Evaluating Visuals:

Increasing Visual Literacy with Infographics

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Abstract. Do college students evaluate infographics? If so, what criteria do they use? To answer these questions, students in two journalism classes were given a pre- and post-questionnaire that explored their understanding of the visual elements and textual content of infographics. In both classes, students were also asked to create an infographic. In the second class, students learned about specific, evaluative and creative criteria regarding infographics from the department's liaison librarian. Results from the questionnaires indicated that students who received instruction on specific evaluative criteria evaluated infographics at a higher rate than students who did not receive the same instruction. Results from the infographic creation assignment indicated that students who received instruction on creative criteria created more visually appealing and textually sound infographics than those who did not receive the same instruction. The study shows that it is possible to increase students' visual literacy skills by teaching specific evaluative and creative criteria for infographics; likewise, it is important to emphasize the process of evaluation when assigning an infographic assignment.

Keywords: visual literacy, infographics, evaluation, journalism, library instruction

The rise of digital culture has brought about an explosion in the amount of information being produced and disseminated in the world and the amount, access, and availability of *visual* information, in particular, has increased exponentially. For instance, in 2017, more than one billion YouTube users watched an average of one billion hours of video content during a single day (YouTube, 2017). The proliferation of photographs has likewise been exponential. In 2000, consumers took approximately 80 billion film photographs (Heyman, 2015), and it was predicted that consumers would take 1.2 trillion digital photographs in the year 2017, fifteen times that number (Cakebread, 2017). Although information graphics, or infographics, are not a new phenomenon, just like video and photographs, they have exploded in popularity in the online environment. To illustrate, the number of searches for the term "infographic" on Google increased by more than 900% from 2007 to 2017 (Google Trends, 2017). In 2017 alone, the hashtag infographic (#infographic) was mentioned 45,200 times, engaged 68,100 users, and reached 155,500,000 users on sites such as Twitter, Google+, YouTube, LinkedIn, Flickr, Four-square, and Instagram (Talkwalker, 2017).

These same social media sites have embraced various forms of visual content. Kane and Pear (2016) have stated:

Many of the successful recent entrants into the social media space, such as Instagram, Pinterest, Snapchat, Vine, Periscope, and Meerkat, emphasize visual media. Platforms that did not originate as chiefly visual — Facebook, LinkedIn, and

Twitter — are transitioning focus to emphasize the prominence and importance of visual content. (paragraph 3)

This is because nearly 60% of all digital impressions, the number of times an article or advertisement is viewed, are now driven by images as well as the fact that posts with visuals receive 94% more page visits and engagements than those without (Kane & Pear, 2016). Scroll through any social media site today, and you will likely land on an infographic.

But just *who* is scrolling through social media sites? In 2018, 88% of 18- to 29-year-olds in the United States indicated that they use social media across a variety of platforms. For 18- to 24-year-olds specifically, Smith and Anderson (2018) reported the following usage: YouTube (94%), Facebook (80%), Snapchat (78%), Instagram (71%), and Twitter (45%). Because these age ranges closely correspond to the age of college students, it follows that this population makes up a large portion of those who use and consume social media. Given that social media sites increasingly utilize visual content, visual literacy remains a vital set of skills for college students to learn in order to consume and produce information effectively. To gauge students' existing visual literacy skills, the authors of this study examined how students evaluate images, specifically, infographics.

Literature Review

Developed over the past fifty years, the phrase *visual literacy* has been used in a wide variety of disciplines. In 1969, the first International Visual Literacy Association conference codified the phrase, and John Debes received credit for defining visual literacy as "a group of vision-competencies a human being can develop by seeing and at the same time having and integrating other sensory experiences" (Fransecky & Debes, 1972, p. 7). Since then, the phrase has frequently been used in art history and criticism, rhetoric, semiotics, and philosophy. More recently, the phrase has been used in the disciplines of information design, graphic design, and data visualization. Despite this wide usage and passage of time, there has been no standard definition, nor agreed upon understanding of the term. Nevertheless, visual literacy, at its most basic level, refers to the ability to comprehend, evaluate, and use images. The most comprehensive definition of visual literacy to date comes from the Association of College and Research Libraries (ACRL), a division of the American Libraries Association, which approved the *ACRL Visual Literacy Competency Standards for Higher Education* in 2011, defining visual literacy as:

- A set of abilities that enables an individual to effectively find, interpret, evaluate, use, and create images and visual media.

