AN EVALUATION OF THE COLLEGE OF AGRICULTURAL SCIENCES AND NATURAL RESOURCES DEPARTMENTAL HOMEPAGES

By

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CHAPTER I

INTRODUCTION

Background and Setting

In the modern world of technology, many people get much of their information from Web sites. Subramaniam stated, "an increasing number of businesses are choosing the Web as an alternative channel for developing a brand reputation, for transacting with and servicing customers and investors, or simply for public relations purposes" (as cited in Agarwal & Venkatesh, 2002, p.168). Often, trying to obtain information can result in user frustration and users going to a different site to get the needed information. When this occurs, a Web site loses not only its clientele, but also its credibility.

A Web site should have a first impression that is valuable, and succeeding visits should be as important to the visitor. The goal for a useful and good usability metric is to help improve an organization's Web presence. A vital key for those who maintain a Web site is to understand the strengths and weaknesses the Web site portrays. A designer can use the assessment of a site to improve the site with different design principles and navigation methods.

"Content Management is a term that refers to the collection, management, and publishing of information online. The concept of content management comes

into play when creating and maintaining a Web site" (Dahl, 2004, p. 24). This researcher further stated it involves the alliance of multiple specialists such as designers, programmers, writers, and editors.

Institutions of higher learning have a concern about finding, enrolling, and keeping the best possible students (Stivers, 2003). To do this successfully, institutions must employ multiple strategies and tools to encourage exploration from and provide information to potential students. The way they are achieving this is through the Internet.

At the college and university level, Web sites often are managed by the individual department; therefore, the content in the sites has a different format. At the University of Gonzaga, office clerks and others found themselves pressed into service to maintain the department areas of the Web site (Powell & Gill, 2003). "Each area of the Web site became as distinct as the office culture which it emerged, and visitors were often unclear if they were still on the university's site. Site navigation became nearly impossible, as there were no rules enforcing a common navigation scheme" (Powell & Gill, 2003, p. 44).

In addition to Powell and Gill, Zakon (2001) also reflected that higher education institutions have been engaged in the creation of Web content for many years — considerably longer than the commercial sector. Other institutions of higher education propose that financial factors have tended to restrain design excellence, due to budget limitations which have resulted in a do-it-yourself climate. Therefore, situations have resulted where institutional departments do not have resources earmarked for the production of Web material and must rely on budget and staff time. Furthermore, the

existing personnel's role has been expanded to include these duties, and often without appropriate formal training. This has created a difficult scene to achieve and maintain a good, consistent design for the overall institutional Web site.

This research study focused on the Web sites of Oklahoma State University's College of Agricultural Sciences and Natural Resources (CASNR), which consists of nine academic departments: Agricultural Economics; Agricultural Education, Communications and 4-H Youth Development; Animal Science; Biochemistry and Molecular Biology; Biosystems and Agricultural Engineering; Entomology and Plant Pathology; Forestry; Horticulture and Landscape Architecture; and Plant and Soil Sciences.

Problem Statement

Many land grant institutions' Web developers do not have a consistent style guide to follow when developing Web pages. This results in site variation throughout the institution's Web pages.

Purpose

The purpose of this study was to develop a rubric based on best practices of Web design. This rubric was tested on Oklahoma State University's College of Agricultural Sciences and Natural Resources departmental Web pages.

Objectives

This study had three objectives:

1) To conduct a review of literature for best practices of Web design.
2) To develop an instrument for evaluating Web sites based on a review of literature for best practices in Web design for public universities.
3) To validate the rubric by conducting an evaluation of CASNR's departmental Web sites.

Considerations or Delimitations

Variables of this study include:

1) Accessibility issues that Web developers are faced with on a governmental level. For example, with the passing of the American Disabilities Act (ADA) in 1990, Congress mandated for all educational services and businesses to open their physical environments to people with disabilities. Therefore, Web sites must be able to accommodate these individuals.
2) The development of clear standards for Web sites, which includes text styles, page layouts, and properties.

Assumptions

The researcher assumes the Web sites reviewed have an accurate account of what departmental programs are offered; therefore, the content will not be evaluated, only the text styles, page layouts, and properties. In addition, each departmental Web site is designed and updated by a different developer within CASNR.

Limitations

Limitations of this study include only testing the nine departments located within CASNR, excluding the homepages for CASNR and the Division of Agricultural Sciences and Natural Resources.

Significance

Data collected from this study plays a crucial role in the quest for content management and site identity within land grant institutions. The rubric used for evaluation purposes can assist departmental Web developers in using best practices when updating or designing their page.

Definitions

Browser —"Personal computer applications designed to request pages from World Wide Web (WWW) servers using a universal resource locator (URL) and use their HTML code to display formatted text and graphics" (Stivers, 2003, p. 12).

Download —The process of moving a binary-encoded file between two computers. In this study it specifically refers to the movement of a file or files associated with a Web page between a Web server and browser (Stivers, 2003).

Homepage —"The welcome page or initial page of a Web site from which navigation using hyperlinks is accomplished. It usually ends in the domain name of a server with no other subdirectories shown. For example, http://www.okstate.edu, is the homepage of Oklahoma State University" (Hubert, 1998, p. 7).

HyperText Markup Language (HTML) — "A protocol for embedding formatting control tags within a text document so that multiple browser types adhering to standards can accurately display them" (Stivers, 2003, p. 12).

Rubric — "A one- or two- page document that describes varying levels of quality, from excellent to poor, for a specific assignment" (Andrade, 2000, p. 13).

Usability — "The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use" (Karat, 1997, p. 34).

Usability —Refers to the methods for improving ease-of-use during the design process (http://www.useit.com/alertbox/20030825.html).

Web page — "A single HTML file that when viewed by a browser on the World Wide Web could be several screen-dimensions long, meaning one would scroll down to view contents located off the viewing area of the screen" (Hubert, 1998, p. 8).

Web site — "A 'place' on the Internet or World Wide Web. The term Web site refers to the all-encompassing body of information as a whole, for a particular domain name" (Hubert, 1998, p. 8).

World Wide Web (WWW) —"Sometimes used as a synonym for the Internet" (Stivers, 2003).

CHAPTER II

REVIEW OF LITERATURE

The purpose of this chapter was to provide the study's theoretical underpinning. Books, professional journals, and magazines were used to provide a representation of related literature. This chapter was divided into the following sections: a) Introduction, b) Methods/ Procedures, c) Web Site Designs, d) Best Practices of Design, e) Web Accessibility, and f) Summary of Review of Literature.

Introduction

To provide the theoretical basis for the study, the following review of literature will serve as the conceptual framework to guide this study. By reviewing the literature, the researcher was better able to understand the aspects of each site within CASNR. This literature provided the foundation for the rubric that was developed to evaluate the sites, which is intended to provide designers with a guide for developing and maintaining CASNR Web sites. This study seeks to establish best practices of Web site design and to test these practices on specific Web sites.

Methods and Procedures

Research was conducted and reported on articles focusing on best practices of Web site design and were used as the basis for establishing the purpose and the methods

of the study. Articles were found by searching the Proquest database, Academic Search Elite via EBSCO, and various books from OSU's Edmon Low Library. Articles which were targeted reviewed the best practices of Web site design when using graphics, logos, background choices, links, color choices, contact information, loading time, layout, and content.

Data was analyzed by the researcher and put into a form of a rubric to assist with the evaluations of the departmental Web sites.

Web Site Designs

Web sites are primarily an artistic endeavor (Spool, Scanlon, Snyder, & Schroeder, 1999). The purpose of the design phase is to translate design requirements derived from knowledge about users, their tasks, the environment of use and their platform technology into prototype interface designs (Henneman, 1999, p. 4). According to Henneman (1999), guidelines to improve the usability includes recommendations for such elements as screen layout, terminology, and color-coding.

Web site design features should provide an understanding of the interaction between an organization's information intensity and its utilization of the new information technology (Palmer & Griffith, 1998, p. 38). The information component of a Web site is to capture, analyze, and disseminate the information required for it to perform its activity. According to Palmer and Griffith (1998), "a Web site design must include both marketing and technical concerns" (p. 40).

According to the Web Style Guide, 2nd Edition, during the stage of site development, a designer will make design decisions about what the audience wants, what

is to be said, and how to arrange the content to best meet the audience's needs. The guide further stated, "although people will notice the graphic design of your Web pages right away, the overall organization of the site will have the greatest impact on their experience" (Web Style Guide, 2nd Edition, 2002).

A Web site's visual and functional continuity in its organization, graphic design, and typography are important to convince the audience that the site offers them timely, accurate, and useful information (Web Style Guide, 2nd Edition, 2002). "A careful, systematic approach to page design can simplify navigation, reduce user errors, and make it easier for readers to take advantage of the information and features of the site" (Web Style Guide, 2nd Edition, 2002).

Before designing a Web page, a designer must decide the purpose of the site; know how the site will be organized; what graphic or logo will be used; the page's basic elements, graphics, and photos; and how the site will be maintained and updated (Lindsey, 1996).

Lindsey (1996) stated that Web page design should involve: (1) planning ahead and writing style sheets to define the who, what, and how of pages; (2) keeping the pages simple; (3) designing the pages for fast use and allowing the user to have a choice between text and graphic; (4) making the pages readable; (5) show interdisciplinary and hierarchical nature of information and knowledge; and (6) keep the links up-to-date.

A list of eight criteria for determining if a Web site is effective was created by Morris-Lee (2000), which includes:

- Download Time — the time it takes a page to download from the server and display in the browser, with the goal in mind of delivering maximum information in the shortest amount of time.
- Speed of Apprehension — a determination of how fast the user understands where they are and what to expect when viewing a page for the first time. Will the viewers know the message?
- Promise of Information Value — when the site has in one glance what the viewer is looking for.
- Perceived Ease of Navigability — the first thought by the visitor that a Web site's navigation systems will be easy to understand and travel will be quick and easy to return to previous pages.
- Clarity of Mission — a measure of how a Web site clearly communicates its purpose and the institution it embodies.
- Graphic Coherence — the extent to which the site reinforces the institution's brand and the graphic connection among the pages of a Web site.
- Printability — the quality of the pages when printed out, which can look different than when on the screen.
- Creative Use of Medium — design values that are appealing and are integrated with the Web site's mission.

When comparing Web pages to print, they contain more elements than just content. Images, navigational controls, menus, and page identifiers must be positioned

carefully so as not to detract from or make more difficult the reading of the primary content. Margins and white space help define the reading area of the page and provide important visual relief (Lynch & Horton, 1999).

Two checklists are provided by researchers Williams and Tollet (1998, p. 153) for recognizing poor page design versus good page design.

