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Merging Mediums: Applying Document Design to Online Help Systems to Increase Usability

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MERGING MEDIUMS: APPLYING DOCUMENT DESIGN TO ONLINE HELP SYSTEMS TO INCREASE USABILITY

A Master's Thesis

Presented to

The Graduate College of

Missouri State University

In Partial Fulfillment

Of the Requirements for the Degree

Master of Arts, Writing

By

Meghan M. Smith

May 2017

MERGING MEDIUMS: APPLYING DOCUMENT DESIGN TO ONLINE HELP

SYSTEMS TO INCREASE USABILITY

English

Missouri State University, May 2017

Master of Arts

Meghan M. Smith

ABSTRACT

Document design is an essential part of print, and more recently, web documents, but recent application to the usability of document design in the current iteration of online help systems has been lacking. As an attempt to fill this gap, I conducted a study testing three document design principles—color, navigation structures (headings/hyperlinks), and visuals—to determine how they should be applied in online help systems to increase usability. I constructed an online help system for the online infographic creator Piktochart, and used these three principles according to theories and practices from prior research on print and web documents. Participants used the constructed help system to complete a task-based scenario using Piktochart. The results show that participants' main criteria for successful usability is that the help system aids them in understanding the program and completing tasks efficiently with minimal frustration. Participants preferred a cohesive and consistent design that allowed them to find what they needed quickly, and to be oriented to the task they were trying to complete. If the three principles helped in these regards, they were deemed effective by the participants. Technical communicators should understand how to best apply document design principles to the growing medium of online help systems.

KEYWORDS: online help systems, usability, color, headings, hyperlinks, visuals, document design, technical communication

This abstract is approved as to form and content

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ACKNOWLEDGEMENTS

I would like to thank the following people for their support during the course of my graduate studies: my parents, for their support in all my endeavors, academic and otherwise; my sister, Emily, for letting me call her and vent my frustration over the 18 months it took me to finish this research; Dr. Rhonda Stanton, for her help and encouragement as I toiled away on this expansive research project (I'm glad I got to be your guinea pig); and to the rest of my thesis committee for their invaluable comments and advice during the planning, writing, and revision process.

I dedicate this thesis to my husband, Scott. You are my foundation, and without you I would not have completed this thesis, much less my Master's degree.

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INTRODUCTION

Document design principles are important for technical communicators to know and understand. When used correctly, these principles play a role in creating functional, user-centered documentation that help users to complete any number of tasks. Research has been conducted on how to apply these principles to both print and web documents; however, these principles have not been applied to online help systems in academic research. Rather than producing a printed user manual, technical communicators can use online help to publish software documentation within the software program itself or linked to a web server. While practitioners conduct usability testing on design principles routinely in online help, this research is generally done internally, and their results are often not published, leaving room for external studies to be conducted in this field.

Technical communicators need to use proper design principles when building online help systems to engender trust with a user, so users will continue to rely on this documentation to help them accomplish workplace tasks. While the use of color, navigation, and visuals is commonly done in industry in practice, it is not often published and translated into theory. To this end, I reinforce prior online help system research by applying a direct transfer of document design principles to a constructed online help system. This study focuses on three document design principles—color, navigation structures, and visuals—to test that these practices do lead to usable and functional help systems.

The purpose of this study is to determine whether design principles, applied to online help systems in the same way they are applied to print and web documents—with

a discussion of existing research on help documentation—increase the usability of the system. I built an online help system using the three design principles in ways discussed in previous scholarship on print and web documents. I then conducted a usability test on this help system to determine if, and how, these design principles affect online help systems.

Driving the study are three research questions developed to reinforce how the use of color, navigation structures, and visuals affects the usability of an online help system. These questions are:

1. How do technical communicators use color, navigation (headings and hyperlinks), and visuals in print and/or web documents?

2. How can these design principles be applied to online help systems?

3. Does incorporating these design principles make help systems more usable, and are some design elements more effective than others?

The first question is answered with the literature review, which looks at what previous scholarship has discussed regarding these three design principles. The answer to the second question comes from the description of the study methods, particularly in how the online help system built for the study incorporates the theories and practices from the prior research found on color, navigation, and visuals. The third question is answered through the study itself, and the results collected from the usability test. The next chapter provides the literature review, and with it the framework for the study. This chapter discusses prior research on color, navigation structures, and visuals, outlining both the theoretical and practical application of each with regard to print and web documentation.

LITERATURE REVIEW

In this literature review, I attempt to answer my first research question: How do technical communicators use color, navigation (headings and hyperlinks), and visuals in print and/or web documents? When a writer builds any type of document, whether it be a user manual or an online help system, having users understand how to use these principles is essential to having an efficient and effective final product. This first research question forms the basis of this study. As such, I have collected research from experts in the field that focuses on these three design principles, either in print or web documents. In the sections that follow, I discuss what has been found to be the most effective ways to use color, navigation, and visuals in these two established mediums.

How to Use Color in Print and Web Documents

With the advance of technology, and in particular computer processing, color has become more common in both print and web documents. Proper color use is especially important in online help systems, where the main objective is to help users accomplish work tasks and learn new software. If color is used incorrectly, users may not be able to follow instructions, which can increase user frustration with the software program they are trying to learn. In this section, I will discuss what experts in the field have said about color and its use in print and online documents.

Color Use in Print. Discussing print documents, Jan White (2003) asserts that users of these documents are not actually readers: they are searchers (p. 485). Rarely do users pick up a user guide to read it cover to cover. Instead, they "flip pages, scan, hunt

and peck" to find the specific information they are looking for to complete a task or solve a problem (p. 485). Color is one way technical communicators can make documents more accessible to the user, but it must be used properly. Color used for the wrong purposes can hinder users' ability to find what they need.

To use color properly, we must use it not to make a document prettier or more appealing, but strictly to make it more useful. For example, color can be used to divide different sections of a document, such as the glossary, chapters, or index. In this way, users can clearly see the organizational structure of the document, which in turn makes it more user friendly. White argues that "color is too often mistaken for cosmetics," and we should avoid this mistake by "apply[ing] color functionally" (2003, p. 488). In this way, the functionality of the document for the user becomes a thing of beauty in itself. White urges us to use color because it is necessary, not because it is fun.

Jo Mackiewicz (2009) expands on White's 2003 article by introducing theory and practice to the use of color. Many technical communicators are still hesitant about using color in documents because they lack prior knowledge about color, which leads to a lack of confidence in practice. Mackiewicz argues that by having a basic understanding of color theory, we could "choose a more accessible color combination and then explain that choice to others" (2009, p. 3). In understanding color properties, we need to look at more than just the color itself. We must also consider the hue, value, and saturation of a color to be "better able to specify and analyze among colors" (Mackiewicz, 2009, p. 4). Technical communicators must also know the difference between the RGB and CMYK color systems; the first is used for color on the web, and the second is specifically dedicated to print documents. This distinction is important to know because colors on a

computer monitor will look different when compared to a printed document. Using the correct color system ensures that when the document goes to print, the colors will be accurate and match what is intended.

In addition to understanding color theory, technical communicators must also know "effective color practice" (Mackiewicz, 2009, p. 6). Here, Mackiewicz uses many of White's arguments on how to use color correctly. Color can be used to help users filter for the information they need, and to help them identify the document's organization. Additionally, using contrasting color between text and its background can help overall readability, or "how well verbal and visual elements show up in relation to the colors 'behind' them" (Mackiewicz, 2009, p. 7). Black text on a white background generally provides the most contrast, so technical communicators need to be aware of continued readability when changing either the text or background color. Having this knowledge will allow technical communicators to provide effective emphasis and not overwhelm the user with color.

Color Use on the Web. Focusing on color on the web, Wouter Alberts and Thea van der Geest (2011) research how color schemes relate to trustworthiness in web sites. While many established companies can simply use the existing colors of their corporate image, other new businesses, or those that are rebranding, may need to develop a color palette from scratch. Alberts and van der Geest state the color scheme businesses choose is essential to make the right impression, and their sites "must not only make the service or product they offer very clear, but also create the users' perception that the organization can be trusted to deliver the purchased product as expected" (2011, p. 150). Building trust is vital for businesses, and with the Internet especially, the initial trust users give a site

when they first visit is essential (Alberts & van der Geest, 2011). The researchers focused on color because it was one aspect of web design that could be easily manipulated for the purposes of their study. Using websites created in four different color schemes using varied hues and tints from the same color (blue, green, black, and red), the authors found that overall, "the blue color scheme was perceived as the most trustworthy, and the black color scheme as the least trustworthy" (Alberts & van der Geest, 2011, p. 156). The participants were of both German and Dutch nationality, and the authors found minor differences in their design preferences, but it was not discussed in much depth. There was some variation found in the results, but what these results do show is that within web design, color can serve as a trustworthiness cue, and color choice does matter (Alberts & van der Geest, 2011). What this means for online documents is that color affects users' judgment of whether the content is reliable.

In a similar vein, Jakob Nielsen and his colleagues in the Nielsen Norman Group offer web usability experts and technical communicators practical advice on how to use color effectively on the web. Focusing specifically on the color of hyperlinks, Nielsen (2004) argues that hyperlinked text should be colored to stand apart from the rest of the text. This will help users know where to click to find more information or move to another page. Also, the same color should not be used for both visited and unvisited links. Nielsen states that "[t]he color for unvisited links should be more vivid, bright, and saturated than the color for visited links, which should look 'used' (dull and washed out)" (2004, para. 4). Having these clearly defined differences in color allows users to understand the differences between the two types of links, and to recognize which links they have already used. Nielsen states that in most cases, it's best to avoid using color for

body text that is not a hyperlink, especially the color blue. Because blue is the default color of unvisited links, users may try to click on blue text thinking it is a link. Even if blue is not used as a hyperlink color, users will still assume that blue text is clickable.

Extending the argument of blue hyperlinks, Hoa Loranger (2015, Mar 8) argues that technical communicators must go beyond simply making links blue, and must make all clickable links easily recognizable. She states that "[p]eople treat clicks like currency and they don't spend it frivolously," which means that links must be "obvious to users" (Loranger, 2015, Mar 8, para. 2–3). When users have to search for links, or question whether content is clickable, it leads to frustration and resentment. This can lessen the trust users have in the website, and may lead them to look elsewhere for what they need. The key to lessening user frustration is to make any hyperlink easily recognizable to users by looking at how users "attach meaning to visual properties such as shapes, colors, and context based on familiar patterns" (Loranger, 2015, Mar 8, para. 4). Echoing Nielsen's advice, Loranger states that if a color other than blue is used for hyperlinks, the link should be clearly differentiated from the rest of the text on the webpage, and that blue should not be used for text that is not hyperlinked. The color choice should also be used consistently throughout the website. Also, if shapes like buttons or boxes are being used as hyperlinks, they should appear in a consistent color because using different colors will hinder users from understanding which ones are links. Color on the web has become much more complex than simple blue hyperlinks, with design theories like low-contrast and minimalist websites, but even if these traditional methods are not followed, color used correctly can still clearly indicate to users the clickable content within a website.

Relating to the idea of using color to inspire user trust in a website, Katie Sherwin (2015, Jun 7) cautions technical communicators against using low-contrast text in websites. A low-contrast design uses shades of gray or other muted colors for an entire webpage instead of using colors that clearly and sharply contrast from each other. This trend has increased with the desire for minimalism on the web, but the lack of differentiating colors makes a site less accessible for users. Sherwin argues that "[i]nsufficient contrast between the text color and the background degrades the user experience" for a number of reasons (2015, Jun 7, Low-Contrast Text section, para. 1). Some of these reasons are that it is harder for users to find links or other information, users feel less confident using the website, and their cognitive strain increases as they try to find the correct way to use the page. In addition, low-contrast text causes legibility issues because the color of the text is no more than a darker shade of gray from the background. This increases a user's eye strain, and leads to trust issues. Sherwin states that "people are less trusting of text that is hard to read—a carryover from the age of 'fine print'" (2015, Jun 7, Low-Contrast Text section, para. 2). Just as Alberts and van der Geest (2011) found that color scheme choices influence users' trust in websites, so do the color choices between text and background. To reduce cognitive strain and eye strain, and increase user trust, technical communicators need to make appropriate color choices, not only in the overall design but also with the text on the page.

Prior Research on Color Use in Online Help Systems. Encompassing both printed user manuals and online help systems, Thomas Barker (2003) states that "[c]olor can add to the appeal and impact of your manuals, especially your online help documents (where color is 'cheap')" (p. 425). He also argues that color can help users to locate and

focus on specific information within large and sometimes overwhelming software documentation. While Barker provides tips and practical advice for using color, like avoiding "reserved" colors such as red and yellow, he does not differentiate between the color use for printed documentation and online help systems.

Both JoAnn Hackos and Dawn Stevens (1997) and William Horton (1994) focus more specifically on online communication, and both assert that color needs to be used functionally and sparingly. Hackos and Stevens mirror Barker's stance that color is easier to use on screen because it is not an expense like it is with print documentation. They also advise that "each color needs a purpose," and they recommend "limit[ing] your colors in your interface to three" (Hackos & Stevens, 1997, p. 220). Hackos and Stevens also advise readers to consider the limitations of color use, both in regard to the possible limitations of the computers (at the time this research was published) users are accessing the help system from, and to ethical and cultural considerations such as color blindness in some potential users. While the computer limitations are a valid concern, given the age of this research and the advancement in current display technologies, the strain of color use may be less of a concern than it was twenty years ago.

Horton (1994) also recommends using a maximum of three colors in online help documentation, and also argues for a functional use of color. He states that "[g]arish colors cheapen the display and the user's opinion of you," which correlates to the idea of engendering trust with the user through design choices (Horton, 1994, p. 243). The color scheme should be developed with thought to help users accomplish their goals, what Barker calls a task-oriented approach to software documentation.

As this research shows, there are many ways to use color in both print and web documents. Color is used to create emphasis or to make a document more usable, and technical communicators need to understand how colors work together to create effective documents in either medium. Color can also be used in conjunction with other design principles, as the research on color in hyperlinks in this section shows. I cover hyperlinks and other forms of navigation in more depth in the next section.

How to Use Navigation in Print and Web Documents

Typically in print documents, headings help users navigate through the document and determine what relevant information they need to complete their task. Headings also serve to chunk information, allowing users to scan through the document and quickly find what they need. Similar to print documents, online documents use heading structures in these same ways, but they also possess a navigation element print documents cannot: hyperlinks. Online documents use hyperlinks to connect different sections of a webpage or multiple webpages, giving users an additional way to navigate through the document. In this section, I explore both navigation structures, and how they are used as design principles.

Heading Use in Print and on the Web. Focusing on heading frequency, Bartell, Schultz, and Spyridakis (2006) compare the effects of headings in print versus web documents. The authors state that headings serve as text signals, allowing readers to create "mental roadmaps" (p. 416), also known as schemas, which help them to understand how the text is structured and to take in and absorb new information. The authors state these roadmaps are easier to accomplish in print documents because readers

can see all the text on a page at once, and they have additional cues such as summaries and page numbers. When this information is transferred to web documents, these extra signals are not present, so online readers have to multitask more. They must navigate through pages and hyperlinks to find information, and this increase in multitasking can increase the reader's cognitive load (Bartell et al., 2006, p. 418). This cognitive overload leads some web designers to believe a high frequency of headings helps readers not only to create schema, but also to "orient a reader who is scrolling through Web pages" (Bartell et al., 2006, p. 417).

