



“New Learning” in Theory - Define a Concept

Project Overview

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Creating Presentations That Work

Version 5

Or: How We Can Learn to Kill the Bullet-point

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Introduction

“[A] PowerPoint is entirely presenter-oriented, and not content oriented, not audience oriented.” - Edward Tufte | Yale Professor of political science, statistics, and computer science

When educators communicate, they create narratives. We categorize, compartmentalize, and divide and conquer information in the hopes of making learning fun, intelligible, and meaningful. At some level, each subject, each course, each syllabus, is a narrative all to its own. A story waiting to be uncovered and told.

The classroom lecture as narrative has probably been around for as long as classrooms have existed. The lecture usually follows a fairly simple pedagogical structure. The teacher determines the explicit content they consider necessary for the students to know; usually in the form of work that the student is to complete on their own (a reading of some sort and/or textbook). The teacher assigns the work. The teacher organizes and structures the work in a didactic lecture format for the class to go over the following class period. The following class period the students listens while the teacher lectures on the work that was assigned. The students are expected to take notes on the lecture that the teacher is giving. At the end, there will usually be a quick check for understanding - “Any questions? No? Good. I hope that was clear.” - and/or a notice that there will be a comprehension assessment the next class period on the material that was just covered.

This learning format should surprise no one. It is the format most became accustomed to by the end of high school, and the format that predominated most post-secondary education classrooms. You may have even said the phrase “I went to go see Professor So and So lecture today” if you went to a university where this type of thing was not only common, but rarified.

The evolution of the lecture slowly progressed as technology availed more and more tools ostensibly designed to aid the lecturer. In 1890 the lecturer acquired the chalkboard. In 1925, the film strip projector. By 1950, the overhead projector. In the mid-80s the LCD Project ('84) and PowerPoint ('87) were created. 1999 saw the first SmartBoards (The Learning Machines). As the tools have evolved, so has the lecture. From one person at the lectern, disseminating information as if straight from the mouth of God, to today, where the lecturer invariably creates a presentation using slideware that is projected on a big screen behind them. The evolution of the discursive meanings—the patterns of person-to-person communication—of the lecture as presentation, and the tools used to aid the presentation of the lecture, are ripe for further investigation (Cope, William). The concept of communication is thus seen as integral in presentations, because a presentation necessarily frames the patterns of interaction between teacher and students, and the students themselves.

Creating a presentation that works focuses the communication pattern back to one that is framed by the interaction between the presenter and audience, instead of one that is framed by the presentation itself. Presentations that work

upend the information and thus communication hierarchy of the standardized, modern presentation by focusing on creating scenes instead of slides, and by incorporating four key and interconnected elements of scene creation: design, structure, narrative, and cognition.

Definition of Concept

“Traditional teaching discouraged lateral communication between students. The New Learning thrives on enormous amounts of lateral communication between learners.” - William Cope and Mary Kalantzis | New Learning Researchers

We can think of educational experiences through the lens of three educational paradigms: didactic, authentic, and transformative (Cope and Kalantzis, 40). Didactic pedagogy has been and still is in some places the dominant paradigm. It is exemplified by the model of the teacher tells, the learner listens (Cope and Kalantzis, 41).

In the didactic classroom, the teacher establishes a pattern of relationships in which students learn to accept received facts and moral truths, comply with commands issued by the teacher and absorb the authoritative knowledge presented in the curriculum. In these classroom settings, students learn to get used to a balance of agency in which they are relatively powerless to make knowledge themselves or to act autonomously (Cope).

Authentic pedagogy places the learner at the center of the learning (Cope and Kalantzis, 39).

The major principles of authentic education are that learners should take a more active part in their learning, and that this learning should be closely and practically connected to their life experiences. Authentic education is more child-centred, focusing on internalized understanding rather than formal repetition of the ‘right’ answers. (Cope)

Transformative pedagogy focuses on both the learner and the learning (Cope and Kalantzis, 39).

It [transformative pedagogy] sets out deliberately to transform students’ life chances and play an active role in changing social conditions. It changes the balance of agency in learning relationships by encouraging learners to build their own knowledge in a supportive learning environment, to work with others in lateral knowledge-making relationships (peers, parents and community members), to negotiate local and global differences, and to extend the breadth and scope of their education beyond the walls of the traditional classroom (Cope).

Designing the communication architecture or discursive space of classrooms are the pedagogical and curricular choices the teacher makes. The lecture and use of presentations in the classroom is a very specific instance of communication architecture; the presentation very deliberately frames the patterns of interaction between the members of the classroom.

Traditionally, classroom presentations have been rooted the aims of didactic pedagogy. These are presentations that don’t work. The process of creating presentations that work can move the pedagogy from didactic to authentic and transformative pedagogies. At their best, they can lend itself to transformative pedagogy when students undertake the creation process themselves.

Anatomy of a Modern Presentation

“Experts in design say that bullet points are the worst way to learn and impart information.” -Carmine Gallo | Communication Coach and Author of “Presentation Secrets of Steve Jobs”

The normal classroom presentation, by its very nature, is a one-sided exercise. The presenter controls the design process, they: organize the material, create the outline, choose the format, select the content, deliver the information, and set the learning expectations. The audience, for the most part, is expected to passively receive the information, like containers waiting to be filled. At its core, it is didactic. Paulo Freire describes this process at its worse:

Narration (with the teacher as narrator) leads the students to memorize mechanically the narrated content. Worse still, it turns them into ‘containers’, into receptacles to be filled by the teacher. The more completely he fills the receptacles, the better a teacher he is. The more meekly the receptacles let themselves be filled, the better students they are. Education becomes an act of depositing, where the students are the depositaries and the

teacher is the depositor. Instead of communicating, the teacher issues communiqués and ‘makes deposits’ which the students patiently receive, memorize and repeat. This is the ‘banking’ concept of education, in which the scope of action allowed to the students only as far as receiving, filing, and storing the deposits. (Freire, Paulo)

The modern classroom presentation, with its strong bullet point cues and rigid hierarchy reinforces the education as deposit model. It creates a harmful perception about knowledge that is stronger than its older relative: students see knowledge existing as a disjunction - the things we need to know (the information on the slides) and the things we don’t need to know (the information not on the slides) (Isseks, Mark). Any classroom teacher with students over a certain age threshold have met the “will this be on the test?” and “is this all I need to know?” questions. The modern bullet-pointed slideware presentation has both exacerbated this disjunction and provided a provided the easy answer to those questions.

The modern classroom presentation also models poor scholarship and communication architecture for students. Most student presentations mimic their teacher examples: they copy and paste from sources, fill their screens with bullet points, and read verbatim slide by slide until “the end.” The learning objectives and skills gained by this type of assessment exercise on Bloom’s scale are low-level and content based, and do not meet authentic nor transformative pedagogical goals.