- Visual literacy skills equip a learner to understand and analyze the contextual, cultural, ethical, aesthetic, intellectual, and technical components involved in the production and use of visual materials.

- A visually literate individual is both a critical consumer of visual media and a competent contributor to a body of shared knowledge and culture. (ACRL, 2011, paragraph 2)

The seven standards outlined in the document show how the understanding of visual literacy has evolved. According to these standards, a visually literate student determines the nature and extent of the visual materials needed (Standard One); finds and accesses needed images and visual media effectively and efficiently (Standard Two); interprets and analyzes the meanings of

images and visual media (Standard Three); evaluates images and their sources (Standard Four); uses images and visual media effectively (Standard Five); designs and creates meaningful images and visual media (Standard Six); and understands many of the ethical, legal, social, and economic issues surrounding the creation and use of images and visual media, and accesses and uses visual materials ethically (Standard Seven) (ACRL, 2011).

Key elements of these standards come into play when considering the infographic as a visual piece of information. The purpose of an infographic is to educate an audience about a specific topic or issue through a combination of words, numbers, and visual elements. Before the rise and rapid proliferation of social media, infographics were commonly found on newspaper pages and in marketing campaigns and annual reports. Infographics, now, are created for any, and seemingly, every, topic in the digital landscape. They often function as stand-alone communication, enabling the audience to comprehend the information by simply looking at it. This can lead to the illusion that all infographics are trustworthy because visual elements tend to carry more impact than words and numbers. Visual creators could potentially mislead audiences, and some viewers might believe information from an infographic that contains questionable material. Many scholars (Kimball & Hawkins, 2008; Kostelnick & Roberts, 2010; Schafer, 1995; Schriver, 1997; Tufte, 2003) have reported that visuals have a more emotional impact and are remembered longer than words. Given their potency and ubiquity, the challenge that infographics pose to educators face is two-fold: 1) teaching students to *evaluate* infographics and checking for meaningful and accurate textual and visual content (Standard Four of the *ACRL Visual Literacy Standards*), and 2) teaching students to *design* and *create* meaningful visual media (Standard Six of the *ACRL Visual Literacy Standards*).

Complicating this challenge of evaluation is the simplicity of online search engines such as Google, Bing, and Yahoo. Because of the ease of searching for online information, students think finding a source is easy. Students might find and cite information that reaffirms their beliefs or needs, regardless of veracity. However, finding a source and finding a relevant, accurate source are two different things (ACRL, 2011; Toth & McClure, 2016). Thus, students need to find and also critically evaluate the source, as well as the aesthetic and technical characteristics of the image.

Likewise, the challenge of visual production is that web-based software makes the design and creation of infographics easy for anyone, which is a boon and a bane for teachers and professors. On the one hand, the design of infographics has been simplified by web-based software such as *Canva*, *Infogram*, and *Piktochart*, all of which enable students to produce infographics with relative ease. On the other hand, this means that it is just as easy for anyone else to create an infographic, too. This becomes problematic when considering the lack of oversight or standards associated with infographic production and dissemination.

Matrix and Hodson (2014), in their examination of using of infographics as a teaching assignment in an online classroom, recommended that instructors adopt infographics as a teaching and learning tool to help students practice the digital competencies needed to participate in a visual digital culture. While the literature on infographics and comprehension is lacking, the literature on infographics and pedagogy increasingly includes a widening array of fields (Toth, 2013; Polman & Gebre, 2015). To address the visual literacy demands of modern digital culture, educators can incorporate an infographic assignment as an assessment tool, as seen in the present study.

Research Questions

To evaluate students' existing visual literacy skills, and to determine if students independently evaluated infographics, this study sought to answer the following three research questions:

RQ1: Do students evaluate infographics?

RQ2: If students do evaluate infographics, what criteria do they use?

RQ3: How do students' initial evaluation criteria change after they are introduced to specific, evaluative criteria of infographics?

