

STUDENT PREFERENCES FOR ONLINE LECTURE FORMATS Does Prior Experience Matter?

Michelle Drouin, Rachel E. Hile, Lesa R. Vartanian, and Janae Webb

Indiana University-Purdue University Fort Wayne

We examined undergraduate students' quality ratings of and preferences for different types of online lecture formats. Students preferred richer online lecture formats that included both audio and visual components; however, there were no significant differences between students' ratings of PowerPoint lectures with *audio* of the instructor and PowerPoint lectures with *video* of the instructor. Notably, students rated the quality of online lecture format higher if they had been previously or concurrently exposed to it. Thus, we suggest that mere exposure may account for much of the difference in preferences for online lectures, rather than any inherent differences in quality.

INTRODUCTION

With recent dramatic increases in the numbers of students taking online classes in higher education (Allen & Seaman, 2010), many instructors now face the challenges of creating online courses. One of these challenges is deciding how to deliver lecture material. According to Parsad, Lewis, and Tice (2008), instructors use a multitude of formats for presenting lecture material in online courses, from basic, asynchronous methods (e.g., one-way transmission of print-only or audio files) to more technologically advanced, synchronous methods (e.g.,

two-way interactive video). With the continual development of new software programs for online education, instructors must now choose from among a vast array of options (see Singh, Mangalaraj, & Taneja, 2010). Given the many available possibilities, instructors need evidence to inform decisions about how to deliver lecture material to students in online courses, including evidence about student preferences. This exploratory study provides some initial conclusions about student preferences for delivery format for lecture material in online courses that can help instructors to consider thoughtfully the multiplicity of factors that

• **Michelle Drouin:** Department of Psychology, Indiana University-Purdue University Fort Wayne, 2101 E. Coliseum Blvd., Fort Wayne, IN 46805. Telephone: 260-481-6398. E-mail: drouinm@ipfw.edu

The Quarterly Review of Distance Education, Volume 14(3), 2013, pp. 151–162
Copyright © 2013 Information Age Publishing, Inc.

ISSN 1528-3518
All rights of reproduction in any form reserved.

may affect students' accessing and use of lecture material.

REVIEW OF THE LITERATURE

Much of the research of the last decade that has examined the effectiveness of online instruction has contrasted online course delivery to face-to-face delivery (e.g., Bernard et al., 2004; Carle, 2009; Kelly, Ponton, & Rovai, 2007; Paechter & Maier, 2010). This research has been of great benefit to educators, as it has shown consistently that there are no significant differences in learning between online and face-to-face instruction (Russell, 2001; WICHE Cooperative for Educational Technologies, 2010). However, research that contrasts online instruction (as a whole) to face-to-face instruction (as a whole) will tend to even out little local differences in course design (Kelly et al., 2007). In other words, previous research on this topic has tended to combine rather than parse out the differences that may help guide online pedagogy. According to Swan (2003), combining data in this way deemphasizes the differences in effectiveness of different types of online course delivery. Consequently, more recent research on online instruction has begun to parse out those little local differences to optimize online courses.

One of the seminal, large-scale studies that compared distance education course structures to one another was conducted by Bernard et al. (2009). In their meta-analysis, Bernard and colleagues contrasted different types of interaction treatments (the media and instructional delivery formats) within distance education courses. As an example, they measured students' achievement in and attitudes toward synchronous online courses, asynchronous online courses, and courses with both synchronous and asynchronous interactions. Bernard and colleagues found that there were no differences in terms of achievement with these different delivery methods; however, students had more favorable attitudes toward synchronous and asynchronous courses than mixed

courses. Other researchers have begun to examine online course delivery at a more granular level, and in the area of lecture formats, a few guiding studies have emerged. For example, Dey, Burn, and Gerdes (2009) compared students' responses to and learning from two formats of online lecture delivery: slides with video of presenter and slides with audio of presenter, which they termed "personal video condition" and "neutral video condition," respectively (a live, face-to-face lecture constituted the control condition). They found no significant differences in learning, but the personalized video condition was preferred slightly over the neutral condition. Additionally, some students in the neutral condition indicated that their experience would have been enhanced had they been able to see the instructor's image. Meanwhile, Skylar (2009) compared asynchronous text-based to synchronous web-conferencing lectures (conducted using Elluminate Live, featuring slides and two-way audio but no video representation of the instructor). As with Dey et al. (2009), Skylar found no significant differences in learning, but students enjoyed synchronous, interactive lecture delivery and indicated their preference for that format for future online courses.