Social Studies teacher Mark Isseks, in an article in Education Leadership, has called this phenomenon the “bulletization of education.” He claims that “the root problem of PowerPoint presentations is not the power nor the point, but the presentation” (Isseks). Many others, both in education and in the private and government sector, have echoed similar concerns and complaints about the bulletization of knowledge and our over reliance on slideware as a means of communication and creating narratives. Some CEOs and army officials have banned its use altogether, with one General commenting that “PowerPoint makes us stupid” and another that it is “dangerous because it can create the illusion of understanding and the illusion of control. Some problems in the world are bullet-izable” (Bumiller, Elisabeth)

How did we get here? Much of the blame has been directed at one easy, big target: PowerPoint. PowerPoint 1.0 was created in 1987 by a company out of Silicon Valley called Forethought. Bought by Microsoft in 1987, Windows PowerPoint 2.0 was released in 1990 with the new release of Window 3 (Austin, Dennis). Robert Gaskins, “inventor” of PowerPoint, recounts that PowerPoint entered as a niche product in a crowded marketplace:

In 1987, when PowerPoint was first introduced as a commercial product, a presenter could choose among overhead transparencies, color 35mm slides, and something called a “multimedia” slide show. These formats were prepared in different ways, with different equipment, and reflected orders-of-magnitude cost differences in terms of time, effort, and money.

...Among these options, overhead presentations, with the lowest level of finish, were appropriate for internal meetings (especially with executives), for academic talks, and for classroom use, as well as for almost any everyday purpose. Color 35mm slide presentations, with a higher degree of finish, were appropriate for formal sales calls or for speeches to large audiences, where time and budget were available for their preparation. Multimedia presentations, with the most polished finish, were appropriate for only highly theatrical occasions with large audiences where entertainment was the main goal.

Against this background, we conceived PowerPoint to give control to the presenter by taking advantage of graphical personal computers, specifically Macintosh and Windows. We introduced three major versions over its first five years, 1987 to 1992, corresponding to the three kinds of presentations: PowerPoint 1.0 made black-and-white overheads; PowerPoint 2.0 added color 35mm slides; and PowerPoint 3.0 added video effects to replace multimedia shows (Gaskins, Robert).

However, things started to change between 1992 and 2002—personal computing went mainstream, laptops became small, light, and powerful, and inexpensive and bright video projectors became a standard and expected boardroom accessory. This had an important “conversion and confusion” effect. Here’s Gaskin again:

This [change] meant that a presentation could now mix the features of all three styles, even as it represented a new problem made possible by PowerPoint. With no constraints from physical media, presenters had no limitation and increasingly no firm intuition as to what was appropriate...Much of this was novel and interesting the first few times, but virtually none of the extraneous entertainment had any purpose or benefit in the kinds of meetings where overheads had been used. Successive versions of PowerPoint made these elaborate features easier and more tempting to use, and eventually many presentations started to look like advertising (Gaskins).

Today, the various versions of PowerPoint claim a ~95% of the presentation market share. It has been installed on at least 1 billion computers worldwide, and an estimated 350 slide decks are given each second (Parks, Bob). Most importantly,

PowerPoint introduced three now ubiquitous slideware presentation design techniques: (1) the model or master slide, (2) consistent layout, (3) rigid information hierarchies.

The slide is a combination of two old presentation mediums: the slide projector slide (a more or less static, defined picture) and the overhead foil (a dynamic, undefined surface). The PowerPoint master slide combines both to create a defined “what you see is what you get” interface that is also dynamic and modifiable. As Dennis Austin, a chief architect of PowerPoint retells:

The model slide had two functions. It provided background art—a border, logo identification or any other consistent information—and provided the location and format of the title and body objects. Background art was the same for all slides (it could be omitted for exceptions), but title and body formatting was only the default. Any slide could change after it was created (Austin).

The consistent layout is the second key feature. Templates and defaults settings allowed for a novice to structure, write, and review. Again, Mr. Austin:

Bob Gaskins (Vice President of Development, Forethought) had a clear vision for the kind of product he wanted to create and there were several key insights that would guide the design. Presenter was to create presentations—not simply slides. It was to provide a means for structuring, writing, and reviewing a presentation as a whole. That would also make it easy to re-sequence old slides and to re-use parts of old presentations to make new ones. It would construct a consistent layout for all slides in a presentation. The layout included items like a graphics border, corporate logo, running heads, and slide numbers. The Presenter package would also use templates with such features to support corporate graphic standards (Austin).

The rigid information hierarchy is a result of the explicit design element choices made to empower presenter to create quick, easy, and convenient presentations; it is a function of (1) and (2). The most conspicuous driver of the rigid hierarchy is the bullet point. As Edward Tufte, the well-known Yale professor and information design expert claims, the default PowerPoint presentation creates a “deeply hierarchical single-path structure as the model for organizing every type of content” (Tufte, Edward). A cohesive narrative, with intellectual and visual organization, gets replaced with a bullet pointed, classified, hierarchical outline, reducing complexity to what Tufte calls an “anti-narrative” where “slide-by-slide hierarchies, indifferent to content, slide and dice the [narrative] into arbitrary compartments” (Tufte). This, perhaps, is PowerPoint’s most damning flaw: we’ve reduced conversation to bullet points, to logically incoherent, superficial, and misleading talking-points.

Without consciously deciding upon them, these three design techniques taken together (master slide, consistent layout, and rigid hierarchy) have created the basic default outline of modern slideware presentations. Take together, they’ve created the phrases “death by PowerPoint,” “PowerPoint is making us stupid,” and more fatally “PowerPoint is Evil.” Taken together, they are creating presentations that don’t work.

The question to ask then, is can the slideware presentation be saved? Is it even worth saving? It probably is if we value learning in all its mediums. Research has shown that students perceive a presentation tool as beneficial to their learning (Lamb, Caroline). A commitment to career and college readiness also places an emphasis on students who can effectively and efficiently communicate, in both written and oral formats. Presentations are nearly ubiquitous in the “real world.” Maybe the evil then isn’t in the medium itself, but rather in its use. The necessary move to make isn’t to kill the slideware, but it instead to kill the bullet point.

