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Teaching Tips & Tools

Teaching Health Impact and Behavior with Infographics

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Abstract

The use of Infographics can be a tool that not only allows for the communication of empirical health data in an understandable format, but encourages the health administration student to present evidence-based research in a creative manner. The purpose of this paper is to describe a learning exercise that implements Infographics to demonstrate an impact of a health issue and/or encourage a health behavior change. This learning exercise is developed to increase student knowledge and visual literacy skills with respect to presenting, in a concise format, a well-researched and referenced health issue and/or a health behavior change. Specifically, the exercise was designed to: (a) curate health statistics and reference information for the selected health issue; (b) identify media resources and apply copyright and fair use in a proper manner; (c) evaluate internet resources for credibility and accuracy; and (d) utilize Infographic tools to communicate one's visual viewpoint. At the conclusion of the course, students reflected on the effective visual aspects of their Infographics and the points that were challenging to communicate using this medium. The benefits of this applied learning approach for students and the faculty instructor are discussed.

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Introduction

The Educated Citizen and Public Health Initiative, developed by the Association of American Colleges and Universities, the Association for Prevention Teaching and Research, and the Council on Colleges of Arts and Sciences, is a response to the National Academy of Medicine's call to action that "all undergraduates should have access to education in public health" (IOM, 2003; AAC&U, 2011). Such an initiative promotes an educated citizenry and develops one's societal responsibility via an understanding of public health (AAC&U, 2011).

The Association for University Programs in Health Administration (AUPHA) has long understood the value of "population/community health" content in the health administration curriculum (AUPHA, 2015). The University of New Hampshire's (UNH) Department of Health Management and Policy (HMP), established in 1975, and housed in the College of Health and Human Services, is AUPHA-certified and offers a Bachelor of Science degree in HMP. The baccalaureate curriculum for this major program of study offers both health management and public health courses, along with a minor in public health and health management for students not matriculated in the HMP major, thus contributing to the development of an educated citizenry.

The HMP course, Global Public Health Issues, is designed to provide students with an introduction to and overview of the key areas of global public health by addressing the major determinants of health as well as how health status is measured to determine the burden of disease in the United States and abroad. Specifically, the course examines the link between public health principles, measurements, and development; health and the role of the economy; burden of disease; and complex humanitarian emergencies. Current events reported by the media that reflect the above-mentioned didactic concepts are also incorporated throughout the course. Special emphasis is placed on understanding and applying critical thinking and analysis skills via Infographic development for the communication of empirical health data in an understandable format, while encouraging the health administration student to present evidence-based research in a creative manner. An Infographic is defined as "a chart, diagram, or illustration (as in a book or magazine, or on a website) that uses graphic elements to present information in a visually striking way" (Merriam-Webster, 2018). The American Public Health Association states that "Infographics can be a powerful tool for sharing important public health information and helping people understand the issues" (APHA, 2018). Infographics require skills in acquiring, evaluating, and presenting a great deal of evidence-based data and health statistics in a visually pleasing format to communicate health information and influence health behavior.

The purpose of this paper is to describe a learning exercise that implements Infographics to demonstrate an impact of a health issue and/or encourage a health behavior change. This learning exercise is developed to increase student knowledge and skills with respect to visually presenting, in a concise format, a well-researched and referenced health issue and/or a health behavior change. Specifically, the exercise was designed to: (a) curate health statistics and reference information for the selected health issue; (b) identify media resources and apply copyright and fair use in a proper manner; (c) evaluate internet resources for credibility and accuracy; and (d) utilize Infographic tools to communicate one's visual viewpoint.

Global Public Health

The Global Public Health Issues course is open to honors students at UNH. Honors students need to meet certain criteria to be invited to participate in such a program, including having a 3.50 minimum Grade Point Average. Honors courses are capped at 20 students and the course is taught twice a week in 80-minute sessions.

