Title:
Teaching Design to Public Health Majors: A Design Case of an Interdisciplinary Course

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This case describes the design of an interdisciplinary course that teaches multimedia design and production skills to undergraduate students in public health. The purpose of the design was to provide public health students with knowledge and skills essential to the multimedia design and production processes in the context of public health. The cornerstone of the design was a synergy of topics related to instructional design, graphic design, and public health. Particularly, students were introduced to needs analysis and assessment, learning objectives, alignment of the content with learning objectives, foundational graphic design principles (e.g., Contrast, Alignment, Repetition, and Proximity principles), and content development strategies, such as writing appropriate, actionable, and easy to follow content. Over the last two years of teaching this course, the design of the course has gone through two major iterations. That is, the latest design of the course is an example of how contextualizing and using authentic tasks and design references facilitates the teaching of an interdisciplinary course. This case is structured around these two major iterations of the course. Particularly, the case reports what design decisions guided the design process of the course during each iteration.

Introduction

This case describes the design of an undergraduate course that is offered at a School of Education for undergraduate students in public health at a large midwestern university. Particularly, this design focuses on two design iterations that were made during the following two academic years: Fall 2016-Spring 2017 and Fall 2018 - Spring 2019. The design iterations were informed by the importance of relating learning activities to the real life context of public health. That is, after design iterations, lectures, and in-class and out-of-class activities were designed based on the current and pressing issues pertinent to the context of public health. In this course, students were expected to demonstrate their mastery of multimedia design and production processes via the design and development of different projects, addressing a specific health issue. Particular emphasis was placed upon the development of the essential design skills necessary to create effective health educational materials to promote and maintain positive health behaviors in communities. To this end, in designing this course, a special emphasis was placed upon contextualization and authenticity of learning tasks. Therefore, this design case describes the context of the course and design decisions through examples and actual design artifacts. We identify the design judgments that governed these specific design decisions that are supported by our prior experiences in teaching this course and supported by our instructional design experiences.

Background for the Design Case

Multimedia design and production skills are among the essential skills that public health practitioners need to possess (Public Health Foundation, 2014), owing to the important role they
play in (1) educating the public about health and (2) training employees in public health organizations (National Center for Biotechnology Information, 2002). Acquiring these skills becomes mandatory among public health majors who seek to enter a competitive fast-growing profession (National Center for O*NET Development, 2019).

Indiana University School of Public Health alumni articulated their need for such skills when reflecting back on their undergraduate educational experience. Additionally, the accreditation agency, such as the Council on Education for Public Health (CEPH), requires public health schools to address competencies focusing on public health program planning, which entails multimedia design and production skills (CEPH, 2018). Based on alumni feedback, workforce demands, and accreditation agencies’ requirements, a new course was created to meet students’ needs for acquiring multimedia design and production skills. This course was designed and offered in the School of Education’s IST program at a large midwestern university.

**Course Description and Objectives**

This course emphasizes the development of design and multimedia production skills among public health undergraduate students. These skills allow the creation of health educational materials that promote and maintain positive health behaviors in communities and/or train employees in public health organizations. In this course, students are expected to demonstrate their mastery of multimedia design and production processes through the design of multimedia products, such as infographics, instructional videos, podcasts, print materials (e.g. brochures, flyers, and posters), and health promotion websites that address a particular health issue of a specific target population. Below is a list of learning objectives of the latest iteration of the course:

1. Describe a series of instructional and graphic design methods and principles.
2. Formulate objectives, potential impact, and outcomes of health communication materials.
3. Apply the instructional design process in the development of health communication materials for target populations.
4. Create effective educational/communication health materials to inform communities about preventing disease or injury, improving health, or enhancing quality of life.
5. Design health educational/communication materials using instructional design methods.
6. Showcase the ability to be a functioning member of a collaborative design team.

**Design Decisions and Judgments**

When discussing our design decisions, we provide a narrative of the design of this course (Boling, 2010) and express our thought process throughout the two design iterations. We differentiate between design decisions and design judgments (Nelson & Stolterman, 2012), as the former is the action taken to design and the latter encompasses the “intellectually soft, intuitive, informal and cookbooky” knowledge that we as designers have (Schön, 1983, p. 46).
**Iteration 1: Contextualizing & Interdisciplinarity**

Our first design decisions involved contextualizing multimedia design and production in the context of public health. We incorporated public health content, particularly the one related to public health program planning, in the design of the course content and assessments. Being guided by the notion that training students in the context of their future professional context constitutes a pedagogically sound approach (Brown, Collins, & Duguid, 1989) and, most importantly, a pragmatic approach to education, course lectures, weekly learning activities, and all assignments were designed based on the most current public health issues in which students were currently engaged in or would be in the future. When designing such cases, we researched the most current or pressing issues in public health on a national, state, and community level, including the opioid crisis in Indiana, the creation of dementia friendly communities, teen pregnancy, the promotion of healthy dieting and exercising, and vaping.