Creating Presentations that Work

“People learn better from words and pictures than from words alone.” - Richard Meyer | American educational psychologist

Most of the presentations teachers create default to the modern PowerPoint anatomy described in the previous section, consisting of stand-alone, anti-narrative slides and a rigid, bullet point hierarchy to go with their daily teaching. These “presentations” become mere disseminators of writable and digestible information, relying almost exclusively on the bullet point to deliver and explain the content. When teachers create presentations that are text and information heavy, the main classroom learning isn’t a dynamic, active interaction between the students and the teacher. Instead it is a more or less a static and didactic interaction between the student and the information and the teacher and the information (fig. 1). With this dynamic established, both the teacher and the student use the presentation as the source of knowledge.

figure 1 (1).jpg

The presentation becomes the placeholder for knowledge and for learning, the classic “banking” concept of education Freire described. The patterns of interaction between students, teachers, and knowledge is framed by the limitations of the presentation. The most important interaction going on in the classroom is the use of the presentation by audience to consume knowledge and the use of the presentation by the presenter to narrate knowledge. This use creates a communication architecture and knowledge architecture that frames learning as an almost exclusive didactic practice. Teacher to student and student to student interaction is marginalized almost completely. This is a presentation that doesn't work.

Presentations that work attempt to create very different communication and knowledge architectures (and in return human cognitive architectures). Presentations that work create scenes—a visual journey that they audience takes with you— by focusing on four basic yet key and interdependent concepts (Shaffer, David). They are:

1. Design
2. Structure
3. Narrative
4. Cognition

By mastering these four basic concepts, presentations that work create a different communication and knowledge architecture: a dynamic, active interaction between the presenter and audience (fig. 2). In this configuration, the most important interaction is between the presenter and the audience, and the presentation becomes the backdrop to the interaction. The communication and knowledge architecture is therefore shaped not by the limitations of the presentation, but instead by the experience between the presenter and audience. This moves the presentation to an authentic model of pedagogy, where knowledge is being actively produced and understood.

figure 2.jpg

Design

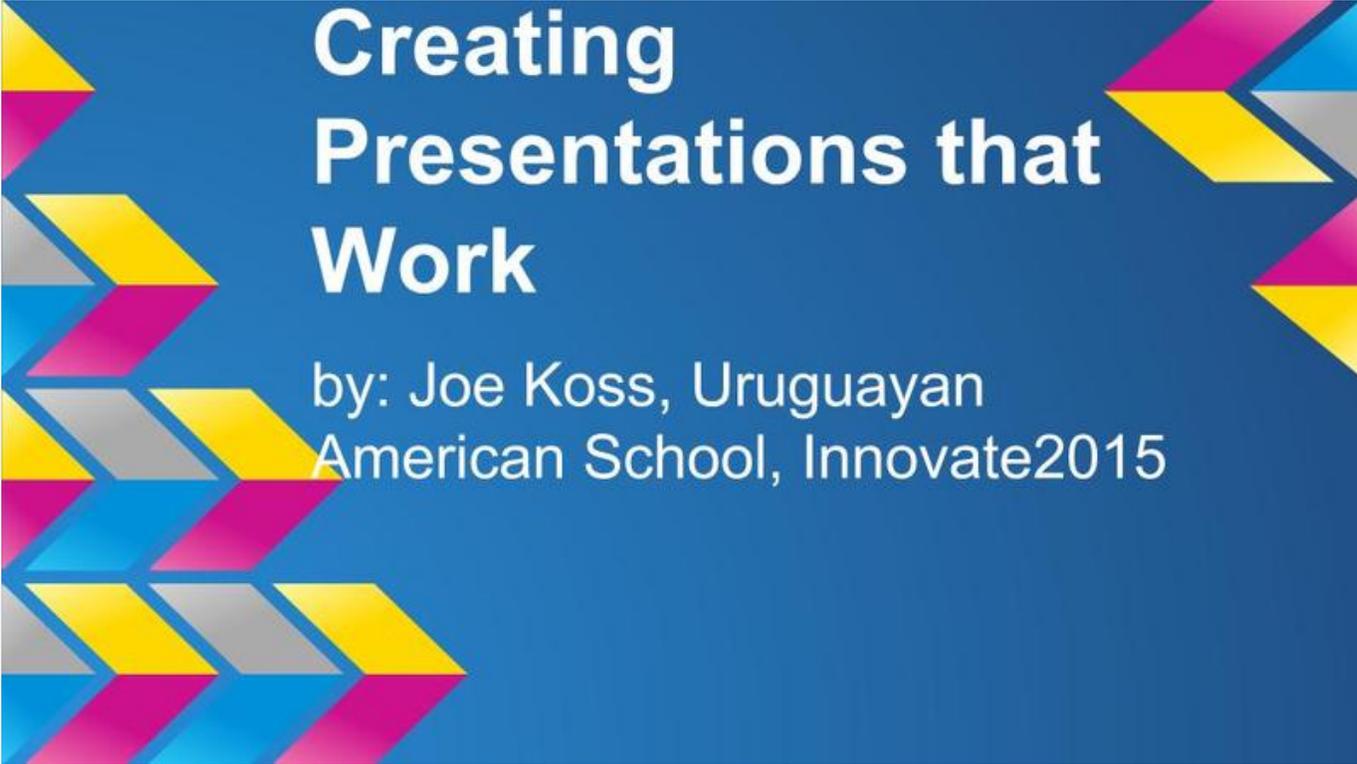
Design is not just for fashion shows and parade of homes tours. Thinking seriously about best design practices while creating a presentation should be at the forefront of every creators mind. There are two major ideas to keep in mind while creating a presentation that works:

1. Use Images
2. Keep it Clean

Using these two principles (Use Images and Keep it Clean) the design goal should be to build a scene, not a slide. A scene can be thought of as a visual journey the audience takes with the presenter. The choice and design of the text should be chosen with the above design principles in mind, and the image and the text should complement each other. Bullet points have no place in a properly constructed and designed scene.

Use Images

Images should be large, high quality, visually interesting, and most importantly, visually explanatory. Images help tell the story. Numerous studies have shown that people learn better from words and pictures than just words alone (Lamb). Presentations that work take advantage of this research by creating visually rich slides that use high quality, complementary images, and use them often.

The slide features a dark blue background with white text. On the left and right sides, there are decorative geometric patterns consisting of overlapping, colorful shapes (yellow, blue, pink, and grey) that resemble stylized arrows or chevrons pointing towards the center.

Creating Presentations that Work

by: Joe Koss, Uruguayan
American School, Innovate2015

Traditional title slide that uses no images

Creating Presentations

that **WORK**

#innovategraded
#cptw



These two scenes use images and text

Keep it Clean

Keeping it clean refers to understanding the basic principles of design. Robin Williams, in *The Non-Designers Design Book* offers four basic principles of design (Williams, Robin). They are:

Contrast: The principle of contrast states that if two items are not exactly the same, then make them different. Really different. The purpose of contrast is to create interest and aid in organization. The best way to add contrast is through your typeface choices, line thicknesses, colors, shapes, sizes, space, etc.