In their study, Bartell et al. (2006) found that high-frequency headings in web documents hindered comprehension the most, which was the same result in print documents (p. 422). The difference is that readers of the print documents were better able to recover from the overload of high-frequency headings than online readers. Online readers performed the best with medium-frequency headings (one heading for about every 200 words), which is the optimal heading frequency for web documents. Bartell et al. (2006) concluded that "comprehension of online readers is much more susceptible to weak structural cues," and they would benefit most from "clear signaling" (p. 422) within web documents. Online readers cannot create schema the same way as print readers, or accommodate for cognitive overload as easily, so a heading frequency optimal for each specific environment should be used.

In an earlier study, Schultz and Spyridakis (2004) studied heading frequency and online comprehension in two different populations. Focusing on online medical information, the authors presented participants with materials that ranged from having no headings present to a high frequency of headings. One group of participants were people

with medical conditions related to the materials, so they had a more vested interest, and the other group consisted mostly of university students who had a more neutral interest in the materials (Schultz and Spyridakis, 2004, p. 507). Schultz and Spyridakis found that, regardless of group, medium frequency headings were optimal for online comprehension. Both groups believed that they could understand more information with the medium-frequency headings, which conflicted with the authors' hypothesis that more frequent headings would increase comprehension. Overall, the study showed that "high frequency headings (a heading approximately every 100 words) appeared to impede either comprehension or perceptions of new knowledge gained" (Schultz and Spyridakis, 2004, p. 513). Heading frequency has been shown to be an important aspect of both print and web documents, and should be adjusted depending on the medium used.

Employing a user-focused evaluation method, Franck Ganier (2007) conducted a case study on user guides for an appliance company, and used headings as part of the design process. Quality-control departments have found that sometimes appliances are returned because the customer contends they failed, but when tests are done on these returned goods, no actual fault can be found (Ganier, 2007). These findings suggest the fault lies not with the appliance itself, but with the user's inability to use it correctly. This often occurs as a result of "the user not reading and/or understanding the instructions properly, if indeed the instructions are used at all" (Ganier, 2007, p. 306). The company that participated in this case study saw these results as an opportunity to redesign its instructions manuals.

One of the areas looked at was content, and the use of headings was one focus within that area. Ganier (2007) states that clear headings will help users carry out tasks in

regard to procedural instructions if the headings relate closely and explicitly to the anticipated task (p. 307). In addition, changing the font size and color of headings will also help make them distinct from the text and stand out to readers as clear signals. These strategies for headings were incorporated into the model document created for this appliance company. While Ganier does not mention the specific results for each design strategy used, including headings, his results do show most participants preferred the model user guide over the original, and "participants identified the information more quickly using the new user guide" (2007, pg. 313). It could be inferred the use of accurate headings relating closely to the desired task, and, set apart from the rest of the text by size or color, were both more attractive to users and more efficient in helping them find necessary information.

Hyperlink Use on the Web. Distinguishing the function of search from navigation, Raluca Budiu (2014) argues that technical communicators cannot abandon navigation completely in web documents and rely solely on search bars for users to find what they need. For a search to be successful, users must know what they are searching for and be able to enter the correct keywords to get the right results. This is not a problem when users know what they are searching for but, as Budiu shows in her example, if users are looking for a new lawnmower but have no idea what type of lawnmower they need, search will not help them find the right mower to buy (2014, Search Requires Knowledge section, para. 1). Navigation, such as category landing pages, which provide categories of different types of lawnmowers and breaks them down by different criteria, will help users to find the lawnmower that best fits their needs. In addition, Budiu argues that search increases users' memory load because it "requires them to *recall* information from their

memory," which means they must come up with the needed complex query to get the right results (2014, Search Increases Memory Load section, para. 1). By contrast, navigation allows users to recognize the items or terms they are looking for without increasing the strain of trying to remember the correct keywords for search. Most users have "no understanding of what makes a good search query on a website" and expect all sites to function like the big search engines, such as Google (Budiu, 2014, Users Have Poor Search Skills section, para. 1). Because of this, navigation is an integral part of creating functioning web content that gets users the information they need without increasing their cognitive load or creating frustration.

Jeffrey Bacha (2012) takes a different approach to research on navigation structures, and looks at the use of hyperlinks in digitally-mediated environments by conducting a case study of the Online Writing Lab at Purdue University. Bacha argues that to make links more functional and understandable to the user, technical communicators need to look at the actual word or word phrases that make up the link (2012, p. 250). Those developing the online environment should be concerned with whether the users recognize the semantic meaning of the words used to make the link as much as they are concerned with the functionality of the link. Discussing usability, Bacha argues that studies should include the theories of ontological semantics and the Semantic Web. By using these two theories, web developers can "restructure how digital information is stored and processed based on how natural language users normally associate meaning to that information in real-world context specific situations" (Bacha, 2012, p. 254). By studying these ideas, web developers can see how users will actually use the program rather than how the developer thinks the user will use the program.

In the case study conducted, Bacha looked at the words used for hyperlinks within the Purdue Writing Lab's Virtual Consultant system that would help tutors navigate through virtual sessions with students. One of the links used the phrase "View Tutorial Queue," which was ambiguous because of the last word. Bacha found the word "Queue" did not offer any connection to the task the tutor was trying to complete (Bacha, 2012 p. 260). The phrase was changed to "View Available Sessions," and the tutors understood the function of the link because of the semantic meaning of the new word (Bacha, 2012, p. 261). According to Bacha's case study, employing the use of semantic meaning in navigation hyperlinks would help readers better understand where the link is taking them, and the overall purpose of the link. This in turn helps match user expectations with the actual function of the link, which will lead to a better and more functional overall user experience.

A member of the Nielsen Norman Group, Kara Pernice (2014) takes the stance that a hyperlink is a promise between the user and the company or creator of the website. When a link does not function properly or, more importantly, does not take users where they expect to go, it reduces the trust and credibility of the website, and makes the user "feel baited, annoyed, disrespected, disappointed, and duped" (Pernice, 2014, para. 1). When looking at eyetracking research, Pernice has found that what looks like a seemingly random pattern is actually users looking for the information they believe is the most important, which includes navigation structures like headings and hyperlinks. Because of this, hyperlinks must not only stand out from the rest of the text, but must also correctly signal to users where they will go if they click the link. Because of this scanning pattern, Pernice states that "the terms used in links should be understandable when taken out of

context and read alone" (2014, Links Should Stand Alone section, para. 2). Links should be "salient and descriptive," and indicate to users what will happen when the links are clicked (Pernice, 2014, Links Should Stand Alone section, para. 4). In addition, once clicked, that hyperlink must fulfill its promise to display the expected information to the user. If the navigation in the hyperlinks is not clear, "users are forced to make assumptions and hunt for the right path," which will increase their frustration and may cause them to look elsewhere (Pernice, 2014, Incorrect Page section, para. 1). Hyperlinks must not only be visually recognizable, but also contain wording descriptive enough for users to use the navigation to find what they need with ease.

One way to fulfill the promise of a hyperlink is for technical communicators to stop using the "Learn More" phrasing commonly found in web documents. Katie Sherwin (2015, Dec 13) argues that these links are not accessible to users because "Learn More" is a "generic label, largely tacked on to information of secondary or tertiary importance" (para. 1). The thinking behind these links is that users are given a short description of content, and can then click the "Learn More" link if they, in fact, want to know more. The pitfalls, though, are that the scope of the hyperlink is often ambiguous, and users are left to wonder what the next page will contain if the "Learn More" link is clicked. In addition, these types of links create a "poor information scent," as well as "uncertainty, because users don't know what to expect if they click" or whether it will be worth their time (Sherwin, 2015, Dec 13, Why *Learn More* is a Problem section, para. 2). This uncertainty also causes cognitive strain as users try to figure out where the hyperlink will go and what the page will contain, which increases frustration and creates a negative experience for the user. Sherwin suggests using descriptive text within the link to

increase accessibility and make users feel more confident about navigating through the website. When the "Learn More" link is acceptable to use, it should be joined with descriptive keywords that tell users exactly what the next page is about—for example, "Learn more about our services" (Sherwin, 2015, Dec 13, Add Descriptive Keywords section, para. 1). In this way, hyperlinks will help create efficient and meaningful navigation structures that eliminate user frustration and create a positive user experience of the web document.

Prior Research on Navigation in Online Help Systems. To achieve task-oriented software documentation, Thomas Barker (2003) argues that navigational aids are a vital component, defining them as "elements of a document that tell the reader where to go next for what kind of information" (p. 326). Headings are one such navigational aid, and they can fail to be effective if they are not clear and explicit in telling the reader what material will be covered in the following section. Barker advises designers to use "elaborate headings" in a "How to" format, and to make headings task-oriented as well a parallel in grammatical structure (2003, p. 334). Given that this research focuses more on user manuals than specifically online help systems, Barker does not cover the use of hyperlinks as a navigation structure.

JoAnn Hackos and Dawn Stevens (1997), however, do focus on hyperlinks in their research (what they call "hypertext links"), and acknowledge that "online information has no obvious beginning or end; rather it is a potentially complex sequence of information" (p. 257). Users can access and navigate through this information using hyperlinks, but only if the hyperlinks allow the users to move through the system to find what they need, and also keep them from getting lost within the system. They advocate

using navigational signposts such as topic numbers or icons, and breadcrumbs throughout the online help system to aid in navigation. Hackos and Stevens echo Barker's advice for keeping a parallel grammatical structure in headings, but otherwise do not focus on the use of headings within online help systems.

William Horton (1994) likewise focuses on the use of links in online documentation, and calls them "the highways, back roads, and sidewalks of information" (p. 127). Links also show relationships between topics or sections, and connect related ideas or facts to one another. The only mention Horton makes of headings is to consider them as a kind of link that is contained within a printed document. None of this research discusses the use of color within either hyperlinks or headings, and instead focuses on the structure and font size and typeface of the navigation structures. This could be because color use wasn't that typical when this research was conducted, or because designers at the time did not deviate from the standard blue hyperlinks we are still familiar with.

How to Use Visuals in Print and Web Documents

As the saying goes, a picture is worth a thousand words, and in the case of technical communication, visuals serve to supplement and enhance surrounding text. Visuals can range from photographs and illustrations to vector diagrams and screen captures. Icons and screen captures are commonly used in software documentation, including online help systems, so technical communicators need to understand how to incorporate them into different mediums. This section will discuss the different theories and practical applications of different types of visuals in both print and web documents.

Theoretical Applications of Visuals. Focusing on screen captures, Hans van der Meij and Mark Gellevij (1998) argue that this type of visual is the most used in printed software documentation. The reason is that "screen captures improve user cognition (that is, knowledge and skill) because they can convey some things better than other illustrations or words" (p. 529). Some of the ways screen captures improve cognition are by helping the user visualize the structure of the program and how different user interface (UI) components work together, switch their attention from the printed manual to the program on the screen, and verify that what appears on their screen is how the program should look when the correct steps are followed. Screen captures of icons and other buttons within a program can also help users to understand the program better and to learn the meaning of the function behind the icon or button. Overall, van der Meij and Gellevij found that screen captures are an essential part of printed software documentation, and they assist the user in many ways. While this article serves as an early study into the use of screen captures, this trend has continued to rise, as screen captures are now found in many print and web documents.

Tiffany Craft Portewig (2008) argues that while technical communicators have become better visual communicators, they still need to learn how decisions are made to include visuals in documents and how that collaborative process unfolds. Calling this process "visual rhetorical invention," Portewig states that technical communicators need to know "the importance of being rhetorically connected to not only the design of visuals but what information they choose to communicate in visuals" (2008, p. 333). It is not enough to know how to place a visual within a document; technical communicators must also know why to place the visual there, and what meaning it conveys to supplement or

replace text. Through her study, Portewig found that visual rhetorical invention can appear at various places throughout the design process depending on different factors such as "the writer's preference, the type and source of the document, and the type of product being documented" (2008, p. 337). This study shows that visual rhetorical invention has an important part in the workplace and in the construction of documents, and we as technical communicators need to "ensure that visuals used fit the rhetorical situation" of the document as a whole (Portewig, 2008, p. 341). Technical communicators need to understand the rhetorical reasons they place visuals where they do, and avoid simply sticking them in when they cannot think of anything to say with words or as pure decoration.

Echoing Portewig's argument, Claire Harrison (2003) also states that technical communicators "are not trained and practised in the use of images for rhetorical purposes" (p. 46). She argues that users no longer rely only on text to construct meaning, but rather take in all elements on the page to determine the purpose and meaning of a document. Because of this, technical communicators need to understand how visuals work with text to create meaning, and to recognize when visuals will help or hinder that meaning. Harrison uses the theory of visual social semiotics to stress that "an image is not the result of a singular, isolated, creative activity, but is itself a social process. As such, its meaning is a negotiation between the producer and the viewer" (2003, p. 47). Using visual social semiotics, technical communicators can understand the social and rhetorical situations surrounding visuals, and how they could be interpreted by users in relationship to the text and within the context of the entire document. This theory can be applied to many different visuals, such as pictures and icons, and allows technical

communicators to recognize the conventions within the visuals that will cause a general reaction among users (Harrison, 2003, p. 58). In using this framework, visuals become much more integral to the document as a whole. They are not simply used to make a document look prettier or more appealing, but to convey an important message that the user needs to, and will, understand.

Looking at the ethical side of visuals, Sam Dragga and Dan Voss (2001) argue that technology has made it easier to create visuals, so their use in documents has increased, but the ethical considerations of using those visuals has stayed the same. Distortion and deception are not the only ways in which graphics can lie. When graphs and charts present statistics of injuries and deaths without taking a humanistic approach as to what that data represents, it skews the reality of what those statistics represent. Dragga and Voss argue that technical communicators have "thus incorporated within the humanistic field of technical communication a technique of visualizing information without adapting that technique to the humanities, without fully humanizing it" (2001, p. 267). To remedy this distortion, the authors suggest that appropriate visuals need to be included with statistical data representations to show the human aspect of the information. A bar graph of work-related injury rates can include a drawing or pictograph that shows the human aspect of what those injuries look like, and who the statistics are referring to (Dragga & Voss, 2001, p. 271). While online help systems do not typically use graphs and charts, relying more on screenshots and icons, technical communicators need to understand the ethical implications of their choices, and make sure to create and place visuals in such a way that it communicates the human aspect of the data to the readers.

Practical Application of Visuals. Focusing again on screen captures, Mark

Gellevij and Hans van der Meij (2002) explore how this type of visual can help users

switch their attention from the printed manual to the program on the computer screen.

