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OPTIMIZING STUDENT LEARNING: EXAMINING THE USE OF PRESENTATION SLIDES

Judy Strauss, Hope Corrigan, and Charles F. Hofacker

Sensory overload and split attention result in reduced learning when instructors read slides with bullet points and complex graphs during a lecture. Conversely, slides containing relevant visual elements, when accompanied by instructor narration, use both the visual and verbal channels of a student's working memory, thus improving the chances of increasing knowledge in long-term memory and assisting the over 40 percent of students who are visual learners. Applying cognitive processing and constructivist learning theories, this paper contains best-practice sample slides for motivating student interest, relating a topic to previously learned material, creating an environment for student knowledge cocreation, and assessing learning.

The chalkboard dominated the front of the classroom for most of the nineteenth and twentieth centuries. Now its day is past, at least in the marketing classroom, where 80 percent of marketing faculty use some form of presentation software (James, Burke, and Hutchins 2006). Faculty often rely on ad hoc methods to generate lecture slides, either borrowing slides from the book publisher or typing bullet points one slide at a time without much forethought as to what is known about student learning, encouraging student participation, conveying key lecture points, or learning assessment. Given the ubiquity of presentation software, even a modest improvement in classroom slide practice could go a long way toward improving marketing student education. The goal of this paper, however, is somewhat more ambitious. In this paper, we review much of what is known about the use of presentation software and attempt to provide a one-stop guide for faculty who wish to improve student learning and interaction using presentation software such as Microsoft's PowerPoint, Apple's Keynote, or OpenOffice's Impress.

Presentations using slides in general have been almost universally maligned. Below we briefly refer to some of the criticisms that have been directed at this teaching tool and review what the current academic literature has to say about current slide presentation practices. Next, we do a deeper examination of education and psychology theory to discover ways that marketing faculty can optimize learning effectiveness using presentation slides in the classroom. The literature highlights three critical theories, which lead to the next three sections of this paper: multimedia information processing, learning styles, and constructivist learning. Subsequently, the paper outlines a stepwise approach to generate improved slides in a manner consistent with these three theories. Finally, the paper provides the reader with some sample slides that illustrate the slide design approach raised in this paper.

CURRENT SLIDEWARE PRACTICE

There is broad dissatisfaction with the use of presentation slides, both inside and outside the classroom (Few 2004; Levasseur and Sawyer 2006; Reynolds 2008). Much of the criticism centers on how slides redirect attention in the classroom, if for the most part accidentally, shifting the nature of classroom from communication and interaction to enabling students to become passive audience members (Clark 2008). Pauw argues that using PowerPoint slides in the classroom creates a "disembodied, decontextualized learning environment" (2002, p. 40). Marketing instructors are not immune to such criticisms—only 27 percent of students found the use of slide presentations to be interesting and fresh in their business classes (Burke and James 2008). Many professors and business professionals equate best practice with bells and whistles (such as animation and sounds), slides crammed with text, and complex tables and

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Table 1
Popular Advice for Improving Presentation Slides

Key Recommendation	Source
Emphasize relevant images, tables, and graphs	Mayer (2001); Tufte (2001)
Do not read your slides	Ludwig (2005); Mayer (2001); Vik (2004)
Slide titles should use complete sentences	Alley and Neeley (2005)
Focus on audience motivation	Ludwig (2005)
Use a story structure to create slides	Atkinson (2007)
Slide show should have low density	DuFrene and Lehman (2004); Godin (2001)
Keep presentations short	Kawasaki (2005)
Keep type sizes large	Alley et al. (2006); Kawasaki (2005); Vik (2004)
Keep animation simple and relevant	Vik (2004)
Create a style guideline	DuFrene and Lehman (2004); Few (2004)

graphs that unfortunately reduces the amount of time that faculty/presenters have available to think about creating a learning environment in the classroom (DuFrene and Lehman 2004; Few 2004; Reynolds 2008). This approach also creates distracted, annoyed, and frustrated students; models ineffective presentation practices; and does not achieve a presenter's communication goals with any audience (Reynolds 2008).

The previous criticisms might lead the reader to believe that we are in favor of banning slide presentation software. This is certainly not the case. Slide presentations are clearly an improvement over the old chalkboard and lecture format, and the academic literature describes reasons not to abandon slide presentations. Empirical work by Apperson, Laws, and Scepansky (2008) and James, Burke, and Hutchins (2006) found that students actually like slide presentations. Students say that slides can help create an organized study framework and can help to communicate more detailed examples than might be possible with note taking alone (Ferrell and Ferrell 2002; Levasseur and Sawyer 2006). Lectures presented with slides lead to higher self-reported understanding by students (Burke, James, and Ahmadi 2009; James, Burke, and Hutchins 2006). Students may not be able to judge their own understanding very well (Bjork 1994), so it is important that faculty ground the discussion of using presentation slides on cognitive theory rather than assessment measures. This tool is worth keeping, and there is much room for improvement in current practice.

There is an abundance of resources explaining how to better use presentation slides. Numerous popular trade books as well as rigorous academic articles provide advice for better slide presentation practice. Table 1 summarizes the most common conclusions for improving presentation slides. With this paper, we hope to go beyond these simple recommendations and give marketing instructors guide-lines, based on cognitive learning theory, for creating dynamic presentation slides that improve student learning.