Contrast

*make different
items different*

Proximity

Alignment

Repetition

Here the different font choices provides contrast to the different ideas

Repetition: The principle of repetition states that you repeat some aspect of the design throughout the entire piece. The basic purpose of repetition is to unify and to add visual interest. Think of repetition as being consistent.

Repetition

repeat design
aspects

JB's Pest Control

Jimmy Baker Smith



666 Proximity Way
Montevideo, MN
(555) 867-5309

JB's Pest Control

Jimmy Baker Smith

666 Proximity Way
Montevideo, MN
(555) 867-5309

Repeating bold elements and horizontal lines

Alignment: The principle of alignment states that nothing should be placed on the page arbitrarily. Every item should have a visual connection with something else on the page. The basic purpose of alignment is to unify and organize. Always find something else on the page to align with.

Alignment

make visual connections

JB's Pest Control

Jimmy Baker Smith

666 Proximity Way
Montevideo, MN
(555) 867-5309

JB's Pest Control

Jimmy Baker Smith

666 Proximity Way
Montevideo, MN
(555) 867-5309

Hard right justified alignment is better than soft, centered justified alignment

Proximity: The principle of proximity states that you group related items together, move them physically close to each other so the related items are seen as one cohesive group rather than a bunch of unrelated bits. The basic purpose of proximity is to organize.



Grouping the related items together makes reading the card easier

Using these two principles (Use Images and Keep it Clean) the design goal should be to build a scene, not a slide. A scene can be thought of as a visual journey the audience takes with the presenter. The choice and design of the text should be chosen with the above design principles in mind, and the image and the text should complement each other. Bullet points have no place in a properly constructed and designed scene.

Structure

Structure

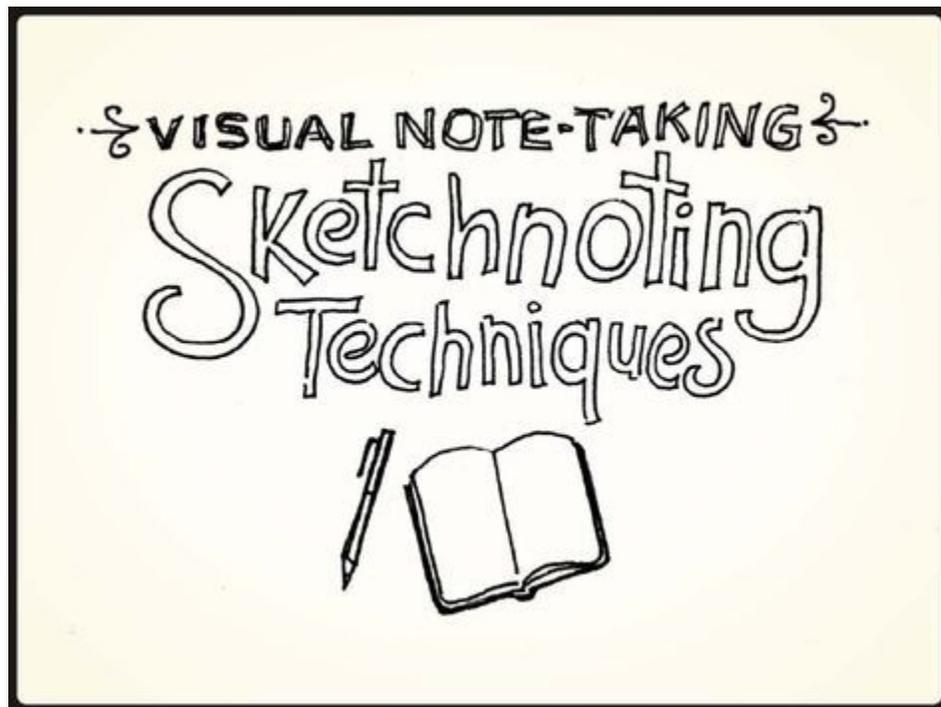
The most important structural principle of presentations that work is to work backwards. Work backwards from the last scene. It is the last image that lingers and stays with people. What is the goal? The big idea? The learning objective? The concept? The most important content? The essential question? The target? Create the last scene. Work backwards from there (cf Understanding by Design).

The internal logic of presentations that works is not driven by the anatomy of the modern PowerPoint (master slide, consistent layout, and rigid hierarchy). Slides with titles and as many bullet points as possible are the worst way to learn and impart information (Lamb). And their overuse has reduced most modern presentations to the structural equivalent of building a bridge with disjointed footings and subfootings with no ability to have a deck to connect the beginning to the end.



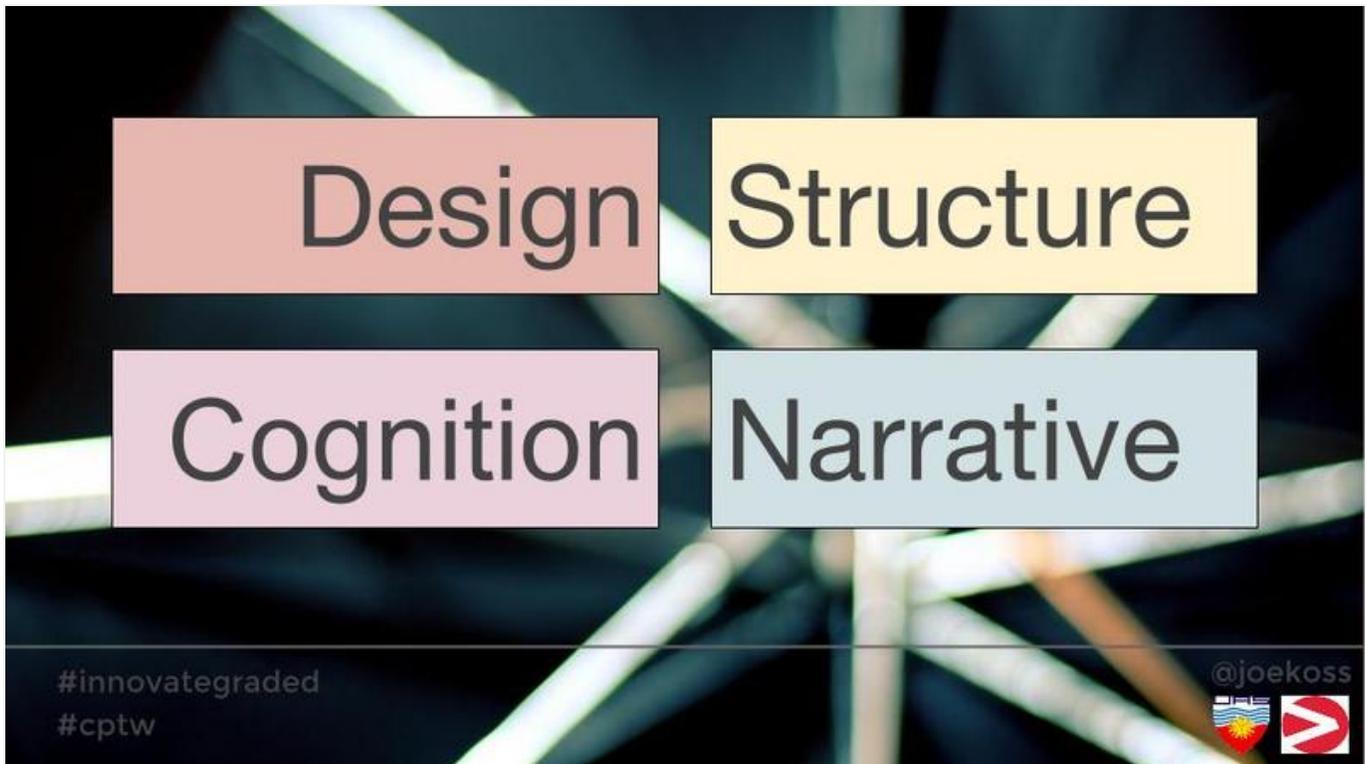
The traditional slide hierarchy of a modern presentation