They argue that using a printed manual to learn a new program could result in the user

focusing solely on the documentation at the expense of what occurs on the computer

screen as steps are completed. To remedy this, Gellevij and van der Meij argue that

screen captures can serve as signals for readers to switch their attention from one to the

other. Screen captures also reduce "cognitive effort in finding the right match between

the textual description and the corresponding pictorial representation on the screen"

because a matching visual is present in the documentation (2002, p. 115). The results of

their study did find support for this use of screen captures, and when a switch from the

manual to the screen was expected, users did look up from the manual the majority of the

time. While they stress that more research is needed, Gellevij and van der Meij conclude

that visuals such as screen captures may indeed "stimulate users to switch more often

between the manual and computer screen than does a textual manual" (2002, p. 120).

Technical communicators must therefore understand how to use screenshots in an

effective way that aids the users in completing their tasks.

In a later study, Gellevij and van der Meij (2004) look at several studies that

provide empirical evidence of the benefit of screen captures in printed manuals (Gellevij

& van der Meij, 2002; van der Meij & Gellevij 1998). They examine the different tasks

screen captures help users accomplish, such as switching attention and helping users

understand the deeper functions of the program. The authors argue that "the manual must

empower the user," that "knowledge [in the manual] must be transferrable" to the user

and "extend beyond the specific examples discussed in the manual," and that visuals like screen captures help accomplish those tasks (Gellevij & van der Meij, 2004, p. 224). Visuals accomplish this by helping to support learning and allowing the user to understand not just how to use a program, but why it works and how it is structured. This leads to more interaction with the program itself, and users benefit from knowing the program more intimately and more quickly. Users can complete more complex workplace tasks and become more comfortable with them through the use of screen captures in the printed manual.

In a discussion of web documents, Aurora Bedford (2014) looks at the use of icons as visuals within web design. She states that "[i]cons are, by definition, a visual representation of an object, action, or idea," and if that is not immediately clear to users, then "the icon is reduced to mere eye candy" (Bedford, 2014, para. 1). Because of this, technical communicators must know how to incorporate icons into web documents in a way that is easily recognizable to the user. Bedford states that, in general, users can recognize icons quickly, but only a few are truly "universal," such as the home icon and the search icon (magnifying glass). Most icons are not universally recognizable, and can have different meanings depending on the program or the interface, as well as cultural differences. Because of this, Bedford argues that "a text label must be present alongside an icon to clarify its meaning in that particular context" (2014, Icons Need a Text Label section, para. 1). In addition, labels should always be visible to the user, and should not be shown only when the user hovers over the icon. Placing the text label in a mouseover increases the interaction cost for the user, and does little to lessen the ambiguity of the icon's meaning. Icons should also be sized appropriately in relation to the rest of the

content, so that the visual is easy to decipher. Bedford argues that if an icon is too small it will make it "less salient compared to other elements on the screen," which can also make the icon less usable (2014, Relative Size Aids Noticeability section, para. 2). Following these principles ensures that an icon is functional within the web documents, and the user can easily understand its meaning and the purpose within the software program.

A member of the Nielsen Norman Group, Kathryn Whitenton (2014) looks at image-focused design and whether large visuals help or hinder web documents. She states that "images can be a powerful way to capture users' attention and communicate your message," but if used incorrectly, they can hide other more important elements (2014, para. 1). While images have appeal and the ability to engage users, web documents also need to be functional and deliver content necessary for users. If a visual overwhelms the other elements on the page, it makes its importance less clear to the user. The key to balance is to make sure that the other elements, such as actions buttons and hyperlinks, have "just as much visual emphasis as the image and the size of the image does not overwhelm" the page, what Whitenton call a balanced approach (2014, Visceral Appeal section, para. 5). To do this, technical communicators must look at the function and layout of the page before adding visuals. Each type of web document has its own set of constraints to consider when using any type of design scheme. Some ways to ensure visuals are used appropriately include prioritizing both the user and business goals of the web document, identifying how each visual relates to those goals, and then using those visuals based on goal importance and their relationship to those goals (Whitenton, 2014, Use Images Appropriately section). In this way, technical communicators will learn how

to use visuals effectively in web documents to ensure that they are both functional and enticing to the user.

Prior Research on Visuals in Online Help Systems. Referencing the use of visuals (he refers to them as "graphics") in both print documentation and online help systems, Thomas Barker (2003) links graphics and their use back to task orientation. He argues that "[a]s with all elements of a well-constructed manual or online help, the graphics should support user questions" while also allowing them to "locate and act" (p. 406). This means that the graphics should support users' actual workplace tasks, and help them find and use the features of the program. Graphics also need to help the user understand the program and to explain complex tasks and provide examples (Barker, 2003, p. 407). While Barker provides numerous examples of different graphics, such as photographs, screenshots, and illustrations, he provides a more general framework for graphic use that could apply to online as well as printed documentation; therefore, he does not include a more specific discussion of the use of certain graphics exclusively in online help systems.

JoAnn Hackos and Dawn Stevens (1997) focus more specifically on the use of visuals in online environments, and also refer to this design element as graphics. They argue that users "may mistake the screen shot for the actual software screen" (Hackos & Stevens, 1997, p. 300). Because of this, designers should use elements such as a border or label to clearly distinguish the graphic from the program. Also, the authors argue that graphics can look different in print than they do online because the resolution on a computer screen is much lower. Because of this, designers need to ensure all graphics

have consistent style and a good amount of white space to help users differentiate between the different elements.

William Horton (1994) also focuses on visuals in an online format, and also labels them as graphics. One of Horton's main arguments is that designers should not "isolate graphics and other media elements from the text" (1994, p. 200). Users should not have to access another menu or drop down to be able to view a graphic that accompanies a step. Horton also states that graphics should be used to draw a user's attention to important information, and can also "show trends, illustrate abstract concepts, clarify complex issues, reveal multiple dimensions in data, and can more effectively present dense information" (1994, p. 286). This mirrors Hackos and Stevens' (1997) assertions that graphics should be used as examples and to verify for the user they have completed a step correctly. Like Barker (2003), Hackos and Stevens (1997) and Horton (1994) do not distinguish between different types of visuals, and instead discuss the design element more generally, providing practical advice for how to incorporate them into various forms of software documentation.

The Relationship between Document Design and Online Help Systems

Previous research offers a great deal of theoretical application and practical advice pertaining to the design principles of color, navigation, and visuals, but this research is contained within the mediums of print and web documents. While acknowledging prior research (Barker, 2003; Hackos & Stevens, 1997; Horton, 1994) that has been done on the use of color, navigation, and visuals in online help systems, this

research does not consistently apply a direct transfer of document design theory and practice to online help systems.

This disconnect between document design and online help systems is why a study like this is needed. My study builds on prior online help system research by performing usability testing on a constructed help system built using established document design theory and practice. This mimics what practitioners have done for years when testing company products and software programs, but places the research firmly in an academic setting. Online help systems are an intricate medium with aspects of both printed user manuals and websites that do not fit neatly in either category. This study serves to reinforce that using good document design within online help systems does in fact lead to more effective and usable help systems that allows users to complete workplace tasks with minimal frustration.

METHODS

My goal with this research is to determine whether design principles, applied to online help systems in the same way they are applied to print and web documents, increase the usability of the system. To that end, I developed three research questions to drive my study:

1. How do technical communicators use color, navigation (headings and hyperlinks), and visuals in print and/or web documents?

2. How can these design principles be applied to online help systems?

3. Does incorporating these design principles make help systems more usable, and are some design elements more effective than others?

The first question is answered by the preceding literature review, but to answer the second and third questions, I developed a usability study with an online help system built using a Responsive HTML5 output for the online infographic software Piktochart. The study consisted of a scenario built around a work-situated task that participants would complete using Piktochart, as well as surveys taken before and after completion of the task. Participants were asked to use the help system to complete the task specified in the scenario. In this chapter, I outline how I developed the usability test, how I built each part, and how each part came together to build the study.

Description of Study Preparation

Before building the actual parts to the study, I had to determine the overall design of the usability test, and how I would deliver and complete the testing. In the following

sections, I outline how I developed the plan for the usability test, how I recruited participants, and how and why the test was constructed in an online format.

      Planning the Study. For this study, I followed Postava-Davignon et al.'s (2004) steps for planning a usability test, as well as their test plan. While their focus was on printed documentation, I found that the process worked equally well for an online usability test. I discuss how I worked through the steps below, and a copy of my test plan can be found in Appendix A.

      The first step, Getting Started, is described as "get[ting] a feel for documentation" (Postava-Davignon et al., 2004, p. 37). Because I was essentially building the "documentation" to be used in this study, I completed this step by increasing my knowledge of the Piktochart system, and developing a detailed outline for the structure of the online help system. Research on usability testing (Hughes, 1999; Morgan, 1995; Nielsen, 2012, Jan 4; Nielsen 2012, Jun 4) and both help documentation and printed documentation (Andrisani et al., 2001; Pratt, 1998; Tomasi & Mehlenbacher, 1999) informed my decisions when building both the online help system and the rest of the study.

      During the second step, Formulating Test Objectives, "[w]riters formulate their test objectives and plan the test" (Postava-Davignon et al., 2004, p. 38). In consultation with my advisor, I decided the usability test would consist of a scenario provided to participants that they would complete while using the online help system. Participants would also complete a short survey before they began the usability test, and a longer survey after completing the scenario. As Postava-Davignon et al. suggest, I also

completed the test plan (Appendix A), using it to develop the first draft of my survey questions.

In the third step of the process, Writing Test Tasks, writers create tasks and testing materials and also "test the tasks to debug any problems and ensure that the usability test will run smoothly" (Postava-Davignon et al., 2004, p. 38). During this step in the process, I built the online help system for Piktochart, created the scenario for participants and designed the corresponding documents, finalized my survey questions and created the survey forms, and built the webpage that would house all of these testing materials. I also submitted an IRB proposal and it was determined to be exempt from further review (February 29, 2016; proposal #16-0320; Appendix B). I then conducted a pilot usability test with a few fellow graduate students to ensure that all parts of the webpage functioned correctly, and the directives laid out were clear and easy to follow.

The fourth step in Postava-Davignon et al.'s process is Conducting the Test. Once I had recruited my participants, I conducted my usability test over a month-long period. I indicated on the webpage the last day the test could be taken, and any surveys completed after that date were not included in the results.

The fifth and final step in the process is Documenting the Results. After the testing had concluded, I collected the raw data and created tables for the quantitative results based on the type of answer format and whether the data came from the pre- or post-test survey. I then collected the qualitative data into one document, sorted by question, and used a coding system to interpret and draw conclusions from the results. How I collected and coded my data is discussed in more depth in the Results section.

With a general outline of how I built my study now established, in the next section I elaborate on how I completed each component of the study, starting with recruiting my participants.

Recruiting Participants. Participants in this study were undergraduate students at Missouri State University, and were enrolled in the seated ENG 321 or online ENG 421 class taught by Dr. Lyn Gattis in the Spring 2016 semester. I recruited these participants by first discussing my study with Dr. Gattis, and indicating that I would like study participants to be as close to "representative users" as possible because it would be a more accurate reflection of what real users do when completing workplace tasks. (Nielsen, 2003, Simplifying User Testing section, para. 1). The representative users for my study are individuals working as entry-level technical communicators, and as such I wanted the usability test to mirror that environment.

I chose these two classes to recruit from because they have basic knowledge of technical communication practices, and limited experience with infographics, but they are not well-versed in document design principles or building online help systems. Their knowledge is similar to that of someone in an entry-level technical writer position, which was my representative user for this study. Because my target number of participants was 20–25, I chose to recruit from two classes instead of one. This provided allowance for any students who were too busy or chose not to participate in the study.

After meeting with Dr. Gattis, and getting permission to conduct the study with her classes, I developed a short script that would be posted on the Blackboard homepage for each class (see Appendix C). Within the script I also provided a beginning and end date for the study. Once the study was completed, I recorded the total number of

participants in case any attempted to complete the study after the end date. Between the two classes there was a total of 47 potential participants.

Dr. Gattis decided to provide extra credit for any student who participated in the study and so needed a way to determine which student had participated. As Schade (2016) argues, it is essential to determine if real data from users is necessary for the purposes of testing. Because providing names could bias results, I decided to use student IDs. This is still real data from participants, but protects anonymity. At the end of the study, I sent the list of IDs to Dr. Gattis, but had no knowledge of who received the extra credit or how much they received. Asking for student IDs was the first question of each survey, but I made it clear that this real data was solely for their instructor. It would not be included in the results of the study, and would not be kept as part of the data records.

Constructing the Usability Test. For this study, I chose to conduct the usability test in an online setting rather than in person for the students' convenience. Having the usability test conducted completely online is more beneficial to participants, and also made it more likely I would meet my goal of 20–25 total participants.

Conducting the usability test with all participants at once, such as in a usability lab, was not a practical option for this study. For example, finding a time in which all participants could meet at once would be impractical for the scope of this study. Also, online students would have to come to campus solely for the purpose of completing the test, and it is impossible to know if those students have any seated classes, and wrong to assume they do.

It was also impractical to have students complete the usability test during class time. First, this would apply only to the seated class of participants; and second, it would

displace the instructor's lesson plans that had been established since the beginning of the semester. Also, having the test done in a classroom setting could skew the results because students could feel like they are taking an exam, which would create unneeded stress. Conducting the usability test online allowed participants from both classes to complete it on their own schedule and when they could find the time, which Nielsen (2005) and Grayling (1998) argue is important because it truly mimics a real user environment as much as possible.

I also provided participants with an outline of the usability test. Before detailing how each part of the study was built, I provide a summary of the entire usability test, and what participants were asked to complete. Participants were first given the web address for the study (www.thesis.meghanmsmith.com). This webpage contains a shortened explanation of informed consent, with a link to the full informed consent form (Appendix D) that participants downloaded if they chose to. Next are the study materials, listed in the order participants need to complete, starting with the scenario and link to related scenario materials (Appendix E). Once participants read all scenario materials, they completed the pre-help system survey. They then opened the online help system, went to the Piktochart website, and started the scenario task. Once they finished the scenario task, they completed the post-help system survey, which concludes the study.

I now turn to an in-depth discussion of each component of the study materials. In the next section, I explain the software used to build each component, and how and why each component was built to fit within the larger design of the study.

Description of Study Materials

In this section I discuss the following pieces of the usability test: the online help system, the scenario, the surveys, and the webpage that houses the test itself. In discussing these parts of the test, I explain how I built each piece, including the technology used, and also the reason they were created a certain way. As the online help system is being tested through this study, I start my discussion with this component.

Building the Online Help System. For this study, I built an online help system for the infographic maker Piktochart. I chose to use this software I am familiar with it, which helped me in building the help system because I did not have to learn the program as I went. Also, because users can create infographics with the free standard account, participants would not have to subscribe to or purchase software to complete the study. Piktochart is also an appropriate program because infographics are something that technical communicators often work with or create, so by using this program within the study, it further mirrored the real work environment I was trying to create through the scenario.

The help system itself was built using Adobe RoboHelp, and was generated as a Responsive HTML5 output. This output was then uploaded to the study webpage, and presented to participants as a hyperlink to the online help system. While the help system does not cover every possible feature and function of the Piktochart program, what Swarts (2015) calls "stabilization knowledge," it does cover the essential features of the program that would allow participants to complete the scenario and also understand what they could do with Piktochart, which Swarts identifies as "possibility knowledge" (p. 19).