The findings of Dey et al. (2009) and Skylar (2009) suggest that students prefer online courses in which the teacher is *present* in some form, whether the lectures are delivered synchronously or asynchronously. This is not surprising, as much of the research of the past decade has posited that to build an effective community of inquiry (Garrison, Anderson, & Archer, 2000), teaching presence is integral. In fact, the community of inquiry model depicts an overlap between *teaching presence* or "the design of the educational experience" and the "facilitation" of that experience (Garrison et al., 2000, p. 90) and both *social presence* ("the ability of participants ... to project their personal characteristics into the community" [Garrison et al., 2000, p. 89]) and *cognitive presence* ("the extent to which the participants ... are able to construct meaning through sus-

tained communication” [Garrison et al., 2000, p. 89]). Recent studies have provided empirical support for this theoretical depiction: teaching presence appears to affect both social and cognitive presence (Garrison, Cleveland-Innes, & Fung, 2010; Shea & Bidjerano, 2009), and both teaching and cognitive presence affect student satisfaction and, in turn, persistence (Joo, Kim, & Kim, 2011). Hence, teaching presence appears to play a significant role in the success of an online course.

Recent research has suggested that the use of video, specifically, may have a positive effect on students’ feeling that the instructor is real and present. In two recent studies (e.g., Borup, West, & Graham, 2012; Griffiths & Graham, 2009) students indicated that they felt more connected to their instructor, fellow students, or both, when asynchronous (i.e., prerecorded) videos were used for delivery of instructional materials and general course communication. According to Griffiths and Graham (2009), the distinct advantage of video is that it allows for immediacy, which was defined by Mehrabian (1966) as the behaviors that communicate physical or psychological closeness. Research has demonstrated consistently that students respond favorably to instructor immediacy (e.g., Moore, Masterson, Christophel, & Shea, 1996), but immediacy can be communicated in a variety of ways in online courses. Some instructors communicate immediacy by being warm and expressive or maintaining eye contact (Guerrero & Miller, 1998); others may share personal stories or present a smiling image of themselves (LaRose & Whitten, 2000). Although some of these instructor immediacy behaviors could only take place within context of a video (e.g., eye contact or facial expressiveness), others (e.g., warmth, sharing stories, smiling image) could exist in nonvideo contexts, such as audio lectures accompanied by a picture or even through e-mails and static instructor introduction pages (LaRose & Whitten, 2000). Therefore, though Borup et al. (2012) and Griffiths and Graham (2009) found that students responded favor-

ably to videos, they might also respond positively to voice-over PowerPoint presentations, or even to audio-only or text-only presentations, provided the instructor uses immediacy cues within or in addition to those lecture formats.

With regard to their *value to learning*, video-based lecture materials may provide the best opportunity for learning course material. Paivio’s (1986) dual coding theory posits that the human mind creates and stores memories through two functionally independent systems, one for images and another for words. During retrieval, the stored memory can be accessed through either the visual or verbal code or both; hence, presentation of material to both systems increases the likelihood that the information will be recalled. Mayer (2001) developed the implications of Paivio’s work with specific reference to the design of multimedia educational materials, based on several linked assumptions: (1) learners use two distinct channels, auditory and visual, to process information; (2) cognitive load theory posits the limited processing capacity of each channel; (3) having two channels, each limited in capacity, means that the best learning results from students’ experience of integrating inputs from both channels. Mayer thus recommended that instructors pay explicit attention to creating learning materials that provide information through both the auditory and visual channels. Present-day lecture-capture software (e.g., Mediasite, Adobe Presenter, Echo 360) allows for the creation of online lectures that use both audio and video. Instructors can now create presentations with informational slides (e.g., PowerPoint) accompanied by a video of the instructor or informational slides accompanied by the voice of the instructor. According to the work of Mayer (2001) and Paivio (1986) either of these lecture formats would be beneficial to learning as they would convey information to both the audio and visual channels.