The internal structure of a presentation also impacts how the audience structures their comprehension of the information. An anti-narrative, bullet point heavy presentation creates a disconnect between the information and the overall learning goals of the presentation itself. Structuring the presentation by working backwards and creating scenes that combine the power of words plus images helps foster a structure based on a focused narrative and learning goal. This focus will open new possibilities with how the audience interacts and structures with the information. For example, [visual notetaking or sketchnoting can be encouraged](#).



Finally, scenes should not have any extraneous fluff, such as sound effects, transition effects, animation effects, clip art effects, etc. These additions may superficially show the technological prowess of the creator, but they do not add to presentations that work. They instead introduce extraneous cognitive detractors for both the audience and the presenter.

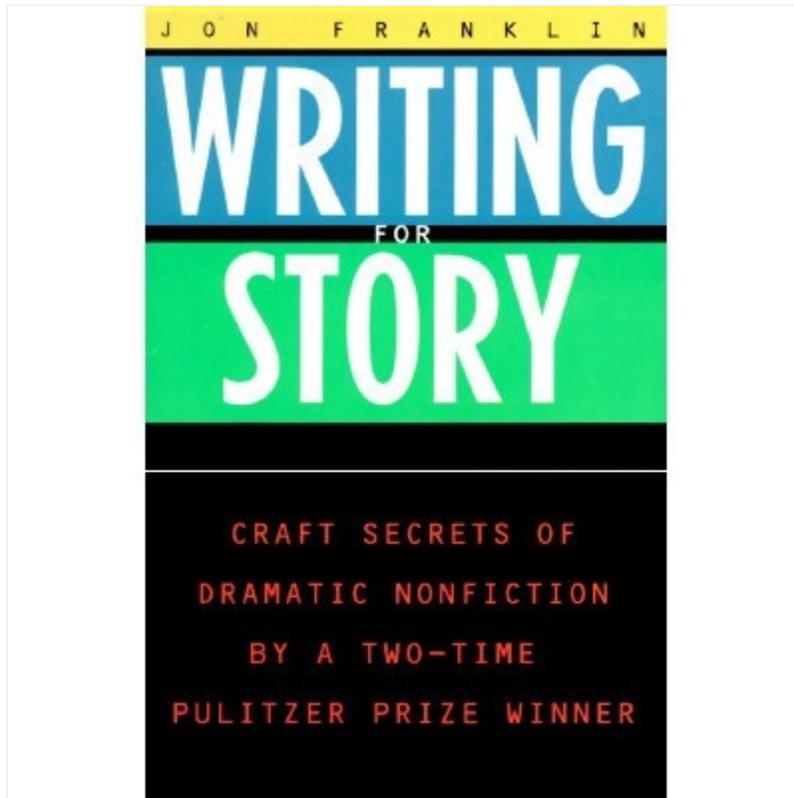
Structure instead should be driven by the goals of the presentation. Rigid bullet point hierarchy of information is rarely a goal. Instead, each scene should be thoughtful and purpose driven. Each scene should focus on one idea and do it well. By using the internal structure of scene creation along with design principles, presentations begin to work.



The last scene for a presentation on Creating Presentations that Work

Narrative

Most presenter creators don't think of their presentation as a narrative, as writing for story and purpose. They should. All narrative is story, and as Jon Franklin in *Writing for Story* says, a story needs a focus —the mind of the audience has to have something specific to focus on in order to make an identification (Franklin, Jon). All stories can be divided into two parts: focuses and transitions. Franklin uses a helpful analogy. Imagine a filmmaker wanting to capture the essence of a huge crowd of people. The filmmaker would go about this in two ways. First, she would zoom in on each face, faces that would visually show the emotion and movement of the person. Second, the filmmaker would zoom out, pan, and find another face, in other words, transition from one face to another by showing the magnitude of the crowd. In this way, "the crowd in the hands of the filmmaker would become a human thing, and therefore meaningful" (Franklin).