Using the perspective of public health, the course covers factors associated with the development of health problems and efforts to prevent disease in impoverished areas. Students also explore the role of social communication, politics, religion, economics, education, and culture in contributing to global public health issues, and how to integrate these factors and values in developing solutions to the widespread public health issues impacting communities worldwide. Students learn about the magnitude of public health issues in the developing world (e.g., communicable and non-communicable disease, women and child health, nutrition, and unintentional injuries) as well as how health is assessed and how health systems work together effectively to improve global health.

This course is taught in a seminar format utilizing a mixture of teaching methods including lecture, class discussion, group work, and the incorporation of literature and the arts to illustrate central themes and course principles. Representative course assessments include written work in essay-format quizzes; the use of Twitter to relate current findings and policy development to the core functions of public health; analysis and synthesis of course material and peer-reviewed literature to propose feasible solutions to complex global public health issues via group work; and a series of three plenary sessions, part of an Honors Program Symposium, that include the development of a video that highlights a specific global public health issue and proposed practical recommendations.

Global Public Health Infographic

In preparation for this assignment, the corresponding author contacted the Health and Human Services Librarian about teaching the students the requisite skills necessary to complete a comprehensive Infographic. The First Year Instruction Librarian was also invited to co-teach due to his experience providing information literacy instruction to first-year students. The assignment was divided into four parts. The two librarians interested in this project visited the class five times and were allotted 40 minutes to work with the students (i.e., half of the class period) during each visit.

For each librarian-led session, the librarians developed a research guide topic page (Tables 1-4), a presentation, and a relevant active learning activity. The topics of the five sessions were: (a) Health Statistics and Reference Resources; (b) Media Resources, Copyright and Fair Use; (c) Infographics Tools and Tips; (d) Evaluating Websites; and (f) Bringing It All Together. In order to provide students with hands-on practice of the concepts covered by the librarians and to facilitate ease-of-access and collaborative learning, each active learning activity was designed in and made available through Google Docs.

The students were assigned to select a health topic of their choosing. The instructor was available to discuss their discipline-related interests. The students were encouraged to consider a topic that interested them and what point(s) they wanted to communicate about this topic via their Infographic.

Health statistics and reference resources

Once students selected a health topic for the Infographic, the librarians led a session focusing on developing effective research questions and finding related health statistics using a curated list of library databases and reliable online websites (Appendix A). After a short presentation in which the librarians introduced a variety of health statistics reference sources, students were asked to form into teams, read global health-related news articles selected by the librarians, generate research questions related to the news articles, and find reliable health statistics to support the students' research questions. By the end of the class, students had shared their findings in a collaborative Google Doc.

Media resources, copyright, and fair Use

The second librarian-led session focused on the ethical use of image resources in media projects and infographics. As a result of this session, the learning objective was for students to identify sources to find royalty-free images and to understand how to use images ethically in their infographics.

Following a lecture on the value of information, copyright and fair use, the First-Year Instruction Librarian introduced web-based tools (Appendix B) that students used to practice searching for royalty-free and Creative Commons-licensed images related to their sample topics. Once a relevant and ethically obtained image was located, students practiced citing and providing license information for the images they selected. Student responses were once again recorded in the collaborative Google Doc.

Infographics tools and tips

The students were required to submit a storyboard, or draft, of their Infographic for discussion with the course instructor. In order to prepare students to use tools to develop their Infographics, the next librarian-led session introduced students to Infographic software applications. Several free, web-based infographic creation tools were listed on the research guide webpage (Appendix C), and librarians led a workshop on using one of these tools: Piktochart.

Piktochart was chosen by the librarians because it is easy to use and to teach, offers a clean, modern design, and includes a free version online. Following a tutorial on using Piktochart, students practiced using the tool to create simple Infographics on their sample topics. At the end of class, students provided links to their draft Infographics in the shared Google Doc.

Evaluating websites

The fourth librarian-led session focused on the critical evaluation of information sources. The Health and Human Services Librarian provided an introduction to evidence-based medicine, a critical concept for students in the College of Health and Human Services. This information was paired with a discussion on how students evaluate and examine information found on the open web. The librarians provided criteria that students could use to determine the reliability of their selected web resources (Appendix D).

