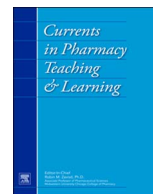




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## Currents in Pharmacy Teaching and Learning

journal homepage: [www.elsevier.com/locate/cptl](http://www.elsevier.com/locate/cptl)

## Research Paper

## Development and impact of a simplified approach to didactic powerpoint presentations performed in a drug information course

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## ARTICLE INFO

## Keywords:

Pharmacy education  
Teaching  
Multimedia  
Drug information services  
PowerPoint

## ABSTRACT

**Introduction:** To describe multimedia presentation development and assess impact of use on student and educator performance in a drug information course.

**Methods:** Slides were modified from bullet-point format to simplified pictorial format and three-slide handouts became outlined Word documents. Student performance, via exam scores and class average, and educator evaluation scores were compared between 2013 and 2014.

**Results:** Presentation revision resulted in a similar number of slides per presentation and smaller handout packets. Class average and final exam scores decreased (86.65% vs. 85.91%,  $p = 0.222$ ; 84.88% vs. 84.08%,  $p = 0.053$ ) while midterm exam scores improved (85.81% vs. 87.80%,  $p = 0.007$ ). Assessment of teacher effectiveness (scale of 1 = strongly disagree to 5 = strongly agree) rose from a median of 3–4 ( $p = 0.06$ ).

**Conclusion:** Simplifying presentations provided anecdotal value but did not impact student performance nor student perception of educator effectiveness.

## Introduction

The ineffective use of Microsoft PowerPoint® in medical education has been connected to the well-established concept of “death by PowerPoint,” perhaps because presentation design in medical education is not an area of focused training for professionals who select a career in academia.<sup>1–5</sup> In fact, most faculty members utilize a traditional, bullet-point style of lecture slides using this software.<sup>5,6</sup>

However, such software was not intended to contain a large amount of text. Research shows that audiences have difficulty simultaneously processing presented written and verbal information, so the more words on the slide, the less the audience will absorb.<sup>5–7</sup> Therefore, simplifying slide presentations by removing text and focusing on images has the potential to enhance student learning.

One approach to presentation simplification is from the book *Presentation Zen*.<sup>7</sup> This text has been referenced in the medical literature as a way to improve audience comprehension, because it promotes the concepts of using pictures and storytelling in slideshow design.<sup>2,3,8</sup> The approach was developed to enhance communication by re-envisioning presentations considered normal by today's standards (e.g., bulleted slides, many words) regardless of the software tool used to provide them. *Presentation Zen*<sup>7</sup> provides education and tips on how to become a better presenter through presentation design and performance techniques. It includes guidelines on how to create live presentations using multimedia and offers anecdotes and examples of slides that help the reader understand the concepts. Finally, the text explains the importance of developing a proper handout to free the presenter to remove content from slides. This simplification of the presentation gives the presenter the ability to focus on important concepts while still

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<https://doi.org/10.1016/j.cptl.2017.11.004>

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providing the audience with information they need; it also allows the audience to focus on the presenter and not notetaking or reading of slides.<sup>7</sup>

Multimedia learning in medical education has been defined as learning from words and pictures, so the principles align with those of the *Presentation Zen* approach.<sup>5,6,9</sup> Literature on the use of these principles has shown enhanced learning in the education of healthcare professions.<sup>5,6,10</sup> Issa and colleagues<sup>6</sup> completed a pre-test/post-test control group study that presented a single multimedia lecture to 91 undergraduate medical students and compared the results with a group of 39 similar students receiving the same content from a traditional lecture. Student groups had similar knowledge at baseline, and both showed significant improvement in retention, transfer, and total scores from pre-test evaluation scores. Investigators were able to demonstrate significantly improved retention ( $p = 0.0016$ ) and total scores ( $p = 0.0081$ ) in students receiving the multimedia presentations when compared with students receiving the traditional presentation, supporting the conclusion that multimedia presentations improve short-term retention in medical students. The authors additionally concluded that these principles are easy to implement and should be taught in faculty development sessions.