MULTIMEDIA INFORMATION PROCESSING

Cognitive theory provides rich clues for optimizing learning effectiveness from presentations using slides. One classic information processing model proposed by Atkinson and Shiffrin (1968) has been tested, refined, and applied by psychology and education researchers for a better understanding of how students receive, process, retain, and gain meaning from environmental data, including faculty lectures and accompanying slide presentations (Figure 1). One additional refinement to the model is Paivio's (1971) dual coding theory, which proposes that humans have different information processing channels for auditory and visual stimuli. It works like this: in class, students first perceive sounds (e.g., a professor speaking) and images (e.g., pictures, movies, and graphs on a slide) through their sensory registers. Within seconds, assuming attention, these data enter working memory (also called *short-term memory*) through either an auditory or visual channel where the learner, assuming motivation, tries to understand this input using the following three steps: (1) converting the visual image of text on a slide into language (from the image of letters to meaningful words), (2) coordinating the auditory words spoken by the instructor with what is seen on the slide, and (3) drawing from schema and knowledge already stored in long-term memory to find meaning. If all is successful, the learner will integrate the new knowledge into information already present in long-term memory.

After decades of experiments on the capacity of working memory, it is clear that people can process only five to nine chunks of information simultaneously; the rest are forgotten (Chase and Simon 1973; Sweller 1994). This

Figure 1
Cognitive Theory of Multimedia Learning (After Atkinson and Shiffrin 1968)
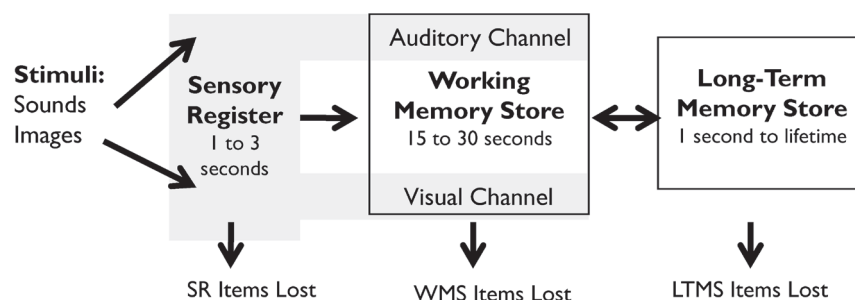
explains the blank stares seen when listeners are overwhelmed with a complex, text-heavy, slide presentation while listening to the speaker at the same time. The size of each "chunk" of information varies by learner. For example, a person might only recall three letters of seven random letters but might recall three three-letter acronyms, such as CIA, that are already stored in long-term memory and brought to working memory for integration with new input (Atkinson 2007). This indicates that students with relevant knowledge in long-term memory can retrieve it for more efficient information chunking in working memory (Sweller, van Merrienboer, and Paas 1998).

It is important to emphasize the very limited capacity of working memory. Typically items are displaced from working memory in a very short time—15 to 30 seconds—unless the learner lengthens the time by actively rehearsing the material (Peterson and Peterson 1959). This prompted Sweller (1994) to propose cognitive load theory and Atkinson (2007) to compare working memory to the eye of a needle: too much auditory or visual stimuli from a multimedia slide presentation, with an instructor reading bullet points, overloads the limited capacity of working memory and reduces learning potential. The following techniques have been empirically shown to minimize cognitive overload, thus optimizing learning effectiveness when giving slide presentations.

Visual Slide Emphasis. Use mostly visual components on a slide along with accompanying instructor narration so that both visual and auditory channels are used and one is not overloaded (Mayer 2001). Similarly, explain complex graphs using the spoken word, not written text, because this makes use of both channels (Leahy, Chandler, and Sweller 2003).

Relevant Visuals. Focus student attention by removing interesting but extraneous information or unrelated visuals from slides (Atkinson 2007; Mayer and Moreno 2003). Graphics that are pretty but not completely relevant to the

key points take more cognitive processing time as a student tries to relate them to the text in working memory.

Full Sentence Titles. Focus student attention and lower cognitive processing time by using full sentence slide titles that clarify the key points, rather than fragments or category headings that need additional processing because they take time to read but do not add much to meaning. Note that Alley and Neeley (2005) found an 11 percent improvement on test scores with full sentence headings.

Spacing and Timing. Segment learning by spacing the information chunks and delivery timing in order to give students time to process (Mayer and Moreno 2003).

Chunking. Separate complex concepts into smaller chunks for easier processing and better integration with schema from long-term memory (Atkinson 2007; Sweller, van Merrienboer, and Paas 1998).

Relating. Help students draw from their preexisting long-term memories by providing relationships between new and previously learned material (Sweller 2004). Use slides that help students rehearse and deeply process information, thus increasing their integration with long-term memory (Sweller, van Merrienboer, and Paas 1998).

The Lecture. Reading bullet points contributes to cognitive overload because students are converting the text on the slides into meaningful words and also trying to synchronize this with the instructor's words in the auditory channel while viewing bullet points (Mayer and Moreno 2003; Sweller 1999).