The activity during this session allowed students to practice comparing and contrasting examples of different types of information sources, including subscription-based library sources and a variety of reliable sources from the open web. Although students were not required to use scholarly sources in the Infographic assignment, the learning objective of the session was to introduce the class to a broad selection of information sources in order to assess which ones might or might not be useful or appropriate for the students' research needs in the Infographic project or in future academic pursuits.

The activity during this session allowed the student groups to examine selected sources and answer two questions. First, they needed to be able to identify the type of resource (i.e., news article, report, scholarly article, etc.)

Second, they should have been able to articulate why this resource is needed in their Infographic project (i.e., the benefit it provides). Students entered their findings into the shared Google Doc and then discussed the evaluations of these sources as a class.

Bringing it all together

Before the Infographics were due, the librarians met with the students for a fifth and final session to review all of the concepts that had been covered in the previous four library-led sessions (i.e., finding reliable health statistics; finding images and using them ethically; using tools to create Infographics; and evaluating information sources. For the review, the librarians designed an interactive, low-stakes, online quiz using a free version of a presentation software, Mentimeter. The librarians used this session to reinforce certain concepts that were necessary to complete the Infographic assignment and to follow up on concepts that students found difficult to understand. Additionally, the review provided the librarians with an opportunity to assess the students' retention of the concepts that were covered and to address any final questions that the students had related to finding and using information for their Infographic assignment.

Two representative examples of an Infographic communicating the impact of a health issue and one influencing health behavior are demonstrated in Appendix E.

Conclusion

Social and digital media are communication staples for today's students. It is imperative that faculty too become proficient in these communication methods in order to prepare our students. We need to be innovative in how we utilize these tools to achieve our course objectives. This paper described one faculty member's foray into adapting and integrating digital media into a course that is qualitative and quantitative in nature.

Many students access the materials they need for assignments online. As a result, the data that is used today is not only limited to peer-reviewed journals but encompasses tweets, blogs, videos, and images. This course illustrated the utility of Infographics in communicating a great deal of information in a concise format to demonstrate the impact of policy decisions and/or to influence health behavior and the rationale behind these calls to action. The work described herein supports the findings of Chong (2012) which highlight that visual digital literacy competencies are essential for 21st century learners across the disciplines. Certainly, there are field-specific visual communication styles, expectations, and norms, and the experience of designing an Infographic

can serve to enrich students' understanding of their own discipline-specific requirements and offer an opportunity to reflect upon questions of audience (Chong, 2012; Matrix & Hodson, 2014).

A key objective in this course is to distill a great deal of information and present it in a concise, professional format. Students used Infographics, a tool they were not familiar with prior to this course, which required them to curate information and present it effectively. The peer-reviewed literature, with respect to the utilization of health Infographics and pedagogy, is currently sparse yet growing. The way in which Infographics were used in this course are transferable to other HMP (and non-HMP) courses. Furthermore, the use of a free software program (Piktochart), allowed the students to connect with each other by sharing their work with each other, as well as with others they invited to view the Infographics and the general public who may have come across the Infographics. Thus, this exercise also informed students that their work is public so the importance of being cognizant of what they published was emphasized.

Since the majority of the students in the class had no experience with developing Infographics, at the conclusion of the assignment, the students were asked to reflect on their experience by considering two questions. What visual aspects of the Infographic do you think are effective and why? What components of your Infographic did you find most challenging to communicate? Following are select student comments.

"I think that the visual elements, mostly the graphs, the bolded parts of the quote, and the big numbers to emphasize the difference, help draw attention to the importance of the subject. It also helps make the data easier to understand. For example, a table of numbers representing total health expenditures per capita and life expectancy at birth makes it significantly harder to detect the trend that more money tends to lead to a longer lifespan. The graph can easily portray it, especially with the addition of the estimated trend line. In addition, the viewer can easily see that governments can do a lot. Governments account for a huge piece of the pie in regards to total health expenditures, as seen by the second section "Who's Paying?" This is further reinforced by the fact that government spending per person can dramatically reduce the adult mortality ratio."

