grow.



What is a difference between metal and water or wood and glass? One difference is texture. Water, for example, has both a visual and a tactile (physical) texture. As with color and form, providing contrasts in texture can create a more exciting design. Examine the Tanner Fountain at Harvard University in the image to the right. The fountain's designer, Peter Walker, used the fine airy texture of the mist to contrast against the jagged boulders.

Texture can also play a functional role when incorporated into designs for sight-disabled individuals. By walking a path with different textures, the individual could easily become aware of placement on the path.




*When you feel that you have thoroughly explored this program in its entirety [click here](#) to proceed to the final questionnaire.*

Choose [PEOPLE](#), [PLACES](#), [TIME](#), or [COMMUNICATION](#) to continue program exploration.

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**Figure A.14. Explore - Ideas: Part 2**



## REFLECT <

Again, the information you provide will help to analyze the effectiveness of this program. You will receive no grade based on your answers. Please answer these questions honestly and to the best of your ability. Please choose the appropriate answer or type your answer in the spaces provided. This information will remain confidential, and will be in no way traceable to you.

1 : Who is commonly referred to as the “Father of Landscape Architecture?”

- ☐ A. Walter Hood
- ☐ B. Garrett Eckbo
- ☒ C. *Frederick Law Olmsted*
- ☐ D. Frank Lloyd Wright

2 : Of the following, select the best definition of a landscape architect.

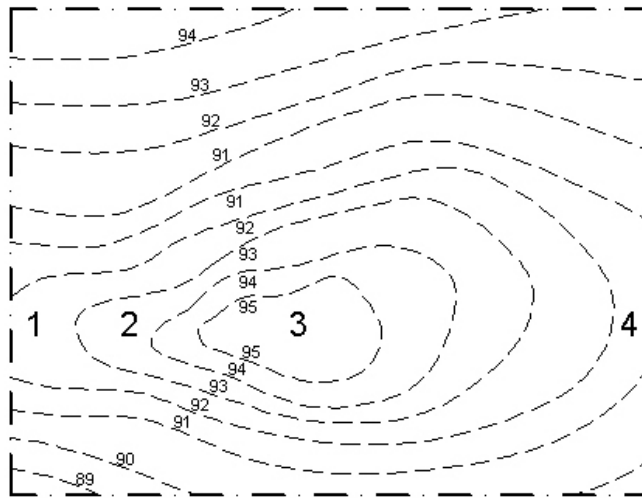
- ☐ A. A landscape architect maintains lawns (mowing, trimming shrubs, etc.)
- ☒ B. *A landscape architect designs exterior environments through design and problem-solving strategies.*
- ☐ C. A landscape architect grows flowers, fruits, and vegetables.
- ☐ D. A landscape architect designs homes, hospitals, and office buildings.

Figure A.15. Reflect: Part 1



3 : Select the map location number (1-4) which designates an elevation of 92-93 feet.

- ☒ A. 1    ☐ B. 2    ☐ C. 3    ☐ D. 4



4 : Which graphic would give a client the best idea of what it would feel like to be within the design?

- ☐ A. A drawing of a plan view  
☐ B. A black and white section drawing  
☐ C. An image of a 3D model  
☒ D. An animation of a walk-through

