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Educator's Blueprint: A How-To Guide for Creating a High-Quality Infographic

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Educator's Blueprint: A How-To Guide for Creating a High-Quality Infographic

Abstract

Infographics are a valuable tool for increasing knowledge translation and dissemination. They can be used to simplify complex topics and supplement the written text of a study. This Educator's Blueprint paper will provide ten strategies for creating high-quality infographics. These strategies include: selecting appropriate content, defining the target audience, considering the format, selecting the software, using consistent font and color schemes, increasing image utilization, ensuring a consistent flow of ideas, avoiding copyright and HIPAA violations, getting feedback from others, and utilizing effective dissemination strategies. These strategies will help guide educators to increase their ability to create more effective infographics.

Introduction

There are over one million peer-reviewed papers published every year.[1] Once published, there can be a significant lag in knowledge translation from journal publication to application in practice, with experts reporting a delay of up to 17 years.[2-4] Social media has been proposed as one tool to reduce the time needed for knowledge translation.[5] Social media can include modalities such as podcasts, blogs, microblogs (e.g., Twitter, Instagram), and social network platforms (e.g., Facebook, LinkedIn). However, it can be challenging to keep up with the massive influx of data published on a daily basis.

As the amount of information continues to proliferate, it is critical to help end-users identify and interpret the information in an efficient manner.[6-8] Infographics (short for "information

graphics") are an image-enhanced representation to facilitate the interpretation of information or data. Visuals are powerful tools for learning and can help improve both learning and recall.[9] Infographics can be a valuable tool to help simplify complex topics and supplement the manuscript text, which can be beneficial for clinicians and patients alike.[10,11] Studies have also demonstrated that they can be effective for increasing visibility and dissemination of research.[12-13] Some journals have even requested authors to submit infographics to accompany their publications.

Therefore, there is a need to better understand the key components of creating an effective infographic. This Educator's Blueprint paper will present ten practical strategies for creating a high-quality infographic (Figure 1).

Ten Strategies

1. Select Appropriate Content

The first question to ask when creating an infographic is whether the topic is appropriate for an infographic. Infographics serve to help clarify complex topics and facilitate knowledge dissemination.[12-14] They are well-suited for summarizing large amounts of information into bite-sized content. Examples of this include journal publications, blog posts, clinical guidelines, or even public health messaging. This tool can also be useful to supplement and simplify information within studies, such as conceptual frameworks and guidelines.[15] Another role is to enhance knowledge dissemination and to increase the likelihood of reading an article. One study reported that the use of an infographic led to greater numbers of article clicks compared with a screen capture of the abstract itself.[13] While infographics can help simplify many complex

topics, they are less ideal for topics that are highly complex or require a more nuanced explanation given the space and word limitations of infographics. In general, infographics should focus on 1-3 main points and be presented in a single page (as opposed to a multi-page handout).[9]

2. Define the Target Audience

Similar to curricular design, an infographic should always be created with the end-user in mind.[16] The target audience reflects the primary group to which the infographic is designed for and may include clinicians, healthcare leaders, governmental leaders, or the public.[6-8] The selection of a specific target audience will inform both the choice of focus areas, as well as the degree to which topics or terms need to be defined. Moreover, the target audience may need specific design expectations (e.g., a study infographic may require data representation while an infographic for students may have more illustrations). The intended key points and take-home messages may also differ between the end-users. Furthermore, terms which may be germane to experts in a given field will require much greater explanation based upon the target audience (e.g., the public versus specialists and researchers in that field).

3. Consider the Format

When creating an infographic, it is important to always remember that the overall goal is to make information *more* accessible than it may have been in a purely text-based format. The chosen format can directly inform that in three important ways: dimension, layout, and resolution. While there is not an exact "size" requirement for the infographic dimensions, consider the practical problems that can arise from an infographic that is "too wide" or "too tall." Readers will require

more cognitive load to "follow" the content around. For most circumstances, an ideal infographic will be in 16:9 or 4:3 ratios. These are common default ratios for most visual displays (e.g., televisions, computer monitors, cell phones turned on their side) and conveniently the two default ratios for slides in Microsoft PowerPoint. While the portrait orientation is more common than the landscape orientation, it is important to choose the orientation based upon the target medium. For instance, if the goal is to target mobile phone devices, choosing portrait orientation is much more usable. The layout should follow a logical direction. Since first learning to read as children, we have been socialized to move across a page from a standard direction (e.g., left-to-right and top-to-bottom in English). The layout of an infographic should take advantage of that normative anchor to process information by putting information in that order. One way to assess if the layout is logical is to have a colleague review it and ask if there were any areas where the flow was unclear or they had to pause and restart in a new location. Once the infographic has been created, export it in a manner such that the resolution is appropriate for its display medium. For infographics shared on social media, a screenshot or exporting as a standard PDF (Portable Document Format) will likely be adequate. If the infographic is going to be sent to print (e.g., paper handout or a larger poster) export it as a higher resolution (e.g., higher dots per inch [DPI] with at least 600DPI) PDF, image file, or vectorial representation. A vectorial representation is an image consisting of points, lines, and curves based upon mathematical equations and can be particularly valuable as it maintains crisp image borders when scaled to larger sizes.