DIFFERENT STUDENTS HAVE DIFFERENT LEARNING STYLES

The "CIA" example illustrates that not all students experience the same cognitive loads with all materials. In addition, it has long been known that different people have different ways of learning, a subject variously referred to as "cognitive style" or "learning style" (see Karns 2006). Most faculty

are well versed in the idea that individual learners prefer auditory, visual, or kinesthetic learning styles (Levasseur and Sawyer 2006), and that effective teaching supports each style. This body of research indicates using visual slide components with instructor lecture or audiovisual material for aiding all learners. In a lesser-known schema, one group of learners can be said to be holistic. These students make a global and immediate judgment of lecture input and tend to be informal and creative (Allinson and Hayes 1996). Another group, said to be analytic, waits to judge pending the outcome of more formal and critical reasoning on their parts (Allinson and Hayes 1996). Based on a review of several empirical studies on holistic/analytical learning, Riding (1997) provides specific advice in terms of this important holistic/analytic distinction. According to Riding, while analytics are able to deduce a structure and organize material on their own, holistics do better when structural clues, such as slide titles, are given. Since structural aids do not hurt analytics, Riding suggests that such aids always be included. In terms of slides, this means that holistics need clues as to the overarching structure of the lecture and help in terms of how and where each slide fits into the topic being presented.

Riding (1997) also discusses another important learning style distinction, namely, the difference between imagers and verbalizers. Each group learns best depending on its preferred information processing channel (recall Paivio's 1971 dual coding theory) so each has a different ideal presentation mode: pictorial or textual. Because presentation without words is not possible, but a presentation without images is possible, this suggests that imagers are often shortchanged in lecture slides. In addition to adding images, visually descriptive text can help imagers.

Visual images have another key role to play in imparting concepts. Alley and Neeley (2005) point out that text bullet points do not allow the student to see relationships among those points. They recommend that slides contain a headline along with a slide body that presents evidence to support that headline in a visual form. Images, graphs, or visual arrangements of text and arrows resembling causal or schematic diagrams were mentioned. In order not to unduly add to the cognitive load of the students, these images need to be relevant to the text (Bartsch and Cobern 2003) and coherent with it (Levasseur and Sawyer 2006) as previously discussed.

Providing students with a changing sequence of novel and relevant visual material can lead to positive educational outcomes (as opposed to overused clip art drawings). Burke and James (2008) cite a body of research supporting the benefits of novelty in terms of the amount and depth of processing, attention, interest, and recall. Novelty can also increase the level of arousal and thereby student attention. Unfortunately, it is possible to have too much arousal (Lang, Potter, and Bolls 1999) so once again, simulation needs to be relevant.

Another potential negative consequence of too much stimulation in a slide presentation accompanied by a lecture is a loss of "teacher immediacy" and lower student–teacher interaction (Levasseur and Sawyer 2006). Teacher immediacy includes nonverbal behaviors such as facial expressions, posture, and body language that can help to stress key points and keep students engaged. Instructors want students to be involved recipients of presentation materials and not be distracted with the exciting visual sensory input. Students need to be active participants in their own learning.

CONSTRUCTIVIST LEARNING: STUDENTS NEED TO PARTICIPATE TO LEARN

Education has moved from a focus on instructor teaching to student learning. This change can be called "student-centered teaching," or in the words of Barr and Tagg (1995), the "learning paradigm." Although Barr and Tagg did not directly address presentation slides, their point was that the goal of classroom activity is to create learning, and learning requires coproduction on the part of the student.

Marketing researchers have learned that consumers do not retrieve their choices; they construct those choices (Bettman, Luce, and Payne 1998). Analogously, in the learning constructivist view, the student cannot passively receive knowledge through some sort of instructional "pipeline," but must undergo an active process of constructing it (Cunningham, Duffy, and Knuth 1993). Ideal slides create a classroom environment that can nurture the active construction of student knowledge. Cunningham, Duffy, and Knuth (1993), while not addressing slides per se, made the notion of constructivist learning more concrete by supplying seven goals for creating an active classroom environment. These goals make an ideal basis for talking about slide design, as described in Table 2.

PUTTING THEORY INTO PRACTICE

It is common for marketing faculty either to write a lecture using bullet points, one slide at a time, or by editing the textbook publisher's slide sequence and content. Neither of these techniques allows for effective application of the

Table 2
Goals for Slide Design

Goal	Reasoning
Provide experience with the knowledge construction process	Students need to ask questions, not just provide canned answers to questions raised by instructors. Effective slides will motivate student questions, which will start the knowledge construction process.
Offer experience in and appreciation for multiple perspectives	Students should help provide alternative points of view that can then be compared analytically. A slide could prompt opinions.
Apply learning in realistic and relevant contexts	Slides can be used to present mini-cases or real-world examples with visual details.
Encourage ownership and voice in the learning process	Rather than tell students how they are going to learn, slide sets might provide various routes that cover slightly different materials. The instructor could then let students decide or have a voice in what route is taken and therefore what they will learn.
Embed learning in social experience	Dialog and social interaction are great learning strategies, and slides should trigger these.
Implement multiple modes of representation	This point reinforces the idea that instructors should use both verbal and visual modes of interaction with students, and slides can be enhanced to play a visual role. Similarly, students could be assigned the task of providing visual slides to share.
Support self-awareness of the knowledge construction process	Slides could be prepared about the class itself and the process that the class is going through or has gone through in learning. These slides could help students become more reflective about the process of learning and to be better managers of their information-processing capacities.

common conclusions from the literature for improving slide presentations (Table 1) or for applying information processing theory or constructivist learning as described above. Burke, James, and Ahmadi warn, "Be cautious in using the preexisting slides provided by the publisher, as some slide sets simply replicate textbook examples or limit text content to key headings and subheadings" (2009, p. 250). Instead of using either of these two techniques, below we boil down the best practices as described in the literature, buttressed by the theory presented earlier.