Although the work of Paivio (1986) and Mayer (2001) would suggest that memory-creation—that is, learning—would increase by presenting information in both visual and ver-

bal forms, Sweller, Chandler, Tierney, and Cooper (1990) discovered the caveat that split attention, when students must attend to too many pieces of information, leads to decreases in learning. In their experiment, cognitive load was increased and learning was diminished in conditions where students had to integrate disparate sources of information (e.g., text and diagrams). However, when this was examined experimentally with regard to video lectures specifically, Dey et al. (2009) found no split-attention effect: students learned just as much from the personalized (video of presenter) as from the neutral (audio of presenter) video presentations. This suggests that seeing the presenter of an online lecture does not constitute distracting information and that lecture delivery featuring the video of an instructor can be an effective learning tool.

In sum, both the empirical and theoretical evidence suggest that videos can be used effectively in an online course, and that lectures featuring instructor immediacy cues in some form, especially video, might be preferred. However, there is an important issue that has not been considered in the literature—students' previous exposure to different types of lecture formats and whether that influences student preference. According to a meta-analysis by Bornstein (1989), the *mere-exposure effect*, or the psychological effect of having a more favorable opinion of something that one has already been exposed to, is a real and somewhat consistent phenomenon. Therefore, it is possible that students' preferences for (and learning derived from) different types of lecture formats are influenced by their previous or concurrent lecture experiences. As an example, if a student has had many courses where the instructor is featured in a video and then takes an online course featuring the instructor via video, the student might indicate a preference for this type of learning platform because of his or her familiarity with it. Thus, it may not be the superiority of one lecture delivery method over another that influences students' preferences and learning but rather their previous exposure to it. Applying this theory to previous findings, it may not

be that students would prefer seeing an image of their instructor in their online lectures (as in Dey et al., 2009), but rather that they have more exposure to lecture formats in which their instructor is visible and may have developed a preference for that format because of the mere-exposure effect.

In the present study, we sought to compare students' perceptions of the quality of and preferences for two formats of online lectures that both have the possibility of conveying instructor immediacy—*slides with video of presenter* and *slides with audio of presenter*, as in Dey et al. (2009). However, unlike in Dey et al., we controlled for the mere-exposure effect, that is, the effect of having previous or concurrent exposure to those lecture formats. We gathered our data within online courses that used either PowerPoint slides including video of instructor or PowerPoint slides including audio of the instructor. As part of our course evaluation surveys, we asked students about the quality of their specific course, their ratings of quality for different types of lecture formats (i.e., their enjoyment of and perceived learning from those formats), their preferences for different types of lecture formats, and their experiences with different types of lecture formats. To put these delivery methods in context, we also asked students to rate the quality of, their preferences for, and experiences with other types of lecture formats that were not our main areas of interest (e.g., text only, PowerPoint slides only, or audio only). Based on previous research (e.g., Dey et al., 2009), we expected that students may show a slight preference for *slides with video of presenter* formats, where more immediacy cues might be present; however, we also expected students to favor lecture formats to which they had been previously or concurrently exposed.

METHOD

Participants

Participants were students ($N = 113$, 86 women and 27 men) at a midsized, Midwest-

ern university enrolled in one of eight online sections of psychology and English classes from fall, 2010, through fall, 2011. In terms of age, the participants were quite diverse: 40% ($n = 45$) were 18 to 22 years old, 36% ($n = 45$) were 23 to 30 years old, and 24% ($n = 27$) were over 31. However, most were upperclassmen: 8% ($n = 9$) were freshmen, 21% ($n = 24$) were sophomores, 28% ($n = 32$) were juniors, and 43% ($n = 48$) were seniors. The majority of participants (79%) had taken at least one Internet course prior to this one ($M = 3.73$, $SD = 3.65$, $range = 0-20$).

Courses and Instructors

The online courses were taught by three different instructors, 2 in the Psychology Department (PSY) and 1 in the English Department (ENG). Each of the instructors was well versed in the quality standards for online courses; 2 were national Quality Matters reviewers and 1 had her course reviewed with the quality standards for online education established by the university. The course level for the 8 sections spanned from introductory (e.g., introductory psychology or literature) to advanced (e.g., an upper-level psychology specialty course); however, the course structures were all very similar: they all had assigned readings and also full online lectures (30 to 75 minutes in length) for each topic or chapter. Two of these instructors (one PSY and one ENG) used full-media lectures (Mediasite), where a video of the instructor speaking accompanied the PowerPoint presentations (PP + video). The other instructor (PSY) used voice-over PowerPoint lectures (Adobe Presenter), where students could hear her voice and see the PowerPoint slide show, but she was not visible (PP + audio). According to Blackboard statistics, the percentage of time that students accessed the online lectures across the three instructors was remarkably similar. As an example, in one of the regular (i.e., nonsummer) semesters of 2011, students spent 28.93% (PSY 1), 28.10% (PSY 2), and 26.05% (ENG) of their time in the online course accessing the online lectures.