4. Select the Software

There are a growing number of software options now available to create infographics that each have their own advantages and drawbacks. Table 1 provides a summary of the major infographic

software solutions. When selecting a software option, it is important to consider the cost, range of infographic template options, customizability, and user-friendliness. We recommend starting with Microsoft PowerPoint or Piktochart. Beyond the user friendliness of them, they also put some "thoughtful restraint" boundaries so that the infographic does not get over-designed.

5. Use Consistent Font and Color Schemes

Font and color scheme selection are two other key components of infographic creation. One key element of font selection is to minimize the number of fonts used and to prioritize Sans Serif fonts over Serif fonts. Multiple different font styles can be distracting for the audience. Therefore, it is advisable to use no more than three fonts in one infographic.[17-19] Additionally, Sans Serif fonts have been found to be easier to read and preferred by most audiences.[20] The advertising literature has shown that color can be used to increase impact and user engagement.[21] We suggest using three to five complementary color palettes and to consider using online resources (https://coolors.co, https://www.canva.com/colors/color-palette-generator, https://color.adobe.com) to assist with color scheme generation.[17-19] We advise novice users to utilize available templates or model their infographics after existing frameworks when first starting out with infographic design. Reviewing existing infographics (e.g., https://dailyinfographic.com, https://coolinfographics.com) can also help to inspire other design ideas.

6. A Picture is Worth a Thousand Words

When it comes to selecting text and graphics for infographic creation, use the smallest amount of text feasible for highlighting the key points and consider using graphics over text when feasible.

Cognitive load theory suggests that working memory has a limited capacity. Therefore, smaller bullet points of text are potentially easier for the audience's working memory to process and to subsequently integrate into long-term memory than large paragraphs of text.[22] Furthermore, dual-coding theory postulates that pictures and graphics are encoded as both verbal and visual traces in long-term memory, as opposed to text which is only encoded as a verbal trace. When information is encoded in two different pathways, it has greater potential to be stored and retrieved.[23] As such, using carefully selected graphics and pictures as part of the infographics could allow for better learning and knowledge retention for the intended audience. Icons can also be used to help represent information or emphasize key components and are freely available on a number of sites (e.g., https://thenounproject.com/, https://fontawesome.com)

7. Ensure Consistent Flow of Ideas

Infographics tell a story about a key message. A great story should consist of compelling ideas, memorable takeaways, and a persuasive tone.[24] Infographics should contain a single key message or a select number of takeaways (maximum of three).[9] The title should be clever, compelling, and summarize the key point(s). When creating an infographic, laying out all the ideas on sticky notes (e.g., https://jamboard.google.com) could help to organize the ideas and create the "story". Next, sort the notes in a logical orientation around the key message(s) to reduce the cognitive load that was mentioned in strategy #6 above. At this stage, some ideas can be removed from the infographic if they do not fit the key message(s). The layout can be enhanced by breaking text into smaller pieces to create more manageable content; using lines, borders, and simple shapes to create boundaries; experimenting with different arrangements of items; and effectively using white space to avoid crowding and create emphasis. Humor and metaphors can also be used to

increase the effectiveness of infographics.[9] Finally, review the new storyboard and ensure that all ideas flow in a progressive direction with minimal need to visually jump back and forth between sections of the infographic.

8. Avoid Copyright and Privacy Issues

Copyright issues may arise when an infographic uses resources that are protected. When creating an infographic, assets such as digital media (e.g., pictures, graphics) or font types should be chosen carefully. It is wise to use images from websites that provide free resources that do not have any usage restrictions (e.g., https://pixabay.com, https://unsplash.com, https://www.wikimedia.org/). While there are many copyright rules and restrictions, Creative Commons (CC) is one of the most famous license types. These are often available for free use with attribution, but it is important to ensure that the criteria are met, as some CC licenses may have restrictions. Publishers often require appropriate licenses and permission prior to using their images, even if it is not for a commercial purpose. These often have an associated cost.

Privacy is also another issue to consider. The Health Insurance Portability and Accountability Act of 1996 (HIPAA) includes a provision for violations of patient rights by the release of protected health information (PHI), which can include patient photos or identifying information (e.g., a hospital wristband, an identifiable tattoo). It is generally advisable to avoid patient photos or potential PHI in infographics. However, if this must be used, make sure to obtain written consent prior to use. It is prudent to consider the consent for other healthcare providers, as well. Although not governed by HIPAA, not everyone wishes to be broadly featured on the internet.