Creating a New Slide Presentation

Before opening presentation software to create a new slide deck, it is important to decide on what is to be accomplished in a particular class session. Using presentation slides is only one communication method to achieve learning goals. Table 3 displays many possible class session goals along with their appropriateness for slide presentations.

The slide show construction process begins only once the instructor decides that presentation slides are appropriate for what will be accomplished in a particular class meeting. Many practitioners suggest using a story format with a beginning, middle, and end (e.g., Atkinson 2007; Vik 2004). A story might start with an attention-getting slide that motivates learning such as a marketing problem, video, case, or provocative question. Then to introduce the topic,

a visual summary slide or handout will show the connection to previously learned concepts, possibly from earlier in the semester, a prerequisite course, or other sources of long-term memory. The following slide might include an agenda of the presentation—to assist holistic learners. The next slides introduce or clarify concepts and provide support for activities that apply the concepts from assigned readings, videos, cases, and so forth. The University of Minnesota Center for Teaching and Learning (2009) recommends doing an interactive activity every ten minutes in a slide presentation. Slides for learning assessment can occur throughout the presentation (as in the clicker response slides) or at the end of the substantive content. Finally, end the story by asking students to connect the information with what they already know or to summarize the main points from the class session. This can be done by asking students to use the presentation material to solve a problem posed in the opening slide.

We advocate adopting an outcome-oriented process, such as that suggested by Atkinson in *Beyond Bullet Points* (2007). Atkinson recommends that the presentation author start in the Slide Sorter view option of Microsoft's PowerPoint and work out the story outline, deciding where to transition to different topics. He suggests printing a blank set of slide handouts and using paper and pencil to fill them in. Conversely, one can use paper Post-it® notes on the wall so they can be rearranged or an outline in a standard word

Table 3
Preparing Slide Sequences

Class Session Goal	Appropriate for PowerPoint?	Rationale
Class Organization Housekeeping	No	Announcements better done as narration because if put in a slide it results in reading slides and the need to change for each semester/each class section.
Sell/Motivate, Transfer Topic Passion	Yes	Can include provocative questions or links to multimedia.
Connect Topic with Knowledge in Long-Term Memory	Yes	Slides can show basic concept relationships with previously learned material while visual summary handouts (Clarke, Flaherty, and Yankey 2006) can be used for more complex connections.
Disseminate Lengthy Information	No	Large amounts of information are not appropriate for slides but better distributed as handouts.
Disseminate Short Information	Yes	Can easily be included on a slide with relevant visuals using learning theory principles.
Clarify Concepts	Yes	Can be used to prompt discussion or application activity.
Constructivist Learning	Yes	Slide, handout, or words on whiteboard can draw students into evaluation and questioning modes.
Evaluate Learning	Yes	Clicker response–type slides evaluate knowledge; other more provocative questions can evaluate higher levels of learning.
Model Good PowerPoint Presentations	Yes	Students need to learn how to give good presentations, and they are learning by watching the instructor's slide shows.

processing program. Open the slide presentation and begin by writing the notes pages that will be your narration to communicate the desired topics, or by copying and pasting from the Word document. Finally, go to the Normal slide view and think about how to make very visual slides with a relevant image and a full sentence title that will convey a unified meaning. Each slide functions as a supporting visual aid for the narration. Recall that students learn better from coordinated visual and verbal input and that irrelevant visuals create cognitive overload (Atkinson 2007; Paivio 1971).

This procedure will likely produce slides that achieve classroom learning goals, as opposed to a procedure that simply reproduces textbook figures and definitions. Two final notes: first, try publishing the presentation to Microsoft Word as thumbnail slides with accompanying notes pages. This way you will have notes in hand during class. Second, if instructors desire to post slides for the students online or hand them out in class, it is perhaps better to use a version without the instructor notes so that students can construct their own notes during class.

Example Slides

This section provides marketing faculty with five examples of slides that effectively illustrate the theories and styles previously described. The slides in this section focus on the topic of market segmentation to help the reader visualize the implementation of an opening slide, a summary slide, a pair of constructivist slides, and an assessment slide.

Opening Slide

Figure 2 is an example of an opening slide for a class meeting on segmentation. The slide has a complete sentence title, relevant images, and a large type size (36 points) as would be consistent with the advice in Table 1. The title of the slide describes a marketing problem and gets the class thinking: Why target the kids and fifty-plus markets? The two photographs (from Microsoft Office Online Clip Art), one of young children and one of senior women, were chosen to stimulate interest and provide traditional-age students with the opportunity to consider consumers who are different than themselves. These two age groups were also selected because they each need their own communication strategies and both segments are rapidly growing.