Procedure

At the end of the semester, students were asked to complete an anonymous survey that contained demographic questions and questions about the organization and quality of the online course in which they were enrolled. They were then asked questions about their impressions of and preferences for five different lecture formats that were popular (or gaining popularity) in online courses at the instructors' university. These lecture formats were described to students as follows: (1) "Written notes (like a MS Word document)," (2) "PowerPoint slides (you see slides only with no voice or video added)," (3) "PowerPoint slides enhanced with sound (i.e., you hear the instructor's voice talking about the information contained on the slide, like with Adobe Presenter)," (4) "Recorded audiovisual lectures (i.e., you see the instructor as he or she talks about the slides, like with Mediasite)," and (5) "Recorded audio lectures (i.e., you hear the instructor talking, but you don't see any slides or video, like with Audacity or iTunes)." Finally, they were asked about their preference for lectures of different lengths.

Measures

Organization and Communication Within Current Course. Students were asked 7 questions related to the organization of and communication within their online course from Drouin and Vartanian (2010): 3 were related to the structure and organization of the course, 2 were related to communication with instructor, and 2 were related to communication with students in the course. These questions were combined into a single variable reflecting the overall organization and communication within the course (Cronbach's $\alpha = .90$).

Perceived Learning From Different Online Lecture Formats. Students were asked four questions about the extent to which the lectures in an online course contributed to their learning in the following ways: reinforcing key concepts from the book, introducing new con-

cepts, providing opportunity to learn by hearing the material discussed, and providing the instructor's special expertise in the subject matter. Students were asked to respond on a 5-point Likert scale (1 = *never*, 5 = *very often*). These questions were combined into a single variable reflecting the learning students derived from online lectures (Cronbach's alpha = .90).

Quality of Different Online Lecture Formats. Students were asked two separate questions pertaining to the quality of online lectures: (1) their enjoyment of the different lecture formats, and (2) the extent to which they felt these lecture formats were valuable to their learning (5-point Likert scale; 1 = *not at all*, 5 = *very much*). For those who had never experienced that type of lecture format, they were asked about the extent to which they thought they would enjoy the format or think it would be valuable to their learning. These two separate questions were combined into a single composite variable for each type of lecture format. Cronbach's alpha for these five composite variables (one for each of the lecture formats) ranged from .88-.97.

Preferred Lecture Format. Students were asked separate questions about the extent to which they preferred the lecture format type for *this instructor* and for *all instructors* (5-point Likert scale; 1 = *not at all*, 5 = *very much*). These separate questions were combined into one variable for each of the five lecture formats. Cronbach's alpha for these combined variables ranged from .92-.95.

RESULTS

As a preface to the main analyses, we conducted preliminary analyses to determine whether students perceived their specific online course to have good organization and communication and whether there were any differences in this measure between instructors or lecture formats (PP + audio versus PP + video), as this could be a potential confound. Overall, the students rated the three instruc-

tors' online courses highly for organization and communication, $M = 4.00$, $SD = .88$ (PSY 1, PP + video), $M = 4.09$, $SD = .89$ (ENG, PP + video), and $M = 4.01$, $SD = .66$ (PSY 2, PP + audio). Additionally, there were no significant differences between instructors ($F(2, 110) = .126$, $p = .88$) or between the PP + audio and the PP + video lecture formats ($t(111) = .114$, $p = .91$).

We also wanted to determine whether students felt that online lectures (overall) were of value to their learning, as students' preferences for different types of lecture formats are not very meaningful if they do not feel that these lectures are valuable to their learning. Overall, students felt that online lectures contributed to their learning "often" ($M = 4.06$, $SD = 0.84$), through various ways (e.g., reinforcing book concepts, introducing new concepts, etc.).