"In my Infographic, I wanted to communicate with those that either are dealing with opioid addiction or know someone that is. My Infographic was meant to both inform the viewer about the opioid epidemic at the national, state, and local level and then convince the viewer to seek help through the Safe Stations program, if needed. I did not want to just simply display a bunch of information and statistics, so I organized my Infographic in a way that followed the "Stages of Change" behavior

change model from top to bottom. The model has five stages: precontemplation, contemplation, decision/determination, action, and maintenance. My Infographic can communicate with opioid addicts at many of these stages. The Infographic could make someone who doesn't realize they have an opioid problem come to this realization, it could hopefully convince someone who knows they have a problem to weigh their options and eventually make the decision to seek help, and it offers a way to act and actually receive the help. Once in the Safe Stations program, maintenance will be taken care of by other treatment programs. Another important point I wanted to get across in my Infographic is the fact that opioid addicts are not alone. These people should feel comfortable seeking help, as thousands of others share their drug issues in the city of Manchester alone and many of them have sought after treatment and have benefited from doing so. Overall, I wanted my Infographic to convince opioid addicts to seek help in order to slowly eliminate the burden of opioid addiction in Manchester through a behavior change model approach."

"Although I am confident in the way I communicated my ideas in the Infographic, there were definitely some challenges along the way. One of the most difficult challenges I had to work around was the fact that most of this data is relatively recent, especially for the Safe Stations program. This is difficult because without a long history of data, statistical relationships and correlations cannot be made with much certainty. For instance, I can say opioid overdose deaths in Manchester decreased from the year 2017 compared to 2016, but I cannot say this was due to the creation of Safe Stations in the middle of 2016, as there is no current evidence that supports this claim. Another challenge I had was with determining the most important warning signs of being an opioid addict. This part of my Infographic was key because it helps the viewer determine if they should seek help, so I wanted to make sure I included some of the most prevalent signs of opioid abuse to make this section of my Infographic contribute more to my overall message."

"I deliberately used bright, contrasting colors in blue and yellow to a purpose: to grab viewers' attention. Yellow is typically used to depict hazards--I capitalized on this association in order to instill a sense of urgency in my Infographic. Several attempts were made in order to limit the word count on the poster such that it was approachable, not overwhelming. The use of maps serves to reinforce the text information in a memorable manner. Cohesion in font style and size throughout also attempts to foster a focus on what is important - the material - as opposed to distracting the reader. I sought a simple, pleasing, and organized layout to this effect."

"It was extremely challenging to communicate such a broad scope of material succinctly. Prioritizing which statistics were most valuable, and which would have a lasting impact on my audience, proved the most difficult. There is so much

more to be said on the topic of polio eradication; however, including too much would have taken away from the effectiveness of the project as a whole. I initially wished to provide more of a background on the disease, its transmission, and the three poliovirus types. In the initial stages of my research, though, a friend looked over my shoulder at the title of my Infographic: Polio Eradication. "I have some bad news for you…They already cured polio," he said. It was at that moment that my project's aim shifted. Without getting into the nitty-gritty science, I realized my counterparts lacked a fundamental understanding of the current events surrounding modern polio eradication efforts. That is what I attempted to convey."

Following are observations noted by the authors in using Infographics as a framework to assist in teaching a health management and policy course.

- Depending on their familiarity with Infographics, some faculty may want to include time in their course development schedule to use and test this digital media tool prior to implementation.

- Scheduling class time for the students to learn the requisite critical analysis skills taught by expert librarians requires a balancing act between not covering more course content and allotting time for skill development.

- Students are made aware that their Infographics, once published, are viewable by the public, so their writing must be clear and professional.

- Students commented that they had not considered using Infographics for major or discipline-specific purposes prior to this assignment.

The faculty instructor's summation following the experience of using Infographics in one specific course is that it (a) allowed for sustainable engagement with the course material in a community of learners who shared a common knowledge of how to quickly adapt to new technology; (b) increased the interaction among peers and communication with the instructor; and (c) exposed students to visual information pertaining to a specific health issue that has the potential to directly or indirectly affect them and others. Just as employers expect our graduates to be proficient in the latest technologies utilized in the field, our students expect us as faculty to be proficient in these same technologies in the classroom (Wankel, 2009; Hannay & Fretwell, 2011).