The reader will also notice what is not included in this opening slide. There are no bullet points, distracting backgrounds, or animation (Alley and Neeley 2005). The slide is simple and provides the minimum visual stimuli (Clark 2008). Without bullet points, the instructor will not be tempted to read from the slide. This will lessen any problem of overwhelming the audience with simultaneous visual and auditory stimuli. Other ways to keep the opening slide

Why Target the Kids and Fifty-Plus Markets?

interesting and engage the student's attention are to link to a photograph, video, music, or film clip.

Visual Summary Slide

Visual summary slides use diagrams to show students the connections among concepts. Detailed visual summaries distributed as handouts during lectures have been shown to increase exam scores and overall satisfaction with the professor (Clarke, Flaherty, and Yankey 2006). Clarke, Flaherty, and Yankey (2006) found that visual summaries work well for most marketing topics, but are especially effective for thematic topics such as segmentation, pricing, and the marketing mix. Alley and Neeley (2005) also suggest the importance of letting students see causal relationships among concepts.

When the visual summary includes previously learned concepts, it will help students retrieve previous knowledge from long-term memory to more efficiently integrate the new concepts from working into long-term memory (Atkinson 2007). Visual summaries are structural aids that will likely enhance knowledge for holistic learners (Riding 1997). This type of slide will also aid the more than 40 percent of college students who are visual learners (Clarke, Flaherty, and Yankey 2006) and not pose any problems for the remainder.

Figure 3 displays a visual summary slide to relate concepts at the beginning of a market segmentation lecture with consumer behavior material from an earlier class or chapter (Sweller, van Merrienboer, and Paas 1998). This slide uses the bicycle market (images from Microsoft Office Online Clip Art) as an example and connects previously learned consumer behavior knowledge with the soon-to-be-discussed segmentation and target market selection topics. The instructor could ask students to recall consumer decision-making criteria and then use these criteria to identify homogeneous segments and select the best target audience for either leisure or off-road bicycles.
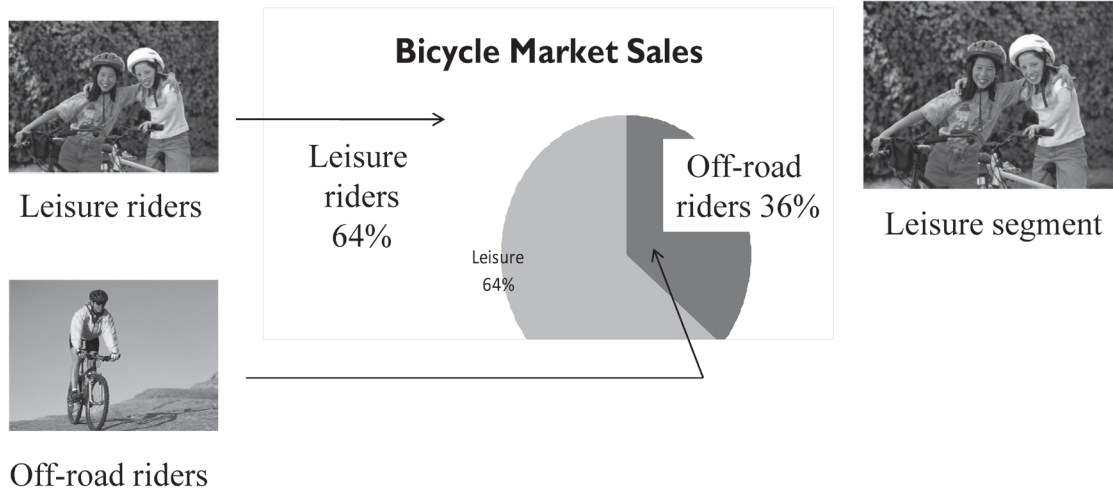
Constructivist Slides

Marketing faculty who want to actively engage students in the classroom can do so by incorporating what we call "constructivist slides" to encourage student coproduction and the active construction of knowledge (Cunningham, Duffy, and Knuth 1993). Figure 4 shows a slide that includes a dozen different people (from Microsoft Office Online Clip Art) pursuing a favorite hobby or interest. The professor could show this slide and ask students to brainstorm (individually, in pairs, or in groups) all the variables that can be used to segment this sample and calculate the percentage in each segment. Students should be given enough time to

Figure 3
Visual Summary Slide

Segmentation is based on consumer behavior and provides information to select the most valuable target.

1. Consumer behavior ➡️ 2. Market segmentation ➡️ 3. Target market

Leisure riders

Off-road riders

Bicycle Market Sales

Leisure riders 64%

Leisure 64%

Off-road riders 36%

Leisure segment

process their responses (Mayer and Moreno 2003). A dozen people were chosen for this slide so that there would be multiple ways to segment the sample.

Students could generate several approaches to arrange and segment this sample. When the class describes how they sorted the people in the market, a list of student-generated segmentation bases will emerge that likely includes age, gender, race, hobbies, location, and so forth. Some students will hesitate and ask the professor for more information about these 12 individuals to further segment the market. As the facilitator for this exercise, your answer is a question: What information would be valuable for marketers to know about these people? Now the students are constructing their own knowledge. This exercise encourages students to ask questions and assemble other criteria marketers use to divide the market based on their prior knowledge, courses, or work experience. Students would also be able to learn from the responses provided by their peers. This example gives students the opportunity to actively construct the knowledge surrounding segmentation bases as opposed to taking a passive role of listening as the professor lists the ways to segment the market (King 1993).