Methodology

This study was conducted over two semesters in a copyediting course offered by a Journalism and Mass Communications department at a four-year university in the southeastern United States. This specific course, offered every semester during the academic year, is required for journalism majors. The university's general student body, approximately 10,000 students, is 60.1% female and 39.9% male, with students coming from 46 states, 55 foreign countries, and 106 Kentucky counties. The student population is 80% white, 6.4% black, 6.3% non-resident alien, 2.3% unknown, 2.2% multiracial, 1.8% Hispanic, and 1% Asian (Murray State University, 2018). The student population involved in this study included journalism majors as well as creative writing, public relations, organizational communication, and television production majors. The majority of students were sophomores or juniors and were approximately 19-21 years old.

The study was conducted in two classes over two semesters; the two classes are referred to as Method 1 and Method 2 to distinguish them and were taught by Instructor 1 and Instructor 2, respectively. Both methods included a unit on infographics. In addition, Method 2 included a lesson on evaluating infographics led by the department's liaison librarian. This approach provided a focused instructional emphasis on the evaluation of textual and visual information, addressing Standard Four of the *ACRL Visual Literacy Standards*. In both courses, students had an assignment in which they had to create an infographic, addressing Standard Six of the *ACRL Visual Literacy Standards*. The procedures used in the two methods are described in the following narratives.

Method 1. In the spring semester of 2017, Instructor 1 taught the infographics unit over four 50-minute class periods to nine students. In the first two class periods the instructor taught the material, and in the last two class periods students created infographics using different platforms.

The lessons, which were taught through lecture, discussion, and hands-on activities, began by focusing on the history and background of infographics before progressing to the "hows" and "whys" for making and using infographics in the fields of journalism and mass communications. The lessons included instruction on the anatomy of infographics, highlighting the distinction between one-level and two-level infographics (Crane, 2016) as well as the different types of infographics: statistical, chronological, process, geographical, and research-based. Each type of infographic was represented visually as a way to help the students better understand the different types of infographics. The lessons also included a brief review of the writing and research techniques needed to create an infographic. These techniques included story, style, simplicity, size, statistics, sources, and shareability (Crane, 2016) and addressing Standard One and Standard Five of the *ACRL Visual Literacy Standards*. Finally, students were given instructions on how to make a successful infographic before creating their own, in order to address Standard Six of the *ACRL Visual Literacy Standards*.

The instructor did not teach the specifics of each platform, *Infogram* and *Canva*, in class but did assign online tutorials for the students to watch before each class session. During the first class period devoted to creating an infographic, students used *Infogram* to create an infographic about understanding tuition and fees at their university based on data from the institution's fact book. The assignment was used as a low-stake assessment to check the students' understanding of constructing an infographic and interpreting data visually. During the second class period devoted to creating an infographic, students researched a historical element of the Kentucky Derby and created an infographic in *Canva*. Most students reported that they felt

Infogram allowed them to make numbers have more meaning than a listing in a story. However, they reported that *Canva* was an easier and more creative program in which to make an infographic because it allowed for easier text entry and helped them to tell a story with their data.

Method 2. In the fall semester of 2017, Instructor 2 and the department's liaison librarian taught the infographic unit during two fifty-minute class periods to eleven students. For the first class period, the instructor explained the following topics and concepts: explanation of how infographics originated; discussion of why infographics are used; introduction to various infographics with examples provided (e.g., pie chart, timeline, maps); and basic elements of infographics, such as source, credit line, and title. An in-class infographic creation assignment using *Canva* was completed as a low-stake assessment to help students navigate the software.

The librarian led the second class period, approaching the assignment from a visual literacy perspective and introducing evaluative criteria, absent in Method 1. The infographics assignment directly addressed Standards Four and Six of the *ACRL Visual Literacy Standards*.