Given the parameters of the study, this possibility knowledge was sufficient to test the three document design principles with a group of representative users.

Using Color in the Online Help System. Following White's (2003) advice on limited and functional color use, I kept the color use within the sections of the online help system to specific areas. Each level of heading was a different color, which allows users not only to see the heading hierarchy, but also to easily determine what each section will be about. I also used color for notes and tips throughout the help system. Placing this text in color sets it apart from the rest of the instructions and gets the user's attention by indicating the note is a special piece of text. This ensures the user is less likely to miss the important information contained in the note, which often helps to clarify or provide more detail for a procedure. Figure 1 shows the colors used for different elements in the help system. Teal was used for the notes, blue was used for the hyperlinks, and gray/green and orange used for the level-one and -two headings, respectively.

I also used color in the hyperlinks to set them apart from the rest of the text, and used Nielsen's (2004) stance that a different color should be used for visited and unvisited links. I chose to keep the default color choices for hyperlinks (blue for unvisited, purple for visited). I also made hyperlinks easily recognizable, as argued by Loranger (2015, Mar 8), by making them clearly visible within the rest of the text. I did not use blue for any text that was not a hyperlink because I did not want to confuse users and increase user frustration. I tried to limit the use of hyperlinks to only when it was necessary within the body of the text. Most of the hyperlinks were used on the homepage of each section so that users could jump to a specific topic they needed help with rather than having to go linearly through the section. Figure 2 provides an example of these

homepage hyperlinks. I used this layout consistently throughout the help system, and did

not use any icons or other elements as hyperlinks (Loranger, 2015, Mar 8). I used color

for hyperlinks in a way that would help users easily recognize clickable content, and that

separated that content from the rest of the colors used in the help system.
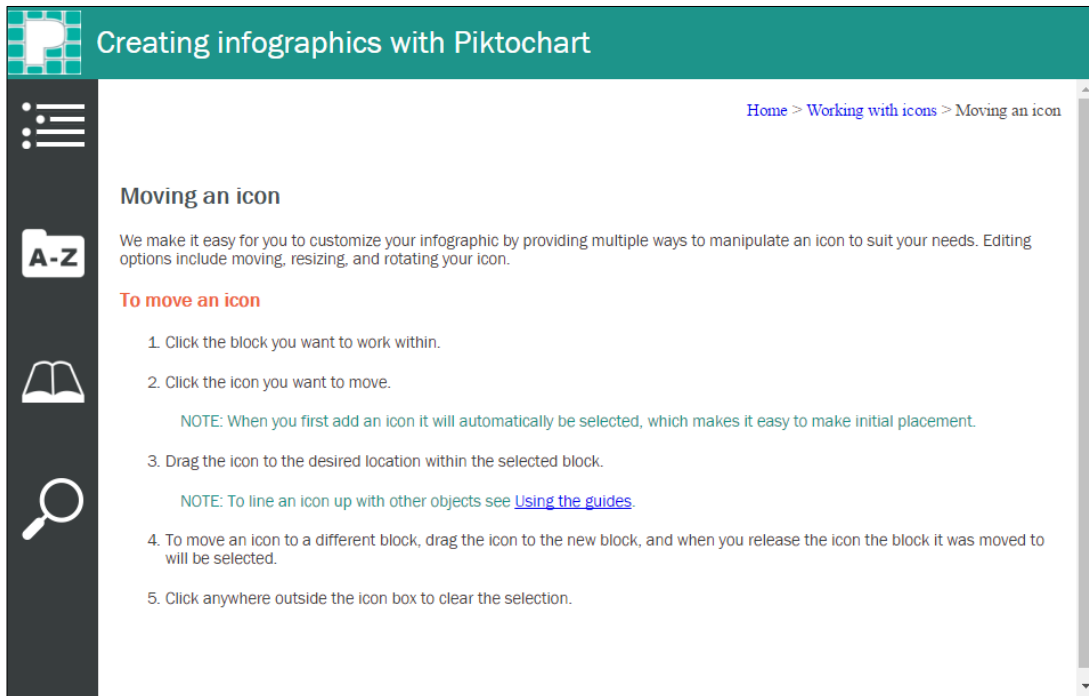
Figure 1. Colors used for heading, notes, and hyperlinks in the Piktochart online help system.

Expanding on Alberts and van der Geest's (2011) research on color and trust, I

built the online help system using the color scheme of the Piktochart website. I also made

sure all of the colors contrasted enough with the white background so that they were

easily readable without causing cognitive strain or reducing users' trust in the help

system (Mackiewicz, 2009; Sherwin, 2015, Jun 7). When generating the Responsive

HTML5 output in RoboHelp, one can customize the colors of the chosen layout, so I

changed as many elements as allowed to the same colors used for the headings and notes to further match the Piktochart color scheme. I kept to the Piktochart color scheme because doing so increases the trust users have that this help system is credible and offers accurate information (Alberts & van der Geest, 2011). Because I could not actually embed the help system into the Piktochart program, by matching the color scheme to the company's website, I increased the trustworthiness of my constructed online help system.
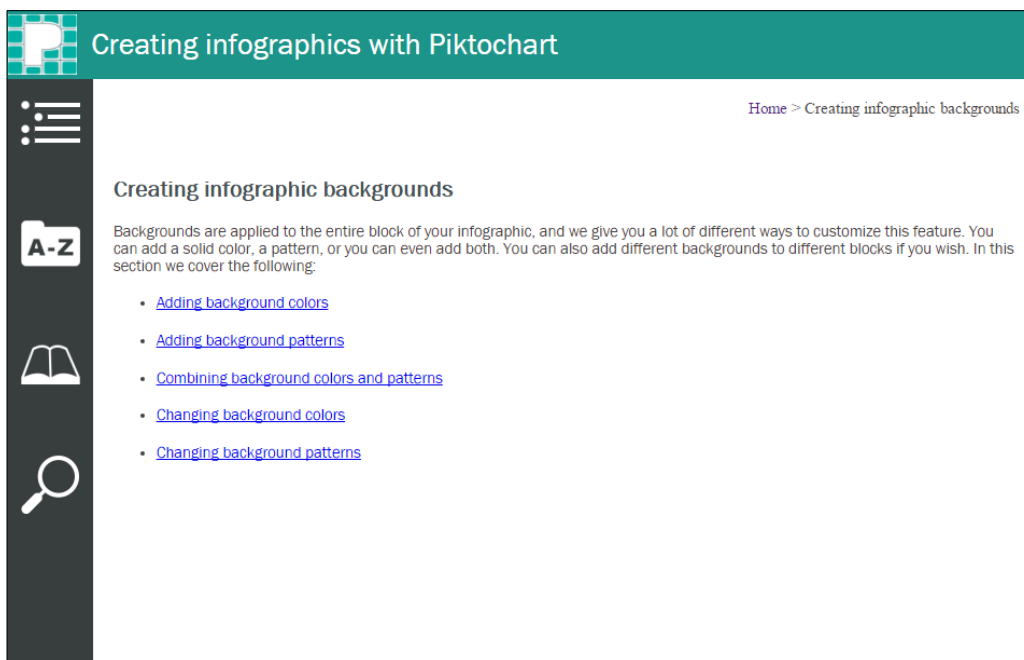
Figure 2. Example of hyperlinks for topics within a section in the Piktochart online help system.

The next section shows how navigations structures were used, expanding on some of the points mentioned above.

Using Navigation in the Online Help System. This online help system was built in such a way that I did not expect users to read it linearly, but to jump around to topics as they needed information, which mimics the real usage of online help content that is

designed for nonlinear access. Because of this nonlinear access, as Bartell et al. (2006) found in their study, headings are needed to help users create mental roadmaps to understand how the help system is structured. To accomplish this, only two levels of headings were used; I grouped similar topics together (Bartell et al. and Schultz and Spyridakis, 2004) and used clear language that clearly described the topics (Ganier, 2007). Figure 3 provides an example of the heading structure and frequency for one of the topics within the online help system.
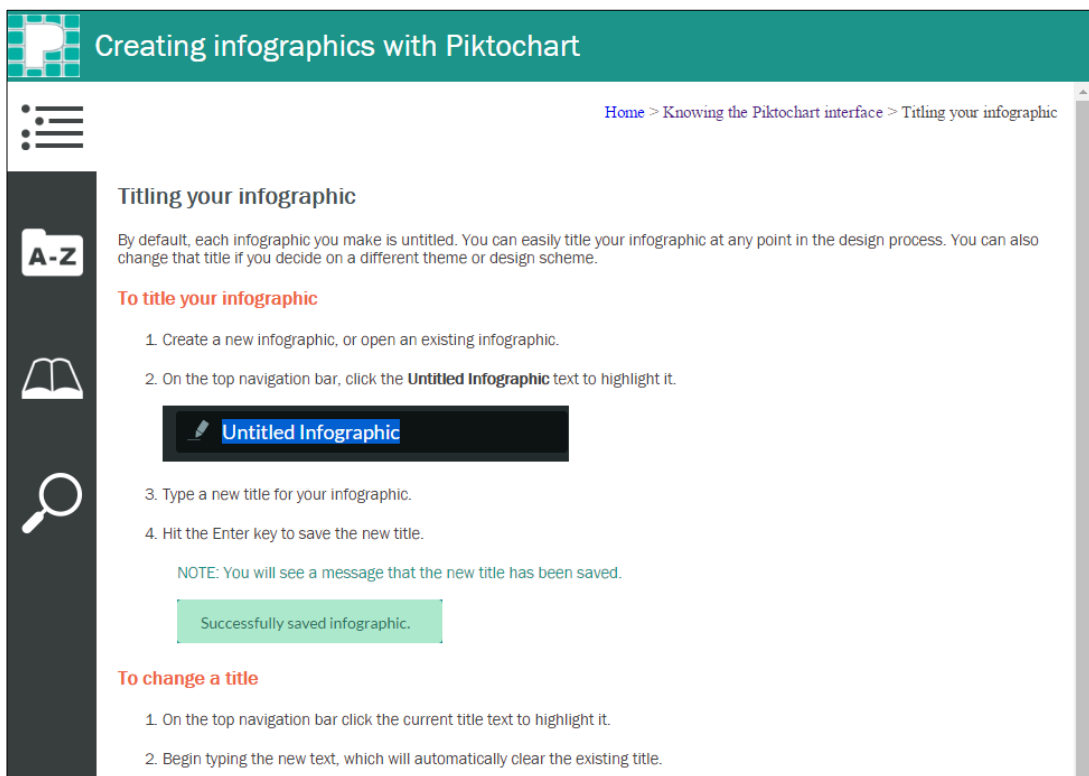
Figure 3. Example of heading structure and frequency in the Piktochart online help system.

In my use of hyperlinks within the online help system, I made sure they not only looked like hyperlinks, but also functioned as such. As Budiu (2014) argues, websites

cannot just have search functions and suggests using category landing pages to help with navigation. While the Responsive HTML5 output includes a search feature, I also included hyperlinks within each section to all topics presented, which serves as sort of section landing page, as well as section-level table of contents. To reinforce the promise of the hyperlink to the user (Pernice, 2014), I verified all hyperlinks in my pilot test before starting the study with participants, ensuring they functioned properly and took the user where they expected to go. I did not use any "Learn More" links as Sherwin (2015, Dec 13) suggests, and instead used semantic wording within each hyperlink, as Bacha (2012) suggests, which matched the level-one heading of each topic. Figure 4 provides an example of the semantic text used within the hyperlinks, as well as a sample landing page that was created for each section.

Using Visuals in the Online Help System. Because this online help system is for software that is used to create visually driven material, the visuals used in building the help system are screenshots or icons of buttons, and were taken using TechSmith Snagit. I used this technology to accurately resize the visuals when needed, so as not to distort any of the images presented. Not using this process would have also distorted the meaning and context of the visual, which is not ethically sound according to Dragga and Voss (2001). As van der Meij and Gellevij (1998) argue, I used screenshots of certain steps and of the icon buttons to improve user cognition and help them visualize the structure of Piktochart while learning how parts of the program worked. I also made sure that the screenshot served a functional purpose, such as showing users how to complete a complicated step, or what the screen should look like when a step was completed. The button icons were placed inline with the name of the button to help reinforce the meaning

of not only the icon but also the action itself. Both types of visuals had a clear meaning and reinforced the message of the text, which contributes to Portwig's (2008) concept of visual rhetoric invention. Using visuals in this way also reinforces Harrison's (2003) idea of visual social semiotics because I used screenshots and button icons within the context of the entire help system.
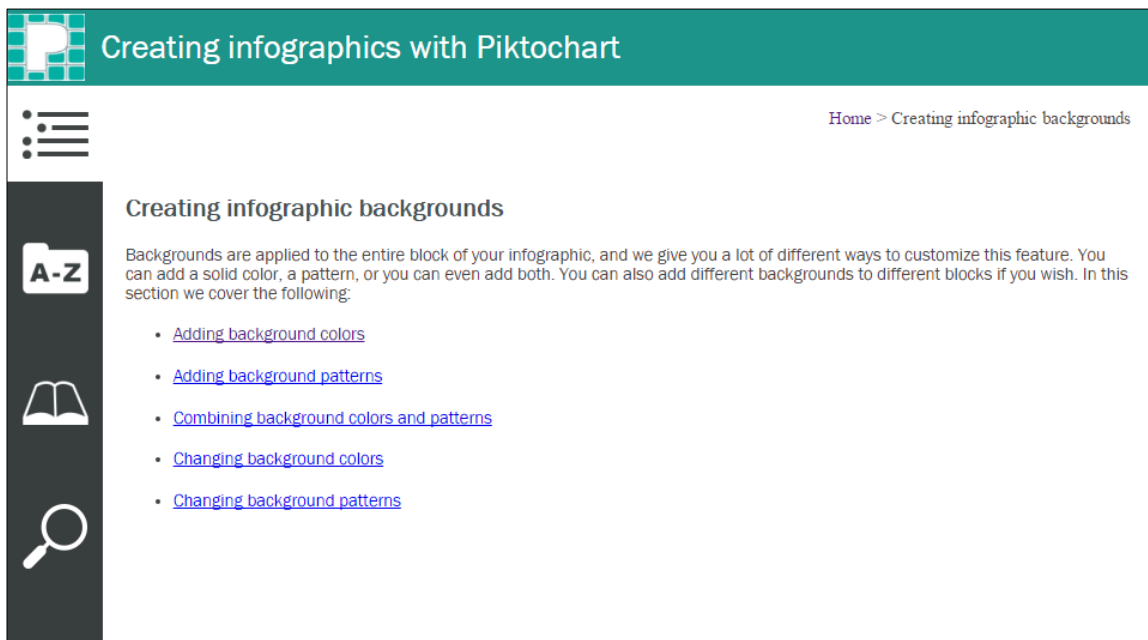
Figure 4. Example of semantic hyperlinks and section landing page for the Piktochart online help system.