A second example of a constructivist slide uses a "think-pair-share" cooperative learning technique to involve students. Introduced by Frank Lyman (1981), think-pair-

share is a structured discussion process done in pairs. It was found to be more effective than tasks done individually in an English as a second language word-building exercise experiment conducted by Baleghizadeh (2010). Think-pair-share employs three stages of student action. During the first stage, the professor asks a question and all the students are given a few moments to quietly think about a response (and possibly write down notes). During the second stage, students are paired up with a partner (this could be random or assigned by the professor). This stage has students rely on each other and cooperatively explain ideas to develop a response. During the third stage, the professor asks pairs to share their answers with the rest of the students (Jones 1981).

Figure 5 shows a slide designed to analyze the segmentation strategy for a favorite magazine. This slide includes a blank table, the marketing problem as the title, and a relevant graphic of two girls reading a magazine together (from Microsoft Office Online Clip Art). This slide works well as a guide for an in-class exercise to reinforce a lecture or reading about segmentation and could be adopted with other art to refer to Web sites or other activities. This version of the exercise asks students to consider a favorite magazine and evaluate how its readers can be classified. Each student would have a worksheet that includes the

Figure 4
Constructivist Slide—Consumer Segments

How could this group of people be organized into market segments?

same blank table seen in the slide. After several minutes of working independently (think), students would be grouped (pair) by type of magazine selected. Students that picked a sports magazine, fashion magazine, news magazine, and so on would work together for another ten minutes to fully complete the table for each type of magazine. Last, a person from each group could present their team's segmentation findings to the rest of the class (share). This type of exercise is realistic and relevant for students because they each have a favorite magazine to bring to the activity. It is also a social experience for students because they learn about their peer's interests that are often different from their own. The table format also can help students break the complex topic of segmentation into smaller chunks of information. Each of the segmentation bases can be addressed separately better matching the capacity of students' working memories. The blank table in the slide can be used as a study guide when students are reviewing the material to prepare for a quiz or exam (Sweller, van Merrienboer, and Paas 1998).

There are many other ways to prepare slides that will encourage students to construct knowledge. One final suggestion included here is to have students read an article, examine an advertisement, visit a Web page, or study a photograph or a billboard and then list the strengths and weaknesses of the reviewed material in terms of reaching the target segment. A follow-up question could ask students to improve the reviewed material to better communicate with potential customers.

There is a two-pronged debate about whether or not to post slides online for student access: Does it help them on exams and does it keep them from coming to class? (Clark 2008). A constructivist approach to creating slides makes this argument moot; with simple slides, the student adds the meaning and value through active in-class learning. Some instructors may post the slides along with the notes pages of narrative. Even so, this online content would still be incomplete because the student only gains the interactive part by attending class.

Learning Assessment Slides

Now that the instructor has built excitement and the students have deeply explored market segmentation, it is time to evaluate: What has the student learned and can he or she apply this knowledge? Instructors can use a simple multiple-choice slide to assess student knowledge acquisition, an open-ended question requiring writing to assess concept application, or a higher learning activity, as shown

Figure 5
Constructivist Slide—Favorite Magazine

What characteristics of the target audience are important to magazine publishers?

Segmentation Bases	Characteristics for Your Favorite Magazine
Demographic	
Geographic	
Socioeconomic	
Psychographic	
Benefits sought	
Usage rate	

Figure 6
Assessment Slide

Which type of restaurant would have the best chance of success in this zip code: full service, family, or quick service?

in Figure 6. To begin, each student is given the neighborhood segmentation characteristics for the university's zip code (the free report version from either Esri's Tapestry Segmentation or Claritas's Prizm) that describes the population by race, gender, household income, interests, and buying preferences. Based on these demographic variables and consumer behavior characteristics for the local zip code, students are asked, "If you were a restaurant owner, which type of restaurant, full service, family, or quick service, would have the best chance of success in this zip code?" The response should be outlined according to the segmenta-

tion bases used for the previous favorite magazine in-class exercise. The slide for this learning assessment includes the marketing problem question as the title and three relevant images that illustrate the tiers of the restaurant industry (from Microsoft Office Online Clip Art). This assessment thus relates to the previous class activity and asks students to actively retrieve and apply concepts previously learned to a new situation—a high-level learning assessment.

There are many other ways to use presentation slides to assess student learning in addition to the open-ended mini case described in the previous paragraph. A slide including

a table with empty cells, similar to the blank table in the favorite magazine slide (see Figure 5), could be used as a quiz or graded class work. A clicker response slide, where students see a multiple-choice question and select their answer using a response clicker, can be used to measure student learning in a large lecture hall.

IMPLICATIONS AND RECOMMENDATIONS FOR MARKETING INSTRUCTORS

Slide presentation software is here to stay. In contrast to current use among many instructors, such software can be used as a powerful tool to improve teaching effectiveness. In this paper, we emphasized student information processing, learning styles, and constructivist learning. These three notions can guide instructors as they prepare slides to include titles, images, and text to support the marketing topic and optimize classroom interaction and student learning.