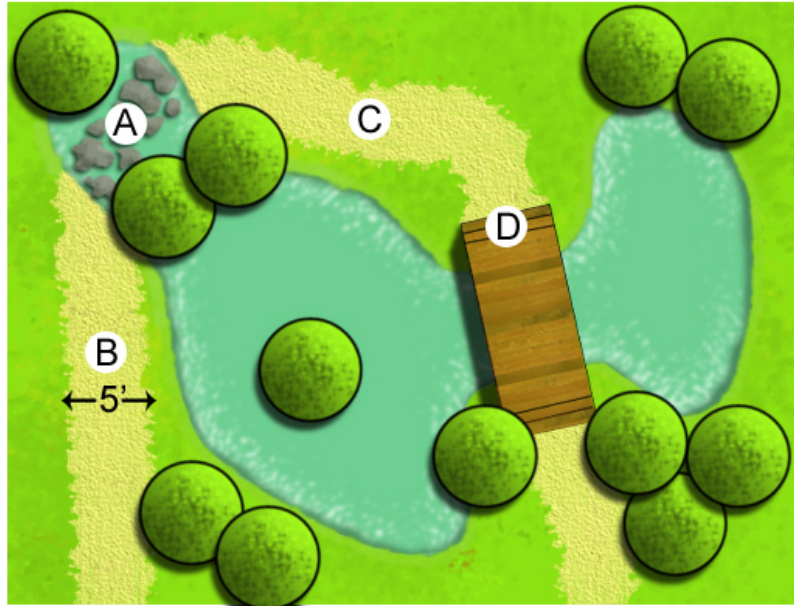
5 : A landscape architect is hired to design an entrance for a popular national restaurant chain. The same basic design must be used for all restaurants, only making adjustments based on the restaurant's location in the United States. A good landscape architect would design the restaurant's entrance in Louisiana with less shaded waiting areas than the same entrance in Michigan.

- ☐ A. true  
☒ B. false

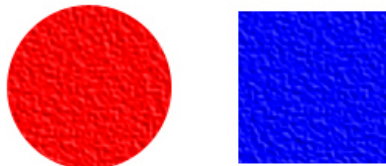
Figure A.16. Reflect: Part 2

6 : Examine the following drawing of a park's design. What would *not* be of concern to a wheelchair-bound park visitor?

- ☐ A. The stepping stones
- ☒ B. *The width of the path*
- ☐ C. The sand path
- ☐ D. The bridge steps



7 : What best describes the following two objects?



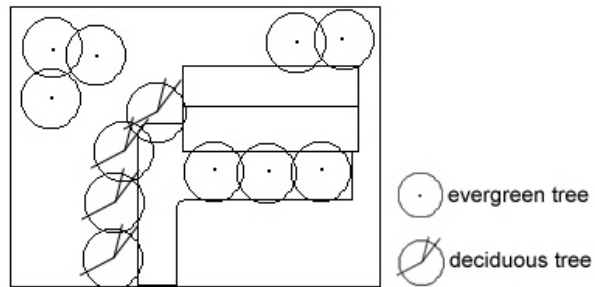
- ☒ A. *Contrasting color and form*
- ☐ B. Contrasting form and texture
- ☐ C. Contrasting texture, color and form
- ☐ D. Contrasting texture and color

Figure A.17. Reflect: Part 3

8 : Water can be released through the leaves of vegetation. Which part of the hydraulic cycle is this?

- ☐ A. Condensation
- ☐ B. Evaporation
- ☐ C. Infiltration
- ☒ D. Transpiration

9 : What is the best depiction of what the following design would look like in winter in approximately 5 years?







- ☒ A. 
- ☐ B. 
- ☐ C. 
- ☐ D. 

Figure A.18. Reflect: Part 4

10 : The following image shows where people have continually walked over grass, where there is no sidewalk. What would you suggest doing?



- ☐ A. Nothing. It is fine as it is.
- ☐ B. Block off this area on which people are walking. People should obey the rules.
- ☐ C. *First look at the existing design of the space to better understand why people are walking here. Make adjustments based on this research.*
- ☐ D. Construct a sidewalk over this area since people are walking there already.

11 : What do you think about the following design?

- ☐ A. I like it.
- ☐ B. I do not like it.

Because:

12 : A piece of wetland property has been approved for development as a national park. The first proposed design develops approximately 80% of the existing property. Should the proposed design be built?

- ☐ A. The proposed design should be built - it would bring in more money by employing people in its construction and increasing the number of park visitors.
- ☐ B. The proposed design should not be built - because we have enough parks.
- ☐ C. The proposed design should be built - it provides more area for visitors to relax and learn about nature.
- ☐ D. The proposed design should not be built - it destroys a large part of the wetland.