Recognizing Poor Design

- Color combinations of text and background that make text hard to read.
- Busy, distracting backgrounds that make text hard to read.
- Line too long (text lines should be no longer than 12-14 words).
- Paragraphs in ALL CAPS.
- Text links that are not obviously links.
- Dead links.
- Long download times.
- Graphics with anti-aliasing artifacts.
- Tables with borders turned on.
- Anything that blinks.
- Animations that are unnecessary or that do not stop.
- Having to scroll sideways.
- Unclear navigation.
- "Useless page titles that don't explain what the page is about."
- Main page that does not fit 640x460 pixels.
- Cluttered.

- Lack of alignment.

Recognizing Good Design

- Text big enough to read, but not too big (*i.e.* not so large that it looks juvenile).
- Hierarchy of information is perfectly clear and logical.
- Text width not too long.
- Navigation is clear so the user knows what to do.
- Important "stuff" in secondary pages is in the first 640x460 pixels so that users don't have to scroll down.
- Continuity (repetition) exists through all pages of the site. This gives the user the sense that he or she is viewing an integrated whole.

Best Practices of Design

To provide guidance to institutions in creating the most effective Web presence, best practices need to be identified. Decisions about content, organization, navigation, and design are vital for development of a successful Web site.

This section will focus on the best practices when using graphics, logos, background choices, links, color choices, contact information, loading time, layout, and content.

Graphics

Repetition is important from page to page within a site as it provides continuity and graphic identity that "creates and then reinforces a distinct sense of 'place' and makes the site distinct and memorable" (Lynch & Horton, 1999, p. 56). A set of design standards that are created and remain builds unity within a site and speeds up page development.

Usability.gov stated, "only use graphics that enhance content or that lead to a better understanding of the information being presented." Furthermore, users may be willing to wait for graphics to download when they add value to the content of the site. Yet, Usability.gov encourages designers to use small and minimal graphics when possible to reduce the time to download.

According to IBM's Ease of Use Web site, a consistent design allows an organization to be recognized by the public easier. They further stated that a consistent visual style throughout the site gives it a "sense of unity and reinforces users' experience that they are rooted in a certain place" (IBM Ease of Use Web site, retrieved August 3, 2005).

Logos and Contact Information

"It is important that Web site visitors be able to quickly interpret and understand the purpose of a page and the possible actions that can be taken" (Stivers, 2003, p. 34). Stivers further stated labels are those words the Web designer chooses to clearly communicate to the user where a hyperlink will take them or the function of a button. "A well-chosen label communicates information efficiently" (Stivers, 2003, p. 35).

Typical navigation system label conventions that should be used on most sites are offered by Rosenfeld and Morville (1998, p. 76).

- Main, mainPage, home, homepage
- Search, find, browser, search/browse, site map, contents, table of contents, index
- Contact, contact us, contact webmaster, feedback
- Help, frequently asked questions
- News, what's new
- About, about us, who we are

A labeling system on a homepage will maintain consistency in terminology and consistency in granularity if it is well designed. "You do not want to mix tasks, audiences, and topics on a homepage" (Rosenfeld & Morville, 1998, p. 83).

Background

According to Hubert (1998), the visual design of Web sites is a factor that researchers identify. Using the visual design of Web sites is as imperative as content.

"Web designers should be cognizant of the types of information users' desire, the high importance they place on finding information, and how ease of use influences their perceptions of Web site effectiveness" (Sandvig & Bajwa, 2004, p. 18).

Authors write about the contrast of page design to be essential. Nielsen (2000) recommends high contrast between text and background. The background should be plain and subtle so the text stands out. Fonts should be unornamented and large enough for

reading easily. Avoid writing in all caps because this slows the reader and is often described as "shouting" (pp.125-126).

Links

According to the article "Broken Links and Poor Information Architecture Design" by McGovern (2001), "Links are an essential infrastructure allowing Web content to be navigable. Without links, you might as well pile all the billions of documents on the Web into one huge container," (found at: http://www.clickz.com/experts/archives/disign/site_design/article retrieved August 3, 2005).

McGovern further stated broken hyperlinks, or links, cause problems on the Web; for example, some reasons are that a large number of Web sites are being closed down, Web sites are not being properly maintained, and Web site information architecture is constantly being changed (McGovern, 2001).

Color Choices

Researchers Lynch and Horton (1999) state designers should use subtle colors for background and small elements and they recommend not using highly saturated primary colors except in unusual situations.

Lynch and Horton further state high contrast not only is good for readability, but also to draw the reader to the important element (1999). Therefore, contrast is also used to establish a sense of organization on the page.

Animations on a page usually are distracting, and add no value to the page; therefore, many authors do not recommend using them. "Any page element that is not relevant to the content [of the Web page] is simply distracting, particularly one that talks or winks or twirls" (Lynch & Horton, 1999, p.137).

Nielsen (2000) agrees, saying "to use animations sparingly and not to use moving text (blinking, zooming, etc.)" (pp.126, 143).

Load Time

According to the Web site Usability.gov, designers should design for connection speeds of 56 kilobytes (kbps) per second. This site stated 60 percent of users use a 56 kbps connection speed or slower, whereas the remaining users have faster connection speeds (*e.g.* ISDN, DSL, Cable, etc.). They further noted actual connection speeds are about 38 percent lower than modem speed capability, meaning users with a 56 kbps connection actually have a connection averaging about 35 kbps.

Usability.gov stated users will wait about 10 seconds for a page to download and often up to 15 seconds before they lose interest.

Page Layout

Lynch and Horton (1999) say users have a problem with direction if the pages are not designed carefully. According to these researchers, an entire page should be visible without having to scroll and at most be no longer than two screens' worth of information. While scrolling, users tend to be confused because navigational controls and identifiers disappear off screen. When pages are longer than a single screen, these elements should be frequent or in some other way kept on the screen when the user scrolls.

According to the IBM Ease of Use Web site, the visual design of a Web site is an essential part of the design process. Writers for this Web site further stated the goal of visual design is to allow the user to see all aspects of the principles of design. They give the following recommendations for visual design principles which allow the interface to have visual simplicity and clarity:

- Subtractive design - reduce the clutter that does not necessarily relate with the visual aspect of the design.
- Visual hierarchy - understanding users' tasks and visually establish hierarchy of these tasks; give prominence to an object that is important. Using contrast in color and size and relative position is an option.
- Visual scheme - map a visual scheme that allows the user model and lets the user modify the interface. White space is good to provide breathing room visually, but do not eliminate extra space in the image just to save space.

Content

Expert developer Jakob Nielsen (2000) stresses the importance of making good Web design decisions and the impact on user response. "The site's design should help the user manage all the information available" (Nielsen, 2000). While choosing the right information and graphics to be displayed is very important, it is also critical to format, organize, and label properly.

Nielsen (2000) stated "it is important to consider the relationship to: aesthetics, the emotional or psychological response to something beautiful or elegant; usability, the

ability of the Web visitor to easily and quickly understand how to use a Web site; accessibility, the degree to which an audience with varying levels of education, learning style, background, and handicap can effectively use the site; platform standards; and respect for the visitor's time" (Nielsen, 2000, p. 14-15).

According to the Web Style Guide, 2nd Edition, when consistent design standards are not adopted, standard users experience confusion, reduced productivity, and opportunities are lost to benefit from the Web information source. "The advantages of consistent graphic design and user interface standards are immediately obvious in a user-centered approach to Web design and clearly transcend the parochial interests of participating departments, groups, and individuals" (Web Style Guide, 2nd Edition, 2002). In addition, without clear design standards, the overall enterprise of Web presence will advance as a "patchy, confusing set of pages – some well designed, some disastrous, and all mere parts of a dysfunctional system" (Web Style Guide, 2nd Edition, 2002).

A Web site's design and scheme was considered important to attracting and maintaining visitors (Hubert, 1998). Hubert (1998) further stated that designs are as simple as text only on a solid color background or any combination of pictures, art, graphics, sound, movement, and video.

According to Nielsen (2000), the site's main page "should set the tone and answer the questions 'Where am I?' and 'What does this site do?'" (Nielsen, 2000, p. 166). "The main page also should have three features: a directory of the site's main content areas, summary of important news, and a search feature" (Nielsen, 2000, p. 168). "This page also should prominently display the university name; all other pages in the Web site should have a link back to this homepage" (Nielsen, 2000, p. 178).

Many decisions are considered when designing a Web page (Lindsey, 1996). How a page looks, technology used, links provided, and kinds of patrons who use the page are considerations the designer must make.

Nielsen (2000) found most users scan pages instead of reading them word for word. The study showed the reasons for this include that reading text on a computer screen is considerably slower than reading print on paper; since the Web is a user-driven medium, users feel the need for interactivity and are impatient with staying on a single page; the user knows there are millions of other Web pages on the Web and is evaluating consistently whether or not the one they are looking at has the best information for his or her purpose; and the fast pace of life decreases the amount of time people feel they have to find information.

Web Accessibility

"Web accessibility can be defined simply as to which degree a site is accessible to the largest possible range of people" (Zeng, 2004, p. 1). This researcher further stated, the more people able to access a Web site; the more accessible the site. Web accessibility highlights making Web sites accessible to those with disabilities and entails removing potential barriers caused by Web designs (Zeng, 2004).

The American Disabilities Act (ADA) passed in 1990 by Congress mandated for all educational services and businesses to open their physical environments to people with disabilities. "Since that time, the WWW has become an integral part of post secondary education, and the ADA must be reinterpreted to include access to Web-based educational programs and resources" (Byerley & Chambers, 2002, p. 170).

In 1998, the Rehabilitation Act was amended by Congress to make their electronic information accessible to those with disabilities. Section 508 stated "agencies must give disabled employees and members of the public access to information that is comparable to the access available to others" (Section 508, retrieved July 10, 2005, from *www.section508.gov*).

Section508.gov has an area of regulations, 1194.22 Web-based Intranet and Internet information and applications, which designers at a federal agency are required to follow when developing a new Web site:

a) A text equivalent for every non-text element shall be provided (*e.g.,* via "alt," or in element content).
b) Equivalent alternatives for any multimedia presentation shall be synchronized with the presentation.
c) Web pages shall be designed so that all information conveyed with color is also available without color, for example from context or markup.
d) Documents shall be organized so they are readable without requiring an associated style sheet.
e) Redundant text links shall be provided for each of active region of a server-side image map.
f) Client-side image maps shall be provided instead of server-side image maps except where the regions cannot be defined with an available geometric shape.
g) Row and column headers shall be identified for data tables.

h) Markup shall be used to associate data cells and header cells for data tables that have two or more logical levels or column headers.

i) Frames shall be titled with text that facilitates frame identification and navigation.

j) Pages shall be designed to avoid causing the screen to flicker with a frequency greater than 2 Hz and lower than 55 Hz.

k) A text-only page, with equivalent information or functionality, shall be provided to make a Web site comply with the provisions of this part, when compliance cannot be accomplished in any other way. The content of the text-only page shall be updated whenever the primary page changes.

l) When pages utilize scripting languages to display content, or to create interface elements, the information provided by the script shall be identified with functional text that can be read by assistive technology.

m) When a Web page requires that an applet, plug-in or other application be present on the client system to interpret page content, the page must provide a link to a plug-in or applet that complies with 1194.21 (a) through (1).

n) When electronic forms are designed to be completed on-line, the form shall allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues.

o) A method shall be provided that permits users to skip repetitive navigation links.

p) When a timed response is required, the user shall be alerted and given sufficient time to indicate more time is required.