The authors' work reinforces the findings of Matrix and Hodson (2014) who note, based on their research, "When asked why learning to design and decipher Infographics matters, students' top response was that these evocative visual artifacts enable faster and more efficient communication, with the potential to reach and resonate with a large online audience composed of diverse publics." Furthermore, Matrix and Hodson (2014) state, "Encourag-

ing students to develop multimodal literacy skills and new visual digital competencies thus prepares them for opportunities to actively participate in creating, consuming, and critiquing our contemporary digital culture arrangements." The assignment described herein can assist in achieving this developing competency.

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Appendix A

Health Statistics and Reference Resources from the Library Research Guide

Sources for Background Information

CREDO Reference

Online reference library that provides access to a selection of reference books including encyclopedias, dictionaries, thesauri, and books of quotations, not to mention a range of subject-specific titles covering everything from art to accountancy and literature to law.

Link: http://libproxy.unh.edu/login?url=http://www.library.unh.edu/scripts/redirect.php?dbase=353

CQ Researcher

Offers balanced, in-depth analyses of contemporary topics by veteran journalists, pro and con arguments by experts, chronologies, and annotated bibliographies to guide additional research.

Link: http://libproxy.unh.edu/login?url=http://www.library.unh.edu/scripts/redirect.pl?dbase=137

MedlinePlus

A consumer-friendly resource on health information created by the National Library of Medicine.

Link: https://medlineplus.gov/

World Health Organization Health Topics

WHO is a global organization that works to direct and coordinate health among nations of the United Nations.

Link: http://www.who.int/topics/en/

Sources for Health Statistics

Statista: The Statistics Portal

Tool for researching quantitative data, statistics and related information.

Link: http://www.library.unh.edu/scripts/redirect.php?dbase=710

World Development Indicators

World Development Indicators (WDI) is the primary World Bank database for development data from officially-recognized international sources for more than 180 countries. Other databases provide information on external debt and financial flow data, governance issues, education, health, gender, and more.

Link: http://www.library.unh.edu.libproxy.unh.edu/scripts/redirect.php?dbase=411

OECD Health Statistics

Various health statistics for years 1960+.

Link: http://www.library.unh.edu/scripts/redirect.pl?dbase=288

National Center for Health Statistics

Developed by the CDC, the National Center for Health Statistics provides statistical information to guide health policy decisions. Includes NCHS Fact Sheets, data visualizations, and FastStats on diseases, health policy, populations, and more.

Link: https://www.cdc.gov/nchs/index.htm

World Health Statistics

Download annual reports on WHO member states and browse statistical reports for WHO programs.

Link: http://www.who.int/gho/publications/world_health_statistics/en/

Appendix B

Media Resources, Copyright and Fair Use from the Library Research Guide

Copyright and Fair Use

Copying, modifying, displaying or distributing the work of others may require determining:

- if the work is in the public domain,

- whether your use of it is covered by fair use (or another exemption)

- whether permission needs to be obtained from the copyright owner

Fair Use Checklist

This can help you focus on factual considerations that are important in your evaluation and serve as a record of your fair-use analysis

Link: http://copyright.columbia.edu/copyright/fair-use/fair-use-checklist/

Royalty-Free Images

Remember that you must have the right to use the images you are including in your project. These sites search for images with open licenses. Some require you to credit the artist or photographer:

- Creative Commons Search (https://ccsearch.creativecommons.org/)

- Image * After (http://www.imageafter.com/)

- Freeimages (http://www.freeimages.com/)

- Advanced Flickr search (http://www.flickr.com/search/advanced/)

Image Databases at University of New Hampshire

ARTstor (http://www.library.unh.edu/scripts/redirect.pl?dbase=383)

Digital library of nearly one million images in the areas of art, architecture, the humanities, and social sciences with a set of tools to view, present, and manage images for research and pedagogical purposes

Google Images

Use Advanced Image Search (http://images.google.com/advanced_image_search?hl=en) to refine searches to specific content or file types, color or black-and-white, or usage rights (such as "free to use, share or modify")

Please note: Exercise caution when using material downloaded from websites as the Internet contains a mix of works protected by copyright and works in the public domain.