An evaluation of the impact of different slide presentations given to third-year veterinary students was conducted by Margaret Kustritz.<sup>10</sup> Students were enrolled in a required course and given the option to attend a traditional lecture in the evening ( $n = 31$ ) or an assertion-evidence lecture the following morning ( $n = 68$ ). All students were administered a pre-test before the lecture, were given the same non-slide based handout, completed a take-home assignment post-lecture, and completed two online multiple-choice tests, one administered three weeks after the lecture and a different one a month later in order to test retention. Results showed that student groups did not have different pre-test, assignment, or post-test scores, and both groups significantly increased scores from pre-test to post-test and from pre-test to retention test. Retention scores were significantly better in the assertion-evidence group when compared with the traditional group ( $p = 0.03$ ). The authors concluded that retention of lecture material was superior with the assertion-evidence method of lecture.

In pharmacy education specifically, Pate and Posey<sup>5</sup> redesigned a single slide software lecture using multimedia design principles. In the 2011 course, the lecture was given via traditional slides; it was then redesigned in 2012 and 2013. Authors compared student performance on exam items between the three classes. Student perception of the redesigned lecture was assessed via a survey administered to the 2012 and 2013 classes. Reformatting the lecture took 14 hours, increased slides from 37 to 45, and reduced bullets per slide from 6.87 to 0.3. Exam item performance significantly improved from 2011 to 2012 and 2013 ( $p < 0.05$ ) and students indicated approval of the new format. The authors concluded that redesigning slides for a single lecture was successful based on improved student performance and opinion.

While these studies and *Presentation Zen* offer insight on the concept of multimedia presentation design, none of these resources provide a wide-ranging account for the healthcare faculty member who seeks to implement these principles into their teaching style. The primary objective of this article was to describe the experience of a drug information (DI) and critical literature evaluation course coordinator who undertook the process of complete presentation conversion in order to find a better way to teach. Furthermore, the value of using slides in a *Presentation Zen* style on student learning and educator effectiveness for an entire healthcare professional course has not been evaluated. A secondary objective of this study was to determine the impact of using this simplified slide presentation style on student performance and educator evaluation scores. It was hypothesized that this teaching style would improve student performance and educator effectiveness in a DI course taught in the fall semester of the third year of a traditional four-year doctor of pharmacy curriculum at a distance-education college of pharmacy.

## Methods

The South Carolina College of Pharmacy (SCCP) is a distance-education school of pharmacy that teaches students at three campuses across the state of South Carolina via synchronous presentation with recordings for later student review. The DI course, Advanced DI, is a required, two-credit hour, primarily didactic course taught to third-year pharmacy students (P3s) over 15 weeks in the fall semester. This course, taught almost exclusively by a single faculty member who serves as course coordinator, is designed to provide students with the DI skills necessary to perform responsibilities assumed on clerkship rotations and as licensed pharmacists upon graduation. Students review and enhance literature searching skills taught in previous courses and develop proficiency in critical literature evaluation through practical application. Students are also introduced to the concept of a journal club, a group project through which they get an opportunity to cultivate their teamwork and presentation skills as part of their coursework. Student course grades are determined via semi-weekly, online, password-protected assignments consisting of multiple-choice questions (31%), two critical literature evaluation short-answer exercises (7% each), two electronic multiple-choice exams (20% each), and the aforementioned journal club presentation (15%). Attendance is not required, but is encouraged via the online, password-protected assignments completed during the week following the provided lecture; the passwords are distributed near the end of the class session and are not recorded, and students are warned that sharing passwords would result in an honor code violation.

To determine the value of the change in lecture style, comparisons of student performance and educator evaluation scores were conducted. This study used a before-and-after cohort methodology to meet its objective. P3s from subsequent graduating classes made up both cohorts. Students were taught using two different presentation methodologies. In 2013, P3s were taught via traditional slide presentation format, using bulleted slides and handouts that contained three slides with note-taking space to the right of the picture of the slide. In 2014, P3s were taught via simplified slide presentations, with picture slides containing minimal text, and streamlined handouts developed in word processing software. During both years, audience response systems were used to engage students in active learning; questions used during lectures were the same in both years.

The simplification process started with the creation of handouts from existing slide presentations, using the already bulleted

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