Because infographics contain both text and visuals, students need to learn how to evaluate both textual and visual information. To evaluate the textual information contained in an infographic, the librarian introduced the students to the CRAAP Test. CRAAP stands for Currency (timeliness of information), Relevancy (the importance of the information to one's needs), Authority (the source of the information), Accuracy (the reliability, truthfulness, and correctness of the content), and Purpose (the reason the information exists) (Blakeslee, 2010). The CRAAP Test is frequently used in library instruction as a basis to evaluate sources, particularly websites. Because infographics frequently utilize web-based information (and are also found on websites), the CRAAP Test provides a sound method for determining the accuracy and reliability of an infographic. During the class, students were introduced to the CRAAP Test, given an explanation of the acronym, and provided with an expanded list of questions to accompany each criterion (See Appendix A).

Next, the librarian outlined criteria to evaluate the visual information contained in an infographic based on the principles of design. These principles include similarity and contrast; dominance and emphasis; balance and alignment; proportion and scale; unity and harmony; and hierarchy (J. Paul Getty Museum, 2011). Similarity and contrast include the concept of light and dark, and line. Dominance and emphasis include highlighting, color, and size. Balance and alignment include symmetry and asymmetry. Proportion and scale include size, ratios, and divisions. Unity and harmony include proximity, continuation, repetition, and rhythm. Finally, hierarchy refers to weight and design elements such as trees and nests (Sameer, 2014).

The students were then shown four examples of problematic infographics (Chibana, 2016) and led through the evaluating process for each. The librarian asked the students to evaluate the infographics according to the CRAAP Test and principles of design, addressing both the textual and visual elements. Some of the problems in these infographics included the amount of information (See Figure 1), misleading scales (See Figure 2), the wrong type of representation for the data (See Figure 3), and bad math (See Figure 4).

Figure 1. Example of an infographic with too much information.

Figure 2. Example of an infographic with misleading scales.

Figure 3. Example of an infographic using the wrong type of representation for the data.

After discussing each infographic, the students were instructed to evaluate the infographic they had created for the low stake assessment or one they found on the internet with the criteria they had been given for textual and visual evaluation. Students then applied the lessons from both class sessions to create an original infographic related to the Great American Eclipse, a major natural phenomenon occurring in the region later that day.

In both Method 1 and Method 2, students were formally tasked with creating an infographic as a summative assessment. The objective of the assignment was to represent and communicate a specific concept with accurate and appropriate graphic representations of data and information for a defined audience. During the librarian-led discussion in Method 2, the students were encouraged to use the criteria they had learned for evaluation in creating their infographic, ensuring the information they used passed the CRAAP Test and the visuals they used incorporated elements from the principles of design.
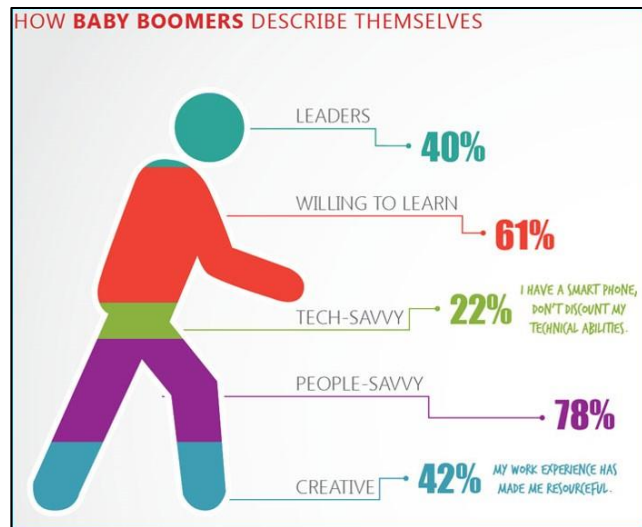
Figure 4. Example of an infographic with bad math.

Results

To investigate the research questions, the authors of this study designed a pre- and post-questionnaire for both methods. The questionnaires, approved in early 2017 by the Institutional Review Board at the authors' university, asked the students about several different aspects of infographics. The first aspect addressed knowledge: "How familiar are you with infographics?" and "What is the purpose of an infographic?" The second aspect addressed evaluation: "Do you evaluate the infographics you read?" and "If you responded 'yes,' how do you evaluate the infographics you read?" The third aspect addressed location and content: "Where do you encounter infographics?" and "What subject matter do you associate with infographics?" The last aspect addressed comprehension: "How do you 'read' an infographic?" and "If an infographic is included in a news article, which do you read first (the headline, article, or infographic)?" The research questions for this study focused on the second aspect, evaluating, exploring Standard Four of the *ACRL Visual Literacy Standards* which addresses whether or not students evaluate images and their sources.