On the practical side of incorporating visuals, adding screenshots to the online help system helps users to switch between screens from the help system to the Piktochart program (Gellevij & van der Meij, 2002). This helps users to match the step in the help system to what they are doing when creating their own infographic. I also used screenshots that were appropriately sized and that supported rather than overshadowed the text (Whitenton, 2014). I used button icons to help users not only switch attention, but

to clarify and reinforce the context of that icon within the larger program as they are not universal in meaning (Gellevij & van der Meij, 204; Bedford, 2014). Figure 5 provides an example of how screenshots and icons work to provide context and reinforce the information provided by the text.
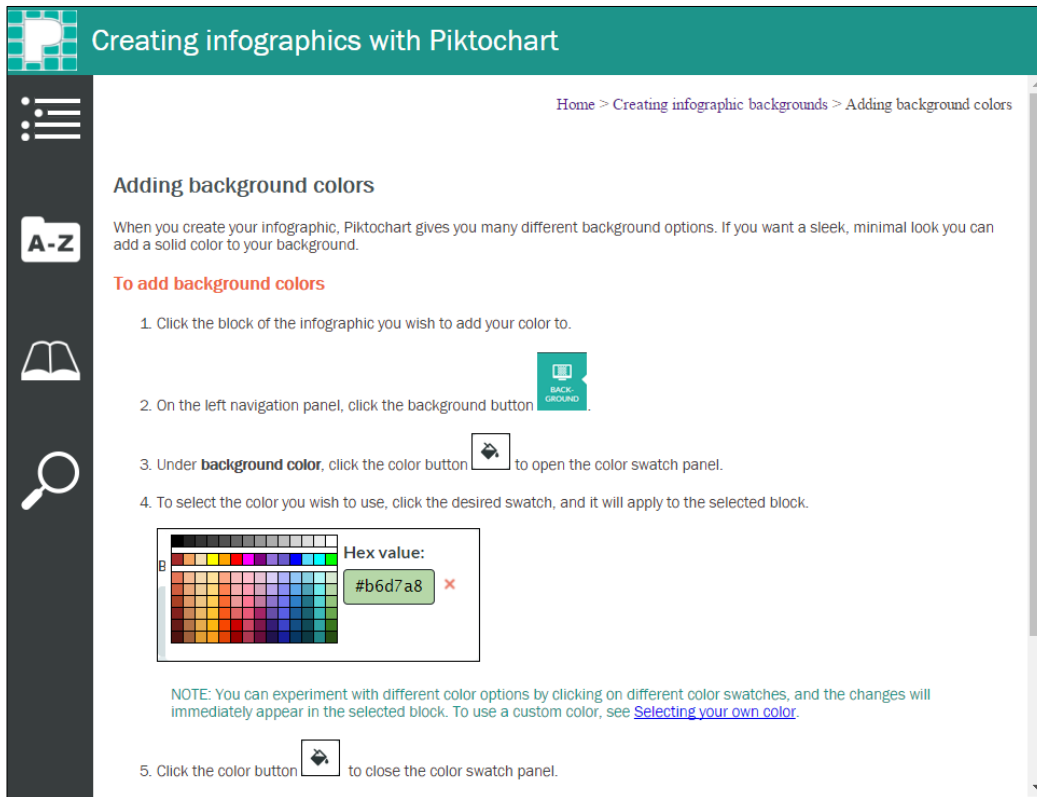
Figure 5. Example of the use of screenshots and icons in the Piktochart online help system.

Now that I have discussed how and why the online help system was built, I will discuss the scenario created for participants to complete during the usability test.

Creating the Scenario. Instead of simply telling participants to play around with the help system to test it, I wanted to engage participants by providing them with a goal to work toward while learning Piktochart and using the online help system to aid them

(Padmanabhan, 2007). To achieve this, I created a task-based scenario that mimicked a workplace situation that an entry-level technical communicator would likely encounter. This scenario gave participants a task to complete while testing the online help system, and also helped the study to further mirror a real work environment.

I created a fictitious company and supervisor for the scenario. I had experience working with an animal shelter creating informational infographics, and felt that this type of organization would give participants a greater range of creativity in working with Piktochart, and therefore testing the online help system. Creating a company that the participant is a part of for the purposes of the scenario, including a supervisor, helps to make the task better mirror a real work environment than simply telling participants to create a random infographic. As the Nielsen Norman Group (2014) argue, "it's better to situate the request within a short scenario that sets the stage for the action and provides a bit of explanation and context for why the user is 'doing X'" (What Users Need to Be Able to Do section, para. 2). Essentially, by situating the request to complete the usability test within a task-based scenario, participants have a better understanding of and motivation for why they are participating in the first place.

For the scenario, I created a persona that the participant would assume for the purposes of the usability test. The summary of the persona and scenario that was provided to participants on the webpage is shown below:

> You are a technical writer at a local organization called Second Chances Humane Society. Second Chances is a non-profit animal rescue that runs a no-kill shelter. Throughout the year they hold fundraisers and other events to help raise awareness about shelter pets. They are a growing organization who have helped hundreds of stray pets find new and loving homes.
>
> Your supervisor, Claire Johnson, has asked you to create an infographic that raises awareness about stray pets in the area, and also

prompts people to take in and adopt these animals. She has asked that you use Piktochart to create this infographic, and to create your own free account. She has sent you a memo outlining what she wants, as well as what she would like the finished infographic to look like. As part of the scenario you are asked to save your infographic, but you do not need to actually send the file to me. This is part of the scenario because it is covered in the help system.

This summary is the first item participants see under the scenario heading, and sets up the role they should assume and the task they need to complete. It also explains why they are using Piktochart and the reason they need to create the infographic. As part of the scenario, I provide a template of the text and layout that participants should use, but allow them freedom to create their own overall design, much like would happen in a work environment. In the scenario materials (Appendix E), I provide participants with the memo mentioned in the scenario that outlines the task in more detail, along with the template of essential information to include.

I chose Piktochart because it is a free online program that participants do not need to pay for to use, and also because it relates to relevant work that technical communicators do. Infographics are a form of visually-driven technical communication, and they have become more popular in recent years. It also allowed me to create a fairly detailed and in-depth online help system to test my research questions. The online help system then also becomes a learning and reference tool (Hughes, 1997) to help them complete a defined goal within the task-driven scenario. The memo and template from the created company's supervisor adds to the immersion of the participant in the persona and task of the scenario, and helps to engage them more in the scenario because they are working toward a goal. Giving users a defined task also ensures that most the content in

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the help system will be tested because I know what functions and features

participants need to use to complete the task. This task-driven concept is then

mirrored in the online help system because the topics and sections focus on and

relate to real tasks that real users need to know how to complete (Jackson et al.,

1992). All of this works in tandem to drive participants toward a goal to

accomplish, which lets them be involved more fully with the usability test, and

perhaps not really see it as a test at all. In addition, the scenario and overall

usability test I created for this study are well-suited for testing my research

questions.

Having discussed the materials created for the usability test for the study, I

now provide an outline of the surveys used to record the results of this usability

test.

Creating the Study Surveys. I created two surveys that participants would

complete: one survey before the usability test and one after. They were titled the pre-help

system survey and the post-help system survey so participants could easily tell which

should be completed first. In the paragraphs that follow I will discuss how I created each

survey, what types of answer formats I included, and why the chosen delivery format was

used.

The pre-help system survey consists of six questions in a variety of answer

formats such as yes/no, Likert scale, and short answer. The purpose of this survey is to

get a sense of participants' prior experience with online help systems, what Schaeffer and

Presser (2003) call "questions about events and behaviors" (p. 68). Before participants

started the usability test, I wanted to know if they had ever used an online help system,

what their experience might have been, and whether they considered themselves competent web users. These types of questions allow me to see what, if any, assumptions participants have about online help systems and how easy or difficult they are to use. Knowing the assumptions participants have toward online help systems also helps to see how much the design choices I built into my help system either changed those assumptions, and therefore made the help system more effective, or if the design choices simply reinforced their prior attitudes toward the usefulness of online help systems.

The post-help system survey is more extensive than the pre-help system survey, and the questions asked try to determine if, and how, the use of color, navigation structures, and visuals made the online help system more effective and user friendly. Like the initial survey, the post-help system survey had a variety of answer formats (yes/no, Likert scale, and short answer) spread across 18 questions. The purpose of this survey is to get participant feedback on their experience completing the usability test, focusing on the three design principles being tested in the online help system; these types of questions "ask for evaluations or attitudes" (Schaeffer & Presser, 2003, p. 66). The responses from these questions were coded and used to answer my second and third research questions about the effect of document design principles on online help systems.

In terms of design, both surveys were created using Google Forms, which is a free online program that is part of Google's office suite. I chose this program over other online survey sites because it allowed me to create an unlimited number of questions with customizable answer formats and to customize the appearance of the form. Singh et al. (2009) argues that web-based surveys are "quick to carry out," and "eliminate the need to manually enter data into data-analysis software applications," and this is one of the

features of Google Forms that led me to choose this specific platform (p. 199). Any

responses from the survey are automatically recorded in a Google spreadsheet when the

survey is submitted, and that spreadsheet is saved in my Google Drive account, and

updates itself whenever a participant completes a survey. Once the study period ends, I

have one spreadsheet for the pre-help system survey and one for the post-help system

survey, and each submission is timestamped and organized by question order, which

makes it easier to record and code the results.

Also, Google Forms creates a link to the survey that I can either share with

participants or post on my own webpage, but the survey itself is hosted by Google. As an

added benefit, participants completing the survey do not need to sign up or enter an email

address as a condition of participation, which is an added protection to privacy (Alessi &

Martin, 2010). Participants are made aware that they would need to enter their student ID,

and also how that personal data would be used, so there is no unexpected intrusion to

participants' privacy beyond what is stated in the informed consent form.

When creating the survey questions, I decided to use a mix of open-ended

questions in which participants would give a "free-form answer," and closed-ended

questions where participants would have a "limited number of possible answers" (Farrell,

2016, May 22, Definition section, para. 1). This mix of question types was more varied in

the post-help system survey, as those results provided the bulk of my data. I chose a mix

of open- and closed-ended questions to obtain more data, and more varied data, than I

could have obtained with closed-ended questions only. As Farrell (2016, May 22) states,

open-ended questions "allow you to find more than you anticipate" because participants

may provide attitudes or concerns about the online help system that I may never have

considered when designing the study (Why Asking Open-Ended section, para. 1). A copy of the questions and answer formats for the pre-help survey can be found in Appendix F, and for the post-help survey in Appendix G.

Because the study was conducted solely online, I crafted the questions in a way that would prompt participants to answer with more detail than "yes" or "no," which is why questions that would elicit this type of answer were asked in a closed-ended format. The closed-ended questions determined a participant's attitude on whether a design element was effective or not, and the open-ended questions "further probed" participants about the reasons that a design element was or was not effective (Plumb & Spyridakis, 1992, p. 630). The mix of questions allowed me to see a more complete picture of not only which design elements in the online help system were effective to participants, but also their reasoning behind their attitudes toward each element tested.

I next provide a brief discussion of how I designed the webpage that housed all of the materials for the study. I outline how I built the webpage, and why I chose this format to deliver my study.

Designing the Study Webpage. Rather than sending all the different study materials to participants in an email, which could cause confusion as to order of completion, I created a webpage to hold all of the study materials. This webpage also explained the study, the task I was asking participants to complete, and the order in which they needed to complete study. I created a subdomain on my existing website for my study (www.thesis.meghanmsmith.com), which gave me control over the design of the webpage and information presented to participants. This also made it easier for participants to complete the study because all materials and instructions were in one

location. Figure 6 provides a screenshot of the header and introductory content of my

webpage as an example of the layout and color design used.
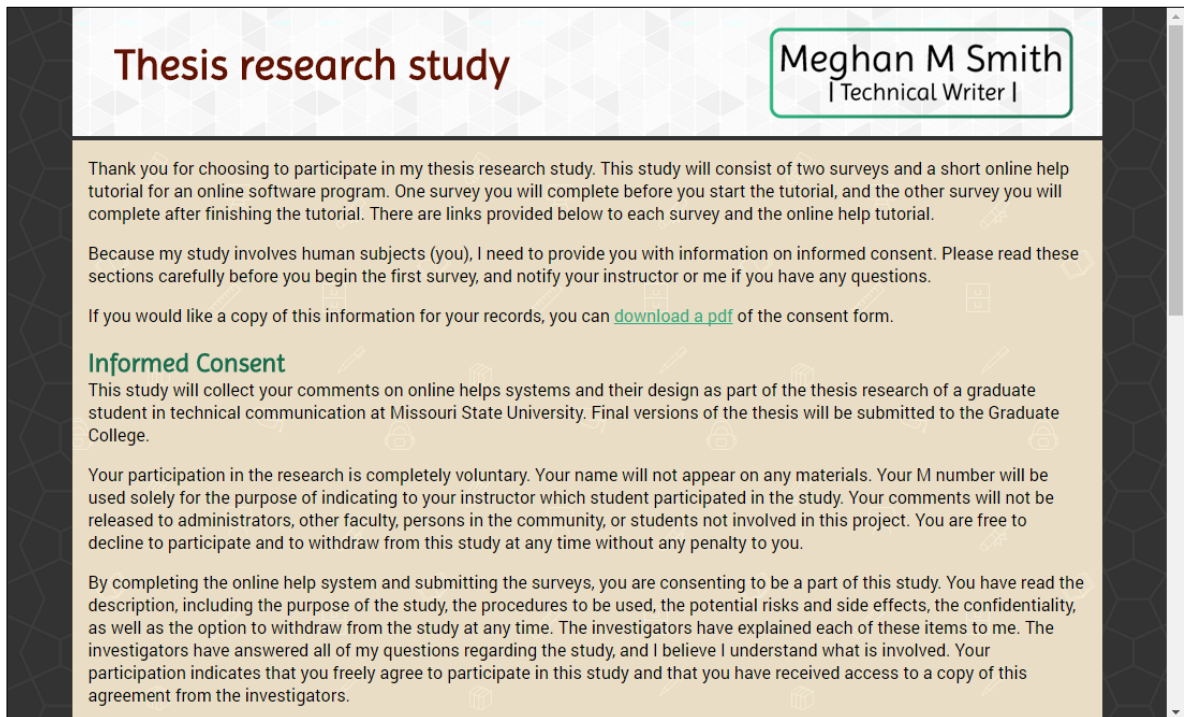
Figure 6. Design layout and color scheme of the webpage built for the study and related materials.

In designing the layout and color scheme of the webpage, I used minimal colors,

and shades of the same color when necessary. I also used my logo in the header of the

webpage. This makes the webpage professional in appearance, recognizable as part of my

larger website, and adds credibility to the study. All links to PDF materials, the online

help system, and the surveys were coded to open in a new tab so participants could easily

refer back to the webpage if needed.

I used a webpage to deliver my study because it is the most efficient way for

participants to access the materials. It is also accessible to a larger number of participants

because they do not have to go to a designated lab setting, and there are no time constraints. All study materials are also available in one central location, and participants can reference them when needed and also print some materials if desired. Overall, using a webpage as the delivery format made sense for this study given the object that was being tested, and the usability test that was being conducted.