Students' Perceptions of Quality of Different Lecture Formats

Our primary research question was whether there were any differences in students' ratings of the quality of online lectures with PowerPoint plus *video of the instructor* as compared to online lectures with PowerPoint plus *audio of the instructor*. To put these in context, we also included other popular lecture formats (i.e., text only, PowerPoint slides only, and audio only). Overall, students rated the PP + audio of the instructor highest ($M = 4.32$, $SD = .96$), then PP + video of the instructor next ($M = 4.23$, $SD = 1.01$), followed by PP only ($M = 4.14$, $SD = 1.08$), printed notes only ($M = 3.92$, $SD = .97$), and finally, audio only ($M = 3.27$, $SD = 1.32$). Paired-samples t tests showed that there were many significant differences between students' quality ratings of lecture types (e.g., audio only lectures were rated significantly lower than every other lecture type); however, there were no significant differences between students' quality ratings for the PP + audio and the PP + video formats ($t(111) = .897$, $p = .39$).

Next, we wanted to examine whether students' *prior* online lecture experiences influ-

enced their ratings of lecture format quality. Therefore, we divided the sample into two groups: those who *had* and *had not* experienced the lecture type prior to the current online course (see Table 1). Notably, the number of students who had experience with different lecture formats was very similar across most categories; approximately three fourths of the sample had experienced notes only, slides only, PP + audio, and PP + video (see note in Table 1). However, fewer students (less than half) had experienced audio-only lectures. To determine whether students who had experienced the specific lecture format previously had higher appraisals of its quality (i.e., enjoy-

ment and value to learning), we conducted independent samples *t* tests contrasting those who had experienced that type of lecture format in the past to those who had not. As Table 1 shows, for every lecture format, those who had experienced that format before rated it significantly higher in quality than those who had not experienced it. The effect sizes for these contrasts were large.

We also wanted to see whether students' *concurrent* lecture experiences influenced their ratings of lecture format quality. Therefore, we contrasted the quality ratings of the PP + video and the PP + audio groups. As shown in Table 2, those receiving PP + audio

TABLE 1
Means, Standard Deviations, and Significant Differences for Students' Appraisals of Lecture Format Quality for Those Who Had and Had Not Experienced that Lecture Type

Lecture Format	Had Experienced	Had Not Experienced	<i>t</i> (111)	<i>d</i>
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)		
Written notes	4.21 (0.74)	3.32 (1.05)	4.48**	0.90
PP slides only	4.40 (0.86)	3.21 (1.31)	5.33**	1.19
Audio only	3.84 (1.18)	2.76 (1.22)	4.69**	1.13
PP + audio	4.59 (0.77)	3.54 (1.07)	5.65**	1.07
PP + video	4.52 (0.79)	3.36 (1.13)	5.99**	0.98

Note: Written notes: Had *n* = 77, Had Not *n* = 34; PP slides only: Had *n* = 87, Had Not *n* = 25; Audio only: Had *n* = 50, Had Not *n* = 60; PP + audio: Had *n* = 83, Had Not *n* = 29; PP + Video: Had *n* = 87, Had Not *n* = 25.

***p* < .01.

TABLE 2
Means, Standard Deviations, and Significant Differences for Students' Appraisals of Lecture Format Quality for Those Who Were Currently Receiving the Lecture Type (PP + Audio or PP + Video)

Lecture Format	PP + Audio	PP + Video	<i>t</i> (111)	<i>d</i>
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)		
Written notes	3.86 (0.77)	3.94 (1.05)	-0.43	-0.09
PP slides only	4.17 (0.96)	4.13 (1.13)	0.19	0.04
Audio only	3.06 (1.32)	3.37 (1.31)	-1.17	-0.24
PP + audio	4.69 (0.56)	4.16 (1.06)	3.46**	0.63
PP + video	3.81 (1.18)	4.41 (0.89)	-2.68*	-0.55

Note: PP + audio *n* = 78, PP + video *n* = 35.

p* < .05. *p* < .01.

rated its quality significantly higher than those in the PP + video condition. Similarly, those receiving PP + video rated its quality significantly higher than those in the PP + audio condition. However, the two groups rated the other lecture formats very similarly.

Students' Preferences for Different Lecture Formats

Overall, students' preference ratings were very similar to their appraisals of the quality (enjoyment and learning) of different lecture formats. For the composite preference variable (i.e., "prefer for this instructor" combined with

"prefer for any instructor"), students preferred PP + video the most ($M = 4.20$, $SD = 1.00$), then PP + audio ($M = 4.18$, $SD = .99$), then PP slides only ($M = 3.95$, $SD = 1.23$), notes only ($M = 3.72$, $SD = 1.13$), and finally, audio only ($M = 3.13$, $SD = 1.31$). Pairwise comparisons revealed significant differences between nearly every lecture format *except* for the PP + video and PP + audio ($t(108) = 0.6235$, $p = .81$), and the PP + audio and PP slides only contrast just missed reaching significance ($t(108) = 1.930$, $p = .06$).