Research Question 1: Do students evaluate infographics?

Before any instruction on infographics, 5 out of 9 students (56%) of students in Method 1 and 6 out of 11 students (55%) in Method 2 answered that they evaluated infographics, approximately the same percentage. Analysis revealed that for Method 1, after receiving instruction on infographics in general, the percentage of students who indicated that they evaluated infographics rose from 5 out of 9 students (56%) to 7 out of 9 students (78%). For Method 2, in which the students received specific instruction regarding evaluation criteria, the percentage of students who indicated that they evaluated infographics rose from 6 out of 11 students (55%) to 10 out of 11 students (91%).

Research Question 2: If students do evaluate infographics, what criteria do they use?

Before any instruction on infographics, 4 out of 9 students (44%) in Method 1 responded that they did not evaluate infographics. For the 5 out of 9 students (56%) who indicated that they did evaluate infographics, three mentioned that they use fact-checking as a criteria, stating "I usually check other sources to see if the information all matches up with the same data," "I evaluate the

infographic by looking at the credentials on the bottom. The sources and sponsored organizations are found there," and "I try to fact check the infographic, verify the source, etc." Two students mentioned both fact-checking and visual criteria, writing that they evaluate infographics depending on whether or not "the information of the infographic is right and the picture of the infographic is clear" and "if they make sense, if they are visually appealing."

After receiving instruction on infographics but no further information on evaluative criteria, 7 out of 9 students (78%) responded that they now evaluate infographics. On the post-questionnaire, the students gave much of the same types of answers, referencing fact-checking, responding that they "fact check, source check," "ask myself if it makes common sense, go back through the sources to see if it matches up" and "I look up sources on the bottom." One student also mentioned visual components, citing "pic content." Two students mentioned both visual and textual criteria by stating, "the colors, the clarity, look for grammatical errors, and fact check using links, if provided" and checking to see if "the infographic displays a clear picture [and] the infographic display the right information."

Before any instruction on infographics, 5 out of 11 students (45%) in Method 2 responded that they did not evaluate infographics. For the 6 out of 11 students (55%) who indicated that they did evaluate infographics, students reported that they "take in all of the information," "look at the facts they use and sometimes compare to what's written in the article itself [sic]," and "read all the info I can." The students also mentioned some visual elements such as "read the article and judge how the graphics relate" and "not only is the information on the infographic important but the composition is as well, such as color palette, text organization, etc."

Research Question 3: *How do students' initial evaluation criteria change after they are introduced to specific, evaluative criteria of infographics?*

After being introduced to specific, evaluative criteria, 10 out of 11 students (91%) in Method 2 responded that they now evaluated infographics. Four students mentioned both textual and visual criteria, stating "I evaluate the infographic by analyzing both the text and visual aspects more precisely," "look for accuracy first and then I'll go through specific design elements like alignment, color, flow, etc.," "looking for clear information shown, readability, credibility," and "by credibility, the layout of facts." Four students focused on visual criteria: "the spacing of the graphic, the symmetry, and the text," "I make sure it looks good without a lot of clutter. It is easy to understand if it's more appealing," "by their design and readability," and "looking if it is readable, what information is on there, is there enough information to understand the meaning of the infographic." One student focused on textual criteria, writing "evaluate how it relates to the info and how accurate it is. If it's from a credible source or not, if it makes sense." One student replied succinctly that they evaluate the infographics they read by "using the criteria from this course."

In both methods, approximately half of the students did evaluate infographics before any instruction on infographics: 5 out of 9 students (56%) in Method 1 and 6 out of 11 students (55%) in Method 2. After instruction on infographics in general (Method 1), there was a 22% increase in the number of students who evaluated infographics, from 5 out of 9 students (56%) to 7 out of 9 students (78%). The students mentioned both textual and visual criteria in their responses to the questionnaire. However, the answers were not very specific in regards to either criterion.