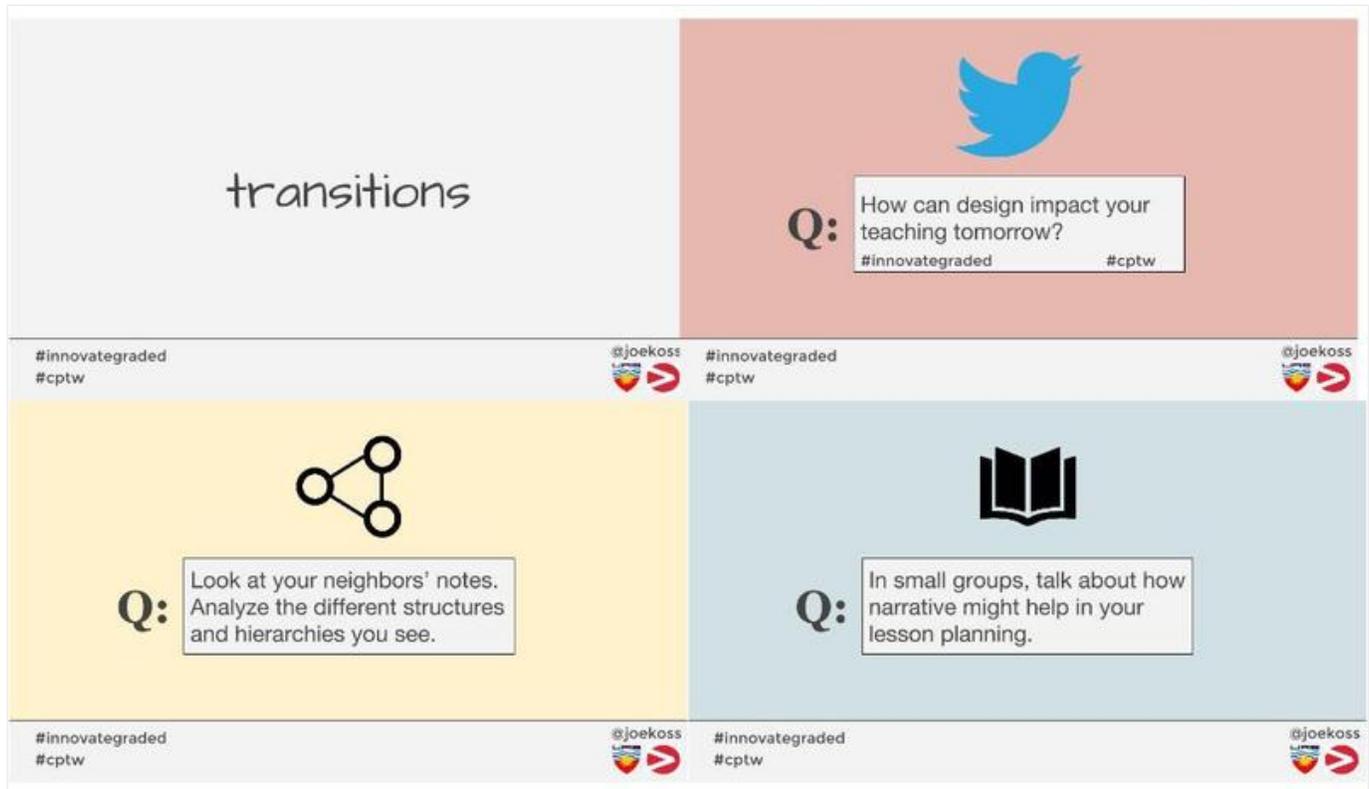


In almost all narratives, but especially in presentations, a focus starts with an image, and these images become the fundamental component of story. In a presentation, the scene is the image, and it should be built using the power of word and picture combination—using both visual and verbal cues. Franklin stresses that the human mind is preoccupied with action. In order to focus the audience’s mind on action, successful images must be based on active verbs—“if they aren’t, they can’t transmit much in the way of meaningful information.”

Focus is especially important for creating presentations. Out of all narrative types, presentations that work have the least amount of narrative space to work with. Words must be carefully chosen. Visuals must be properly complementary. Within a properly constructed scene, words denote, images connote. Standing text, using the design principle of contrast, can also create a visual mnemonic that both denotes and connotes. The scene should both denote the desired understanding and connote the action of the story.

A successful scene incorporates design, structure, and a focus; in this way they become visual journeys. Between successful scenes the narrative uses transitions. Some transitions are minute and obvious; the landscape doesn’t change so one focus logically follows to the other. These smaller focuses usually form a part of a larger focus. When the presentation moves from one large focus to another, here explicit transitions are needed.

Successful presentation narratives use these explicit transition opportunities to bring the audience into the narration. Educational presentations can use these transitions to create active participation with the production and understanding of the knowledge. The teacher could have students: ask a formative question and discuss among a table group, come up with their own example, generate a “quiz” question, analyze a picture or political cartoon associated with the previous scene, discuss a brief explanatory video, complete a problem together, tweet a response, among many other check for understanding options.



Sample transition scenes

One last note about successful narratives. Almost all successful stories use a basic common literary technique. There is a complication and a hero; a problem to be solved and a hero who solves it. The best presentations find ways to incorporate this technique as well.

Cognition

In general, humans process information through two primary pathways, a visual channel and verbal channel. Educational Psychologists Richard Meyer and Roxana Moreno describe these means as “an auditory/verbal channel for processing auditory input and verbal representation and a visual/pictorial channel for processing visual input and pictorial representations” (Mayer, Richard).

This general framework is used not only in understanding sound design, structure, and narrative in presentations, but also in understanding two broad aspects of human cognitive architecture that apply to presentations. The first is working memory, the second is attention span. Used wisely, recent brain research into cognition and the cognitive architecture we use when gaining and retaining information can offer the last key concept for creating presentations that work.

Working Memory

Working memory is a general term used for the ability to remember short lists of information with no delay. While the literature uses different jargon and disagrees on some characterizations, a more meta view finds a general agreement with the idea that humans have a limited working memory capacity. The research also generally agrees that there are two important aspects to our working memory capacity: 1) the amount or load we can hold, and 2) the type of load being held.

The amount of information we can hold at any one time is fixed; it is limited by our working memory. This fact should impact both the design and structure of scenes created for presentations. A general consensus (again, this is brain research, there are disagreements) is coalescing around new research that puts the maximum amount of discrete information we can store in our consciousness at any one time at 3 or 4 (Moskowitz, Clara). Scenes of presentations that

work should follow this rule in the overall planning of each scene and the overall build of the slideware deck. For a nice overview of working memory, [watch this short TED talk](#).



Short video on working memory

What does creating scenes and presentations with these cognitive limitations in mind look like? Use a principle of 1, 2, 3, or 4, but never 5 or more. Each scene should not have more than 4 pieces of discrete information on it (small focuses), and each build should not have more than 4 constituent concepts or big ideas (large focuses). This allows presentations that work to keep an eye on the load itself.





A sample scene of three details from one concept of the Russian Revolution

Presentations that work rely on the effective and proper use word and picture combination because learning is increased when words and pictures are used than from words alone. However the goal is still knowledge acquisition and it still requires cognitive effort. Therefore the type of load being held in our consciousness is also important. In the 1980s, Australian Educational Psychologist John Sweller proposed Cognitive Load Theory (CLT)—“a theory that emphasizes working memory constraints as determinants of instructional design effectiveness” (Sweller, John et al, 1998)—as one way we can break down the effort being used in the working memory process According to Sweller:

“Cognitive load theory uses evolutionary theory to consider human cognitive architecture...The theory assumes that knowledge can be divided into biologically primary knowledge that we have evolved to acquire and biologically secondary knowledge that is important for cultural reasons. Secondary knowledge, unlike primary knowledge, is the subject of instruction.” (Sweller, 2011)

CLT proposes that the secondary knowledge loads taken on by our limited working memory capacity can be broken into three distinct types. These three loads, or demands, are: intrinsic load, extraneous load, and germane load.

Intrinsic load refers to “the intellectual demands or complexity of the learning material” (Sweller et al, 2003). Extraneous load “imposes mental work that is irrelevant to the learning goal” (Sweller, 2011). Germane load is “mental work imposed by instructional activities that benefit the instructional goal” (Sweller, 2011). A basic understanding of these three memory loads types impacts the design and structure of good presentations—that “the manner in which the human cognitive system is organized to acquire, retain, and disseminate biologically secondary information is directly relevant to instructional design” (Sweller, 2011).