Viewing an image online doesn't automatically mean that you can reuse or copy it without permission or payment.

What is Creative Commons?

From the CC website (http://creativecommons.org/about):

"Creative Commons is a nonprofit organization that enables the sharing and use of creativity and knowledge through free legal tools. Our free, easy-to-use copyright licenses provide a simple, standardized way to give the public permission to share and use your creative work — on conditions of your choice. CC licenses let you easily change your copyright terms from the default of "all rights reserved" to "some rights reserved."

Creative Commons licenses are not an alternative to copyright. They work alongside copyright and enable you to modify your copyright terms to best suit your needs."

Citing Images in APA Style

Guidelines for citing images found online in APA Style can be found at http://www.easybib.com/guides/citation-guides/apa-format/how-to-cite-a-photo-digital-image-apa/

The basic formula is as follows:

Photographer, F.M. (Photographer). (Year, Month Date of Publication). Title of Photograph [digital image]. Retrieved from URL

Also include license information if available, e.g., "Liver: Herpesvirus Hepatitis" by Ed Uthman is licensed under CC BY 2.0

Examples of Transformative Uses

Examples of the fair use of copyrighted work to create transformative works for educational, noncommercial purposes.

A Fair(y) Use Tale

Created by Prof Eric Faden of Bucknell University, this video explains copyright fair use principles through the use of very short clips from numerous Disney movies.

Buffy vs Edward: Twilight Remixed -- [original version]

Created by Jonathan McIntosh and licensed under a Creative Commons BY-NC-3.0 License - permitting non-commercial sharing with attribution.

Required Language in Media Projects

If you are including any text, images, or audio that are not your own creation, your media project should provide:

a notice of use restrictions on the opening page (see section 6.3, and include text starting with "certain materials are included..." to the end of the sentence)

"Certain materials are included under the fair use exemption of the U.S. Copyright Law and have been prepared according to the multimedia fair use guidelines and are restricted from further use."

acknowledgement and attribution through a credit section (see section 6.2, first paragraph for what copyright owner information needs to be included in addition to the basic citation)

"Crediting the source must adequately identify the source of the work, giving a full bibliographic description where available (including author, title, publisher, and place and date of publication). The copyright ownership information includes the copyright notice (©, year of first publication and name of the copyright holder)."

The above text is from sections 6.2 and 6.3 of the Fair Use Guidelines for Educational Multimedia, which are part of the Crash Course in Copyright (version 1), a tutorial on copyright created by Georgia Harper, University of Texas System.

Some ways to type the copyright symbol ©:

MS Word: AutoCorrect converts (c) to ©

Mac: Press Option and g

PC: Press Alt and type 0169 on the numeric keypad

Appendix C

Infographic Tools and Tips from the Library Research Guide

Free Infographic Tools

- Piktochart
- Canva
- Visually
- Infogram

Piktochart Tips

Adding your own Images

While Piktochart has a massive collection of images you can browse and use in your Infographic, if you want to use an image from your computer, click upload on the left hand menu to upload images from a folder on your computer. Once uploaded, your image will live in the uploads library in your account.

Resizing Images

It can sometimes be hard to resize an image without it stretching too tall or too wide. In order to maintain the proportions of your image, hold down the SHIFT key while clicking and dragging to resize your image.

Charts and Maps

Visual data can be more powerful than words! Remember that you can create charts or maps through Piktochart.

Downloading and Saving your Infographic

You can make your Infographic accessible through the web by clicking on the Share button at the top right of the page.

Tutorial Resources

Piktochart Video Tutorials
Piktochart has its own library of video tutorials on using the tool. You can find clips on anything from Piktochart for Beginners to Publishing Your Infographic.

Piktochart Video Tutorial Blog
Here's an additional resource with a few more videos on how to use Piktochart.

