

**IST526 Interactive Multimedia Exam**

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IST 526: Interactive Multimedia

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The exam consists of **10 questions** split into **three sections**. The first section presents different case scenarios of client-instructional designer interaction (you would need to choose only one); in the second section you will analyze an e-learning tutorial; and in the third section you will define using your own words a few instructional design concepts. Please be concise in your answers, ideally, answers should not be longer than half of a page.

**Chosen prompts bolded.**

### **Section 1: Case Scenarios (Answer **one** of them)**

Read the following three scenarios and respond to **one** of them.

1) A client says they already have a lot of free clip art that you can use in the development of their eLearning module for 11th grade Native American students learning about their culture. What might be some issues using this clip art? State some instructional principles that could be violated.

**2) Another client hiring you to design eLearning for Senior Citizens to teach them their options in Social Security payouts, says she wants the eLearning to be "very interactive" and so wants you to use lots animations and sound effects. Which principles will you look to help you decide if this is a good idea?**

The multimedia principle states that students “learn more deeply from words and graphics than from words alone” (Clark & Mayer, 2016, p. 95). An understanding of cognitive processing, however, does call for discretion in the use of dynamic images like animations. As Clark and Mayer (2016) relate, “a number of research studies have failed to find that animations are more effective than a series of static frames depicting the same material” (p. 97). For senior citizens exploring social security payout options, opting for simpler depictions in the form of illustration and text might better support active processing. Still images permit learner-controlled pacing and effectively avoid extraneous cognitive load from images “so rich in detail” and “so transitory” (Clark & Mayer, 2016, p. 97) that they cannot be held in working memory. In general, “unless there is a compelling instructional rationale,” (Clark & Mayer, 2016, p. 99) evidence points to the use of static images in lieu of animation.

While the goal of creating attention-grabbing interactive eLearning is laudable, known design principles ought to guide both visual and auditory selections. Perhaps of greatest relevance to this request is the coherence principle, which calls for discretion in design. This principle recommends avoiding the use of words, sounds, or graphics that do not explicitly support learning objectives (Clark & Mayer, 2016). While it might be “[tempting] to embellish lessons in an effort to motivate learners” (Clark & Mayer, 2016, p. 168), any visual or auditory element’s inclusion ought to be predicated upon identified learning objectives.

It is thus incumbent upon designers to elucidate learning objectives prior to embarking on design. Judicious selection of appropriate elements will then serve to minimize extraneous processing (Clark & Mayer, 2016). While students may report a greater degree of attraction to exciting materials, studies show that “decorative and seductive visuals [do] not increase

learning” (Clark & Mayer, 2016, p. 95) and that extraneous audio diminishes learner performance. In studies where learners had extra sounds added to education on the topics of lightning and brakes functioning, the addition of environmental sounds produced much worse test results (Clark & Mayer, 2016). Auditory and visual selection choices can either support or distract from learning.

3) Another client asks you to create a "Historic Walking Tour eMap" specifically for use on iPads and other mobile devices, and wants you to include lots of rollover buttons and rollover images, so if a user hovers over an item say on a map, a video will popup and play, or an audio will play telling the user something about that location. What will you say to the client?

## **Section 2: eLearning Product Analysis (Answer **five** questions)**

As part of this section, we will use the following multimedia e-learning training program which is intended for tech support staff.

<https://www.smartbuilder.com/examples/computerportsSB4/index.html>

Answer **five** of the following questions

### **1. Does this e-Learning product apply the Multimedia Principle? Why or Why not?**

The multimedia principle states that people learn better from words and pictures than from either pictures or words alone (Clark & Mayer, 2016). This eLearning product applies the multimedia principle well, incorporating well-selected simple visuals accompanied by textual explanations. The main graphic serves as the lesson interface, providing the participant the opportunity to interact and learn (Clark & Mayer, 2016).