Figure A.19. Reflect: Part 5

ARRIVE ► : EXPLORE ◀ : REFLECT ◀

13 : On a scale from 1 to 5 (1 representing "not at all" and 5 representing "absolutely"), would you now consider landscape architecture as a career?

☐ A. 1    ☐ B. 2    ☐ C. 3    ☐ D. 4    ☐ E. 5

14 : On a scale from 1 to 5 (1 representing "very little" and 5 representing "very much"), how much did this program teach you about landscape architecture?

☐ A. 1    ☐ B. 2    ☐ C. 3    ☐ D. 4    ☐ E. 5

15 : On a scale from 1 to 5 (1 representing "very little" and 5 representing "very much"), how much did you enjoy using this program?

☐ A. 1    ☐ B. 2    ☐ C. 3    ☐ D. 4    ☐ E. 5

16 : How would you improve this program?

Figure A.20. Reflect: Part 6

## Appendix B: Diagnostic Questionnaire

**Table B.1. Student Awareness and Perception of Landscape Architecture**

Grade	Have You Ever Heard of Landscape Architecture?	If so, where?	What Do You Think a Landscape Architect Does?
10 <sup>th</sup>	No		
10 <sup>th</sup>	Yes	from college curriculum and other people	makes the blueprints for people's yards and business' landscape such as fountains and gardens
10 <sup>th</sup>	Yes	at school and from my cousin	Deals with making and touching up and designing yards, dealing with grass plants and with garden etc.
10 <sup>th</sup>	Yes	HGTV	they design inviting outdoor spaces through sculpture, plant life and architectural elements.
10 <sup>th</sup>	Yes	My neighbor is a landscape architect	I think a landscape architect designs landscapes for big buildings.
10 <sup>th</sup>	Yes	One came to our house.	Landscape gardens.
11 <sup>th</sup>	No		probably just paint the surrounding landscape (actual people, places, etc.) on canvas
11 <sup>th</sup>	Yes	on TV	Provides ideas and knowledge about where to build
11 <sup>th</sup>	Yes	Random places, but mostly on t.v.	They design buildings and homes. They use land, measurements, and geometrical shapes in order to find design the best building possible.
11 <sup>th</sup>	Yes	My mom.	A landscape architect designs landscaping for people by mapping out areas and drawing up designs.
11 <sup>th</sup>	Yes	magazines, contractors,	they design the landscape using stuff like flower beds and trees and fountains put in specific spots that all belong to a plan

11 <sup>th</sup>	Yes	My neighbor	I think a landscape architect designs a yard with trees and flowers for someone's home, or a business.
11 <sup>th</sup>	Yes	In school	designs the types of plants, fountains, etc. that should be put in a given area
11 <sup>th</sup>	Yes	My aunt is a landscape architect	consults and creates the landscape outside of a building or area.
11 <sup>th</sup>	Yes	mom	designs land and plants flowers
11 <sup>th</sup>	Yes	family	A landscape architect designs plans for lawns. Designs flowerbeds, patios, etc.
11 <sup>th</sup>	Yes	school	I think that a landscape architect designs a layout for a home or some kind of architectural design, and they develop around the development, including things like plants and any other developments.
11 <sup>th</sup>	Yes	My friend's dad is an architect.	Draw designs
11 <sup>th</sup>	Yes	commercials	designs landscape around houses
11 <sup>th</sup>	Yes	school and parents	A landscape architect goes around in peoples backyards and takes there lawn furniture.
12 <sup>th</sup>	No		
12 <sup>th</sup>	No		They make designs of landscaping
12 <sup>th</sup>	No		works on landscape architecture by building landscapes outside
12 <sup>th</sup>	Yes	Through older people.	Designs layouts for gardens and parking lots, neighborhoods etc.
12 <sup>th</sup>	Yes	mainly my uncle	A landscape architect is a designer of landscape. He deals with plants and soils a lot. He can design flower beds and other layouts of plants in a specified area. For example, you may call a landscape architect to layout some designs for flower beds and plants around your new home.
12 <sup>th</sup>	Yes	i heard from a college recruiter	someone who creates and plans a certain piece of land.