According to the Web Accessibility Guidelines 1.0 (1999), those who are unfamiliar with accessibility issues pertaining to Web design should consider that many users may be operating in contexts different from their own:

- They may not be able to see, hear, move, or process some types of information easily or at all.
- They may have difficulty reading or comprehending text.
- They may not have or be able to use a keyboard or mouse.
- They may have a text-only screen, a small screen, or a slow Internet connection.
- They may not speak or understand fluently the language in which the document is written.
- They may be in a situation where their eyes, ears, or hands are busy or interfered with (e.g., driving to work, working in a loud environment, etc.).
- They may have an early version of a browser, a different browser entirely, a voice browser, or a different operating system.

Disabilities which require attention by Web designers are hearing, motor skills, and cognitive/neurological disabilities. "Graceful degradations, one key to well-designed accessible Web sites, allows screen readers and other adaptive technology supporting people with disabilities to convey the core content even if the original Web site has additional design components that are not accessible by these technologies" (Loiacono, 2004, p. 84). For instance, using alt tags, which are hidden when graphics are visible but

revealed when a user opts to browse with the graphics turned off is important to those with disabilities.

According to the Web Style Guide (2002), an alt, is a built-in fallback designed to allow the content to degrade gracefully under different viewing conditions. This attribute allows the designer to supply alternate text description with any images on the page. When users cannot see images, they will see or hear the text supplied with the ALT attribute.

If a text-only browser is used, visually impaired users will not be able to use the site if graphic only menus are provided. In the Web Style Guide (2002), it was noted that if the site's navigation interface uses graphic menus, it must provide an alternate navigation route using basic text links.

A test of Fortune 100 home pages conducted by Loiacono (2004) showed that 94% of the companies do not provide fully accessible home pages. Loiacono (2004) also concluded that accessibility is currently limited, and most of the major stumbling blocks are not too large to resolve. However, modest and inexpensive modifications may fully unlock a Web site's accessibility.

Summary of Review of Literature

As noted by researchers Spool, Scanlon, Snyder, & Schroeder (1999), Web sites are an artistic venture and the designer has many requirements to keep in mind when developing a site. Designers must determine how the page will look, technology that is being used, links, and users of the site. This is to ensure they make the site they are developing desirable to the user.

To provide guidance to institutions in creating the most effective Web presence, best practices need to be identified. Decisions about content, organization, navigation, and design are vital for development of a successful Web site.

When developing Web sites, the best practices when using graphics, logos, background choices, links, color choices, contact information, loading time, layout, and content should be considered to ensure quality Web site design.

Palmer and Griffith (1998) stated Web site design features are to provide an understanding of the communication between an organization's information and its utilization of the new information technology. The information component of a Web site is to capture, analyze, and disseminate the information required for it to perform its activity. Palmer and Griffith (1998) further stated a Web site design must include both marketing and technical concerns.

When identifying Web sites, researchers look for the visual design the site has to offer, which can be just as important as the content of the site. According to Lindsay (1996), Web page design should involve six steps: (1) plan ahead and writing style sheets to defining who, what, and how the pages will be used; (2) keep pages simple; (3) design pages for fast use and allow the user to have a choice between text and graphic; (4) make pages readable; (5) show interdisciplinary and hierarchical nature of information and knowledge; and (6) keep links up-to-date.

When comparing Web pages to print, they contain more elements than just content. Images, navigational controls, menus, and page identifiers must be positioned carefully so as not to detract from or make more difficult the reading of the primary

content. Lynch and Horton (1999) state margins and white space provide important visual relief and help define the reading area of the page.

Check lists for good design help the designer when developing Web pages. Researchers like Williams and Tollet (1998) provide a checklist for recognizing poor page design versus good page design, and Morris-Lee (2000) created a list of eight criteria for determining if a Web site is effective.

When designing, developing, or maintaining a Web site, the designer must remember to follow the standards from the American Disabilities Act (ADA) passed in 1990. The ADA requires all businesses to be accessible and open their environments to people with disabilities. Designers must consider hearing, motor skills, and cognitive/neurological disabilities when designing their sites. Providing "alt" tags allows screen readers and adaptive technology to help support people with disabilities in accessing the content from a site. A well-designed accessible Web site, allows screen readers and other adaptive technology supporting people with disabilities to convey the foundation of the site, even if the original Web site has additional design components that are not accessible by adaptive technologies.

In 1998, the Rehabilitation Act was amended by Congress to make their electronic information accessible to those with disabilities. Section 508 stated "that agencies must give disabled employees and members of the public access to information that is comparable to the access available to others" (Section 508, retrieved from *www.section508.gov*).

Section 508.gov has an area of regulations, 1194.22 Web-based Intranet and Internet information and applications, which are required to be followed when designers

at a federal agency are developing a new Web site. They further mention those (designers) who are unfamiliar with accessibility issues pertaining to Web design should consider that many users may be operating in contexts different from their own.

As the literature suggests, many practices should be conducted when developing a Web site for it to establish a presence and be effective for the user. With best practices laid out before a designer, Web sites can become more desirable and worthwhile to the user.

CHAPTER III

METHODOLOGY

Chapter 3 describes the methods and procedures used to develop and conduct this study. The purpose of the study is to develop a rubric and use it to evaluate CASNR Web pages and to assist Web developers in CASNR departments to improve Web sites for a consistent Web identity. The content of the chapter includes a) Objectives, b) Research Design, c) Population, Instrument, Rubric Categories, d) Data Collection and Analysis, e) Validity and Reliability of the Rubric, and f) Summary.

Objectives

This study had three objectives:

1) To conduct a review of literature for best practices of Web design.
2) To develop an instrument for evaluating Web sites based on a review of literature for best practices in Web design for public universities.
3) To validate the rubric by conducting an evaluation of CASNR's departmental Web sites.

Research Design

This study was based on evaluation that required the researcher to determine the value of or judge the situation at hand, in this case, the CASNR Web sites. Fitzpatrick,

Sanders and Worthen (2004) define evaluation as "the identification, clarification, and application of defensible criteria to determine an evaluation object's value (worth or merit) in relation to those criteria"(p.5).

Evaluation uses inquiry and judgment methods, including:

1) "Determining standards for judging quality and deciding whether those standards should be relative or absolute;
2) Collecting relevant information; and
3) Applying the standards to determine value, quality, utility, effectiveness, or significance" (Fitzpatrick, Sanders, and Worthen, 2004, p. 5).

The evaluation method leads to suggestions intended to optimize the evaluation of the project in relation to its proposed purpose. In addition, evaluation can assist stakeholders in establishing whether the evaluation object is worth embracing, extending, or growing.

According to Scriven (1980), when conducting an evaluation study the researcher has important functions to keep in mind. Functions that are important to this study include a) identifying the needs for evaluation and a timeline for evaluation; b) ensuring how valuable the project is; c) obtaining baseline data; and d) making suggestions that seem appropriate for improvement of plans, with breadth that the evaluator's expertise seem to provide a basis for remediation.

In the finalization of a report, the evaluator refers to the context, input, process, and product information and obtains other needed information (Stufflebeam, 2003). In addition, this information is used to address the retrospective questions: "Were important

needs addressed? Was the effort guided by a defensible plan and budget? Was the service design competently and modified as needed? Did the effort succeed?" (Stufflebeam, 2003, p. 3).

Stufflebeam (2003) further stated that evaluation's most important purpose is not to prove but to improve. "Evaluation is thus conceived primarily as a function activity oriented in the long run to stimulating, aiding, and abetting efforts to strengthen and improve enterprises" (Stufflebeam, 2003, p. 4).

The research design was based on Elizabeth Kirk's (1996) criteria for evaluating Internet information based on the same criteria used by scholars to evaluate documents in the print field.

The researcher considers the following:

- Authorship may be the key criteria used in evaluating information. Evaluators need to know who wrote the information, to see if it has some critical value, and the basis in which the author speaks.
- Point of view of bias reminds the evaluator to examine who is providing the viewed information and the point of view or bias being submitted.
- Referral to and/or knowledge of the literature is the context in which the author situates his or her work. This exposes what the author knows about his or her practices and allows the evaluator to evaluate the author's knowledge.
- Accuracy or verifiability of details is important in evaluating to determine if there is work of an unfamiliar author by an unfamiliar organization or if it is non-traditionally presented.

- Currency is the information's timeliness. With print documents, this is the date of publication, which is the first sign of currency.

Population

The population for the study included departmental Web sites within the OSU College of Agricultural Sciences and Natural Resources. These sites included:

- Agricultural Economics - *http://agecon.okstate.edu*
- Agricultural Education, Communications, and 4-H Youth Development - *http://agweb.okstate.edu/agedcm4h/web/index.html*
- Animal Science - *http://www.ansi.okstate.edu*
- Biochemistry and Molecular Biology - *http://biochem4.okstate.edu*
- Biosystems and Agricultural Engineering - *http://biosystems.okstate.edu*
- Entomology and Plant Pathology - *http://www.ento.okstate.edu/*
- Forestry - *http://www.okstate.edu/ag/asnr/fore*
- Horticulture and Landscape Architecture - *http://www.okstate.edu/ag/asnr/hortla*
- Plant and Soil Sciences - *http://pss.okstate.edu*

Instrument

To fulfill the purpose and objectives of this study, a rubric was developed online with the assistance of the Rubristar Web site [http://rubistar.4teachers.org]. The evaluator developed the rubric based on the best practices of design in the literature reviewed. The rubric can be found in Appendix A.

According to Small (1997), the number of World Wide Web sites continues to grow at a booming rate, which increases the need for design guidelines. Small (1999) further stated that with the growth of print resources, the number of electronic resources continues to escalate; therefore, the need to evaluate those resources increases in importance.

The rubric, which was developed, emphasizes the quality and functionality of a Web site. Questions developed are based on the literature, are centered on the user, and the feedback is intended for Web site improvement.

The rubric consists of nine categories including graphics, logos, color choices, links, background, contact information, load time, layout, and content. Categories were scored on a five-point scale with five being the highest and one being the lowest score for each category.

Rubric Categories

Graphics

Repetition is important from page to page within a site as it proves continuity and graphic identity that "creates and then reinforces a distinct sense of 'place' and makes the site distinct and memorable" (Lynch & Horton, 1999, p. 56). A set of design standards that are created and remain builds unity within a site and, in addition, speeds up page development.

Usability.gov stated, "only use graphics that enhance content or that lead to a better understanding of the information being presented." Furthermore, users may be willing to wait for graphics to download when they add value to the content of the site. Yet,

Usability.gov encourages designers to use small and minimal graphics when possible to reduce the time to download.