The use of seductive, but distracting animations is foregone in lieu of static illustrations that support learning. These stationary graphics are representational, effectively communicating to learners what computer ports look like in real life (Clark & Mayer, 2016). Distracting decorative visuals are not present.

### **2. Does this e-Learning product apply the Modality Principle? Why or Why not?**

Of the principles that Clark and Mayer (2016) present, the modality principle is the one with the greatest amount of supporting research. However, it is not applied within this eLearning course. The modality principle states that “there is considerable evidence that presenting words in audio rather than on-screen text can result in significant learning gains” (p. 130). The modality principle capitalizes on the dual channel principle, which recognizes that humans can simultaneously process information in two cognitive channels: auditory and visual (Clark & Mayer, 2016). If this course were to integrate concise, clear audio descriptions of port uses, it

might capitalize on the ability to offload information processing into the auditory channel, allowing the graphics to hold full space in the visual channel.

Adhering to the modality principle, however, can present challenges. It is possible that the creators of this course had technical limitations that prevented audio recording, or they desired to avoid the extra time and cost it would entail. Additionally, given the technical nature of presented information, it is reasonable to include text, allowing terms to “remain available to the learner for memory support” (Clark & Mayer, 2016, p. 134).

### **3. Does this e-Learning product apply the Contiguity Principle? Why or Why not?**

The contiguity principle calls for corresponding graphics and text to be physically integrated to reduce extraneous processing (Clark & Mayer, 2016). This course adheres well to the contiguity principle, with some exceptions.

Well-integrated multimedia supported processing; the learner is not left searching for information. When each port's purpose is provided, the port remains visible above the corresponding text that appears below. Feedback is displayed on the screen upon which a question was posed, directions are visible within the context of application, and text and image placements are generally well-organized, aligning with tenets of the contiguity principle (Clark & Mayer, 2016).

It is possible that the contiguity principle might have been implemented to greater advantage, however. When each port is selected, the information for other ports disappears. While this clearly communicates to the learner that new information is being provided for the highlighted element, this transience mitigates the ability to compare ports. The learner is prevented from simultaneous data review and must retain information in mind to contrast uses. Additionally, when a port is selected, the title and description of each port appears to the far left of the screen. Data processing might be optimized if the port titles and explanations were to appear directly underneath the corresponding image.

### **4. Does this e-Learning product apply the Coherence Principle? Why or Why not?**

### **5. Does this e-Learning product apply the Redundancy Principle? Why or Why not?**

As this eLearning course did not include audio, the redundancy principle could not be applied. The redundancy principle advises instructional designers that learners process information “better from concurrent graphics and audio than from concurrent graphics, audio, and on-screen text” (Clark & Mayer, 2016, p. 150).

Without incorporated audio instruction, this course did not adhere to the redundancy principle, but it also did not violate it. In no instance was attention to a narrated graphic marred by additional distracting on-screen text.

Notably, this course includes technical terms. Presenting these potentially novel words on-screen minimizes the learner's "need to grapple with decoding...spoken words" (Clark & Mayer, 106, p. 160). Clark and Mayer (2016) acknowledge this type of technical scenario as a relevant exception to complete redundancy principle adherence.

**6. Was the Personalization and Embodiment Principles implemented in this Multimedia e-Learning product? If so, in which way?**

The personalization principle was implemented in this course. The embodiment principle's implementation was present but limited.

The personalization principle states that eLearning is improved when conversational style and polite wording are employed (Clark & Mayer, 2016). The goal is to "induce the learner to engage with the computer as a social conversational partner," (Clark & Mayer, 2016, p. 195) which this course integrated in noteworthy fashion. The course requests to receive your first name, after which a customer speaks directly to you (via on-screen text) in the context of a situation that one might encounter in real life. The personalized experience with a virtual agent allowed the experience to feel authentic within the context of a meaningful challenge. Anecdotally, the feeling of a "social presence," (Clark & Mayer, 2016, p. 201) induced higher engagement on my part. The personalization principle does recommend that eLearning courses use human, rather than a robotic voices; in not employing narration this course neither adhered to nor violated this recommendation.