In the next chapter I provide the results of the surveys from my study, and make some generalized statements about patterns seen in the data. The implications of these results are examined in more detail in the Discussion chapter.

RESULTS

This section focuses on the results of my study, specifically the data collected from the two surveys participants completed. As discussed in the Methods, my participants were students from a seated ENG 321 class and an online ENG 421 class. The study was conducted online and ran for three and a half weeks, from April 12 to May 5, 2016. A total of 19 students participated in the study. The sections below present the data from the survey of the pre-help system and post-help system surveys, and also an explanation of the coding system used for the written responses. The pre-help system survey is presented first, and data is grouped according to answer format. The questions that provided quantitative results are presented first, and the questions from both surveys that provided textual answers are discussed in a separate section.

Pre-Help System Survey Results

The pre-help system survey consisted of six questions in a variety of answer formats. There were two questions with a Likert scale rating of 1 to 5, two with a yes/no answer format, and one written response (see Appendix F for full pre-help system survey questions). The first question of the survey asked students for their student ID and was not included as part of the resulting data. The purpose of this short survey was to give me an idea of participants' prior experience, both with online help systems and as computer users in general. The sections below display the results of this survey, grouping related questions together. Unless otherwise specified, all 19 participants answered the survey questions.

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Questions 2 and 3. Question 2 asked participants if they considered themselves experienced web users in general, and provided a yes/no answer choice. A total of 16 participants answered yes, they were an experienced web user, and three participants answered no. What I found surprising in these responses was that some of the participants answered no to this question. I had incorrectly assumed that all participants, being college students, would feel they were experienced web users. This was indeed not the case. The different experience levels could affect how participants approach the online help system in the study. It could also affect how they answer the post-help system survey questions about their attitudes toward the design principles used.

Question 3 asked as participants to rate how familiar they were with online help systems using a Likert scale from 1 to 5 (1=not familiar at all, 5=very familiar). Table 1 displays the number of responses for each answer choice.

Table 1. Pre-Help System Survey Response Data for Likert Scale Questions

Survey	Number of Responses for Each Choice					Average
Question	1	2	3	4	5	Response
Question 3	1	4	6	7	1	3.2
Question 5	1	2	7	4	1	3.0

The data shows that the majority of participants were at least somewhat familiar with online help systems. This question did not ask readers to specify the types of online help system they had used previously.

Questions 4 and 5. Question 4 asked participants if they had any prior experience using an online help system, such as a software tutorial or Microsoft Help, and provided a

yes/no answer. A total of 11 participants responded that they had used an online help system before, while 8 participants answered in the negative. This represents a split (58% yes, 42% no) between participants who have used an online help system and those who haven't, which was a more even percentage than expected.

Question 5 asked participants to rate their experience in using an online help system, and whether the help system was easy to use or not. Like Question 3, the answer format for this question was a Likert scale with rating options from 1 to 5 (1=not easy at all, 5=very easy). Table 1 displays the number of responses for each answer choice. Of 19 total participants, 16 answered this question. The data shows that the majority of participants felt that the online help system they have used was average in its ease of use. One perplexing aspect of this data was that 16 participants answered this question when only 11 participants stated in Question 4 that they have used an online help system. This meant that 5 participants rated an online help system even though they answered in Question 4 that they had never used one. This could mean that these participants either misunderstood this question or the previous one, or they could have forgotten what answer they gave to Question 4. These are just some of the scenarios that could have occurred, but without talking to the participants, I cannot know for sure.

The final question of the pre-help system survey provided participants the opportunity to expand on their previous experiences with online help systems, and the responses are discussed in the section that covers the coding and results of all textual data. In the next section, I discuss the results from the post-help system survey, focusing first on the quantitative data from the questions with a Likert scale and yes/no answer format.

Post-Help System Survey Results

The post-help system survey consisted of a total of 18 questions with a variety of answer formats. These answer formats were a yes/no option, a Likert scale, and short answer (see Appendix G for full pre-help system survey questions). Similar to the pre-help system survey, the first question asked students for their student ID, and was not included as part of the data. The purpose of this survey was to determine how participants felt about and reacted to the use of color, navigation structures, and visuals in the Piktochart online help system built for the study. The questions are grouped and discussed according to the each of the document design principles studied. Unless otherwise specified, all 19 participants answered the survey questions.

Questions 2, 4, and 6. These three questions focused on the color used in the Piktochart online help system, and how they influenced the overall usability during testing. Question 2 asked participants to rate how the overall color use helped certain elements stand out from the rest of the help system. The answer format for this question was a Likert scale rating of 1 to 5 (1=strongly disagree, 5=strongly agree). Table 2 displays the number of responses for each answer choice. The data shows that all participants agreed or strongly agreed that the color use in the Piktochart online help system helped emphasize certain elements that were meant to stand out. This means that items like headings and notes were recognized by participants as special or important elements through the use.

Question 4 focused on the use of color specifically in the headings, and asked users how well the different heading colors helped them understand the overall heading hierarchy. Like Question 2, the answer format for this question was a Likert scale rating

of 1 to 5 (1=strongly disagree, 5=strongly agree). Table 2 displays the resulting data for

each answer choice. The responses were split evenly between agree and strongly agree,

and one participant answered with a neutral response. Almost all participants agreed that

the use of color in the headings helped them determine and understand the overall

heading hierarchy.

Table 2. Pre-Help System Survey Response Data for Likert Scale Questions

Survey	Number of Responses for Each Choice					Average
Question	1	2	3	4	5	Response
Question 2	0	0	0	5	14	4.7
Question 4	0	0	1	9	9	4.4
Question 6	0	0	3	8	8	4.3
Question 8	0	0	0	10	9	4.5
Question 10	0	0	0	10	9	4.5
Question 11	0	0	3	5	11	4.4
Question 12	0	0	1	5	13	4.6
Question 16	0	0	0	9	10	4.5
Question 17	0	0	1	9	9	4.4

Question 6 focused specifically on the teal color used for the notes within the

procedural documentation. Participants were asked to rate how whether this teal color

helped them differentiate the notes from the rest of the steps. The answer format for this

question was a Likert scale rating of 1 to 5 (1=strongly disagree, 5=strongly agree). Table

2 displays the number of responses for each answer choice. A total of 16 participants

either agreed or strongly agreed that the teal color did set the notes apart from the rest of

the text, while 3 participants gave a neutral response. This could indicate that some

participants found the teal color too close to the black of the text in the steps, or the teal was not a bold enough color.

Questions 7 and 8. Questions 7 and 8 focused on the navigation structures in the Piktochart online help system and how effective they were to participant understanding. Question 7 asked participants if the headings were helpful in understanding what each topic would be about and provided a yes/no answer format. A total of 16 participants answered yes, and 3 participants answered no. A majority of participants felt that the wording and structure of the headings helped them to know in advance what each topic of the online help system would cover. The participants who answered no were given an opportunity to expand on their answer in Question 9, which is covered as part of the textual data results.

Question 8 concerned hyperlinks in the Piktochart online help system, and asked participants to rate how well the hyperlinks indicated where they would navigate within the help system. The answer format used the same Likert scale as previous questions (1=strongly disagree, 5=strongly agree). Table 2 displays the resulting data for each answer choice. All participants either agreed or strongly agreed that the wording of the hyperlinks clearly indicated where they would navigate to upon clicking the link. This also indicated that including links more specific and less ambiguous than "Learn More" were a benefit to participants.

Questions 10–13. Questions 10–13 focused on the visuals used in the Piktochart online help system, including screenshots and icons. Question 10 asked participants to rate how well the visuals aided in understanding and completing the scenario task. The question used the same Likert scale answer format (1=strongly disagree, 5=strongly

agree). Table 2 displays the participant responses for each answer choice. The data shows that all participants agreed or strongly agreed that the use of visuals helped them understand how the program worked and to complete the scenario task. This could also indicate that the use of both screenshots of program functions and of icon buttons aided in this understanding, but also the overall visual appeal of the online help system itself.

Question 11 dealt specifically with icons within the Piktochart online help system, and asked participants to rate how well placing a visual of the icon within the step helped them find the function in the program itself. This question used the same Likert scale answer format (1=strongly disagree, 5=strongly agree). Table 2 displays the resulting data for each answer choice. More than half of participants strongly agreed the icons helped, but three participants gave a neutral response. Some possibilities for this response are that these participants did not notice the icons within the steps; they were already familiar with the program so knew where everything was; they did not put much importance on the use of icons in general; or the text labels were sufficient enough for users to perform the task.

Question 12 focuses on the screenshots used throughout the online help system, and asks participants to rate whether or not the screenshots aided them in understanding the more complex steps. The answer format is a Likert scale with a rating of 1 to 5 (1=strongly disagree, 5=strongly agree). Table 9 displays the participant responses for each answer choice. The average response for this question was between agree and strongly agree, which indicates that the screenshots did help most participants understand the more complex steps within the online help system to complete the scenario task.

Question 13 asked participants if the visuals, both screenshots and icons, helped them understand the larger functionality of the UI, and how different components work together. This question was asked in a yes/no format. A total of 11 participants answered yes to this question, and 8 participants answered no. The results were almost evenly split between participants (58% yes, 42% no), indicating that there may be ambivalence toward this aspect of usability.

Questions 16 and 17. Questions 16 and 17 focused on the overall usability of the Piktochart online help system, taking the above document design principles into account. Question 16 asked participants to rate how usable the Piktochart online help system was in helping them to complete the scenario task. The answer format was a Likert scale with a rating range from 1 to 5 (1=not usable at all, 5=very usable). Table 2 displays the number of responses for each answer choice.

Question 17 asked participants to rate whether the Piktochart online help system helped them to understand how the program functioned as a whole, in addition to helping them complete the scenario task. Like the previous question, the answer format was a Likert scale rating (1=strongly disagree, 5=strongly agree). Table 2 displays the resulting responses for each answer choice. The average response was 4.4, which indicates that participants generally agreed that the online help system did aid them in understanding the Piktochart program better. The short answer Question 18 expands on these previous two questions, and is discussed in the next section along with all the other qualitative responses.

Textual Data from Pre-Help and Post-Help System Surveys

In this section I discuss the results from all the short answer questions participants answered in both study surveys. I also outline the system I used to code the textual data, and the process I used to develop that coding system. Much like the previous sections, the short answer questions are grouped according to related topics.

Referencing research in content analysis (Boettger & Palmer, 2010; Koerber & McMichael, 2016; Thayer et al., 2007; Thompson, 1999), I developed a system of codes to use in quantifying the qualitative textual answers from both study surveys. The initial set of codes were created using the research from my literature review. These codes took the form of words or phrases that represented themes found in the research. I then made a first pass through the survey text responses to refine or add additional codes that represented themes absent in the literature review research. For example, in the color category, the codes "credible/trustworthy" and "user frustration" were developed using research in the literature review, and the codes "consistency with company" and "professionally appealing" were added after the first pass through the text responses. Each of the three document design principles (color, navigation, and visuals) had its own set of codes. In addition, a separate set of codes was developed for Question 6 of the pre-help system survey, and another set was developed to supplement Question 18 of the post-help system survey. There were a total of five main categories, and a list of all codes/themes for each category can be found below.

Once the list of codes was set for each code category, I grouped the questions based on the document design principle they discussed, with the exception of Question 6 from the pre-help system survey and Question 18 from the post-help system survey,

which were in their own group. For the purpose and ease of coding the text, I numbered the codes in each category. I made a second pass through the responses for each question, and marked each time a part of a response related to one of the established codes, using the corresponding number. Once all the responses had been coded, I then counted the number of times each code was displayed in the textual data, generating code frequencies.

Many responses expressed more than one theme within a response, and some did not contain any. In the following paragraphs, each code category is discussed in more detail, along with the codes generated, their frequencies, and the grouping of each question.

The category *Prior Online Help System Experience* encompassed Question 6 of the pre-help system survey, which asked participants to describe their experience in using prior online help systems. This category consisted of a total of 10 codes; the first five represented positive experiences and the last five represented negative experiences. The list of codes for this category, with the frequency of each in parentheses, is as follows:

- Easy to follow (7)

- Visuals aid completion (2)

- Clear and specific information (3)

- Visuals enhance steps (2)

- Structured to aid understanding (4)

- Unclear visuals/steps (4)

- Visuals different from screen (2)

- Cannot find needed information (4)

- Increased cognitive load (4)

- Required external source (2)

Most of the responses focused on visuals they had encountered in previous online help systems, and whether they helped or hindered in understanding the program. The most frequently mentioned theme was that the online help system was easy to follow, and they could use it without complication to learn the program and complete their task. This seemed to be an important component for many participants.

The category *Color* encompassed Questions 3 and 5 of the post-help system survey. This category consisted of 10 codes developed with the literature research and a first pass of the participant responses. Question 3 asked participants if the color scheme made the online help system more credible, and how they felt that was accomplished. The list of codes for this category, with the frequency of each in parentheses, is as follows:

- Credible/trustworthy (11)

- Consistency with company (12)

- Professionally appealing (8)

- Misunderstanding/confusion (3)

- User frustration (0)

- Functional and accessible (9)

- Scannable/find info (0)

- Color combinations (4)

- Color meaning (5)

- Hyperlinked text color (3)

The most frequent responses were that the online help system was credible because the color scheme matched that of the program they were using to create the scenario task, and many participants remarked that it looked as if the help system was made by Piktochart itself.

Question 5 asked participants if any aspect of the color made the online help system harder to understand. A surprising result was that a number of participants remarked that the orange color used within the text itself looked closer to red than to orange. This result is represented by the code of color meaning, and it was mentioned in multiple responses that the meaning of the orange text was sometimes initially misunderstood because of the meaning associated with the color red. This is discussed in more depth in the Discussion section.

The category *Navigation* encompassed Question 9 of the post-help system survey, and consisted of 10 codes. This question asked if participants came across an instance where the navigation was unclear or didn't match their expectations. The list of codes for this category, with the frequency of each in parentheses, is as follows:

- Heading frequency (0)
- Heading structure (3)
- Matches task (3)
- Clear signals (4)
- User expectations (3)
- Promise fulfilled (3)
- Word meanings (0)
- Ambiguity (4)

- Distinct from text/recognizable (5)

- Comprehension of task (0)

The most frequent theme found in the responses was that the headings were distinct from the rest of the text, which relates strongly to the idea of the help system being easy to follow, and participants understood the topics being covered. In comparison, themes such as heading frequency and completion of task were not mentioned by participants in any response.

The category *Visuals* encompassed Questions 14 and 15 of the post-help system survey, and had a total of 10 codes. Question 14 asked participants how the use of visuals helped them move from the program to the help system and back, and Question 15 asked if the visuals made the scenario task more difficult to complete. The list of codes for this category, with the frequency of each in parentheses, is as follows:

- Icon labels (0)

- Visual size (0)

- Recognizable icons (0)

- User confidence (3)

- Understands UI function (6)

- Supports text (4)

- Task completion (4)

- Visualize structure (3)

- Accurate/matches screen (6)

- Switch attention/focus (3)

Given that most participants mentioned visuals when discussing their prior experience with online help systems, this seemed to be the design principle they were most familiar with, or associated the most with online help systems. The most frequent themes mentioned by participants were that the visuals helped them understand how the program itself functions, and that they were accurate and matched what the screen looked like for the step the visual supported. Interestingly, participants did not remark on the overall size of the visual in correlation to the rest of the topic. The frequency of all responses can be found in Table 12.