According to IBM's Ease of Use Web site, a consistent design allows an organization to be recognized by the public easier. They further state that a consistent visual style throughout the site gives it a "sense of unity and reinforces users' experience that they are rooted in a certain place" (IBM Ease of Use Web site, retrieved August 3, 2005).

In the developed rubric, graphics will be determined effective and receive a score of five if they are related to the theme/purpose of the site, are thoughtfully cropped, are of high quality, and enhance the interest or understanding of the site. A site that is lacking high quality, well cropped graphics, but exhibits graphics related to the theme/purpose of the site and assists with enhancing a site's interest received a score of four. A score of three will be received if the graphics are related to the site, somewhat enhance reader interest, and are good quality. A score of two indicates the site's graphics are somewhat related to the theme/purpose of the site, are of fair quality, and somewhat enhance reader interest. If graphics have little association to the site, or are distracting, a score of one will be received.

Logos and Contact Information

"It is important that Web site visitors be able to quickly interpret and understand the purpose of a page and the possible actions that can be taken" (Stivers, 2003, p. 34). This researcher further stated labels are those words the Web designer chooses to communicate to the user where a hyperlink will take them or the function of a button. "A well-chosen label communicates information efficiently" (Stivers, 2003, p. 35).

Typical navigation system label conventions that should be used on most sites are offered by Rosenfeld and Morville (1998, p. 76):

- Main, MainPage, Home, Homepage
- Search, Find, Browser, Search/Browse, Site Map, Contents, Table of Contents, Index
- Contact, Contact Us, Contact Webmaster, Feedback
- Help, FAQ, Frequently Asked Questions
- News, What's New
- About, About Us, Who We Are

A labeling system on a homepage will maintain consistency in terminology and consistency in granularity, if it is well designed. "You do not want to mix tasks, audiences, and topics on a homepage" (Rosenfeld & Morville, 1998, p. 83).

In the developed rubric, sites which have either the Oklahoma State University, the Division of Agricultural Sciences and Natural Resources, departmental logo, or the name clearly stated receive a five in this category. Scores of four indicate that only one of the names is present and may not have been clearly stated. Having one logo which is specified on the site, but not clearly stated receives a score of three. A score of two indicates the site may or may not have the logo clearly stated on the homepage, but is stated in later pages. To receive a score of one, pages do not exhibit any of the names clearly, or are difficult to find or not found on the site.

In addition, for contact information the site must have a statement of authorship, school name, and date of publication/date last edited to receive a five. Scores of four indicate that approximately 90 percent of the pages have the desired contact information.

If most of the Web pages (75 percent to 80 percent) contain a statement of authorship, school name, and a date of publication/date last edited, they receive a score of three. Scores of two and one are received if pages do not contain a statement of authorship, school name, and/or date of publication/date last edited.

Background

According to Hubert (1998), the visual design of Web sites is a factor that researchers identify. Using the visual design of Web sites is as imperative as content.

"Web designers should be cognizant of the types of information users' desire, the high importance they place on finding information, and how ease of use influences their perceptions of Web site effectiveness" (Sandvig & Bajwa, 2004, p. 18).

Authors write about the contrast of page design to be essential. Nielsen (2000) recommends high contrast between text and background. "The background should be plain and subtle so the text stands out. Fonts should be unornamented and large enough for reading easily. Avoid writing in all caps because this slows the reader and is often described as 'shouting'" (Nielsen, 2000, pp. 125-126).

The background of the sites are scored on the scale of 5-1. A score of five is given if the background is exceptionally attractive, consistent across the pages, adds to the theme or purpose of the site, and does not detract from readability. A four is received if the background is attractive to the viewer, has consistency and does not detract from readability. These sites are usually lacking a theme and purpose related to the site. Web sites which received a score of three, contained elements of a consistent background across pages and do not distract from readability. A score of two indicates the site has inconsistencies across the pages and is lacking a theme and purpose related to the site.

Sites which had backgrounds that are detracting from the readability of the site receive a score of one.

Links

According to the article "Broken Links and Poor Information Architecture Design" by McGovern (2001), "Links are an essential infrastructure allowing Web content to be navigable. Without links, you might as well pile all the billions of documents on the Web into one huge container," (found at: http://www.clickz.com/experts/archives/disign/site_design/article retrieved August 3, 2005).

He further stated, that broken hyperlinks, or links, cause problems on the Web; for example some reasons for broken links are that a large number of Web sites are being closed down, Web sites are not being properly maintained, and Web site information architecture is constantly being changed (McGovern, 2001).

Web sites evaluated by the developed rubric received a score of five if all links pointed to high-quality, up-to-date, credible sites. A score of four was received if the greater majority of the links were working and pointed to high-quality, credible sites. Web sites which received a score of three had most of the links pointing to high-quality, up-to-date, credible sites. A score of two was received if the sites had some links that pointing to high-quality, up-to-date, credible sites. A score of one indicated that the site had links that may not point to high-quality, up-to-date, and credible sites.

Color Choices

Researchers Lynch and Horton (1999) stated designers should use subtle colors for background and small elements, and they recommend using highly saturated primary colors except in unusual situations.

Lynch and Horton further state "high contrast not only is good for readability, but also to draw the reader to the important element" (1999, p. 54). Therefore, contrast is also used to establish a sense of organization on the page.

Animations on a page usually are distracting and oftentimes add no value to the page; therefore, many authors don't recommend using them. "Any page element that is not relevant to the content [of the Web page] is simply distracting, particularly one that talks or winks or twirls" (Lynch & Horton, 1999, p. 137).

Nielsen (2000) agrees saying to use animations sparingly and not to use moving text (blinking, zooming, etc.;) (pp.126, 143).

In the developed rubric, a web site will receive a score of five if the colors of background, fonts, unvisited and visited links form a pleasing palette, do not detract from the content, and are consistent across the pages. A score of four indicates the site has characteristics of the five category, but lacks some consistency and may detract from the site. A web site receives a score of three if the colors of the background, fonts, unvisited and visited links do not detract from the content. A score of two indicates the sites have somewhat harder to read content, and detracting link colors due to the color choices. If sites exhibited color of backgrounds, fonts, unvisited and visited links which make the content hard to read and unpleasant to the reader, the site receives a score of one.

Load Time

According to the Web site usability.gov, designers should design for connection speeds of 56 kilobytes (kbps) per second. This site stated 60 percent of users use a 56 kbps connection speed or slower, whereas the remaining users have faster connection speeds (*e.g.* ISDN, DSL, Cable, etc.). They further noted actual connection speeds are about 38 percent lower than modem speed capability, meaning users with a 56 kbps connection actually have a connection averaging about 35 kbps.

Usability.gov stated users will wait about 10 seconds for a page to download and often up to 15 seconds, before they lose interest.

According to the rubric, for a web site to receive a score of five in this category a site must load very quickly (10 seconds or less) due to small graphics, good compression of sounds and graphics, and appropriate division of content. A score of four is received if the site down loads in more than 10 seconds and less than 15 seconds. If a page takes more than 15 seconds to load, but the others load quickly, the site receives a score of three. If pages take more than 15 seconds to load, but still have reasonable sized graphics, a site received a score of two. Pages that take more than 15 seconds to download due to large graphics, animations, and sounds receive a score of one.

Page Layout

Lynch and Horton (1999) stated users have a problem with direction if the pages are not designed carefully. According to these researchers, an entire page should be visible without having to scroll, at most be no longer than two screens' worth of

information. While scrolling, users tend to be confused because navigational controls and identifiers disappear off screen. When pages are longer than a single screen, these elements should be frequent or in some other way kept on the screen when the user scrolls.

According to the IBM Ease of Use Web site, the visual design of a Web site is an essential part of the design process. Writers for the Web site further stated, the goal of visual design is to allow the user to see all aspects of the principles of design.

They give the following recommendations for visual design principles which allow the interface to have visual simplicity and clarity:

- Subtractive design- reduce the clutter that doesn't necessarily relate with the visual aspect of the design.
- Visual hierarchy- understanding users' tasks and visually establish hierarchy of these tasks; give prominence to an object that is important. Using contrast in color and size and relative position is an option.
- Visual scheme- map a visual scheme that allows the user model and lets the user modify the interface. White space is good to provide breathing room visually, but do not eliminate extra space in the image just to save space.

When evaluating the sites, a score of five is given to sites which have an exceptionally attractive and usable layout. In addition to easily locating all important elements, white space, graphic elements and/or alignment should be used effectively to organize the site's material. If the evaluated web sites have a usable layout, but are lacking some of the desired traits such as white space, locating elements, a score of four

was given. Web pages which have a usable layout, but appear busy or boring, and are easy to locate most important elements received a score of three. A site that exhibits characteristics of a usable layout, yet pages are not easy to navigate and it is difficult to locate important elements, received a score of two. The web pages that are not easy to navigate due to clutter or confusing elements and there was difficulty locating important elements received a score of one.

Content

Expert developer Nielsen (2000) stresses the importance of making good Web design decisions and the impact on user response. "The site's design should help the user manage all the information available" (Nielsen, 2000). While choosing the right information and graphics to be displayed is very important, it is also critical to format, organize, and label properly.

Nielsen (2000) stated "it is important to consider in relationships including: aesthetics, the emotional or psychological response to something beautiful or elegant; usability, the ability of the web visitor to easily and quickly understand how to use a Web site; accessibility, the degree to which an audience with varying levels of education, learning style, background, and handicap can effectively use the site; platform standards; and respect for the visitor's time" (p. 14-15).

According to the Web Style Guide, 2nd Edition (2002), when consistent design standards are not adopted, standard users experience confusion, reduced productivity, and opportunities are lost to benefit from the Web information source. "The advantages of consistent graphic design and user interface standards are immediately obvious in a user-

centered approach to Web design and clearly transcend the parochial interests of participating departments, groups, and individuals" (Web Style Guide, 2nd Edition, 2002). In addition, without clear design standards, the overall enterprise of Web presence will advance as a "patchy, confusing set of pages – some well designed, some disastrous, and all mere parts of a dysfunctional system" (Web Style Guide, 2nd Edition, 2002).

"A Web site's design and scheme was considered important to attracting and maintaining visitors" (Hubert, 1998, p. 18). Hubert (1998) further stated that designs are as simple as text only on a solid color background or it had incorporated any combination of pictures, art, graphics, sound, movement, and video.

According to Nielsen, the site's main page should set the tone and answer the questions "Where am I?" and "What does this site do?" (Nielsen, 2000, p. 166). The main page should also have three features: a directory of the site's main content areas, summary of important news, and a search feature (Nieslen, 2000, p. 168). This page should also prominently display the university name; all other pages in the Web site should have a link back to this homepage (Nielsen, 2000, p. 178).

Many decisions are considered when designing a Web page (Lindsey, 1996). How a page looks, technology used, links provided, and kinds of patrons who use the page are considerations the designer must make.