The embodiment principle calls for instructional online entities to "act like humans – using human-like gestures, movements, facial expressions, and eye gaze" (Clark & Mayer, 2016, p. 210). The static images in the course do not move. Human-like gestures are therefore absent, and high embodiment, which has been demonstrated to yield increased learning, was not present (Clark & Mayer, 2016). However, the facial expressions and eye contact in the still photographs, were human-like and meaningful.

While the personalization and embodiment principles were implemented to a degree, the course might be optimized in line with these principles via integration of human voice narration and human-like movement from a pedagogical agent.

7. Do you consider that, in general, the Gestalt and "PARC" visual design principles were applied appropriately in this product? Why or why not?
8. What instructional strategies did the instructional designers include in this brief eLearning product?

9. Provide your general comments about this product. Identify top two good things and two things that could be improved

### **Section 3: Instructional Design Concepts (Define **four** concepts)**

Define / explain **four** of the following concepts related to instructional design using your own words **as though you were explaining them** to a potential client describing how you plan on using them in the eLearning project you would develop for him/her.

- **Dual-code model**

The dual-code model refers to the understanding of human cognition that visual and auditory information are processed in two separate channels. The dual-code model influences instructional design and is reflected in multimedia eLearning principles. For example, the redundancy principle (with notable exceptions) calls for written text to be omitted from graphics and audio presentations, reducing the load on the visual processing channel. “Redundant” on-screen text in conjunction with graphics can overwhelm the visual channel. Offloading this textual information to the auditory channel optimizes efficient learning. Maintaining an awareness of the dual-code model allows instructional designers to capitalize on the human mind’s ability to concurrently process visual and auditory information, while avoiding cognitive overload (Clark & Mayer, 2016).

- Learning Objectives
- Redundancy Principle
- Multimedia Principle
- **Signaling Principle**

The signaling principle calls for the use of words, audio, and graphical elements to draw the learner’s attention to important details. For example, an auditory cue might guide a learner to make note of the first three points in a list, an animation might draw the learner’s eye to the section of an operational system that an instructor is speaking about, or a bold font might indicate to the learner that a term is of particular importance.

The signaling principle is very useful if it is impossible to remove extraneous material. The goal of signaling is reduction of extraneous processing, supporting learners in knowing where to best allocate their limited cognitive resources (Garwood, n.d.).

- First Principles of Instruction
- **Cognitive Overload**

The term cognitive overload refers to the fact that human minds have a limited ability to process new information. If cognitive overload is reached, further data processing is inhibited. Splitting a learner’s attention or presenting extraneous materials, for example, can distract and overwhelm a human’s cognitive capacity. For active information categorization and integration

into current understanding to take place, instructional designers must create content that recognizes the limitations of cognition. For example, the coherence principle calls for discretion when selecting audio, text, and graphics to include in eLearning products. If elements do not serve the learning objectives, they can lead to cognitive overload (Clark & Mayer, 2016).

- Gestalt Principles
- GUI
- **Scenario-based learning**

The aim of scenario-based eLearning is to place participants in authentic, low-stakes online environments that efficiently expose them to job-realistic problems. Mistakes can be made without real-life consequence, allowing risk-free learning to take place. These online learning scenarios can be challenging to create; a well-designed eLearning scenario responds to the learner's decisions, adjusting the course to reflect current understanding. In scenario-based learning the participant assumes a role, engages with problems, makes decisions, and learns as the online environment responds to those decisions. It is a truly valuable tool for increasing the rate of learning and for mitigating the potential for negative consequences of learning dangerous or time-sensitive skills (e.g., Advanced Cardiac Life Support or firefighter training) (Clark & Mayer, 2012).

- SCORM

## References

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