As with quality ratings, students' preferences also appeared to be influenced by their prior and concurrent exposure to the lecture format. Table 3 shows that students with prior

TABLE 3
Means, Standard Deviations, and Significant Differences for Students' Preferences for Lecture Formats for Those Who Had and Had Not Experienced That Lecture Type

Lecture Format	Had Experienced	Had Not Experienced	$t(111)$	d
	$M(SD)$	$M(SD)$		
Written notes	3.97 (1.05)	3.26 (1.08)	3.19**	0.67
PP slides only	4.21 (1.05)	3.02 (1.44)	3.68**	0.96
Audio only	3.63 (1.11)	2.76 (1.31)	4.07**	0.72
PP + audio	4.38 (0.90)	3.61 (1.03)	3.79**	0.80
PP + video	4.39 (0.92)	3.63 (1.06)	3.60**	0.77

Note: N s for these groups are shown in Table 1.

** $p < .01$.

TABLE 4
Means, Standard Deviations, and Significant Differences for Students' Preferences for Lecture Formats for Those Who Were Currently Receiving the Lecture Type (PP + Audio or PP + Video)

Lecture Format	PP + Audio	PP + Video	$t(111)$	d
	$M(SD)$	$M(SD)$		
Written notes	3.48 (1.24)	3.82 (1.07)	-1.44	-0.29
PP slides only	3.97 (1.19)	3.95 (1.26)	0.09	0.02
Audio only	2.91 (1.41)	3.23 (1.27)	-0.18	-0.24
PP + audio	4.49 (0.75)	4.05 (1.05)	2.20*	0.48
PP + video	3.85 (1.09)	4.36 (0.92)	-2.50*	-0.51

Note: PP + audio $n = 78$, PP + video $n = 35$.

** $p < .01$.

experience with that lecture format were more likely to prefer that format (with *this* and *any* instructor). With regard to concurrent lecture experiences, as Table 4 shows, students' preferences for lecture type (for *this* and *any* instructor) were greatly influenced by the lecture format they received in their own course. Those who had experienced PP + audio in their current course preferred this format to all of the others, and those who had experienced PP + video in their current course preferred this format to all of the others. Moreover, the differences between the group means (PP + audio and PP + video) were significantly different only for the lecture formats they received in their respective courses. In other words, their experience of PP + audio or PP + video in their current course did not appear to influence their preferences for the other types of lecture formats, only their own.

DISCUSSION

Online course delivery, though a burgeoning phenomenon, is still relatively new on the higher education scene. Thus, not surprisingly, empirical research on the most effective structural components of online course delivery is still in its infancy. However, empirical study of the granular issues of online course design is important to help guide administrators and educators in the creation of online courses. Therefore, in this study, we examined one important component of online course delivery—lecture formats—focusing on students' perceived learning from and preferences for different types of online lectures with consideration for the mere exposure phenomenon.

Overall, students believed online lectures were helpful to their learning, and that they contributed to their learning through a variety of different ways (e.g., reinforcing book concepts and providing instructor's expertise). This was an important preliminary finding, because students' appraisals of the quality of different lecture formats would be somewhat

meaningless if they did not feel that online lectures were valuable to their learning.

Once we established that students felt that online lectures were useful learning tools, we then examined whether there were any differences in students' appraisals of different types of lecture formats in terms of their enjoyment of or perceived learning from the different lecture types. The results were fairly consistent: Students rated online lectures including both audio and visual components (PP + audio and PP + video) more highly than lectures containing audio-only (e.g., iTunes audio lectures) or visual-only components (PP slides or notes only). These results were not surprising. Previous researchers (e.g., Dey et al., 2009; Guerrero & Miller, 1998; Skylar, 2009) have not even considered those other, less media-rich lecture formats (e.g., audio only or visual-only), presumably because these formats may not allow instructors to communicate immediacy cues, such as warmth, expressiveness, and general involvement. Additionally, as Mayer (2001) and Paivio (1986) suggest that information conveyed to both the audio and visual channels will be most beneficial to learning, it is not surprising that students rated these formats (with both audio and visual) most valuable to their learning.