In addition to the rubric, the evaluator submitted seven of the nine homepages to WebXACT, which checks a site for ADA compliance, found at: *http://webxact.watchfire.com/ScanForm.aspx*. This allowed the researcher to see what areas each homepage needed to improve, to become ADA compliant.

According to the rubric, for a Web site to achieve a score of five, it must have a well-stated, clear purpose and theme that is carried throughout. Sites which have a clear purpose, but may not carry out the same theme throughout the pages, received a score of four. Having a purpose and theme for the site yet being somewhat vague received a score of three. A score of two was received if there was a theme present, but pages were clustered or confusing. Web pages which were difficult to find elements and were cluttered and confusing, received a score of one.

Data Collection and Analysis

An evaluation of the CASNR Web sites was conducted by the evaluator on the afternoons of July 4 and July 5, 2005. Data from each of the departmental Web sites was collected using the developed rubric. Sites were scored based on the developed rubric. Web sites receiving high scores have qualities and attributes that most closely related to the best practices characteristics found in the developed rubric. Web sites that received a lower score had areas that needed improvement according to the developed rubric.

The following ranges were developed to help in categorizing the scores produced from this evaluation:

45-41 = Ideal Web site, very few or some changes need to be made

40-36= Proficient Web site, some changes or improvements need to be made

35-31= Somewhat proficient Web site, has areas that need to be improved, changed or updated

31- and below= Needs improvement, site has areas which need to be improved, areas that need to be changed, or updated, need to make adjustments to the site.

Validity and Reliability of the Rubric

Validity refers to the degree to which a study accurately reflects or assesses the specific concept the researcher is attempting to measure (Howell, et. al, 2005).

Reliability is the degree to which an experiment, test, or any measuring procedures yield the same outcome on repeated trials (Howell, et. al, 2005). In addition, if research is lacking the independent observers able to duplicate research procedures, "researchers would be unable to draw satisfactory conclusions, formulate theories, or make claims about generalizability of their research," (Howell, et. al, 2005).

Internal Validity & Reliability

The instrument was measured on two facets: content validity and internal consistency/reliability.

The issue of content validity was addressed by seeking input from a panel of experts during the days of June 21, 2005, to June 27, 2005, when developing the final stages of the rubric (Appendix A). Suggestions by the panel of expert members were incorporated to guarantee content validity of the instrument.

The rubric that was developed emphasizes the quality and functionality of Web sites. Questions developed are based on the literature, and are centered on the user. The feedback is intended for Web site improvement.

Generalizability/ Transferability

Generalizability or transferability is the extent to which the findings of a study can be applied to situations which are similar. Certain approaches were used to assure

generalizability. These included using a rich, thick description of the categories used in the Rubric, and using the literature to define the best practices of Web designs.

Dependability/Reliability

According to Howell, et al (2005), dependability is being able to account for changes in the design of the study and the changing conditions surrounding what was studied. The world of the Internet is always changing. The researcher kept the field constant by conducting research on the designated days, by the same researcher on the afternoons of July 4 & 5, 2005, and to declare fairness the same procedure was followed for each site. The researcher reviewed the site, examined the categories in the rubric, and referred to the literature to give an accurate account of each of the departmental site's components. The researcher conducted the tests herself, since she had conducted the extensive review of literature and was knowledgeable on what to evaluate on the sites.

To ensure reliability of the rubric, the researcher used two strategies. The first strategy was to provide sufficient detail regarding the methods for evaluation in this project. This was done by providing a thick description highlighting the development of the Rubric and the data collection procedures. The second strategy included using the literature reviewed by the researcher to exhibit strong standards for best practices of Web design.

Summary

Chapter 3 includes the methodology for the study. Using Kirk's (1996) discussion on criteria in which scholars in the print field used to evaluate information, this study adopted those criteria to investigate the Web sites used in the study. The method of qualitative evaluation was used for this study. The rubric was developed based on best

practices of Web design and was evaluated by a panel of experts to establish reliability and validity.

CHAPTER IV

FINDINGS

The purpose of Chapter 4 is to report the findings of this study. The evaluation was organized to address the research study's objectives. The basis of this study was to develop a rubric based on best practices of design and test this rubric on Oklahoma State University College of Agricultural Sciences and Natural Resources departmental Web pages.

Data Collection and Analysis

An evaluation of the CASNR Web sites was conducted by the evaluator on the afternoons of July 4 and July 5, 2005. Data from each of the departmental Web sites was collected using the developed rubric. Sites were scored based on the developed rubric. Web sites receiving high scores have qualities and attributes that most closely related to the best practices characteristics found in the developed rubric. Testing results are found in Appendix B.

In addition to the rubric, the evaluator submitted each Web site's homepage to WebXACT, which checks a Web site for ADA compliance, found at: *http://webxact.watchfire.com/ScanForm.aspx*. To test the sites, the researcher informed the department heads and asked for written permission to check for ADA compliance.

Departmental Results

Agricultural Economics

The Agricultural Economics department scored 32 points out of a possible 45 points, illustrating this is a somewhat proficient Web site that has some changes or improvements that need to be done according to best practices.

Graphics- This site contained very few graphics throughout the site, yet the graphics they had were easy and quick to load and pertained to the Web site. Therefore, they received a score of four out of five in this category.

Logos- This site received a score of five out of five in this category since the top of each page throughout this site contained logos of Oklahoma State University, the Division, and the department. The logos were consistent throughout the pages, which add to the branding of the site.

Background- The background on this site did not distract from the site, yet was lacking for visual interest. Referring to the literature, Nielsen (2000) recommends high contrast between text and background. He stated the background should be plain and subtle so the text stands out. Fonts should be unornamented and large enough for reading easily. Once again, these pages showed consistent background throughout the site, receiving a score of three out of five.

Links- These pages contained many links to different areas of the department site. Links throughout the site were updated and pointed to credible sites. Yet, since some links did not work, they received a four out of five in this category.

Color choices- Color choices were subtle and somewhat pleasing to the eye, did not distract from the site, and were mostly regular throughout. Researchers Lynch and Horton

(1999) believe the use of subtle colors for background and small elements, and recommend using highly saturated primary colors except in unusual situations. This site received a score of three out of five.

Contact information- Contact information on this site was easily accessible, with a clear indication of the Webmaster, office contact and phone numbers, along with when the pages were first developed; therefore, this site received a score of five out of five. It is recommended for a "last update section" to be added to the pages.

Load time- This site received a score of three out of five for loading time, since it took no more than fifteen seconds to load, but took more than the recommended 10 seconds to load.

Layout- This site received a score of three out of five. Layout throughout the site showed consistency, yet some elements of the site were not as easy to locate and navigate. According to Lynch and Horton (1999), images, navigational controls, menus, and page identifiers must be positioned carefully so as not to detract from or make more difficult the reading of the primary content. Margins and white space help define the reading area of the page and provide important visual relief.

Content- By exhibiting that this site is for agricultural economics and its components, the purpose was apparent of the site's focus and therefore it received a score of four. Having the Google feature to the site also added another dimension to the site, allowing it to be more accommodating.

Agricultural Education, Communications, and 4-H Youth Development

The Agricultural Education, Communications, and 4-H Youth Development Web site received a score of 36 out of 45. According to the rubric, this is a proficient Web site, with some changes or improvements that need to be made.

Graphics- The graphics throughout this site were thoughtfully cropped, related to the site, somewhat added interest, and were of good quality. This site received a four out of five in this category. Lynch and Horton (1999) state any page element that is not relevant to the content [of the Web page] is simply distracting, this site only exhibits elements that are relevant to the message of the remaining pages of the Web site.

Logos- A score of five out of five was received by this site, because it was identified clearly by stating the University and departmental name on the homepage and along the bottom of the rest of the site pages.

Background- This site received a score of four out of five in this category displaying a consistent background that went with the theme of the Web site. The background added to the theme or purpose of the site and did not detract from readability.

Links- Most links on this site pointed to high-quality, up-to-date sites, yet some were missing content; therefore, receiving a score of four out five in this category.

Color choices- Color choices were exceptional throughout this site receiving a score of five out of five. Background, fonts, unvisited and visited links formed a pleasing palette, which did not distract from the content and were consistent across the pages. These pages went along with what researchers Lynch and Horton (1999) state about high contrast not

only is good for readability, but also for drawing the reader to the important element. Therefore, contrast is also used to establish a sense of organization on the page.

Contact information- This site had contact information listed at the bottom of the first page, but failed to put it on the bottom of the remaining pages. Granted, there was a link to the contacts, it would be more appealing to the site's viewers to have this information on each page. In addition, on the address information on the front page, there was no Webmaster or other contact information. This site received a two out of five in this category.

Load time- This site received a score of four out of for load time, since it took more than ten seconds, but less than fifteen seconds to load.

Layout- The consistent theme throughout the site added to the usable layout, therefore this site received a score a four out of five in layout. A feature that added to the usability was the consistent tool bar across the top. This allowed for elements to be easily identified and white space, graphic elements, and alignments were used effectively to organize the material.

Content- This sites purpose was clearly stated with the "Overview" link, along with the purpose and theme carried throughout the site. This site received a four out of five in this category. "The site's design should help the user manage all the information available" (Nielsen, 2000). While choosing the right information and graphics to be displayed is very important, it is also critical to format, organize, and label properly.

Animal Science

The Department of Animal Science received a score of 30 out of a possible score of 45. It is recommended this site have some changes and improvements made.

Graphics- Graphics throughout the site are related to the purpose of the site, somewhat enhanced reader's interest, and are of good quality. According to Lynch and Horton (1999), a set of design standards that are created, builds unity within a site and speeds up page development. This site received a three out of five in this category.

Logos- A score of five out of five was received by this site, as the use of the logo was identified clearly by stating the University, the Division, and departmental names on the homepage and most of the content pages.

Background- This site received a score of two out of five in this category due to the inconsistency of the background throughout the site. Nielsen (2000) recommends high contrast between text and background. "The background should be plain and subtle so the text stands out. Fonts should be simple and large enough for reading easily. Avoid writing in all caps because this slows the reader and is often described as 'shouting'" (Nielsen, 2000, pp. 125-126). Even though the background on the pages did not distract from the readability of the site, the lack of consistency brought this site down in scoring.

Links- Most links on this site pointed to high-quality, up-to-date sites, yet some were missing content, therefore the site received a score of four out of five in this category.

Color choices- Researchers Lynch and Horton (1999) believed it was important to use subtle colors for background and small elements, and recommend using highly saturated primary colors except in unusual situations. This site consisted of color choices for the backgrounds, fonts, unvisited and visited links that somewhat distracted from the content, therefore receiving a three out of five in this category.

Contact information- This site had contact information listed at the bottom of the first page, but failed to put it on the bottom of the remaining pages. In addition, there was not

a Webmaster, or other contact information. This site received a two out of five in this category.