Canva: How to Create Infographics
A YouTube video on using Canva to create Infographics

Visually Video Tutorial
A YouTube video on using Visually

Infogram Tutorial
Compilation of videos and articles on getting started using Infogram

Appendix D

Evaluating Websites from the Library Research Guide

Evaluation of Internet Sources

Unlike similar information found in newspapers or television broadcasts, information available on the Internet is not regulated for quality or accuracy; therefore, it is particularly important for the individual Internet user to evaluate the resource or information. Keep in mind that almost anyone can publish anything they wish on the Web. It is often difficult to determine authorship of Web sources, and even if the author is listed, he or she may not always represent him or herself honestly, or he or she may represent opinions as fact. The responsibility is on the user to evaluate resources effectively.

Before using a sources consider the following factors:

Author
- Is the name of the author/creator on the page?
- Are his/her credentials listed (occupation, years of experience, position or education)?
- Is the author qualified to write on the given topic? Why?
- Is there contact information, such as an email address, somewhere on the page?
- Search for this information in a library database or in Google if you can't find it on the website
- Is there a link to a homepage?
- If there is a link to a homepage, is it for an individual or for an organization?
- If the author is with an organization, does it appear to support or sponsor the page?
- What does the domain name/URL reveal about the source of the information, if anything?
- If the owner is not identified, what can you tell about the origin of the site from the address?

Purpose (knowing the motive behind the page's creation can help you judge its content).

- Who is the intended audience?
    - Scholarly audience or experts?
    - General public or novices?
- If not stated, what do you think is the purpose of the site? Is the purpose to:
    - Inform or Teach?
    - Explain or Enlighten?
    - Persuade?
    - Sell a Product?

Objectivity

- Is the information covered fact, opinion, or propaganda?
- Is the author's point-of-view objective and impartial?
- Is the language free of emotion-rousing words and bias?
- Is the author affiliated with an organization?
- Does the author's affiliation with an institution or organization appear to bias the information?
- Does the content of the page have the official approval of the institution, organization, or company?

Accuracy

- Are the sources for factual information clearly listed so that the information can be verified?
- Is it clear who has the ultimate responsibility for the accuracy of the content of the material?
- Can you verify any of the information in independent sources or from your own knowledge?
- Has the information been reviewed or refereed?
- Is the information free of grammatical, spelling, or typographical errors?

Reliability and Credibility

- Why should anyone believe information from this site?
- Does the information appear to be valid and well-researched, or is it unsupported by evidence?
- Are quotes and other strong assertions backed by sources that you could check through other means?
- What institution (company, government, university, etc.) supports this information?
- If it is an institution, have you heard of it before? Can you find more information about it?
- Is there a non-Web equivalent of this material that would provide a way of verifying its legitimacy?

Currency

- If timeliness of the information is important, is it kept up-to-date?
- Is there an indication of when the site was last updated?

Links

- Are links related to the topic and useful to the purpose of the site?
- Are links still current, or have they become dead ends?
- What kinds of sources are linked?
- Are the links evaluated or annotated in any way?
- Note: The quality of Web pages linked to the original Web page may vary; therefore, you must always evaluate each Web site independently.

Conclusion

- Be very critical of any information you find on the Web and carefully examine each site.
- Web pages are susceptible to both accidental and deliberate alteration, and may move or disappear with no notice.
- Print out or download all pages you plan to use in your research so that your bibliography will be complete and accurate.
- Are you sure the Web is where you want to be? It may take an hour to find the answer to a question on the Web that would take a Reference Librarian two minutes to find. When in doubt, ask a Librarian!