12 <sup>th</sup>	Yes	I have seen them around LSU	I think they measure the ground to see if its level and things like that.
12 <sup>th</sup>	Yes	In magazines and in Science classes	They design different types of landscapes for a new building.
12 <sup>th</sup>	Yes	a friend	it is landscaping
12 <sup>th</sup>	Yes	parents	They are the ones that design the area around a building or structure. They do all the landscaping work.
12 <sup>th</sup>	Yes	somewhere	thinks of creative ideas about how to decorate landscapes.
12 <sup>th</sup>	Yes	conversation and tv	Designs landscapes for houses, businesses, etc.
12 <sup>th</sup>	Yes	i don't know	someone who lays out plans for landscapes with plants, etc.



## Appendix C: Question #11

**Table C.1. Student Evaluation of Image**

Grade	Response
10th	I do not like it because... it is not wide enough to accept wheelchairs and it is very ugly in appearance, there is also no wheelchair ramp.
10th	I do not like it because... it isn't very interesting or appealing
10th	I do not like it because... people in wheel chairs are unable to use it because it does not have a ramp.
10th	I do not like it because... The sidewalk suddenly cuts off and becomes grass.
10th	I do not like it because... there is no wheel chair ramp
10th	I like it because... it is wide and clean looking
11th	I do not like it because it cannot be accessed by wheelchairs, the curb is ugly looking, and the sidewalk ends into grass, so when it rains pedestrians could get their feet wet by stepping in the mud.
11th	I do not like it because it does not look wheelchair accessible but it does look fine for all others
11th	I do not like it because there is dead grass. The sidewalk isn't handicap accessible. There isn't any drains. There isn't any trees by the house. There is an ugly crooked chain-link fence.
11th	I do not like it because... even though this sidewalk is useful to some people. it is not useful to the people with wheel chairs and the people who are on crutches. it should not be a raised sidewalk.
11th	I do not like it because... First of all, i don't find it attractive at all. Also if anyone with wheelchairs were to cross over the sidewalk they would have to go over the hump, considering there is no wheelchair ramp.
11th	I do not like it because... if someone with a wheel chair wanted to go up on the side walk they would not be able to because of the curb.
11th	I do not like it because... it appears that the sidewalk sort of ends. In that there is just grass after the cement.
11th	I do not like it because... it doesn't have a wheelchair ramp.
11th	I do not like it because... it is not a very pleasant site to look at, but the construction is fine.
11th	I do not like it because... it is taking away a home from all of the animals that live in the water! THEY WERE HERE FIRST!!!!!!!!!!
11th	I do not like it because... it not only doesn't appear safe but if a handicap were to ride on it there would be no way off it at the close end of it.
11th	I like it because it is nicely constructed and serves a good purpose.

11th	I like it because it is practical, and provides protection from the canal I do not like it because there needs to be a ramp for handicapped individuals, and it clashes with the wildlife of the area
11th	I like it because... It's curved design and the fact that it is accessible to all people
12th	I do not like it because... even though it serves its purpose it is not very appealing to the eye.
12th	I do not like it because... handicapped people will not be able to get on or off of it, it is also very close to the street
12th	I do not like it because... it isn't very attractive
12th	I do not like it because... it isn't very appealing, but it will be used because it is a bridge
12th	I do not like it because... the sidewalk stops instead of continuing on
12th	I do not like it because... there is not a handicap ramp for an individual in a wheelchair. in order for him to enter or exit this sidewalk, he would have to go on the grass, which could be difficult if it was wet or muddy.
12th	I do not like it because... there isn't a ramp for wheelchairs. In addition to not being functional it is not visually appealing. It needs to have vegetation or something to look nicer.
12th	I do not like it because... You cant get up there on a wheelchair or a bike or skateboard or something like that
12th	I do not like it because...it does not seem to be very functional. The sidewalk should continue. It is also not accessible for anyone who has a disability.
12th	I do not like it..., its plain, nothing is around it, there is no drop off for handicapped people either, needs some bushes or something
12th	I like it because... it has a nice flow and the curves make it more appealing to the eye, but the curb is in the path of stepping and walking. It should slope down here to accommodate pedestrians.
12th	I like it because... it looks fine to me
12th	I like it because... It provides a place to walk instead of walking in the street