Load time- This site received a score of four out of five for load time, since it took more than ten seconds, but less than fifteen seconds to load.

Layout- Even though the pages were not consistent throughout the site, the Web pages have a usable layout. This site has a range of pages from extremely busy, to boring and not very appealing. However, most of the important elements are easily located. According to the IBM Ease of Use Web site, the visual hierarchy is understanding users' tasks and visually establish hierarchy of these tasks giving prominence to an object that is important. Using contrast in color and size and relative position is an option. This site needs to establish a visual hierarchy in design. It received a score of three out of five in this category.

Content- The site's purpose was to disseminate information about the animal science industry. Throughout the site, the practices from the literature of having content related to this topic are clearly shown and the purpose is carried throughout the site. The site received a score of four out of five in this category.

Biochemistry and Molecular Biology

Biochemistry and Molecular Biology received a total score of 35 out of a possible 45 indicating this is a somewhat proficient site, yet it has areas that need to be improved, changed, or updated.

Graphics- Graphics related to the theme and purpose of the site, were of good quality, thoughtfully cropped, and enhanced the reader's interest or understanding of the site.

Based on these good practices, this site received a score of four out of five in this category.

Logos- A score of five out of five was received by this site because it was identified clearly by stating the University, the Division, and department's name on the homepage and the rest of the pages throughout the site.

Background- Throughout the pages, the background of this site was very consistent, attractive to the viewer, added to the theme and purpose, and did not detract from readability. Sandvig and Bajwa (2004) stated Web designers should be cognizant of the types of information users' desire, the high importance they place on finding information, and how ease of use influences the perceptions of Web site effectiveness. This site received a score of four out of five in this category.

Links- Most links on this site pointed to high-quality, up-to-date sites, yet some were missing content. Therefore, this site received a score of four out of five in this category.

Color choices- Color choices of the background, fonts, unvisited and visited links did not distract from the content, and were pleasing to the palette; therefore, this site received a score of four out of five in this category. This goes along with what researchers Lynch and Horton (1999) stated about the use of subtle colors for background and small elements, and they recommended using highly saturated primary colors.

Contact information- This site did have a link for contact information. Yet, it did not offer an email address, or Webmaster contact information, and when users are on the internet this could be an accommodating feature. Therefore, this site received a three out of five in this category.

Load time- This site received a score of four out of five for loading time, since it took more than ten seconds, but less than fifteen seconds to load.

Layout- These pages had a consistent functional layout throughout the site, but appeared somewhat busy and distracting. Yet, it is easy to locate most elements on the pages. According to the IBM Ease of Use Web site, the visual design of a Web site is an essential part of the design process. It further stated, the goal of visual design is to allow the user to see all aspects of the principles of design. This site received a score of three out of five in this category.

Content- The site's purpose is clearly stated in the link titled "About." In addition, the content throughout the site exhibited a great deal of knowledge about the industry and its purpose. The site also followed research by Nielsen (2000), who noted the site's main page should set the tone and answer the questions "Where am I?" and "What does this site do?" (p. 166). The main page should also have three features: "a directory of the site's main content areas, summary of important news, and a search feature" (Nielsen, 2000, p. 168). This site received a score of four out of five in this category.

Biosystems and Agricultural Engineering

Out of a possible score of 45, the Biosystems and Agricultural Engineering Web Site received a score of 32. This site exhibited the qualities of a somewhat proficient Web site, yet had areas that needed to be improved, changed, or updated.

Graphics- Graphics related to the theme and purpose of the site, were of good quality, thoughtfully cropped, and somewhat enhanced the reader's interest or understanding of the site. Usability.gov stated "to only use graphics that enhance content or that lead to a

better understanding of the information being presented." This site received a three out of five in this category.

Logos- A score of five out of five was received by this site because it was identified clearly by stating the University and department's name on the homepage and the rest of the pages throughout the site.

Background- Throughout the pages, the background of this site was consistent, was fairly attractive to the viewer, added to the theme and purpose, and did not detract from readability. Nielsen (2000) recommended high contrast between text and background. This site received a score of three out of five in this category.

Links- Most links on this site pointed to high-quality, up-to-date sites, yet some were missing content. Therefore, this site received a score of four out of five in this category.

Color choices- The bold color choices of the background, fonts, unvisited and visited links did somewhat distract from the content. Therefore, this site received a score of three out of five in this category. According to the literature, Lynch and Horton (1999) believed Web designers should use subtle colors for background and small elements, and recommend using highly saturated primary colors except in unusual situations. Furthermore, these researchers stated high contrast not only is good for readability, but also to draw the reader to the important element (1999). Therefore, contrast was also used to establish a sense of organization on the page.

Contact information- This site did have Webmaster (Web guy) contact information. Yet, this site was lacking other additional contact information. Therefore, this site received a three out of five in this category.

Load time- This site received a score of four out of five for loading time, since it took more than ten seconds, but less than fifteen seconds to load.

Layout- These pages had a consistent usable layout throughout the site, but appeared somewhat busy and distracting. Yet, it was easy to locate most elements on the pages. The IBM Ease of Use Web Site recommended visual design principles which allow the interface to have visual simplicity and clarity. This site was lacking in subtractive design, which is reducing the clutter that doesn't necessarily relate with the visual aspect of the design. This site received a score of three out of five in this category.

Content- The site's purpose was clearly stated in the link "About us." The department doesn't have a clear theme throughout the pages, but it does have some type of identification on each page. According to the Web Style Guide, 2nd Edition, when consistent design standards are not adopted, standard users experience confusion, reduced productivity, and opportunities are lost to benefit from the Web information source. This site received a score of four out of five in this category.

Entomology and Plant Pathology

The department of Entomology and Plant Pathology received a score of 35 out of a possible 45 points. This illustrates this is a somewhat proficient Web site that has areas that need to be improved, changed, or updated.

Graphics- Graphics related to the theme and purpose of the site were of good quality, thoughtfully cropped, and enhance the reader's interest or understanding of the site. Repetition is important from page to page within a site as it proves continuity and graphic identity that "creates and then reinforces a distinct sense of 'place' and makes the site

distinct and memorable" (Lynch & Horton, 1999, p. 56).This site received a four out of five score in this category.

Logos- A score of five out of five was received by this site because it was identified clearly by stating the University and department's name on the homepage and the rest of the pages throughout the site.

Background- Throughout the Web pages, the background of this site is inconsistent, yet pages are fairly attractive to the viewer, add to the theme and purpose of the site, and do not detract from readability. This site received a score of two out of five in this category.

Links- Most links on this site pointed to high-quality, up-to-date sites, yet some were missing content. Therefore, this site received a score of four in this category.

Color choices- Links throughout this site were stated clearly and pointed to high-quality, up-to-date and credible sites. This site received a four out of five in this category. This site followed what the literature stated about the use of subtle colors for background and using contrast as a sense of organization on the page.

Contact information- Contact information was clearly stated on every page throughout this Web site. Information included address, phone number, authorship, school name, and date of publication; therefore, it received a five out of five in this category.

Load time- This site received a score of four out of five for loading time, since it took more than ten seconds, but less than fifteen seconds to load.

Layout- These pages had a consistent usable layout throughout the site, elements were easy to locate and white space, graphic elements, and alignment were used effectively. According to the literature, this site had the following recommendations: subtractive

design, visual hierarchy, and visual scheme. Therefore, this site received a four out of five score in this category.

Content- This site had a clear purpose and theme of educating viewers about entomology and plant pathology. According to the literature, a site's main page should set the tone and answer the questions "Where am I?" and "What does this site do?" (Nielsen, 2000, p. 166). This site had good design principles and had practices supported by the literature. Therefore, this site received a four out of five score in this category.

Forestry

Forestry received a score of 35 out of 45. This indicates this site is somewhat proficient, but has areas that need to be improved, changed, or updated.

Graphics- Graphics related to the theme and purpose of the site, were of good quality, thoughtfully cropped, and enhanced the reader's interest or understanding of the site. According to the IBM Ease of Use Web site (2005), a consistent design allows an organization to be recognized by the public easier and provides a sense of unity and reinforces the users' experience that they are rooted in a certain place. This site received a four out of five score in this category.

Logos- A score of five out of a possible five points was received by this site because it was identified clearly by stating the university and department's name on the homepage and the rest of the pages throughout the site.

Background- Throughout the pages, the background of this site was consistent, was attractive to the viewer, added to the theme and purpose, and did not detract from readability. According to Hubert (1998), the visual design of Web sites is a factor that

researcher's identify. Using the visual design of Web sites is as imperative as content. This site received a score of four out of five in this category.

Links- Most links on this site pointed to high-quality, up-to-date sites, yet some were missing content. Therefore, this site received a four out of five score in this category.

Color choices- The color choices of the background, fonts, unvisited and visited links did not distract from the content. [The literature recommends subtle colors for backgrounds and small elements, and recommends using highly saturated primary colors except in unusual situations.] This site received a score of four out of five in this category.

Contact information- This site do not have a statement of authorship, school name, and/or date of publication/last edited clearly stated on any of the Web pages. This is an important element for users if questions arise while navigating. Therefore, this site received a two out of five score in this category.

Load time- This site received a score of four out of five for loading time, since it took more than ten seconds, but less than fifteen seconds to load.

Layout- Pages have a clean, consistent, and usable layout throughout the site. The use of white space was effective adding visual interest to the pages. According to the literature from IBM (2005), this site had subtractive design, visual hierarchy, and visual scheme. This site received a four out of five in this category.

Content- "The advantages of consistent graphic design and user interface standards are immediately obvious in a user-centered approach to Web design and clearly transcend the parochial interests of participating departments, groups, and individuals" (Web Style Guide, 2nd Edition, 2002). In addition, without clear design standards, the overall enterprise of Web presence will advance as a "patchy, confusing set of pages – some well

designed, some disastrous, and all mere parts of a dysfunctional system" (Web Style Guide, 2nd Edition, 2002). The content in this site was somewhat easy to identify and the purpose and theme was carried throughout the site. This site received a four out of five score in this category.

Horticulture and Landscape Architecture

Horticulture and landscape architecture received a score of 31 out of a possible 45 points. This indicates this Web site had areas that needed improvement, areas that needed to be changed or updated and there were adjustments that needed to be made to the site.

Graphics- Graphics related to the theme and purpose of the site, were of good quality, thoughtfully cropped, and enhanced the reader's interest or understanding of the site. Lynch and Horton (1999) suggested using a set of design standards that are created and remained; this builds unity within a site and speeds up page development. This site received a four out of five score in this category.

Logos- A score of five out of five was received by this site, because it was identified clearly by stating the university and department's name on the homepage and the rest of the pages throughout the site.

Background- Throughout the pages, the background of this site were inconsistent. Yet, backgrounds do not detract from the readability of the pages. Hubert (1998) stated the visual design of Web sites is a factor that researcher's identify. Using the visual design of Web sites is as imperative as content. Sandvig and Bajwa (2004) further stated "Web designers should be cognizant of the types of information users' desire, the high importance they place on finding information, and how ease of use influences their

perceptions of Web site effectiveness" (p. 18). This site received a score of two out of five in this category.