The category *Usability* encompasses Question 18 of the post-help system survey, but serves as more of a supplemental category. Because Question 18 asked participants if the three document design principles being tested improved the usability of the system, and many participants remarked specifically on one or more of those principles in their answers. If participants did mention one of the principles specifically, that piece was coded into one of the previous three categories (color, navigation, or visuals). Some participants, however, spoke of usability in a more general sense, or did not mention a specific principle, making it impossible to determine which category to place it in. Because of this, the *Usability* category was created to code these less specific responses. The list of codes for this category, with the frequency of each in parentheses, is as follows:

- Task completion (0)

- Easy to understand/follow (5)

- Understand program functions (4)

- Easily move between topics (3)

- Functionally appealing (2)

As with Question 6 of the pre-help system survey, the most frequent theme from the usability category was that the online help system was easy to understand and follow to complete the scenario task, and that all three document design principles contributed to this usability.

Now that all study results have been coded and displayed, I turn to a discussion of this data, and how these results affect my initial research questions. The next chapter analyzes these data in the context of these questions, and research from the literature review, to determine how these three document design principles should be used within the medium of online help systems.

DISCUSSION

The purpose of this research was to explore, and ultimately answer, a set of three research

questions concerning the design and functionality of online help systems:

1. How do technical communicators use color, navigation (headings and hyperlinks),
   and visuals in print and/or web documents?

2. How can these design principles be applied to online help systems?

3. Does incorporating these design principles make help systems more usable, and
   are some design elements more effective than others?

The first question was answered through the research presented in the literature review,

while the second question is discussed throughout the methods section, particularly in

how I built the online help system for my study. In this section, I discuss my third

question, and analyze the results of my study in an attempt to come to an answer. I look

at each document design principle in its own section, and also include a discussion of the

limitations of this study and some directions further research could take.

How Color Affects Online Help System Usability

The online help system built for the study used color according to the theories and

practical advice found in the literature review, and also used the same color scheme as

Piktochart, the software for which the online help system provided support. Based on the

study results, participants felt the colors were used in such a way as to make important

elements stand out, and that overall they made the online help system functional and

accessible. This allowed them to complete the scenario task with minimal stress, and no

participant commented on user frustration while using the help system.

The aspect participants focused on the most was that the color scheme of the online help system matched that of Piktochart. Many agreed that it made the online help system seem more credible to them, and they trusted the information more because of the belief that it came from the company. A correlation to this is many participants commented that the online help system looked more professional, and it was more appealing because of that professionalism. One participant stated that the color "makes the documents more cohesive, as professional documents should be." Another participant commented that "by using the same color palate [*sic*] [as Piktochart] the help system appeared more professional, cohesive, and polished." An important aspect for participants is that the help system is cohesive and clearly one "document" that flows between topics and elements.

Participants also found that the use of color allowed them to access information easily. This seems to be a common thread throughout the responses, as a majority of participants in Question 6 of the pre-help system survey commented that they had a positive experience when they could easily follow the steps and find what they needed quickly. The use of color in the notes, headings, and hyperlinks met this criterion for most participants, so they responded positively to its use.

A common negative aspect of color was found through a number of responses. Many participants noted that the orange color, when used in the text of the online help system, looked closer to red than to the orange used by Piktochart. This caused some minor and initial confusion among participants because of the cultural connotation the color red has. One participant noted that "To me, red means 'stop' or 'you're making a mistake,' and so at first the color use was misunderstood." This was a common theme

among a number of participants who noted that the similarity to the color red made them think that the text was a warning or was urgent information instead of a second-level heading or part of a table. While they quickly understood this was not the intention, this is still of concern because of the misunderstanding in meaning.

Implications for Using Color in Online Help System Design. What mattered most to participants was that the color helped rather than hindered them in finding what they need and allowed them to learn quickly. The results supported both White (2003) and Alberts and van der Geest's (2011) research into color use. Color must be only used when it is functionally appropriate, and not just because it would make the help system look pretty. No participant commented that the color made the online help system appealing simply for the sake of aesthetics. Every time participants mentioned the appeal of the help system, it was in conjunction with a comment on the professional look of the help system, or the aid it provided in finding what they needed. Also, participants trusted the online help system more because it matched the color scheme of the company whose program they were learning. Many participants felt that the online help system looked like it had been made by Piktochart employees, and that authenticity lent itself to the trustworthiness of the help system.

When designing an online help system, technical communicators need to be aware of not only how colors will look on screen, but also what connotation that color, or the misunderstanding of it, may cause for users. While not a part of this particular study, color use should also take into consideration the potential for colorblind users, and the ethics behind the color choices, as well as cultural connotations of color. As with the Piktochart online help system, many participants initially thought the orange color used

in the text looked closer to red, which caused some initial confusion. As the most important thing to these users was ease of use, this misunderstanding of color could have led to user frustration if it had been more severe. While it is important to match colors to the company, it is equally important that users do not have to guess at what the color use means. In the case of the Piktochart online help system, a solution to the misconstrued orange color would be to use a different hue of the color to move it away from the red spectrum and make it more clearly orange. Alternatively, the orange color should be limited to the parts of the UI customizable by the Responsive HTML5 output, and a different company color used within the headings and other text. While participants responded to the use of company colors and the professional appeal of the online help system, their prior experience and comments throughout the study shows that they responded much more to the ease of use and ability to understand new information quickly, which means that this concept of a help system as easy to use should be a primary concern when designing an online help system and implementing color within the text.

How Navigation Affects Online Help System Usability

Most participants agreed that the navigation structures helped them to move through the online help system to find what they needed to complete the scenario task. While they did not comment on the frequency of the headings, they did focus on whether the navigation structures met their expectations. The most important aspect of the navigation was that the headings and hyperlinks were worded in such a way that participants understood where they would navigate, and that the new page had the

information they expected. This was clearly linked to the overall pattern that participants expect a usable online help system to be clear and easy for them to work through so they can learn new information.

There were a few instances where the navigation was ambiguous, and while it didn't confuse or mislead participants, it was enough for them to make a comment. For example, one participant commented that "I was kind of surprised to find another set of hyperlinks within the hyperlinks under the overview of Piktochart. It seemed odd to have more hyperlinks within those hyperlinks but it wasn't confusing or misleading." This could suggest that having nested hyperlinks with a topic list could make topics harder to find, or that the frequency of links was too high. Fortunately, because it occurred only within one topic, the participant quickly figured out the navigation structure.

Another participant noted that "[t]he only time [navigation didn't meet expectations] was with the icons tab, I thought that I would find more information on how to manipulate the icons under this heading, but found that help later under a different tab." This critique shows that the topic participants were looking for wasn't located semantically where they assumed it would be given their own mental construction of connecting ideas and themes. Had this occurred with multiple participants, this is something that could be tested further to better understand how participants construct a semantic meaning of how to navigate through the online help system.

Overall, though, participant comments on navigation were consistently linked to the overarching idea that an online help system is successful if it takes minimal effort to learn new material and understand the program. Many participants remarked that the navigation structures were well written, and they were able to easily recognize these

elements as separate from the rest of the text. They also had almost no doubt of where the links would lead or what they would learn upon reading a heading or hyperlink. The more specific wording of the navigation structures, the semantic meaning as Bacha (2011) calls it, is effective for participants because it relates to their overall goal of accessing an online help system that is easy to use.

Implications for Using Navigation in Online Help System Design. The results show that participants placed more emphasis on the semantic meaning of the navigation structures, even if unaware they were doing so. The goal when building the online help system was to use headings and hyperlinks that were as descriptive as possible, and would clearly indicate to users what was covered based on that semantic meaning. Users respond best to navigation that serves as clear signals within the larger text, and directs them to the next topic or page with minimal effort. When there was any ambiguity or inconsistency in the navigation, even if it did not cause frustration, users were quick to point it out because it no longer matched the easy flow they had experienced until this point. Even something as small as a spelling error stands out more to users because it does not meet the expectations they have established upon starting the online help system and have come to anticipate as they continue throughout.

When designing an online help system, technical communicators should be more concerned with features that aid in quick comprehension of new information, and with specific details that clearly indicate how users move through the system. Reinforcing prior research, headings should clearly explain what users will learn in the following instructions, and each heading should be written so it semantically matches the task users assume they will be completing. Likewise, hyperlinks need to be more descriptive than

"Learn More" or "Click Here" and need to specifically indicate to users where the link will take them. Consistency and clear, easy-to-understand information are vital to users, and the navigation in online help systems needs to be designed around these criteria, as the way a user thinks and makes meaning has a high degree of impact on how usable they view the help system to be.

How Visuals Affect Online Help System Usability

As visuals were the one document design principle mentioned by participants in the pre-help system survey, this seemed to be the aspect they were most familiar with when assessing the usability of online help systems. The majority of participants agreed that the use of screenshots and icons helped them better understand the program interface and how different functions worked, and also aided them in completing the scenario task. The use of screenshots in particular helped participants move between the program and the online help system with little difficulty. The screenshots of button icons also aided in finding the corresponding button in the Piktochart UI, but participants focused more on the effect of the larger screenshots on overall usability.

The most frequent themes that emerged from the study data were that the visuals helped participants understand the UI function of the program they were using, and that the visuals were accurate and matched what they were doing on the screen. One participant commented that "By having images which correlated to images in the Piktochart program, I was easily able to find the functions of the program to create the infographic. I felt navigating back and forth between the help system and Piktochart was eased by having well-designed, large, and clear screenshots." These findings mimic those

of Gellevij and van der Meij (1998, 2002), as many participants remarked how the screenshots helped them to move between the program and online help system with minimal effort. The use of screenshots helped the act of switching from one screen to another, or from one tab to another, and no user reported frustration or confusion when matching the screenshot to what they were doing on the screen.

Another important component for participants is that the visuals were accurate and matched the step they were completing within the program. One participant remarked that the screenshots "acted like a step by step guide" that allowed this user to complete the scenario task and understand how to complete a step or set of steps easily. As with the other document design principles, the most frequent themes about visuals strongly correlated with participants' overall stance that an online help system needs to be easy to use to be successful. Participant comments about the visuals aiding them in knowing what to do next, or what their screen should look like, all tie back to their need for the online help system to be clear and concise, and allow them to complete tasks quickly and with no frustration. If the use of visuals helps participants in understanding the program UI functions and accurately represents the steps in a topic, then the visual increases usability for participants because they can find what they need in a shorter amount of time.

Implications for Using Visuals in Online Help System Design. Visuals are an important part of online help systems because they support the text and can make complex steps easier to understand. The data shows that participants place a good deal of importance on the accuracy of the visual, and its ability to help them understand what they need to know. When designing online help systems, technical communicators need

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to understand how users learn, and how they will use the help system to complete a task. Care must be taken to make sure the visuals support the text, and do not take the place of written instructions. Rarely do visuals alone aid learning.

Visuals, like screenshots, should be used only in places where the user should switch focus from the online help system to the program, or to illustrate a particularly complex step. Placing a screenshot after every step is not a benefit to users, as it will cause them to be constantly looking from one screen or tab to the other. There is a fine balance between a system helping or overwhelming the user. Screenshots should also be large enough so users can easily see needed detail, but not so large that they overpower the text. The key here is to use visuals in a way that helps users complete their task and learn the program as efficiently as possible. As visuals, especially screenshots, are what users associate the most with online help systems, they must be used in a functional way that aids the user and also makes using the program itself seem easier and less daunting.

Putting It All Together: The Three Document Design Principles

Based on the results of this study, using these document design principles in the context of an online help system does aid in usability, as long as they are used in a way that helps users understand the program without frustration. What mattered most to participants was that the help system helped them find what they needed quickly, and they could move through it to complete their task with minimal effort. Whenever they noticed inconsistency in the use of these principles, or something that caused even a moment of confusion, they were quick to point it out in their comments. Even something as small as a spelling error did not escape their notice because it interrupted the cohesive

and professional design they expected. The most frequent emerging themes all tied back to the overarching pattern that the online help system was easy to use, and participants continually stressed that the color, navigation, and visuals made it easier for them to complete a step or find needed information.

While participants didn't expressly prefer one document design principle over another, they did provide more feedback on the use of color and visuals. These two principles, more than navigation, were the focus of participants' comments, and they responded with a greater variety of praise and critique. This could be because color and visuals are more overtly obvious to users upon first glance, and it is only upon working through the online help system that users see the structure of the headings. Many times the headings and hyperlinks were mentioned in conjunction with color. Visuals were the one principle that multiple participants commented on when discussing their prior online help system experience, so this seems to be the one principle they are most familiar with. Overall, though, participants did not favor one design principle over another, and the principles all worked together to achieve what participants deemed to be an efficient and usable online help system for the Piktochart infographic maker program.

Limitations of the Study

This study was conducted in an online setting where participants worked outside of a designated lab setting in testing the online help system and completing the scenario-based task. There are some inherent limitations in this type of study setting, which are discussed in the following paragraphs.

Loranger (2015, Apr 26) states that there are limitations in unmoderated studies, which occur when the researcher is not present. Among these are that participants could alter their behavior to what they think researchers want, or if they think they are doing something wrong, when no one is present to reassure them that what they're doing is right, or they may work as quickly as possible, believing that is the goal. Also, the researcher is unable to ask participants follow-up questions for clarification or to gather more information. While the lack of a suitable usability testing lab was a catalyst for conducting this study online, the results could have been enhanced by conducting a moderated study. Some of the survey responses were ambiguous to me when reading them, and being able to ask a participant to clarify an answer would have been helpful in these situations.

Another downfall of online testing is that participants may provide answers they think the researcher wants rather than what they really think. In a moderated study, I would have an opportunity to observe participants while they worked through the scenario task, and provide feedback or ask questions while they completed the task. I would be better able to see how participants worked through the help system by using the think-aloud method, which could have provided more potentially unbiased results. Using this method, I could ask participants to talk out loud as they think about and complete the task, which would provide a more realistic picture of how each user works through the system.

Farrell (2016) argues that while closed-ended questions are good for surveys, they can have some limitations, and that even open-ended questions may be better suited for face-to-face usability testing. Closed-ended questions can have the potential to "limit

someone's answers to only the things you believe are true" (Why Asking Open-Ended section, para. 2). While the nature of the study being online necessitated online surveys, I asked a mix of closed- and open-ended questions to get a better sense of users' motivations and thinking process. While this was successful in most cases, some participants, even in the open-ended questions, answered with a short "Yes," "No," "I don't know," or something similar. If these questions had been asked in a face-to-face setting, participants may have been more inclined to have a discussion with me and talk through their answers.

While the study was successful and provided a good deal of relevant data, if I expanded on it in the future, I would potentially conduct the same study but in a face-to-face setting in a usability lab. I would use a slightly smaller sample size, but would interview participants and talk to them as they worked through the scenario task, either in place of or in addition to the surveys. Combining these results with the results from the current study would provide researchers with a larger and more diverse collection of data on the usability of document design principles in the medium of online help systems.