Be wary of slides that are only bullet lists, too complex, or contain distracting material. Yes, it might require a bit more preparation time on the part of the professor, but it keeps the classroom a more interactive experience, for motivating students about a topic, exploring concepts, applying knowledge, and assessing learning.

Six summary recommendations for practical in-class use and future research to improve presentation slides used by marketing faculty are provided below:

1. Use a proven process for slide presentation creation. Begin with the learning objectives, think about how to develop a story in slides, write the narration, and then create slides that support the presentation.
2. Create highly visual slides with full sentence titles. Cognitive processing theory demonstrates the need to throw out bullet points in favor of slides that use both verbal and visual pathways into working memory.
3. Create slides that encourage the construction of learning on the part of students. Instead of disseminating information by reading slides during a lecture, use precious class meeting time to apply knowledge and engage students as knowledge coproducers.
4. Create a quality slide repository. Each semester hundreds of marketing instructors redundantly create slides for illustrating market segmentation as well as other marketing topics. Rather than working in isolation, a repository of good slides could be shared to save time and improve the quality of marketing education. In today's networked world where students can exchange papers and test answers, marketing professors could surely exchange slides.
5. Find great images for your slides. There are many sources of free images, such as the Microsoft Office Online Clip Art collection used in the examples in this paper. As long as the clip art is relevant and adds to the slide meaning, it will enhance learning. Other sources of noncopyrighted images include links to live Web pages and videos, government works, images in the public domain, digital images with no copyright protection, and pictures you take with your own camera. Try Flickr (www.flickr .com) (among others), which offers royalty-free images. For copyrighted images, consult the Fair Use law for educational use at www.copyright.gov.
6. Finally, regarding future research on slide presentations in marketing classrooms, we recommend that the type of presentation be considered when measuring student attitudes or presentation effectiveness. A presentation using the techniques in this paper might well receive different results than one using bullet-point-heavy content. In future research, we recommend empirical testing that compares these two formats.

REFERENCES

Alley, Michael, and Kathryn A. Neeley (2005), "Rethinking the Design of Presentation Slides: A Case for Sentence Headlines and Visual Evidence," *Technical Communication,* 52 (4), 417–426.

——, Madeline Schreiber, Katrina Ramsdell, and John Muffo (2006), "How the Design of Headlines in Presentation Slides Affects Audience Retention," *Technical Communication,* 53 (2), 225–234.

Allinson, Christopher W., and John Hayes (1996), "The Cognitive Style Index: A Measure of Intuition-Analysis for Organizational Research," *Journal of Management Studies,* 33 (1), 119–135.

Apperson, Jennifer M., Eric L. Laws, and James A. Scepansky (2008), "An Assessment of Student Preferences for PowerPoint Presentation Structure in Undergraduate Courses," *Computers and Education,* 50 (1), 148–153.

Atkinson, Cliff (2007), *Beyond Bullet Points: Using Microsoft Office PowerPoint 2007 to Create Presentations That Inform, Motivate, and Inspire,* Redmond, WA: Microsoft Press.

Atkinson, R.C., and Shiffrin, R.M. (1968), "Human Memory: A Proposed System and Its Control Processes," in *The Psychology of Learning and Motivation,* vol. 2, Kenneth W. Spence and Janet Taylor Spence, eds., New York: Academic Press, 89–195.

Baleghizadeh, Sasan (2010), "The Effect of Pair Work on a Word-Building Task," *ELT Journal,* 64 (4), 405–413.

Barr, Robert B., and John Tagg (1995), "From Teaching to Learning—A New Paradigm for Undergraduate Education," *Change,* 27 (6), 13–25.

Bartsch, Robert A., and Kristi M. Cobern (2003), "Effectiveness of PowerPoint Presentations in Lectures," *Computers and Education,* 41 (1), 77–86.

Bettman, James R., Mary Frances Luce, and John W. Payne (1998), "Constructive Consumer Choice Processes," *Journal of Consumer Research,* 25 (3), 187–217.

Bjork, Robert A. (1994), "Memory and Metamemory Considerations in the Training of Human Beings," in *Metacognition: Knowing About Knowing,* Janet Metcalfe and Arthur P. Shimamura, eds., Cambridge: MIT Press, 185–205.

Burke, Lisa A., and Karen James (2008), "PowerPoint-Based Lectures in Business Education: An Empirical Investigation of Student-Perceived Novelty and Effectiveness," *Business Communication Quarterly,* 71 (3), 277–296.

——, ——, and Mohammad Ahmadi (2009), "Effectiveness of PowerPoint-Based Lectures Across Different Business Disciplines: An Investigation and Implications," *Journal of Education for Business,* 84 (4), 246–251.

Chase, William G., and Herbert A. Simon (1973), "Perception in Chess," *Cognitive Psychology,* 4 (1), 55–81.

Clark, Jeniifer (2008), "PowerPoint and Pedagogy: Maintaining Student Interest in University Lectures," *College Teaching,* 56 (1), 39–45.

Clarke, Irvine, III, Theresa B. Flaherty, and Michael Yankey (2006), "Teaching the Visual Learner: The Use of Visual Summaries in Marketing Education," *Journal of Marketing Education,* 28 (3), 218–226.