Links- Most links on this site pointed to high-quality, up-to-date sites, yet some were missing content. Therefore, this site received a four out of five score in this category.

Color choices- The color choices of the background, fonts, unvisited and visited links did not distract from the content. There were not strong subtle colors for background and small elements, and according to the literature it was recommended not to use highly saturated primary colors except in unusual situations. This site received a score of three out of five in this category.

Contact information- This site did have contact information for the user to find on the main page. Yet, since this information was not found on the other pages throughout the site, it received a three out of five score in this category.

Load time- This site received a score of four out of five for loading time, since it took more than ten seconds, but less than fifteen seconds to load.

Layout- The layout on the homepage of this site was difficult and confusing to navigate and there was no consistency throughout the pages. This site received a two out of five in this category. Lynch and Horton (1999) said that with page layout, users have a problem with direction if the pages are not designed carefully. This site lacked the layout of subtractive design, visual hierarchy, and visual scheme.

Content- A Web site's design and scheme was considered important to attracting and maintaining visitors (Hubert, 1998). In addition, without clear design standards, the overall enterprise of Web presence will advance as a "patchy, confusing set of pages – some well designed, some disastrous, and all mere parts of a dysfunctional system" (Web

Style Guide, 2nd Edition, 2002). The content in this site was somewhat easy to identify and the purpose and theme was carried throughout the site. This site received a four out of five score in this category.

Plant and Soil Sciences

Plant and soil sciences had an ideal Web site receiving a score of 41 out of a possible 45 points. This indicates this site had very few or minor changes that needed to be made to the site.

Graphics- Graphics related to the theme and purpose of the site, were of good quality, thoughtfully cropped, and enhanced the reader's interest or understanding of the site. Repetition was important from page to page within a site as it proves continuity and graphic identity that "creates and then reinforces a distinct sense of 'place' and makes the site distinct and memorable" (Lynch & Horton, 1999, p. 56). This site received a four out of five score in this category

Logos- A score of five out of five was received by this site because it was identified clearly by stating the university and department's name on the homepage and the rest of the pages throughout the site.

Background- Background was consistent throughout the pages, added to the theme and purpose of the site and did not distract from readability. This site received a four out of five score in this category.

Links- All links pointed to high-quality, up-to-date, credible sites, therefore this site received a five out of five in this category.

Color choices- This site received a five out of five in this category. The colors of the background, fonts, visited and unvisited links formed a pleasing palette and did not

distract from the content of the site. Colors were consistent across the pages. This site followed the guidelines of best practices for color choices with subtle colors for background and small elements and the use of high contrast for good readability and drawing the viewer to the page's elements.

Contact information- Contact information is clearly stated on every page throughout the site, along with the statement of authorship, school name, and date of last publication. This site received a five out of five score in this category.

Load time- This site received a score of four out of five for loading time, since it took more than ten seconds, but less than fifteen seconds to load.

Layout- This site was easy to use due to the usable layout, easy to locate information and important elements, along with appropriate white space, and graphic elements. This site received a four out of five in this category. According to the literature, the goal of visual design is to allow the user to see all aspects of the principles of design. This site accomplished these design recommendations.

Content- This site received a score of five out of five, since the content of this site had a well-stated, clear purpose and theme that was carried on throughout the site. The literature stresses the importance of making good Web design decisions along with the impact on user response. "The site's design should help the user manage all the information available" (Nielsen, 2000). While choosing the right information and graphics to be displayed was very important, it was also critical to format, organize, and label properly. This site corresponded to the literature's standards.

Additional Site Testing

In addition to the rubric, the evaluator submitted each Web site's homepage to WebXACT, a Web site that checks for ADA compliance found at: *http://webxact.watchfire.com/ScanForm.aspx*. This allowed the researcher to see what areas the homepage needed to improve, to become accommodating to ADA standards. Out of the nine sites tested with the rubric, the researcher only received permission to test seven of the departmental Web pages. Therefore, this evaluation was based on the common accessibility issues these sites possessed.

Agricultural Economics

According to the WebXACT, this page did not comply with all of the automatic and manual checkpoints of the Section 508 Accessibility Guidelines, and it was recommended for repairs and manual verification.

Errors included needing to provide alternative text for all images, provide alternative text for each APPLET, and explicitly associate form controls and labels with the LABEL element.

Warnings for the site included if color was used to convey information, making sure it was represented in another way, identifying headers for table rows and columns, using structural markup to identify hierarchy and relationship if a table has two or more rows or columns serving as headers, making sure the page does not cause the screen to flicker rapidly, providing alternative content for each SCRIPT that conveys information or functionality, making sure users can skip repetitive navigation links, and constructing an alternate version if a page can not be made accessible.

Agricultural Communications, and 4-H Youth Development

This page did not comply with all of the automatic and manual checkpoints of the Section 508 Accessibility Guidelines, and it was recommended for repairs and manual verification.

One error was reported and included providing alternative text for all image map hot-spot (AREAS).

Seven warnings were issued including if color was used to convey information, making sure it was represented in another way, identifying headers for the table rows and columns, using structural markup to identify hierarchy and relationship if a table had two or more rows or columns serving as headers, making sure page did not cause the screen to flicker rapidly, providing alternative content for each SCRIPT that conveys information or functionality, and constructing an alternate version if a page can not be made accessible.

Animal Science

This page complied with all of the automatic checkpoints of the Section 508 Accessibility Guidelines. Yet, it did not comply with all the manual checkpoints and required manual verification.

The warnings issued included if color was used to convey information, making sure it was represented in another way, identifying headers for the table rows and columns, using structural markup to identify hierarchy and relationship if a table has two or more rows or columns serving as headers, making sure page did not cause the screen to flicker rapidly, making sure users can skip repetitive navigation links, and giving the user notification and a chance to extend the timeout if a timed process is about to expire.

Biochemistry and Molecular Biology

This page did not comply with all of the automatic and manual checkpoints of the Section 508 Accessibility Guidelines, and it was recommended for repairs and manual verification.

One error was reported which included explicitly associating form controls and their labels with the LABEL element.

The warnings issued including if color was used to convey information, making sure it was represented in another way; identifying headers for the table rows and columns; using structural markup to identify hierarchy and relationship if a table had two or more rows or columns serving as headers; if style sheets are ignored or unsupported, ensuring pages are readable and usable; making sure users can skip repetitive links; and if timed process is about to expire, giving the user notification and a chance to extend the timeout.

Biosystems and Agricultural Engineering

This page did not comply with all of the automatic and manual checkpoints of the Section 508 Accessibility Guidelines, and it was recommended for repairs and manual verification.

Errors included the need to provide alternative text for all images, associate form controls and their labels with LABEL element, and make sure there was a link to download accessible plug-ins.

The six warnings are as follows: if color were used to convey information, make sure it was represented in another way; identifying headers for the table rows and columns; using structural markup to identify hierarchy and relationship if a table had two

or more rows or columns serving as headers; making sure page did not cause the screen to flicker rapidly; making sure users can skip repetitive navigation links; and if a timed process was about to expire, giving the user notification and a chance to extend the timeout.

Entomology and Plant Pathology

This page did not comply with all of the automatic and manual checkpoints of the Section 508 Accessibility Guidelines, and it was recommended for repairs and manual verification.

Only one error was issued which included associating form controls and labels with the LABEL element.

Warning which were issued to the site included if color was used to convey information, make sure it was represented in another way; identifying headers for the table rows and columns; using structural markup to identify hierarchy and relationship if a table had two or more rows or columns serving as headers; making sure a page did not cause the screen to flicker rapidly; providing alternative content for each SCRIPT that conveys information or functionality; making sure users can skip repetitive navigation links; and if a page can not be made accessible, constructing an alternate version.

Horticulture and Landscape Architecture

This page complied with all of the automatic checkpoints of the Section 508 Accessibility Guidelines. Yet, it did not comply with all the manual checkpoints and required manual verification.

This site had the same warning signs as the Biosystems and Agricultural Engineering site. The six warnings were as follows: if color was used to convey

information, making sure it is represented in another way; identifying headers for the table rows and columns; use structural markup to identify hierarchy and relationship if a table has two or more rows or columns serving as headers; making sure a page did not cause the screen to flicker rapidly; providing alternative content for each SCRIPT that conveys information and functionality, and if a timed process was about to expire, giving the user notification and a chance to extend the timeout.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter will present the summaries of the a) Purpose of the Study, b) Objectives of the Study, c) the Population, and d) the Major Findings, Conclusions, Recommendations and Implications.

Purpose

Oklahoma State University's College of Agricultural Sciences and Natural Resources was comprised of nine academic departments. These departments use their Web sites to disseminate information to users about its department, whether it is related to academics or research. With the consistent growth of the Internet, a consistent Web presence is important to keep users interested in the College's offerings.

Therefore, this study developed a rubric that was used to evaluate CASNR Web pages and to assist Web developers in CASNR departments to improve Web sites for a consistent Web identity.

Objectives

This study had three objectives:

1) To conduct a review of literature for best practices of Web design.
2) To develop an instrument for evaluating Web sites based on a review of literature for best practices in Web design for public universities.
3) To validate the rubric by conducting an evaluation of CASNR's departmental Web sites.

Population

The population for the study included departmental Web sites within the College of Agricultural Sciences and Natural Resources. These sites included:

- Agricultural Economics - *http://agecon.okstate.edu*
- Agricultural Education, Communications, and 4-H Youth Development - *http://agweb.okstate.edu/agedcm4h/web/index.html*
- Animal Science - *http://www.ansi.okstate.edu*
- Biochemistry and Molecular Biology - *http://biochem4.okstate.edu*
- Biosystems and Agricultural Engineering - *http://biosystems.okstate.edu*
- Entomology and Plant Pathology - *http://www.ento.okstate.edu*
- Forestry - *http://www.okstate.edu/ag/asnr/fore*
- Horticulture and Landscape Architecture - *http://www.okstate.edu/ag/asnr/hortla*
- Plant and Soil Sciences - *http://pss.okstate.edu*

Instrument

To fulfill the purpose and objectives of this study, a rubric was developed online on the Rubristar Web site [*http://rubistar.4teachers.org*]. The evaluator developed the rubric based on the literature reviewed. The rubric can be found in Appendix A.

The rubric, which was developed, emphasized the quality and functionality of a Web site. Questions developed were based on the literature and were centered on the user; the feedback was intended for Web site improvement.

The rubric consisted of nine categories including graphics, logos, color choices, links, background, contact information, load time, layout, and content. Categories were scored on a five-point scale with five being the highest and one being the lowest score for each category.