Appendix E

Infographic Samples

Figure 1a: Student Infographic Assignment: Global Health Expenditures
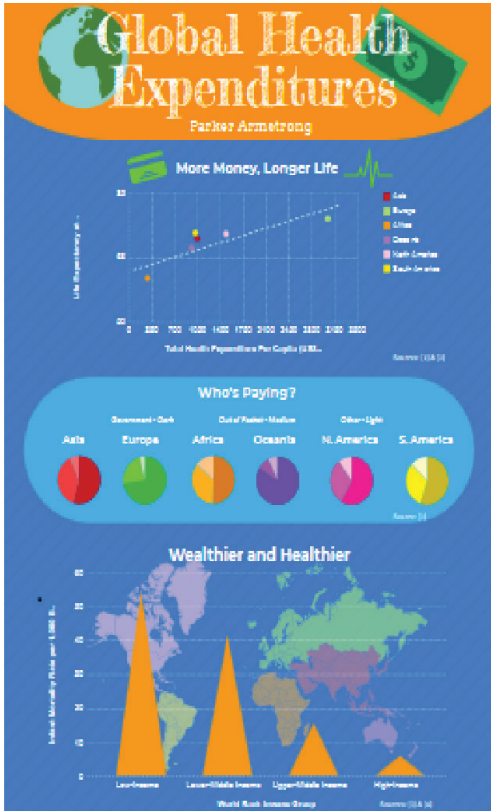
Figure 1b: Student Infographic Assignment: Global Health Expenditures
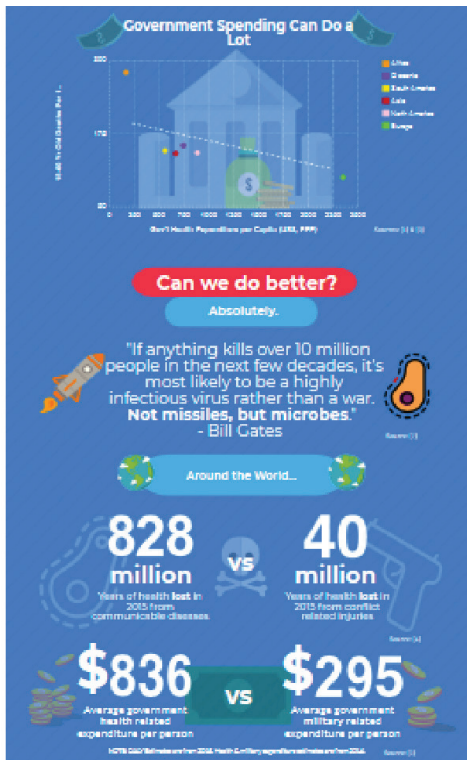
Figure 1c: Student Infographic Assignment: Global Health Expenditures

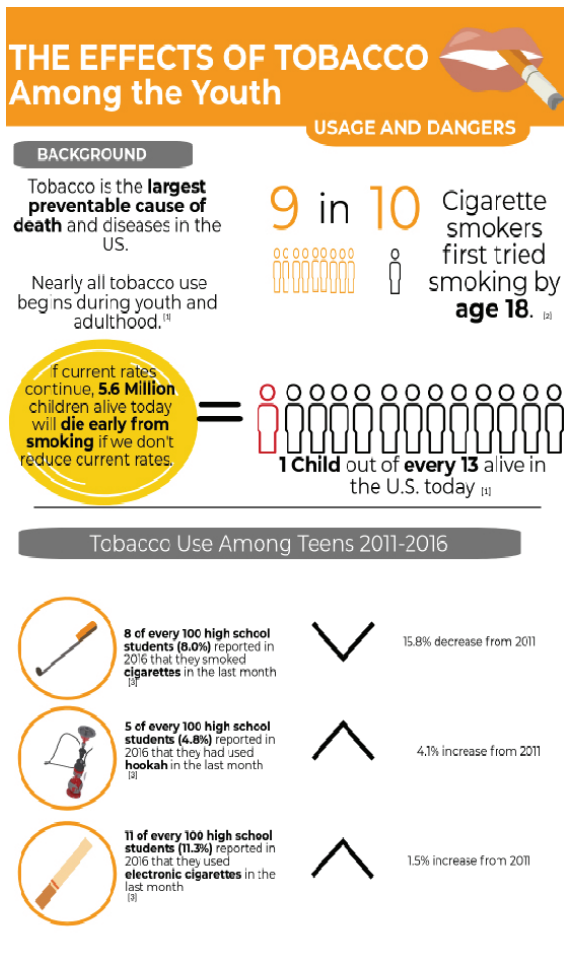Figure 2a: Student Infographic Assignment: The Effects of Tobacco Among the Youth

Figure 2b: Student Infographic Assignment: The Effects of Tobacco Among the Youth