Below is one case that was used for case-based, in-class discussion:

*Currently, you’re coordinating a project at a local hospital. The project is aimed at having Indiana communities become recognized as dementia friendly. Dementia-friendly communities emphasize breaking down stigmas around dementia. One element of dementia friendly communities is dementia friendly businesses. By striving to have businesses actively accept and welcome people with dementia, dementia-friendly communities address respect and social inclusion of older adults, including those living with dementia and their caregivers. You have scheduled meetings with local businesses in Bloomington to advocate for a program that serves older adults and to become a dementia-friendly business. Your key goal is to help them understand what this disease is and why it’s important to build dementia-friendly businesses. Ultimately, you’ll want them to take your online training so that they become certified dementia friendly businesses.*

You realize that you have a good amount of information to present, and you’re thinking of creating effective visuals (e.g. a fact sheet, brochure, or infographic) to show the importance of this issue.

**Here’re the data you’re thinking to use:**

- Over 5 million Americans are living with Alzheimer’s Disease
- The numbers are rising, and it is estimated that 16 million people will be living with this disease by 2050
- Nearly one in three seniors who die each year has Alzheimer’s Disease or Dementia
- In 2016, there were 110,000 people living with Alzheimer’s ages 65 and older
- By 2025, the numbers are projected to increase to 130,000 people living with Alzheimer’s ages 65 and older
- Alzheimer’s is the 5th leading cause of death in Indiana
- The estimated costs of care in 2016 related to Alzheimer’s and other Dementias total around $236 billion in the U.S.
- Because it can happen to any of us, and as the numbers continue to increase, we need to create an environment where we all can thrive, no matter the diagnosis.
Task:
1. In your team, discuss ways to present the data that would clearly show the importance of this issue.
2. Once finished discussing, draw a sketch or outline of what you would create to present data (e.g. a fact sheet, brochure, or infographic).
3. Explain why it would be a great way to present data.
4. What principles would you use to convey your message effectively and efficiently?

Iteration 2: Authenticity of Tasks and Design References

After the first iteration, it was noted that students would benefit more from learning activities that were better related to the real life context of public health. Therefore, during the second iteration we decided to capitalize more on this approach.

When designing authentic tasks, we were guided by the description of authentic learning offered by Brown, Collins, and Duguid (1989). Particularly, per Brown et al. (1989), authentic learning situates newly acquired knowledge in the context of future use, since context and learning are inseparable. Further, we considered the four characteristics of authentic learning that Shaffer and Resnik (1999) put forth. Per the authors, authentic learning can be considered: (1) learning that is personally meaningful; (2) learning that is connected to the outside world; (3) learning that mimics or models disciplinary practices; or (4) learning in which assessment is aligned with learning tasks. In this case, the design of learning activities allowed students to choose any public health related topic that was meaningful and relatable to them. For instance, some students chose to work on health issues to which they lost their family members or friends, health issues their family members or friends are currently coping with, or health issues which they had themselves. In addition, students were encouraged to work with a real life public health organization on the design of health educational materials. Finally, knowing that public health professionals design and develop different types of interventions (e.g. educational, regulatory, environmental, etc.), the assignments were presented to students as if they were working on an educational public health intervention by creating different resources, such as brochures, infographics, instructional videos, podcasts, or websites, as a part of a campaign addressing a particular health issue of their choosing. For instance, students worked on projects aimed to promote positive mental health among college students, raise awareness of the issue of the “Freshmen 15” and how to maintain a healthy lifestyle while in college, address sleep deprivation among college students, or share information on vaping among adolescents.

Figure 1: Example of an assignment description encouraging students to relate projects to the context of public health
Assignment Description

For creating your 2-3 minute instructional video, you have the following options:

1. Creating a video describing a particular public health issue: select a health issue of a specific target population. First, you will need to select a target population and research what health issues they currently have. In your video, you will describe a particular health issue through emphasizing its importance and consequences, as well as suggestions/ways to address it. You can create your instructional video around the same topic as for your infographic. When describing a specific issue, be sure to cite credible sources, such as American Public Health Association, Centers for Disease Control and Prevention, etc.

2. Also, you can create a video to promote healthy behaviors and healthy lifestyle: benefits of a specific diet, benefits of a particular sport, or even a healthy recipe. Your video should be informative and engaging.

When working on your video about a particular health issue, keep in mind the following questions:

- What is your target population?
- What is a health issue?
- Why is it important?
- What are social and behavioral determinants of a health issue?
- What is being done to address a health issue? or What are the ways to solve a health issue?

When working on your video aimed at promoting healthy behaviors and healthy lifestyle, keep in mind the following questions:

- What is your target population?
- What are you promoting in your video: working out, healthy diet, etc.?
- Why is it important? or What are the benefits of working out, healthy diet, etc. (include facts)?
- Suggestions on how to get started on developing healthy behaviors and healthy lifestyle.