After instruction on infographics with additional lessons about specific textual and visual evaluative criteria (Method 2), there was a 36% increase in the number of students who evaluated infographics, from 6 out of 11 students (55%) to 10 out of 11 students (91%). The students' answers here tended to be more specific regarding how they were evaluating infographics regarding text and visuals. Students also mentioned visual criteria more often.

To increase students' visual literacy skills, students in both Method 1 and Method 2 were also directed to create an infographic. This assignment focused on the creation of an infographic,

exploring Standard Six of the *ACRL Visual Literacy Standards* which addresses whether or not students can create meaningful images and visual media.

The following infographics are examples created in Methods 1.

Figure 5. An example of an infographic created in Method 1.

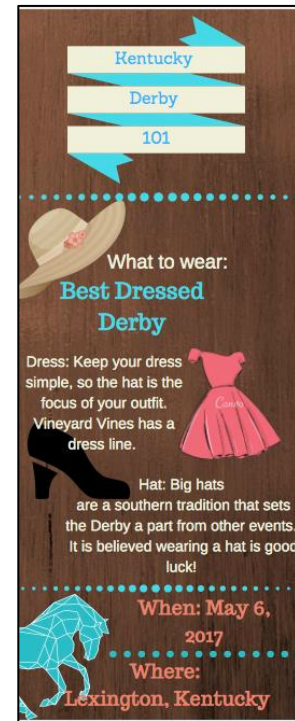Figure 6. An example of an infographic created in Method 1.

Figure 7. An example of an infographic created in Method 1.

Upon content analysis, student-created infographics from Method 1 tended to be more text-heavy. The students relied on using full sentences and provided excessive information within the space, instead of using charts or graphs to convey information concisely (see Figures 5, 6, and 7). While the information used was relevant to the topic, no sources were cited, and so there was no indication of the currency, authority, or accuracy of the information (see Figures 5, 6, 7, and 8). The graphics and visual elements lacked cohesion and look merely placed on the infographic rather than integrated into the infographic as a whole (see Figures 6 and 7). The created infographics were busy, with too much variety in font selection and size (see Figures 5, 6, 7, and 8). The students' choices did not look refined or intentional (see Figure 8). The graphics used were relevant to the Derby, but again, were simplistic (see Figures 5, 6, 7, and 8), and, in one example a chart was even used as a design element rather than displaying any information (see Figure 8).

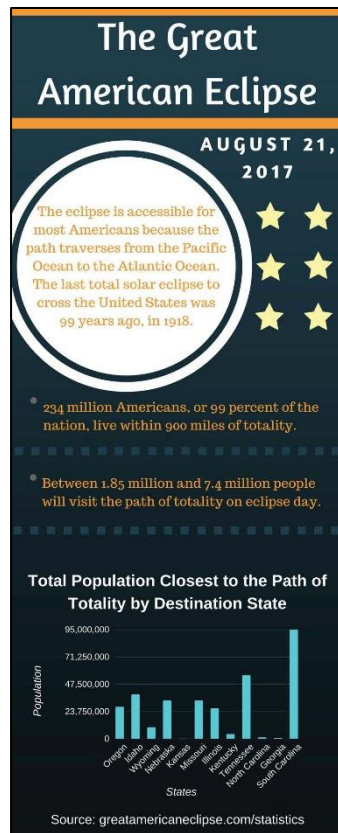Figure 8. An example of an infographic created in Method 1.

Figure 9. An example of an infographic created in Method 2.

The following infographics are examples created in Method 2 (see Figures 9, 10, 11, and 12).

In Method 2, the student-created infographics displayed greater cohesion, placing textual and visual elements in relative harmony. The information was cited, indicating authority and accuracy (see Figures 9, 10, 11, and 12). Charts and graphs were integrated into the infographic, usually using a bar chart (Figures 9, 10, 11, and 12). The font was differentiated in style and size, but there were not too many different styles and sizes; the information was easy to read (Figures 10 and 12). The infographics in Method 2 also included a title, a credit line (see Figures 9, 10, and 11) and one student even put her name on the infographic as well as the class, which lent further credibility to the infographic (see Figure 12). Color was used in a way that makes sense, and design elements were interesting without being over-whelming (see Figures 9, 10, and 12).

When comparing the student-created infographics from Method 1 and Method 2, student-created infographics from Method 2 appear to be more informed by the specifics of the principles of design than their counterparts from Method 1, who received no visual criteria for evaluating infographics. The student-created infographics from Method 2 also included textual information such as a title, chart, and credit line for the sources used, which could be attributed to information gained from exposure to the CRAAP Test.

Limitations

The journalism department's class enrollments are capped at 15 students because of accreditation standards, and the timing of the instruction unit (at the end of the spring semester and beginning of the fall semester) proved problematic with spotty attendance issues, leading to a smaller than anticipated sample size.

An additional limitation included the amount of class time spent on the infographic unit due to scheduling and timing conflicts; there were four days allotted for instruction in Method 1 and only two days in Method 2.
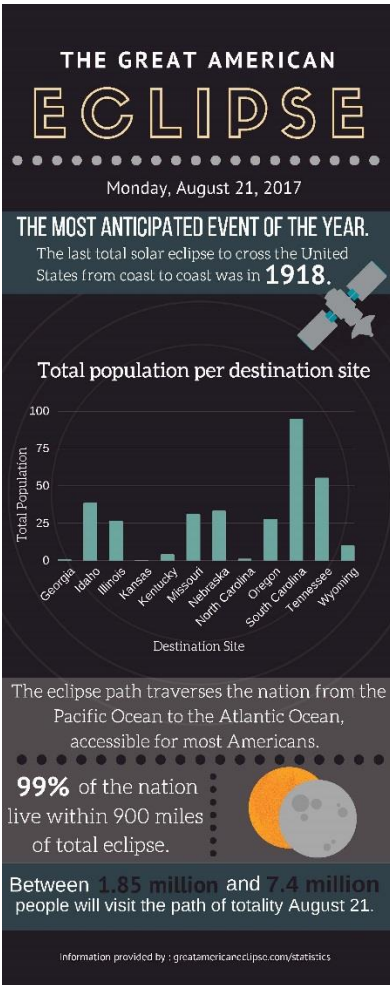
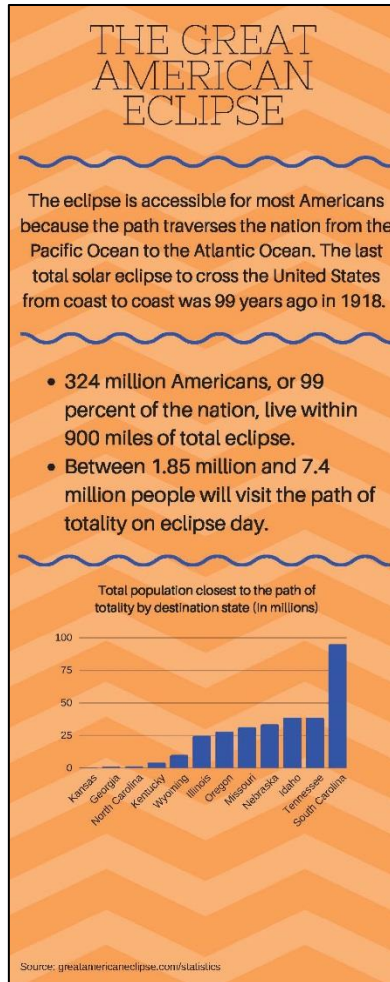Figure 10. An example of an infographic created in Method 2.

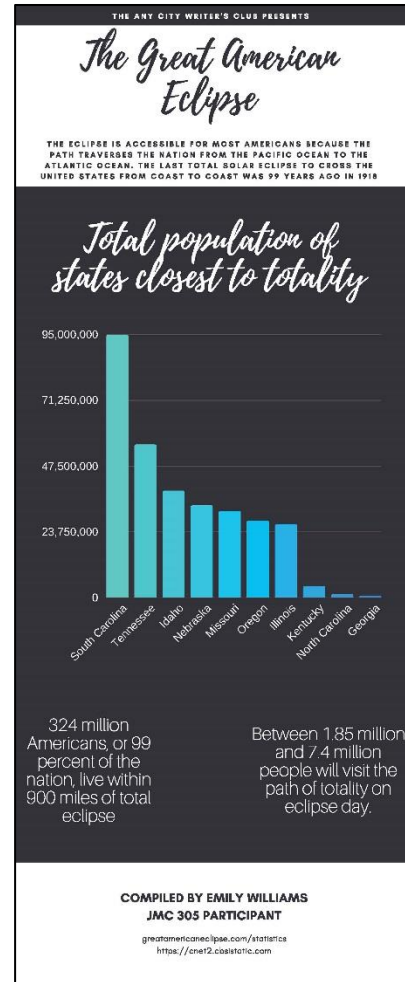Figure 11. An example of an infographic created in Method 2.

Figure 12. An example of an infographic created in Method 2.

Conclusions and Recommendations

This study demonstrated that there are definite ways to increase students' visual literacy skills using instruction on infographics. The first way to increase these skills is by providing explicit instruction to students regarding both textual and visual evaluating criteria. Although both methods in the study saw an increase in whether students evaluated infographics, more students in Method 2 (91%) evaluated infographics compared to Method 1 (78%). This indicates that by including instruction specifically about evaluating criteria, it is possible to increase students' evaluation of infographics. It also indicates that specific instruction has a higher impact than simple instruction about infographics in general. While this may seem like an obvious outcome, it is important to recognize this point. Many assignments exist about *creating* infographics but far fewer include information about *evaluating* infographics. By including criteria for evaluating infographics in an assignment, students learn how to think critically about the information they will include in their infographics and also become more critical consumers of information. Based on the findings, it seems prudent to encourage teachers and professors to include evaluative criteria, both textual and visual, in their lecture on infographics.

The second way to increase students' visual literacy skills is implementing an infographic assignment that stresses utilizing textual and visual evaluation criteria while simultaneously creating an infographic. Comparing the student-created infographics from Method 1 and Method 2 shows that students who receive explicit visual literacy instruction become critical consumers and creators of visual information more so than those students who do not receive the same instruction. Students who receive specific visual literacy instruction can effectively create infographics that tell a story with text, numbers, and graphics. Teachers and professors are encouraged to create an infographic assignment to accompany their lecture on infographics.

To conclude, instruction must guide students to develop visual literacy skills and competencies that will empower them to communicate effectively. While journalism is one field that contains specific visual communication styles, visual literacy skills and competencies are necessary for learners across the disciplines. Although the *ACRL Visual Literacy Competency Standards for Higher Education* explicitly refer to higher education, the infographic assignment is applicable for online or face-to-face courses in any discipline and any student; the instructor need only to adjust the level of the assignment for the appropriate grade level.

Future Studies

Information gleaned from the students' responses in the pre- and post-questionnaire will be included in subsequent studies. Future research will explore the knowledge component of the study, further investigating students' understanding of the functions and purpose of an infographic. The comprehension component of the study, exploring how students physically read and visually process infographics, also holds great promise for future studies in visual literacy.

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Appendix A

MURRAY STATE UNIVERSITY
University Libraries

JMC 305
Evaluating Textual Content

Evaluating Sources: The CRAAP Method

Currency: the timeliness of the information

- When was the information published?

- Has the information been revised or updated?

- Does your topic require current information or will older, historic sources work as well?

Relevance: the importance of the information for your needs

- Does the information relate to your topic or answer your question? How so?

- Who is the intended audience?

- Is the information at an appropriate level for your needs? (Too simple? Too advanced?)

- Have you looked at a variety of sources before choosing this one?

Authority: the source of the information

- Who is the author/publisher/sources/sponsor?

- Are the author's credentials or organizational affiliations given, and what are they?

- What are they author's qualifications?

Accuracy: the reliability, truthfulness, and correctness of the content

- Where does the information come from?

- What type of evidence does the author provide?

- Has the information been peer-reviewed?

- Can you verify the information in another source?

- Does the language seem biased?

Purpose: the reason the information exists

- What is the primary purpose of the information? (To inform? To teach? To sell? To entertain?)

- Is this information fact, opinion, or propaganda? How can you tell?

- Is it objective and impartial? Why or why not?