Since intrinsic cognitive load refers to the complexity of the knowledge being acquired without reference to how it is being acquired, once the knowledge to be learned is determined, the intrinsic load becomes a fixed entity and cannot be altered. The working memory load that instructors should care about then is the load that is directly impacted by instructional design: extraneous and germane load. All instructional design should strive to decrease extraneous cognitive load—the

load that is determined by how the knowledge is acquired. With reference to presentations, if the slides are bullet point heavy, text heavy, and fluff heavy, the audiences' extraneous load is overloaded with unnecessary distractors if they are also suppose to pay attention, write, and try to comprehend the anti-narrative of the lecture. Presentations that work deliberately minimize extraneous load by the sound design, structure, narrative, and cognitive practices discussed above. As Sweller explains:

"Although both can be altered by instructional interventions, extraneous cognitive load reflects the effort required to process poorly designed instruction, whereas germane cognitive load reflects the effort that contributes to the construction of schemas. Appropriate instructional designs decrease extraneous cognitive load but increase germane cognitive load" (Sweller, 1998).

Until recently, most cognitive load research focused exclusively on reducing extraneous load. However, germane load has been shown to be important in long-term memory schema creation. A schema, according to Sweller:

"[C]ategorizes elements of information according to the way they will be used...According to schema theory, it is through the building of increasing numbers of ever more complex schemas by combining elements consisting of lower level schemas into higher level schemas that skilled performance develops. Often, this acquisition of schemas is an active, constructive process" (Sweller, 1998).

Later he argues:

"Schema construction has two functions: the storage and organization of information in long-term memory and a reduction of working memory load. It can be argued that these two functions should constitute the primary role of education and training systems" (Sweller, 1998).

Increased germane load leads to positive reinforcement of schema creation. Take together:

"The combination of decreasing extraneous cognitive load and at the same time increasing germane cognitive load involves redirecting attention: Learners' attention must be withdrawn from processes not relevant to learning and directed toward processes that are relevant to learning and, in particular, toward the construction and mindful abstraction of schemas" (Sweller, 1998).

Presentations need to focus on decreasing extraneous load while increasing germane load, in turn helping students categorize and make connections between new knowledge with old knowledge. By focusing on the principles discussed of design, structure, and narrative, presentations that work may be getting closer to achieving this cognitive goal (see the four concept and three detail schema pictured above).

Attention Span

Everyone has done it. Sitting in lecture, taking notes from the PowerPoint, and boom, eyes start to close, head bobs down, the pen drawing a squiggly line across the page, only to jerk back to life a second later, and resume taking notes like nothing happened. This is mind wandering at its most extreme, and death by PowerPoint's greatest trophy. Other less extreme examples include inattentiveness, distraction, interruption, blank stares, among others.

Attention span and mind wandering research has been ongoing for decades. In one of the more famous studies, Educational Psychologists A. H. Johnstone and F. Percival observed students in over 90 lectures of twelve different lecturers. They recorded breaks in physical markers of student attention and inattention, and identified a general pattern: each lecture had a general 3-5 minute settling down period, and "the next lapse of attention usually occurred some 10 to 18 minutes later, and as the lecture proceeded the attention span became shorter and often fell to three or four minutes towards the end of a standard lecture" (Middendorf, Joan and Kalish, Alan).

More recent research has tried to focus on examination of notetaking, retention rates, and direct probes of mind wandering. All studies uncovered similar trends: during lectures, large quantities of students were inattentive at any given time, and many times the inattentiveness was correlated with the length of the lecture. Harvard Psychologists Karl K. Szpunar, Samuel T. Moulton and Daniel L. Schacter recently reviewed much of the mind wandering studies and summarized a good example of recent research:

In a more recent study, Lindquist and McLean (2011) more directly assessed the occurrence of mind wandering during lectures. Specifically, the authors asked students in three 50-min psychology lectures to report on the occurrence of task unrelated thoughts in response to auditory attention probes that were sounded on five separate occasions—8, 15, 25, 34, and 40 min. Across the entire lecture, task unrelated thoughts were reported in response to ~33% of the attention probes. Moreover, the authors found that task unrelated thoughts were more likely to be reported at the end of the lecture (44%) than the beginning of the lecture (25%) (Szpunar, Moulton, and Schacter).

These findings shouldn't be a surprise to any classroom teacher. Teachers know that engagement is one of the most critical features of effective learning, and that the more time spent in didactically in front of students, the more engagement will decrease. Action is key to a learning environment. As Johnstone and Percival noted

“lecturers who adopted a varied approach . . . and deliberately and consistently interspersed their lectures with illustrative models or experiments, . . . short problem solving sessions, or some other form of deliberate break . . . usually commanded a better attention span from the class, and these deliberate variations had the effect of postponing or even eliminating the occurrence of an attention break” (Middledoft and Kalish).

By after the principles of sound design, structure, and narrative, presentations that work incorporate active learning and attention span cognitive research into their creation. Presentations that work actively engage the audience with transitions and stimulate both visually and verbally. By after the rule of 1, 2, 3, or 4, but never 5 or more, presentations that work also manage time effectively, ideally staying under 20 minutes in length.