The ultimate goal of your instructional video should be either raising awareness of a particular issue so that a target population can take preventive measures, teaching a procedure, or encouraging a specific target population to improve or maintain positive health behaviors.

Design References

During the second iteration our second design decision involved relying on design references as a pedagogical design tool. In designing each unit on how to design a particular artifact (e.g., brochure, video, or infographic), we gathered or asked the students to gather examples of artifacts that they can either appreciate or regard as “bad examples.” Each assignment included a collection of exemplary work done by previous students and examples provided by major public health organizations (e.g., Center for Disease Control and Prevention, American Public Health Organization (APHA), National Institute of Environmental Health Science, World Health Organization, US Department of Health and Human Services, and US Public Health Service). The rationale for this approach was that the presentation of design references to students allows them to form design precedents, which are essential tools in design (Boling & Smith, 2008).

Additionally, we found that bringing design references as the foci of class discussions allowed students to form their own design judgments and identify their values and biases that they might have.

Figure 2: Example of a Public Health Website Analysis In-Class Activity
1. Below you can see a list of topics that you used for creating your projects. Since most of you will likely continue the same topics, below you can see examples of websites addressing health issues you covered in your materials (brochures, infographics, and instructional videos). Click on your topic to explore different websites.

2. Select one website and critique it from the following perspectives:

   Website structure & functions: do you find it easy to use and navigate between pages? Why or why not?
   
   Content: can you describe each page in one short sentence? It is an “FYI” or a “Call to Action” content?
   
   Organization: how is it organized? What logic is used to organize the website?

Use this Paddlet board to write down your ideas to share them with the class: https://paddlet.com/vabramen1/3w6jachbiraq

- Stress Management and Prevention
- Healthy Eating and Diet
- Mental Health
- Sleep Deprivation
- Smoking
- Wellness and Fitness
- HIV and AIDS
- STDs

Stress Management and Prevention
- Stress Management and Prevention
- Stress Management
- Guided Meditations
- Stress Management Society

Healthy Eating and Diet
- Choose MyPlate
- Verwell Fit

**Design Tools Demonstrations**

Our third design decision involved planning weekly demonstrations of computer-based (e.g., PowerPoint, Publisher, Audacity) and analog (e.g., Sketching, Storyboarding) design tools. Such demonstrations included show-and-explain and step-by-step instructions in the form of handouts and video tutorials. We recognized that the concept of design tools did not encompass only actual/tangible types of tools; it included methods, techniques, and approaches to design (Lachheb & Boling, 2018). This open-ended approach to design tools allowed us to help students form and evoke their own judgments in selecting and adopting design tools (Boling & Gray, 2015). For design tools demonstrations, students were provided step-by-step instructions and walkthroughs in class, as well as additional resources, such as handouts and video tutorials posted on the course Canvas site.

*Figure 3: Example of a Canvas course page with a list of additional resources for creating an infographic*
Figure 4: Example of a Canvas course page with a list of additional resources for creating an instructional video

**Resources for video creation tools:**
- Adobe Spark Quick Guide
- Powtoon Video Tutorials

**Resources for finding free music:**
- Royalty Free Music
- Audacity
- SoundCloud

Figure 5: Example of a Canvas course page with a list of additional resources for creating a podcast

In-Class Studio Days
Our fourth design decision involved allocating class time to work on projects, in the form of studio days. Students worked on their projects and experimented with different production paths while being supported by the instructor. Students received prompt feedback and peer review that allowed them to iterate on their design and practice using their design tools. We recognize the importance of studio pedagogy in design (Hokanson & Gibbons, 2013), and we wish we had the opportunity to fully turn this class into a studio format. However, as institutional constraints prevented us from doing so, we sought to integrate studio pedagogy by designating selected class meetings as “studio days”.

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Resources/Tips for Creating Infographics:
- Piktochart Guide
- Piktochart Video Tutorials
-退休教师 offender of Canvas’a free infographic maker: 请参考此快速指南，了解如何在Canvas中创建信息图表
- How to Make an Infographic in Canvas

Choosing the Right Colors
- Adobe Color CC: 一个在线色板生成工具
- Color Combos
Conclusion
In this design case, we described the design of an interdisciplinary course that teaches multimedia design and production skills to undergraduate students majoring in public health. Through design decision making and by relying on our design judgments—separately or combined, influenced by our design knowledge and experience—we aimed to help students develop solid multimedia design and production skills that were relevant to the needs expressed by the alumni and specific to their future careers as health professionals. The aforesaid skills are aligned with core competencies essential in the workplaces of public health professionals. Our pragmatic focus on the development of design skills allowed us to contextualize the course within the students’ public health majors and in their future professional practice. This allowed the course to become interdisciplinary, where public health and instructional design, two non-neighboring fields, met.

References:


