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EDET 709, Spring 2012

Mini-Redesign Design

March 19, 2012

Mini-Redesign Re-Design of “Fractions” PowerPoint Slide Show by Cary Lee

The PowerPoint presentation I have chosen to redesign is entitled “Fractions” and is available at <http://www.grossmont.edu/mathstudy/lessons/fractions/Fractions.ppt>.

<b>Design Item:</b>	<b>Description:</b>								
<b>Learning Objective</b>	<p>I am only using the first 15 slides of the PowerPoint, which discuss vocabulary and the concept of fractions. This will review concepts needed to meet the South Carolina 5<sup>th</sup> grade mathematics standard 5-2. The standard reads, “The student will demonstrate through the mathematical processes [...] the relationships among whole numbers, fractions, and decimals; and accurate, efficient, and generalizable methods of adding and subtracting fractions.”</p> <p>The indicator or lesson objective is “5-2.4 Compare whole numbers, decimals, and fractions by using the symbols &lt;, &gt;, and =.”</p>								
<b>Knowledge Domain-Behaviorism - Bloom’s Taxonomy</b>	Cognitive – acquisition of mental skills in mathematics								
<b>Learning Processes &amp; Instructional Techniques – Cognitivism – Gagne’s Principles</b>	<p>The redesign will add or enhance the following events of instruction (listed next to the associated cognitive/learning process and application in the redesign)</p> <table border="1"><thead><tr><th><b>Gagne’s Event</b></th><th><b>Process/Change to Design</b></th></tr></thead><tbody><tr><td>Gaining attention</td><td>Motivational introduction</td></tr><tr><td>Informing Learners of objective</td><td>Establish expectations – include state standards</td></tr><tr><td>Stimulate recall of prior learning</td><td>Retrieval from long term memory - Identify and review topics from 4<sup>th</sup></td></tr></tbody></table>	<b>Gagne’s Event</b>	<b>Process/Change to Design</b>	Gaining attention	Motivational introduction	Informing Learners of objective	Establish expectations – include state standards	Stimulate recall of prior learning	Retrieval from long term memory - Identify and review topics from 4 <sup>th</sup>
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		grade
	Presenting Stimulus Materials	Selective Perception – ensure clarity of instructional material, reinforce importance of material, scaffold where necessary
	Providing Learning Guidance	Semantic encoding – present materials in context of desired understanding using a multimedia approach
	Eliciting Performance	Response Generation – students can print handouts to work goal-free problem-solving activities
	Providing Feedback	Students will self-evaluate based on worked examples and interaction with teacher (teacher interaction not included in redesign)
	Assessing Performance	Students will self-assess based on worked examples and interaction with teacher in class (teacher interaction not included in redesign)
	Enhancing Retention and Transfer	Provision of context to increase relevance of material, and real-world examples that improve long-term retention and generalization
<b>Graphic Design</b>	Change color scheme and content distribution to meet Universal Design for Learning standards and mediate cognitive load.	
<b>User Interface</b>	Users will access PowerPoint online via desktop or laptop and hard copy through printed copies made available by the instructor or printable at a school lab, the library, or at home.	
<b>Content</b>	The content will be enhanced to include motivation theory aspects including explicit statement of learning objectives, provision of context to increase relevance of material, and real-world examples that improve long-term retention and generalization (Gagne' enhancing retention and transfer, schema theory)	
<b>Modification #1: UDL and Graphic/Visual design principles</b>	Background color changed from blue to white, text changed to black. Ensures readability for people with color blindness, increases contrast for people with poor vision, reduces color ink costs for printing. Red used for some highlighting.	
<b>Modification #2: UDL and Graphic/Visual design principles</b>	Arial non-serif font used for screen viewing; Times New Roman font used for printed handout. – Standard web design concession for screen-viewing or hard-copy viewing and both	

	<p>fonts are very common and likely to be available on any computer or operating system used in North America. The slide titles are increased to 32pt font or above and the slide content text is 28 pt font or above.</p>
<p><b>Modification #3: Motivation Theory and Gagne’s Principle of Informing Learners of Objective</b></p>	<p>The South Carolina state standards and objectives are listed in the PowerPoint.</p>
<p><b>Modification #4: Science of Learning Contiguity and Dual Code Multimedia Effects</b></p>	<p>Images and their descriptions, as well as related instruction are placed together and are illustrated graphically and presented in text.</p>
<p><b>Modification #5: Constructivist Scaffolded Instruction</b></p>	<p>Language and definitions are adjusted to meet those typical of elementary level instruction or defined using grade-level appropriate terms</p>
<p><b>Modification #6: Cognitive Load Theory/ Cognitive Design</b></p>	<p>In order to manage cognitive load, I further reduced and re-organized the content of the PowerPoint to reflect one of the main concepts inherent in the explicit learning objective: comparing equivalent fractions and demonstrating a mathematical relationship among fractions. Because the learner can focus on one major concept with discrete steps building understanding, the information is easier to process.</p>
<p><b>Modification #7: Science of Learning/Instruction – Multiple examples</b></p>	<p>Each concept discussed includes multiple examples or solved equations to improve understanding through self-explanation and demonstration. For the redesign I re-worded, clarified examples, or added examples.</p>
<p><b>Modification #8: Cognitive Theory of Multimedia Learning</b></p>	<p>I further reduced and re-organized the content of the PowerPoint to reflect one of the main concepts inherent in the explicit learning objective: comparing equivalent fractions and demonstrating a mathematical relationship among fractions. The illustrations, text, and design features work together to enhance understanding the concept.</p>
<p><b>Modification #9: Constructivist Theory</b></p>	<p>The redesign builds on prior knowledge by using familiar fractions required in 4<sup>th</sup> grade standards and referencing prior knowledge and its application in present instruction.</p>
<p><b>Modification #10:</b></p>	<p>Because this re-design modifies instruction for children from</p>

**Adult Learning  
Theory/Cognitive  
Theory/Piaget  
Developmental  
Stages**

instruction designed for adults several items a modified. Children have different motivations for learning and are at a different developmental stage. Children ages 9-12 are just entering formal operations from a concrete stage and need less nuanced examples. Moreover because many levels of automacy in mathematical computation have not yet been acquired, the extent of the content is reduced and I have removed the algebraic explanations that are beyond the experience and skill of the new target audience that were appropriate for older learners.

Additionally the motivation for adult learners, which might be intrinsic or goal-oriented, is supplemented or replaced by introducing goals and objectives within the instruction.