Although students rated the media-rich formats more highly than the less media-rich formats, there were no significant differences between students' ratings for the PP + audio and PP + video formats, and students rated both formats quite highly. These similar, high ratings suggest that instructor immediacy cues like warmth, expressiveness, and general involvement may have been present in both formats. Although these immediacy cues were not examined specifically in this study, previous research (Guerrero & Miller, 1998) has shown that these are the types of cues that may relate to students' positive appraisals. At the very least, these similar, high ratings suggest that either lecture format (PP + audio or PP + video) could be used successfully to deliver content within online courses, and that one format is not consistently better than the other.

That said, the most notable contribution of this study is the finding that students' ratings of quality and preferences for different types of lecture formats were influenced significantly by their previous and concurrent lecture experiences. Those who had previously had the lecture format in an online course rated it much higher than those who had not previously had the lecture format. The effect sizes were strong for every lecture format, which suggests that mere exposure (Bornstein, 1989) is more important in shaping students' online lecture preferences than any inherent differences between the lecture formats. Students' quality ratings and preferences were also shaped by their concurrent experiences: Students in the PP + audio classes preferred the PP + audio format, whereas the students in the PP + video classes preferred the PP + video format. These were the only significant differences between the two groups; their appraisals of the quality and preferences for the other online lecture formats did not differ significantly. Again, exposure to the online lecture format appears to have a strong influence on student appraisals and preferences.

Limitations and Conclusions

As with all work conducted in natural educational settings, our study has limitations that affect the interpretation and generalizability of the findings. First, we did not measure actual student learning, but rather students' perceptions of their learning and their preferences. Because the courses were at different levels, taught by different instructors, in different disciplines, comparison of grades or other assignments would be difficult. This is a well-known downside of this type of research, and those wishing to explore differences in actual learning outcomes across the different lecture formats might design an experimental study to explore actual learning outcomes. Second, students in English and psychology were the participants in these studies; hence, their appraisals of quality and preferences for different types of lecture format are likely affected

by their previous exposure to these lecture formats in both face-to-face and online classes, classes in which PowerPoint presentations are probably common. Therefore, these results may not generalize to other disciplines, especially those in which PowerPoint presentations are not typically used for lectures in face-to-face classes. Finally, it is not possible from the present study to determine to what extent student preferences for the richer lecture formats (involving both audio and video) derive from a desire for a stronger sense of the teacher as a person (instructor presence hypothesis), or a desire to receive information through two senses (audio and visual) (dual coding hypothesis), or the mere exposure effect. Future, experimental studies should address this issue systematically.

Limitations aside, the results of this exploratory study provide practical guidance for both instructors and researchers. If a course is well organized, students will likely develop positive feelings about the course, *including* the presentation format for the lecture material. However, students do have preferences, and, all else being equal, they clearly prefer richer formats that engage both audio and visual channels. More specifically, PowerPoint lectures with either audio or video appear to be the formats favored by this cohort of students, perhaps because these formats allow for more immediacy cues, or perhaps because these formats align best with their previous online and face-to-face classroom experiences. With regard to guidance for researchers, our study shows that mere exposure is a strong effect, and it should be considered in future research examining the effectiveness of different types of educational methods. One way to harness this effect for the benefit of students might be to use similar methods of online lecture delivery across or within disciplines.

REFERENCES

- Allen, E., & Seaman, J. (2010). *Class differences: Online education in the United States, 2010*. Needham, MA: Sloan Consortium.