Explication: Moving from Didactic to Transformative Communication

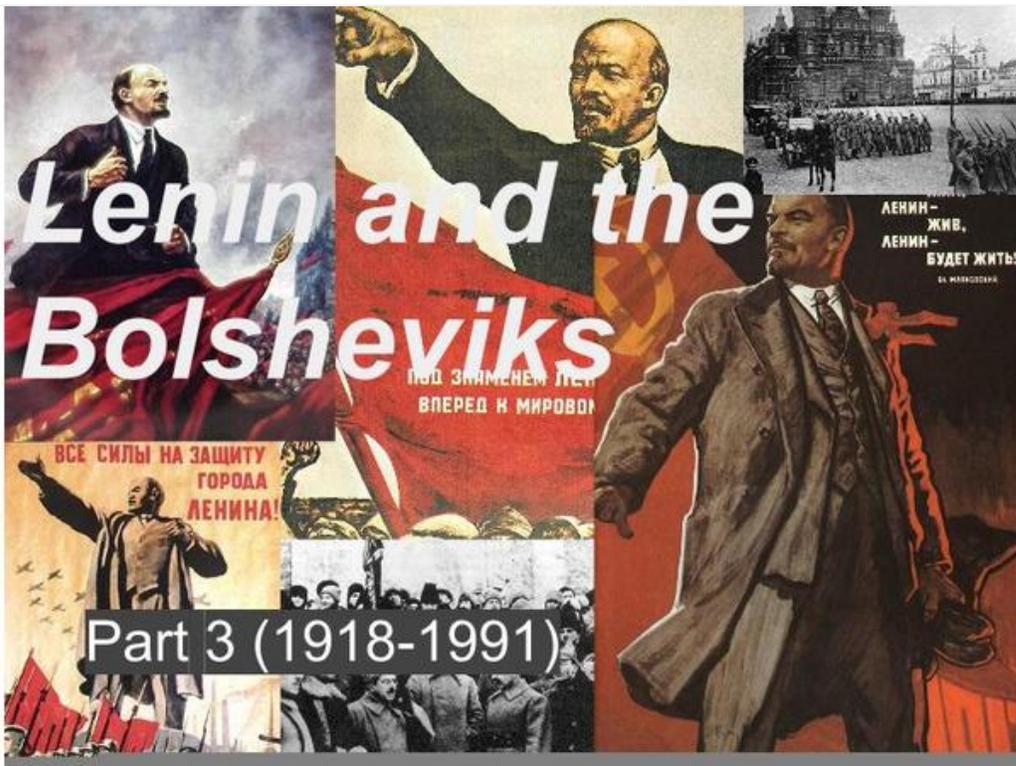
The discursive architecture of the standard modern presentation that doesn't work is dominated by unequal exchange between teacher and learner (Cope and Kalantzis). It is teacher dominated, teacher led, and interaction is limited.

Following some, most, or all the key elements of creating presentations that work has the potential to turn the classroom presentation from a purely didactic exercise to one that embraces authentic and transformative pedagogy.

I'd highlight three ways creating presentations that work can move the presentation as communication from a discursive architecture of didactic pedagogy to authentic and transformative: teacher presentations, concept formation lessons, and student presentations.

Teacher Presentations

When teacher create presentations that work, they necessarily create spaces for lateral student interaction. Large transitions are used as opportunities to check for understanding, facilitate peer-to-peer interaction, and use new learning channels for communication. A presentation that works creates an interwoven lattice of teacher-led and student-led discourse patterns by focusing on narrative and structure. The structure can also facilitate student inquiry groups into the main topic being explored before and/or during the presentation itself. The teacher can create handouts of the concept and/or detail scenes before hand and have the students investigate the main ideas and teach others as a mutually shared exercise in knowledge production between the teacher and students. Here is my own [teacher presentation example](#).



An example of a teacher presentation using the elements discussed in this paper

Using Google Slides allows teachers to easily create presentations that work. They have easily accessible tools to create presentations that are visual and aren't based on bullet point hierarchy. Users have access to hundreds of fonts to create contrast and visual mnemonics. Plus if the school is a Google Edu school, slide presentations are easily shared with students, increasing their access to the material, and forming another communication relationship. Since presentations that work don't bullet point information into stuff you need to know and stuff you don't, the student's relationship with the presentation is very different from traditional lecture based presentations. When they use presentations that work, they will have to recreate the visual journey and narrative, creating new and longer lasting connections with the material.

Concept Formation Lessons

The teacher can also create concept formation lessons based on the principles of scene creation. A concept formation lesson is used to help students understand complex and abstract ideas. Using this model, students have to grapple with the factors and characteristics that typify a concept rather than being merely presented with a specific but shallow definition. Concept formation lessons

help students acquire a deeper understanding of world history concepts than what a textbook or dictionary might afford (Harris and Shreiner).

The Word/Picture Analysis activity students use critical thinking skills, make connections between words, interpret images, and analyze relationships between words and images. Students therefore engaged in a more in-depth investigation of what is behind the concept. [Here is an example](#). Below you can find the student handout.



Revolution concept formation example



Word/Picture Analysis Student Handout

Student Presentations

When students are given the tools to create presentations that work their presentations move toward a transformative interaction with the information and concepts. Students begin to approach the content with a need to develop their own design thinking process. They are required to structure the information with the end goal in mind. They need to create scenes that are visual and explanatory. They will have to organize, categorize, and prioritize information, the results of which create a type of knowledge schema. Here is a [sample class exercise](#) on creating a presentation that works.

example of one "scene"

introduction +
3 visual slides +
1 summary slide
5 total slides

= 1 scene

It might be wise to return to our definition of transformative pedagogy. Transformative pedagogy focuses on both the learner and the learning (Cope and Kalantzis, 39).

It [transformative pedagogy] sets out deliberately to transform students' life chances and play an active role in changing social conditions. It changes the balance of agency in learning relationships by encouraging learners to build their own knowledge in a supportive learning environment, to work with others in lateral knowledge-making relationships (peers, parents and community members), to negotiate local and global differences, and to extend the breadth and scope of their education beyond the walls of the traditional classroom (Cope).

It is important and pertinent to ask if creating a presentation be more than authentic, can it deliberately transform students' life chances? Effective communication of information is a career and college readiness skill. It is also a highly desirable and hireable skill. Providing students with a framework to create a presentation that works can approach transformative pedagogy. When students collaborate on a Google Slide presentation together, it can approach transformative pedagogy. When students need to create a presentation with design thinking in mind, their presentation can approach transformative pedagogy. When students are required to examine, analyze, and understand what are the factors and characteristics of a good presentation and a bad presentation, then their presentations can approach transformative pedagogy.

Creating a presentation that works replaces the competent use of knowledge for a classroom objective, in this case creating a presentation that retells information, with the capacity of a design mindset by re-shaping, transforming, and remaking knowledge (cf Kress, Gunther). Instead of creating a PowerPoint with the goal of delivering content to an audience, students are forced to design a presentation that reshapes and remakes the information into a narrative that

focuses on the communication, knowledge, and cognitive architecture of their understanding. By truly presenting their information and interacting with their audience students are no longer retelling knowledge, but instead creating the communication and knowledge architectures themselves.

Conclusion

Presentations that work move the presentation from didactic to authentic pedagogy that can also become enterprises of transformative pedagogy for teachers and students. Presentations that work create scenes—a visual journey that they audience takes with you— by focusing on four basic yet key and interdependent concepts. They are:

1. Design
2. Structure
3. Narrative
4. Cognition

Presentations that work create a communication, knowledge, and cognitive architecture that push them from a purely didactic enterprise to one that can be authentic and transformative. They do so by learning to use visual design principles. They reject the default organizational structure of the modern presentation that relies on templates and rigid bullet point hierarchy. They view the presentation as a visual journey the audience takes with you by creating focuses and transitions. Finally, presentations that work use current research about our visual working memory capacity and attention span, thereby enabling meaningful conscious acquisition, organization, and processing of secondary knowledge to understanding. Classroom presentations that focus on the four key elements, in turn killing the bullet point, can hope to see authentic and transformative learning objectives become a classroom reality.

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