## Appendix D: Question #16

**Table D.1. Student Suggestions for Program Improvement**

Grade	Response
10 <sup>th</sup>	I wouldn't do anything differently. The site was very well organized and interesting. It was written to where I could understand it easily and the pictures kept my attention.
10 <sup>th</sup>	the question about the wheel chair should be labeled better.
10 <sup>th</sup>	I wouldn't. The animations were very interesting.
10 <sup>th</sup>	let people use a demo of the CAD design program
11 <sup>th</sup>	eliminate some of the questions that are not needed
11 <sup>th</sup>	There is to much reading and not enough visual diagrams.
11 <sup>th</sup>	put some games on it where you can make simulated designs of landscapes.
11 <sup>th</sup>	make the chat room answers faster.
11 <sup>th</sup>	I think the program is fine as it is.
11 <sup>th</sup>	I don't know
11 <sup>th</sup>	I would have "choose" advance you to the next question, instead of having to click continue
11 <sup>th</sup>	It is well done.
11 <sup>th</sup>	maybe throw a few videos in there or something along those lines
11 <sup>th</sup>	I don't know of anything that would improve this program. It was a great overview of this occupation. It was brief yet informative. I was well educated and it kept my interest. Not too lengthy but just long enough.
11 <sup>th</sup>	I liked it alot. I think whoever made it did a really good job. They connected all aspects of the profession into the presentation and it is very appealing to the eye.
11 <sup>th</sup>	Less information, there was too much reading.
11 <sup>th</sup>	Less reading and more visual, maybe a little movie or animation or something!
11 <sup>th</sup>	Maybe some food? I got kind of hungry about half way through the test.
12 <sup>th</sup>	I would cut down on the technical aspects of the learning pages and make them more appealing to learn. Nice pictures though, they went well with the presentation.
12 <sup>th</sup>	I would include more architectural sites, such as other parks and such. I would have liked to learn more about other sites, not so much central park, even though that is where the Father of architecture began. I would like to learn more about an landscape
12 <sup>th</sup>	Less words and less reading. More interaction. Still a very informational program. GOOD JOB
12 <sup>th</sup>	Less reading more pictures.
12 <sup>th</sup>	I would make it a bit more inter-active with some more videos. They should be one that shows the actual process of what a landscape architect does.

12 <sup>th</sup>	I like the layout. It is easy to read and visually appealing. It also has lots of good information.
12 <sup>th</sup>	put more color, or make it more active...more colorful, eye catching
12 <sup>th</sup>	I liked it a lot but I wish there were more pics showing creative examples of landscape architecture.
12 <sup>th</sup>	I would include more interactive activities and less reading.
12 <sup>th</sup>	Its a good program- there is no real way to make taking a questionnaire very fun- so I wouldn't suggest anything
12 <sup>th</sup>	I think it is a good program and has a lot of useful information about landscape architecture

## **Vita**

Courtney Lynn Bailey Gay was born in Anchorage, Alaska, on December 22, 1974. She was the younger of two children to Jeff and Brenda Bailey. In 1993 she graduated from Pineville High School in Pineville, Louisiana. Graduating from Northwestern State Louisiana in Natchitoches, Louisiana, in 1996, Courtney Gay received her bachelor of fine arts with emphasis in theatre and French. She married Douglas Gay on November 4, 2000. She hopes to pursue a career in landscape architecture with emphasis on 3D modeling and visualizations.