- Bernard, R. M., Abrami, P. C., Borokhovski, E., Wade, C., Tamim, R. M., Surkes, M. A., & Bethel, E. (2009). A meta-analysis of three types of interaction treatments in distance education. *Review of Educational Research*, 79, 1243-1289. doi:10.3102/0034654309333844
- Bernard, R. M., Abrami, P., Lou, C. Y., Borokhovski, E., Wade, A., Wozney, L., & Huang, B. (2004). How does distance education compare with classroom instruction? A meta-analysis of the empirical literature. *Review of Educational Research*, 74, 379-439.
- Bornstein, R. F. (1989). Exposure and affect: Overview and meta-analysis of research, 1968-1987. *Psychological Bulletin*, 106, 265-289.
- Borup, J., West, R. E., & Graham, C. R. (2012). Improving online presence through asynchronous video. *Internet and Higher Education*, 15, 195-203.
- Carle, A. C. (2009). Evaluating college students' evaluations of a professor's teaching effectiveness across time and instruction mode (online vs. face-to-face) using a multilevel growth modeling approach. *Computers & Education*, 53, 429-435.
- Dey, E. L., Burn, H. E., & Gerdes, D. (2009). Bringing the classroom to the Web: effects of using new technologies to capture and deliver lectures. *Research in Higher Education*, 50, 377-393.
- Drouin, M., & Vartanian, L. (2010). Students' feelings of and desire for sense of community in face-to-face and online courses. *Quarterly Review of Distance Education*, 11, 147-159.
- Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: computer conferencing in higher education. *Internet and Higher Education*, 2, 87-105.
- Garrison, D. R., Cleveland-Innes, M., & Fung, T. S. (2010). Exploring causal relationships among teaching, cognitive and social presence: Student perceptions of the community of inquiry framework. *Internet and Higher Education*, 13, 31-36.
- Griffiths, M. E., & Graham, C. R. (2009). The potential of asynchronous video in online education. *Distance Learning*, 6(2), 13-22.
- Guerrero, L. K., & Miller, T. A. (1998). Associations between nonverbal behaviors and initial impressions of instructor competence and course content in videotaped distance education courses. *Communication Education*, 47, 30-42. doi:10.1080/03634529809379108
- Joo, Y. J., Kim, K. Y., & Kim, E. K. (2011). Online university students' satisfaction and persistence: Examining perceived level of presence, usefulness and ease of use as predictors in a structural model. *Computers and Education*, 57, 1654-1664.
- Kelly, H. F., Ponton, M. K., & Rovai, A. P. (2007). A comparison of student evaluations of teaching between online and face-to-face courses. *The Internet and Higher Education*, 10, 89-101.
- LaRose, R., & Whitten, P. (2000). Re-thinking instructional immediacy for Web courses: A social cognitive exploration. *Communication Education*, 49, 320-338.
- Mehrabian, A. (1966). Immediacy: An indicator of attitude in linguistic communication. *Journal of Personality*, 34, 26-34.
- Mayer, R. E. (2001). *Multimedia learning*. New York, NY: Cambridge University Press.
- Moore, A., Masterson, J. T., Christophel, D. M., & Shea, K. A. (1996). College teacher immediacy and student ratings of instruction. *Communication Education*, 45, 29-39.
- Paechter, M., & Maier, B. (2010). Online or face-to-face? Students' experiences and preferences in e-learning. *Internet and Higher Education*, 13, 292-297.
- Paivio, A. (1986). *Mental representations: a dual coding approach*. Oxford, England: Oxford University Press.
- Parsad, B., Lewis, L., & Tice, P. (2008). *Distance education at degree-granting postsecondary institutions: 2006-07*. Washington, DC: National Center for Education Statistics Institute of Education Sciences. Retrieved from <http://nces.ed.gov/pubs2009/2009044.pdf>
- Russell, W. (2001). *The no significant difference phenomenon* (5th ed.). Chicago, IL: International Distance Education Certification Center.
- Shea, P., & Bidjerano, T. (2009). Community of inquiry as a theoretical framework to foster "epistemic engagement" and "cognitive presence" in online education. *Computers and Education*, 52, 543-553.
- Singh, A., Mangalaraj, G., & Taneja, A. (2010). Bolstering teaching through online tools. *Journal of Information Systems Education*, 21, 299-311.
- Skylar, A. A. (2009). A comparison of asynchronous online text-based lectures and synchronous interactive web conferencing lectures. *Issues in Teacher Education*, 18, 69-84.
- Swan, K. P. (2003). Learning effectiveness: What the research tells us. In J. Bourne & J. C. Moore (Eds.), *Elements of quality online education*,

- practice and direction* (pp. 13-45). Needham, MA: Sloan Center for Online Education.
- Sweller, J., Chandler, P., Tierney, P., & Cooper, M. (1990). Cognitive load as a factor in the structuring of technical material. *Journal of Educational Psychology: General*, 119, 176-192.
- WICHE Cooperative for Educational Technologies. (2010). NSD: No significant difference. Retrieved from <http://www.nosignificantdifference.org/>