Cunningham, Donald J., Thomas M. Duffy, and Randy A. Knuth (1993), "The Textbook of the Future," in *Hypertext: A Psychological Perspective,* Cliff McKnight, Andrew Dillon, and John Richardson, eds., London: Ellis Horwood, 19–49.

DuFrene, Debbie D., and Carol M. Lehman (2004), "Concept, Content, Construction, and Contingencies: Getting the Horse Before the PowerPoint Cart," *Business Communication Quarterly,* 67 (1), 84–88.

Ferrell, O.C., and Linda Ferrell (2002), "Assessing Instructional Technology in the Classroom," *Marketing Education Review,* 12 (3), 19–24.

Few, Stephen (2004), *Show Me the Numbers: Designing Tables and Graphs to Enlighten,* Oakland, CA: Analytics Press.

Godin, Seth (2001), "Really Bad PowerPoint (and How to Avoid It)" (available at www.sethgodin.com/freeprize/reallybad-1.pdf).

James, Karen E., Lisa A. Burke, and Holly M. Hutchins (2006), "Powerful or Pointless? Faculty Versus Student Perceptions of PowerPoint Use in Business Education," *Business Communication Quarterly,* 69 (4), 374–396.

Jones, Raymond C. (1981), "Strategies for Reading Comprehension: Think-Pair-Share," *ReadingQuest.org* (available at www.readingquest.org/strat/tps.html).

Karns, Gary L. (2006), "Learning Style Differences in the Perceived Effectiveness of Learning Activities," *Journal of Marketing Education,* 28 (April), 56–63.

Kawasaki, Guy (2005), "The 10/20/30 Rule of PowerPoint," *How to Change the World,* December 30 (available at http://blog.guykawasaki.com/2005/12/the_102030_rule.html#axzz0PHCrCjG9/).

King, Alison (1993), "From Sage on the Stage to Guide on the Side," *College Teaching,* 41 (1), 30–35.

Lang, Annie, Robert F. Potter, and Paul D. Bolls (1999), "Something for Nothing: Is Visual Encoding Automatic?" *Media Psychology,* 1 (2), 156–163.

Leahy, Wayne, Paul Chandler, and John Sweller (2003), "When Auditory Presentations Should and Should Not Be a Component of Multimedia Instruction," *Applied Cognitive Psychology,* 17 (4), 401–418.

Levasseur, David G., and J. Kanan Sawyer (2006), "Pedagogy Meets PowerPoint: A Research Review of the Effects of Computer-Generated Slides in the Classroom," *Review of Communication,* 6 (1–2), 101–123.

Ludwig, Dale (2005), "PowerPoint—Best Practices for Developing and Delivering Effective Visual Aids," Turpin Communication, September (available at www.xr-magazine.nl/artikelen/120/methoden-tools/powerpoint-tips-tricks-managers/).

Lyman, F.T. (1981), "The Responsive Classroom Discussion: The Inclusion of All Students," in *Mainstreaming Digest,* Audrey Anderson, ed., College Park: University of Maryland Press, 109–113.

Mayer, Richard E. (2001), *Multimedia Learning,* New York: Cambridge University Press.

——, and Roxana E. Moreno (2003), "Nine Ways to Reduce Cognitive Load in Multimedia Learning," *Educational Psychologist,* 38 (1), 43–52.

Paivio, Allan (1971), *Imagery and Verbal Processes,* New York: Holt, Rinehart, and Winston.

Pauw, Amy Plantinga (2002), "Discoveries and Dangers in Teaching Theology with PowerPoint," *Teaching Theology & Religion,* 5 (1), 39–41.

Peterson, Lloyd R., and Margaret Jean Peterson (1959), "Short-Term Retention of Individual Verbal Items," *Journal of Experimental Psychology,* 58, 193–198.

Reynolds, Garr (2008), *Presentation Zen: Simple Ideas on Presentation and Design Delivery,* Berkeley, CA: New Riders.

Riding, Richard J. (1997), "On the Nature of Cognitive Style," *Educational Psychology,* 17 (1–2), 29–49.

Sweller, John (1994), "Cognitive Load Theory, Learning Difficulty, and Instructional Design," *Learning and Instruction,* 4, 295–312.

—— (1999), *Instructional Design in Technical Areas,* Camberwell, Australia: ACER Press.

—— (2004), "Instructional Design Consequences of an Analogy Between Evolution by Natural Selection and Human Cognitive Architecture," *Instructional Science,* 32 (1–2), 9–13.

——, John, Jeroen G. van Merrienboer, and Fred G.W.C. Paas (1998), "Cognitive Architecture and Instructional Design," *Educational Psychology Review,* 10 (3), 251–296.

Tufte, Edward R. (2001), *The Visual Display of Quantitative Information,* 2d ed., Cheshire, CT: Graphics Press.

University of Minnesota Center for Teaching and Learning (2009), "Active Lecturing: The Potential of PowerPoint," Minneapolis (available at www1.umn.edu/ohr/teachlearn/tutorials/powerpoint/lecturing/index.html).

Vik, Gretchen N. (2004), "Breaking Bad Habits: Teaching Effective PowerPoint Use to Working Graduate Students," *Business Communication Quarterly,* 67 (2), 225–228.