9. Get Feedback from Others

Peer review is a time-honored tradition in academic publishing, but certainly applicable to other digital scholarly pursuits including free open access medical education.[25,26] Borrowing from this, we encourage authors of infographics to engage in some aspect of peer review - both *before* and *after* publishing the infographic. For journals that allow for infographic-type publications (e.g., *Academic Medicine* Last Page), the infographic will certainly be reviewed as rigorously as any other article. For other journals which encourage infographics (e.g., *Academic Emergency Medicine Education and Training*, *Medical Education*), editors or reviewers may suggest that visuals be used to improve papers by better summarizing the methods or key findings of the paper. When engaging in creating infographics, we would suggest reflecting on the work and seeking feedback from others on both the content and the structure. Consider using established frameworks such as the aesthetic learning experience framework to help evaluate the infographic format.[9,27]

10. Utilize Effective Dissemination Strategies

Infographics, and particularly visual abstracts, can be disseminated via various methods. One pathway is formal publication of the infographic resource as described in strategy #9. However, a more common route is *post-hoc* infographic design, which serves as an adjunct to work that has already been created with the intention of disseminating the research findings or knowledge. These can be released across a variety of open social media platforms (e.g., Twitter, Facebook), as well as more closed social media platforms, such as a local department newsletter or a group's internal messaging platform (e.g., WhatsApp, Slack). Infographics could even be collected and stored as a group on a local blog, WikiMedia page, or a Pinterest account. However, it is

important to tailor the infographic for the specific dissemination outlet. For example, both the content and design of an infographic may differ for a Twitter post versus a departmental Slack account.

Conclusion

In this manuscript, we described ten strategies for creating a high-quality infographic. While these strategies can help readers to create more effective infographics, it is critical to review others' work, reflect on your own work, and solicit thoughtful feedback in order to bring your infographic skills to the next level and help maximize the end-user's learning.

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Table 1. List of Infographic Software Solutions

Program	Cost	Pros	Cons
Adobe Suite	High	- Includes multiple programs, such as Photoshop, InDesign, and Adobe Spark - Nearly unlimited creativity and options	- Steep learning curve - Large number of options may be overwhelming for more novice users - Higher cost
Canva	Low	Large array of templates organized by intended dissemination platform	More focused on announcements and other non-medical outlets
Figma	Low	Extensive resource, plugin, and template	- Steep learning curve - Complex tools may be

		libraries for infographic design ● Plugin support for free assets ● Allows interactive web-based infographics ● Free exports and no watermark	overwhelming for more novice users
Infogram	Free/Low	● Can integrate graphs and link to spreadsheet data for real-time updates ● Can create dynamic and interactive content	● More focused on business presentations ● More expensive than the other software options
Microsoft PowerPoint	Low	● User-friendly and already familiar to many users ● Default slide ratio is ideal for most infographics	● Limited template options which often have to be imported from other sites
Mind the Graph	Free/Low	● Has a large number of medical illustrations and icons available ● Offers a design consultation service	● Design consultation service can be expensive compared with other programs
Pablo	Free/Low	● Large selection of background images with the ability to insert custom logos	● Templates are more restrictive and not well-suited for more complex infographics
Piktochart	Free/Low	● Specifically designed for infographics ● Has many ready-to-go templates and icons available	● Some templates are more challenging to customize and may not meet the desired style ● Limited exports on free accounts

Educator's Blueprint

10 tips for Creating a High-Quality Infographic

Select appropriate content

Infographics can help simplify complex topics and emphasize key points but aren't meant for all topics. Choose wisely!

Define the target audience

Align the infographic design and complexity with the target audience. These are not one-size-fits-all!

Consider the format

Consider the dimensions, layout, and resolution (e.g., Screens need 72 dpi vs. Print media which needs closer to 300 dpi)

Choose the software

There are lots of options for software. Consider the pros and cons of each.

Consistency in fonts & colors

Avoid overly complex fonts, too many different fonts, and non-complementary colors.

Picture = a thousand words

Use pictures and icons to supplement or replace text and reduce the cognitive load on readers.

Ensure Consistent Flow of Ideas

Make sure the message and flow of ideas are clear. *Think story, not study!*

Watch for Copyright & Privacy Violations

Make sure to check for copyright issues and potential patient privacy issues prior to using images.

Get Feedback from Others

Is it clear? Are the ideas focused enough? Is the graphic easy-to-follow? Have someone proofread to ensure it is error-free.

Utilize Effective Dissemination Strategies

Consider the platform options and plan your infographic to match that.

FIGURE CAPTION:

"Strategies for Creating a High-Quality Infographic"