In addition to the rubric, seven of the Web site's homepages were submitted to WebXACT, a Web site that checks a site for ADA compliance found at: *http://webxact.watchfire.com/ScanForm.aspx*. This allowed the researcher to see what areas the homepage needed to improve on to become accommodating to ADA standards.

Data Collection

An evaluation of the sites was conducted by the researcher on July 4 and July 5, 2005. Data regarding each of the departmental Web sites was collected using the developed rubric. Sites were scored based on their overall outcome and based on the total number of points they received from the rubric's score panel. Web sites that received the highest scores were Web sites that had the qualities and attributes the rubric proposed.

Web sites that received a lower score had areas that needed to be improved upon according to the developed rubric.

Major Findings

The departmental Web sites contained many of the features the literature stated were best practices of design. The highest score received was a 41 out of a possible 45, meaning this site had many design elements that were desirable when developing or maintaining a Web site. Six Web sites scored in the 35 to 31 category, as somewhat proficient Web sites, with few areas that needed to be improved, changed, or updated. Two Web sites fell in the 31 and below category, indicating the sites had areas which needed to be improved, and had areas that needed to be changed or updated.

When the rubric was broken down into its individual categories (graphics, logos, color choices, links, background, contact information, load time, layout, and content), Web sites scored in the 3 to 4 range.

Common errors for sites following the ADA Compliance included:

- Failing to provide alternative text for all images.
- If color was used to convey information, making sure the information was represented in another way.
- If a data table was used, identifying headers for the table rows and columns.
- If a table had two or more rows or columns that serve as headers, structural markup should be used to identify their hierarchy and relationship.
- If style sheets were ignored or unsupported, ensure that pages are still readable and usable.

- Provide alternative text for all image map hot-spots.

Conclusions

The conclusions are based on the findings from the analysis of the departmental sites. Examination and analysis of the objectives led to the following conclusions:

1) The developed rubric will assist CASNR Web designers to ensure their Web sites follow best practices.
2) The selected departmental Web sites are each different in design, yet each contain certain elements that make their site structurally sound according to best Web practices.
3) The departments in the study all had good logos and identifiers, but were weak in the area of contact information.
4) Departmental Web developers should be aware and more cautious of ADA compliance standards when developing and maintaining their Web sites.
5) There is limited research on University Web site development. Most research and literature found was on E-commerce.

Recommendations and Implications

Based on the conclusions and major research findings, the following recommendations were made. It was recommended:

1) Web developers from all departments should work together to develop a Division Web Style guide, to establish a common theme, elements, and guidelines to follow when developing or maintaining Web sites.
2) When developers are in the process of developing a site, usability studies should be conducted to determine what features viewers have trouble navigating or other problems the site may have.
3) Further tests should be conducted focusing on disability issues within a site. There are many standards within the ADA Compliance, and this test highlighted the non-compliant areas on only the homepages.
4) The CASNR Web sites should be tested by users to identify how user-friendly they appear.
5) Further investigation should be made to unify departmental sites based on a common look by the CASNR homepage.
6) Further study and investigation should be done on dial-up connections. The researcher failed to test the sites on this type of connection; therefore, the results for the connection speed could possibly differ.
7) For further testing, it is recommended for a focus group to be set up to study the same sites, to see if the same conclusions are found. This will ensure validity of the rubric.
8) It is recommended for the rubric scale to be changed to have an average score for each site. The average would then be the result of scores from the 1-5 scale.

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APPENDICES

APPENDIX A

RUBRIC

Rubric

CATEGORY	5	4	3	2	1
Graphics	Graphics are related to the theme/purpose of the site, are thoughtfully cropped, are of high quality and enhance reader interest or understanding.	Exhibits all characteristics of '3' and some characteristics of '5'	Graphics are related to the theme/purpose of the site, somewhat enhance reader interest, and are of good quality.	Exhibits all characteristics of '1' and some characteristics of '3'	Graphics have little association to the site or are distracting to the reader.
Logos	Either the Oklahoma State University, the Division of Agricultural Sciences and Natural Resources, or departmental logo or name was clearly stated.	Exhibits all characteristics of '3' and some characteristics of '5'	One or the specified logos of names was present, but not clearly stated.	Exhibits all characteristics of '1' and some characteristics of '3'	Either the Oklahoma State University, the Division of Agricultural Sciences and Natural Resources, or departmental logo or name was difficult to find or not found on the site.
Background	Background is exceptionally attractive, consistent across pages, adds to the theme or purpose of the site, and does not detract from readability.	Exhibits all characteristics of '3' and some characteristics of '5'	Background is consistent across pages and does not detract from readability.	Exhibits all characteristics of '1' and some characteristics of '3'	Background detracts from the readability of the site.
Links (content)	All links point to high-quality, up-to-date, credible sites.	Exhibits all characteristics of '3' and some characteristics of '5'	Most links point to high-quality, up-to-date, credible sites.	Exhibits all characteristics of '1' and some characteristics of '3'	Links may not point to high-quality, up-to-date, credible sites.
Color Choices	Colors of background, fonts, unvisited and visited links form a pleasing palette, do not detract from the content, and are consistent across pages.	Exhibits all characteristics of '3' and some characteristics of '5'	Colors of background, fonts, unvisited and visited links do not detract from the content.	Exhibits all characteristics of '1' and some characteristics of '3'	Colors of background, fonts, unvisited and visited links make the content hard to read and are unpleasant to the reader.
Contact Information	Every Web page contains a statement of authorship, school name, and date of publication/date last edited.	Exhibits all characteristics of '3' and some characteristics of '5'	Most (75-80%) Web pages contain a statement of authorship, school name, and date of publication/date last edited.	Exhibits all characteristics of '1' and some characteristics of '3'	Pages do not contain a statement of authorship, school name, and/or date of publication/date last edited.
Load Time	The pages typically load very quickly (10 seconds or less) due to small graphics, good compression of sounds and graphics, and appropriate division of content.	Exhibits all characteristics of '3' and some characteristics of '5'	One Web page typically takes more than 15 seconds to load, but the others load quickly.	Exhibits all characteristics of '1' and some characteristics of '3'	Web pages take more than 15 seconds to download due to large graphics, animations, sounds, etc.
Layout	The Web site has an exceptionally attractive and usable layout. It is easy to locate all important elements. White space, graphic elements and/or alignment are used effectively to organize material.	Exhibits all characteristics of '3' and some characteristics of '5'	The Web pages have a usable layout, but may appear busy or boring. It is easy to locate most of the important elements.	Exhibits all characteristics of '1' and some characteristics of '3'	The Web pages are not easy to navigate do to clutter or confusing elements. It is difficult to locate important elements.

APPENDIX B

SUMMARY OF RESULTS

Summary of Results

Department	Graphics	Logos	Background	Links	Color Choices	Contact Information	Load time	Layout	Content	Total Score
Agricultural Economics	4	5	3	4	3	3	3	3	4	32
Agricultural Education, Comm., 4-H & Youth Dev.	4	5	4	4	5	2	4	4	4	36
Animal Science	3	5	2	4	3	2	4	3	4	30
Biochemistry & Molecular Biology	4	5	4	4	4	3	4	3	4	35
Biosystems & Agricultural Engineering	3	5	3	4	3	3	4	3	4	31
Entomology & Plant Pathology	4	5	2	4	3	5	4	4	4	35
Forestry	4	5	4	4	4	2	4	4	4	35
Horticultural & Landscape Architect	4	5	2	4	3	3	4	2	4	31
Plant and Soil Sciences	4	5	4	5	5	5	4	4	5	41
Average score	3.6	4.5	3	4	3.6	3	3.8	3.33	4.1	34.6

APPENDIX C

PANEL OF EXPERTS

Panel of Experts

Dwayne Cartmell, Assistant Professor, Oklahoma State University Department of Agricultural Education, Communications, 4-H and Youth Development

Sherry Grussing, TV Producer, SunUp Web Master, Agricultural Communications Services, Oklahoma State University

Julie Focht, Lecturer, Outreach Coordinator, Web Designer, Oklahoma State University Department of Agricultural Education, Communications, 4-H and Youth Development.

Shelly Sitton, Associate Professor, Oklahoma State University Department of Agricultural Education, Communications, 4-H and Youth Development

VITA

Katie Lee Reim

Candidate for the Degree of

Master of Science

Thesis: AN EVALUATION STUDY OF THE COLLEGE OF AGRICULTURAL SCIENCES AND NATURAL RESOURCES DEPARTMENTAL HOMEPAGES

Major Field: Agricultural Communications

Biographical:

Personal Data: Born in Enid, Oklahoma, March 14, 1981. The daughter of Kirby and Sue Reim. Sister, Annie Reim Coble, and brother, J.Russell Reim.

Education: Graduated from Billings High School in Billings, Oklahoma, in May 1999, attended Oklahoma State University and received a Bachelor of Science Degree in Agricultural Communications in May 2003. Candidate for Master of Science Degree in Agricultural Communications, December 2005.

Experience: Communications Specialist, Oklahoma State University's Agricultural Communications Services, May 2003 to present (2005).

Professional Memberships: Association for Communication Excellence, Oklahoma State University's Staff Advisory Council, Gamma Sigma Delta, the Honor Society of Agriculture

Name: Katie Lee Reim Date of Degree: December, 2005

Institution: Oklahoma State University Location: Stillwater, Oklahoma

Title of Study: AN EVALUATION STUDY OF THE COLLEGE OF AGRICULTURAL SCIENCES AND NATURAL RESOURCES DEPARTMENTAL HOMEPAGES

Pages in Study: 84 Candidate for the Degree of Master of Science

Major Field: Agricultural Communications

Scope and Method of Study: To provide conceptual framework for the study, a review of literature was done. By reviewing the literature, the researcher was better able to understand the aspects of each site within CASNR. This literature provided the foundation for the rubric that was developed to evaluate the sites, which was intended to provide designers with a guide for developing and maintaining CASNR Web sites. This study established best practices of Web site design and tested these practices on specific Web sites. Research was conducted and reported on articles focusing on best practices of Web site design and were used as the basis for establishing the purpose and the methods of the study. Articles were found by searching the Proquest database, Academic Search Elite via EBSCO, and various books from OSU's Edmon Low Library. Articles reviewed highlighted the best practices of Web site design when using graphics, logos, background choices, links, color choices, contact information, loading time, layout, and content.

Findings and Conclusions: The departmental Web sites contained many of the features the literature stated were best practices of design. The highest score received was a 41 out of a possible 45, meaning this site had many design elements that were desirable when developing or maintaining a Web site. Six Web sites scored in the 35 to 31 category, as somewhat proficient Web sites, with few areas that needed to be improved, changed, or updated. Two Web sites fell in the 31 and below category, indicating the sites had areas which needed to be improved, and had areas that needed to be changed or updated. When the rubric was broken down into its individual categories (graphics, logos, color choices, links, background, contact information, load time, layout, and content), Web sites scored in the 3 to 4 range.

ADVISER'S APPROVAL: Dwayne Cartmell