Closing Thoughts and Directions for Future Study

The data from this study sufficiently answers the question of how the document design principles of color, navigation, and visuals can be integrated into online help systems to make them efficient and functional for the user. I found that these three document design principles increase the usability of an online help system when the user perceives that the principles aid them in understanding the structure of both the help system and the program, and allow them to complete workplace tasks quickly and

efficiently while also learning how to use the program. These findings are important because it gives technical communicators a starting point for how to design online help systems using principles initially meant for print, and more recently web, documents. This study reinforces in an academic way what many practitioners have already discovered in professional settings, and also updates and supports prior academic research into online help systems. As online help systems are a distinct medium from print and web documents, technical communicators must incorporate elements of both to create a usable document that meets users' needs. By using these findings, those designing online help systems can have a starting point for using color, navigation, and visuals in such a way that users have success completing workplace tasks with little to no user frustration.

As mentioned above, future studies on these document design principles could be conducted in a face-to-face setting, ideally in a usability lab setting, so participants could be observed by researchers, who could provide immediate and detailed feedback that is limited in the use of surveys. It might also be beneficial for researchers to team up with a company during its usability testing on software documentation or online help systems. By observing how users move thorough the online help system while completing a pre-defined task, researchers could discover additional data on the motivations of users completing workplace tasks, their actions in using the online help system, and their motivations behind those actions. Future studies could focus on different or additional document design principles, and could also test them in different types of help systems, or different types of outputs. This study serves to reinforce the connection between

document design and online help, and, as such, researchers could take many different

directions to build upon this medium within technical communication.

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APPENDICES

Appendix A: Study Test Plan

Below is the test plan I wrote in preparation for my research study, following Postava-Davignon et al.'s (2004) template. Writing this test plan is part of Step 2 of developing a usability test.

What is (your product)?
My "product" is essentially the online help system built for this usability test. The online help system will be built for the infographic maker Piktochart, and constructed using Adobe RoboHelp. This allows more flexibility for participants to view it on multiple devices and have the help system resize to fit their screen.

Test Purpose
The purpose of this test is to find out whether the use of color, navigation structures (heading and hyperlinks), and visuals increase the usability of an online help system. The online help system was built using these design principles, and incorporating them in accordance with prior research found for document design of both print and web documentation. The usability test will show whether the three principles used in this fashion help or hinder the usability within the online help system medium, and *how* these principles helped (or didn't).

Tester Profile
Participants are undergraduate students at MSU who are either technical writing majors, or taking a technical writing course to satisfy a general education requirement. I assume that participants have a basic understanding of the web, and are a fairly knowledgeable web user. Participants may or may not be familiar with help systems or help tutorials. Ideally, participants would have some knowledge of what a help system is in general, and may have used one in the past, even if it was not specifically an online help system.

Questions to Answer
These are the initial survey questions developed for both study surveys, with the answer formats placed in italics. My assumption is that these will go through multiple drafts before the online surveys are created.

Pre-Help System Survey
1. Do you consider yourself an experienced web user in general? *(Yes/No)*
2. How familiar are you with online help systems? *(Likert scale 1–5)*
3. Have you ever used an online help system, such as Microsoft built-in help or a tutorial for a new software program? *(Yes/No)*
4. How easy to use was that help system? *(Likert scale 1–5)*
5. Describe your experience using online help systems. What made them easy to use, or why were they hard to use? *(Textual/Short answer)*

Post-Help System Survey
1. The color used in the help system made in more effective and usable. *(Likert scale 1–5)*
2. How did the color help you use the help system, and did it reflect the software program itself? *(Textual/Short answer)*
3. What about the color was not effective, or made the help system less usable? *(Textual/Short answer)*
4. Did the headings help you understand what you would find in each topic? *(Yes/No)*
5. The hyperlinks were accurate in describing what page you would navigate to. *(Likert scale 1–5)*
6. What navigation issues, if any, did you have when using the headings and hyperlinks? What made the navigation effective or ineffective? *(Textual/Short answer)*
7. The visuals helped you understand and use the online help system. *(Likert scale 1–5)*
8. The use of icons, like the Save button, helped you find where the button was in the program itself. *(Likert scale 1–5)*
9. The screenshots in the help system helped you understand the more complex steps. *(Likert scale 1–5)*
10. How did the use of visuals (screenshots, icons) make the help system easier to use? *(Textual/Short answer)*
11. In what ways could the visuals be more effective? Were the ever not helpful in using the help system? *(Textual/Short answer)*
12. Overall, how usable was the help system to you? *(Likert scale 1–5)*
13. Do you think the color, visuals, and navigation structures (headings/hyperlinks) added to the usability of the help system? Why or why not? *(Textual/Short answer)*

Testing Environment
To prepare for the test, I will need to do the following:
- Build the online help system
- Create all scenario materials
- Create the online surveys using Google Forms
- Construct the webpage to hold all the study materials
- Test all links to ensure participants can access all PDF materials, as well as the online help system and surveys

To complete the study, participants will need the following:
- Access to a computer with a reliable internet connection
- Between 30-45 minutes to complete the study
- Basic knowledge of how webpages and hyperlinks function
- The web address to the study webpage
- Access to the scenario materials and task that they can either view in a new tab or print out if desired

Appendix B: Human Subjects IRB Exemption

Provided below is a copy of the email sent from the Missouri State University Institutional Review Board concerning my thesis study. This email was sent to Dr. Rhonda Stanton as the primary researcher listed on the study, and indicated my study was exempt from additional review, meaning I could proceed with the usability study.

IRB <irb_no_reply@cayuse.com>
Mon 2/29/2016, 1:01 PM
Stanton, Rhonda J;
Smith, Meghan M
To: Rhonda Stanton
English
901 S National Ave Springfield MO 65897-0027

From: MSU IRB

Date: 2/29/2016

RE: Notice of IRB Exemption
Exemption Category: 1.Educational setting
Study #: 16-0320

Study Title: Usability testing on online help systems for thesis research

This submission has been reviewed by the Missouri State University IRB and was determined to be exempt from further review according to the regulatory category cited above under 45 CFR 46.101(b).

Investigator's Responsibilities:

If your study protocol changes in such a way that exempt status would no longer apply, you should contact the above IRB before making the changes.

CC:
Meghan Smith, English

Appendix C: Study Script for Blackboard Posting

The following is the text for the announcement I wrote that Dr. Gattis posted on Blackboard for her two classes. The script provided a short summary of the study, and the link for the webpage, which had more detailed instructions.

Dear students,

I am looking for students to participate in a study looking at how different design principles should be applied to online help systems. This is an online study, and participants will be given a web address that contains all the study materials. Participants will work with an online help system and take two short surveys while working through a scenario and completing a task. This online study is expected to take 30 to 45 minutes. During the study, participants will create an infographic based on a given scenario and using the provided help system. The purpose of the study is to test the usability of the online help system, and not the chosen software program. I would greatly appreciate your help with this research.

If you are interested in participating, please visit http://thesis.meghanmsmith.com/. The webpage will give you the details of the scenario task, and all the materials needed to complete the study.

Thank you,

Meg Smith

Appendix D: Consent Form for Study

Provided below if the text of the consent form provided to participants. This form was made available to download as a PDF, and a shortened summary was shown on the webpage. To view the full consent form, please visit thesis.meghanmsmith.com.

Project Title
Usability testing on online help systems for thesis research

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Description
This study will collect your comments on online helps systems and their design as part of the thesis research of a graduate student in technical communication at Missouri State University. Final versions of the thesis will be submitted to the Graduate College.

Risks and Benefits
This project is highly unlikely to result in any risk or discomfort to you. Your feedback will help an English graduate student to complete original research for her Master's thesis in the Technical and Professional Writing program.

Voluntary Participation
Your participation in the research is completely voluntary.

Confidentiality
Your name will not appear on any materials. Your M number will be used solely for the purpose of indicating to your instructor which student participated in the study, and will not be stored or used as part of the study results. Your comments will not be released to administrators, other faculty, persons in the community, or students not involved in this project. Results from the research will be reported as group findings, not as individual data. Data will be stored at the researcher's office at Missouri State University, Springfield, and destroyed after six years.

Right to Withdraw
You are free to decline to participate and to withdraw from this study at any time without any penalty to you. If you wish to withdraw from the study, you may exit the survey without submitting it and your results will not be stored.

Informed Consent
By completing the online help system and submitting the surveys, you are consenting to be a part of this study. You have read the description, including the purpose of the study, the procedures to be used, the potential risks and side effects, the confidentiality, as well as the option to withdraw from the study at any time. The investigators have explained each of these items to me. The investigators have answered all of my questions regarding the study, and I believe I understand what is involved. Your participation indicates that you freely agree to participate in this study and that you have received access to a copy of this agreement from the investigators.

Appendix E: Study Scenario Materials

This appendix provides a text copy of the materials created for the study scenario, in which I created a fictitious company and supervisor in order to simulate a real-world task as a technical communicator. These materials include the scenario and task description provided on the webpage, the text of the memo sent by the scenario supervisor and a copy of the sample infographic that contains the elements participants were required to include in their design. To view the original documents, please visit the study webpage at thesis.meghanmsmith.com.

Scenario and Task Description

You are a technical writer at a local organization called Second Chances Humane Society. Second Chances is a non-profit animal rescue that runs a no-kill shelter. Throughout the year they hold fundraisers and other events to help raise awareness about shelter pets. They are a growing organization who have helped hundreds of stray pets find new and loving homes.

Your supervisor, Claire Johnson, has asked you to create an infographic that raises awareness about stray pets in the area, and also prompts people to take in and adopt these animals. She has asked that you use Piktochart to create this infographic, and to create your own free account. She has sent you a memo outlining what she wants, as well as what she would like the finished infographic to look like. As part of the scenario you are asked to save your infographic, but you do not need to actually send the file to me. This is part of the scenario because it is covered in the help system.

Memorandum

TO: Technical Writer
FROM: Claire Johnson
RE: New infographic for raising awareness of stray pets
DATE: April 1, 2016

The purpose of this memo is to inform you of a new project I would like you to work on. We are currently trying to raise awareness about stray animals in our area, and to get the community involved in reducing the number of homeless pets by caring for and potentially adopting these pets. Below I'll discuss some of the details of this project, and what we'd like from you as our in-house technical writer.

The project
For this project, I'd like you to create an infographic using the online software program Piktochart. You will need to create an account, but their free account will work for this project.

I'd prefer you use one of the templates Piktochart provides, and I believe there's one which matches what I would like the finished infographic to look like. This infographic will be something we put on our website, post on social media, and use in our email newsletters.

The design
Attached to this memo is a mock-up of what I would like the final infographic to include. While you can create your own design background and color scheme, the finished infographic must have the same layout, images, and text. You can also change the color of the lines and icons if you want, as well as the typeface. You can match the color scheme to our company colors (all are used in this memo), or you can create your own design.

As our technical writer, I leave it up to you to create something we can use to raise awareness about our shelter and stray pets, and is something we can use on multiple web formats.

Please save the infographic as an image file and email it to me so I can give final approval of the infographic before publishing.

Best Regards,
Claire Johnson
Director
Second Chances Humane Society
123 Main Street
Springfield, MO 65806

Mock-up of the infographic project. The color and background choices are up to you, but these elements must be included in this format.

HOW TO SAVE A LIFE
adopt a stray

try approaching the stray to see how he reacts

put out food and give him space to eat

regularly feed the stray to build up trust

take the stray to the vet to get him checked out and fixed

put the stray in a safe and secure carrier

pet the stray so he gets used to you--show affection

bring the stray home and care for him

Buy toys and other supplies to make him happy

adopt your stray and give him a forever home!

brought to you by :

Second Chances Animal Shelter

powered by
Piktochart
make information beautiful

Appendix F: Pre-Help System Survey

This is a copy of the survey participants completed before working with Piktochart and the online help system. The online survey can be viewed at thesis.meghanmsmith.com.

1. **Please enter your M number.**

   _____

2. **Do you consider yourself and experienced web user in general?**
   Mark only one oval.

   ◯ Yes

   ◯ No

3. **How familiar are you with online help systems?**
   Mark only one oval.

	1	2	3	4	5	
Not familiar at all	◯	◯	◯	◯	◯	Very familiar

4. **Have you ever used an online help system, such as Microsoft built-in help or a tutorial for a new software program?**
   Mark only one oval.

   ◯ Yes

   ◯ No

5. **How easy to use was that help system?**
   Mark only one oval.

	1	2	3	4	5	
Not easy at all	◯	◯	◯	◯	◯	Very easy

6. **Describe your experience using online help systems. What made them easy to use, or why were they hard to use?**

    _____

    _____

    _____

Appendix G: Post-Help System Survey

This is a copy of the survey participants completed after finishing the scenario task with the online help system. The online survey can be viewed at thesis.meghanmsmith.com.

1. **Please enter your M number.**

   _____

2. **The use of color helped certain elements stand out, like headings, hyperlinks, and screenshots.**
   Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

3. **Did the colors used, which match the colors of the Piktochart logo and website, make the help system seem more trustworthy and credible? How so?**

   _____
   _____
   _____

4. **The different colors used for the headings helped you understand the overall heading structure.**
   Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

5. **Did any aspect of the color use make the help system hard to understand or certain tasks hard to complete? How so?**

   _____
   _____
   _____

6. **The teal color used for the notes within the help system made them stand out from the steps.**
Mark only one oval.

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

7. **Did the headings help you understand what you would find in each topic?**
Mark only one oval.

○ Yes

○ No

8. **The hyperlinks were written in such a way that you understood where you would navigate to when you clicked them.**
Mark only one oval.

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

9. **Was there ever an instance where the headings and/or hyperlinks as written didn't match your expectations of the page you would navigate to, or what the topic covered? How so? Provide an example.**

_____

_____

_____

10. **The visuals used in the help system helped you understand the program's interface, and aided you in completing the scenario task.**
Mark only one oval.

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

11. Using a visual of an icon in the help system aided you in finding the corresponding button in the program (ex: the Save button).
Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

12. The screenshots in the help system helped you understand the more complex steps.
Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

13. Did the visuals help you understand how the different parts of the program interface worked together, and how they were used to complete the task?
Mark only one oval.

◯ Yes

◯ No

14. How did the use of visuals, like screenshots, help you switch your focus from the help system to the software program, and vice versa?

_____
_____
_____

15. Was there ever an instance where the visuals made it harder to complete the task; for example, the screenshot for a step didn't match what was what was on your screen? Explain and provide an example if possible.

_____
_____
_____

16. Overall, how usable was the help system in aiding you in completing the task outlined in the scenario?
Mark only one oval.

	1	2	3	4	5	
Not usable at all	◯	◯	◯	◯	◯	Very usable

17. The help system helped you to complete the scenario task, and also helped you better understand the different components of the program and how they worked.
Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

18. Do you think the color, visuals, and navigation structures (headings/hyperlinks) added to the usability of the help system? Why or why not?

_____

_____

_____