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DETC 620
Section: 9040
March 20, 2009
Multimedia Evaluation

Multimedia Evaluation

Multimedia in simplest terms is defined “as the seamless integration of two of more media” (Heller, 2001, para 1). When coupled with interaction, the question arises to its effectiveness in the education realm. Kennedy (1998, p. 411) feels interactivity should be promoted as “it encourages deeper processing of the learning material.” Thus, the appraisal following compared two different interactive multimedia websites judged by a jury panel and a winner was selected according to which was deemed more beneficial in the learning process. Both the Teaching Geography and The Brain from Top to Bottom programs had similar ratings; however, Teaching Geography excelled in layout and interactivity.

Approach

The approach taken for this appraisal took four main steps derived from Baumgartner and Payr (1997, para. 7) which included the following: formulation of value criteria, formulation of standards, measurement and comparison (analysis), and value judgment (synthesis). A rubric was created by the jury based on the readings of Heller et al (2001) which discussed developing a taxonomy that can be applied to multimedia evaluation, Reeves and Harmon (1994) who provided a description of pedagogical and usability dimensions of multimedia, and Baumgartner and Payr (1997) who suggested a system in order to weight the criteria.

The rubric produced evaluated each website derived from usability and pedagogical dimensions in an effort to unveil strengths and weakness and consequently determine a winner. Reeves and Harmon (1994, p. 474) described the usability dimension as those that “are

concerned with aspects of interactive multimedia that insure the learner can engage in a meaningful interactive with a program.” Thus, examples of usability would include navigation, ease of use, interactivity between learner and learning objects, sequencing, interface design, etc. The data was recorded as shown in Appendix A.

In relation, Reeves and Harmon (1994, para. 474) described the pedagogical dimension as those “concerned with those aspects of the design and implementation of interactive multimedia that directly affect learning.” Examples of pedagogical taxonomy can include, but are not limited to the following: promotion of interaction between learners, consistency between learning objectives and content of instruction, guidance and support, learner control, etc. The data was recorded as shown in Appendix B.

Using Baumgartner and Payr (1997, para. 10) Qualitative Weight and Sum (QWS) method, criteria were listed with weight, hence importance assigned to each using symbols. This method was chosen since assigning numbers for rating “assumes a linear scale of utility for all criteria” (Baumgartner, 1997, para. 9). Once criterion was established and weighted by the jury, each website underwent scrupulous review and was rated using Baumgartner’s item rating. The results were tallied and a winner was selected with the jury providing a summary report supporting their decision. The key for weight of criterion and definition of item rating follows in Figure 1.

Figure 1: Key for weight and definition of item rating

Key for Weight of Criterion	Definition of Item Rating
* = <i>very important (very valuable)</i>	* = <i>meets standards</i>
# = <i>important, relevant (valuable)</i>	# = <i>partially meets standards</i>
+ = <i>additional, less important (marginally valuable)</i>	+ = <i>marginally meets standards</i>
0 = <i>zero</i>	0 = <i>does not meet standards</i>
<i>*Please note that a criterion cannot be scored higher than its given weight.</i>	

Usability Results

Results for the website, Teaching Geography were * = 12, # = 17, + = 9, while The Brain from Top to Bottom ranked * = 10, # = 14, + = 12, and 0 = 2.

Both had similar markings in the areas of structure and sequencing, implementation, adaptability and satisfaction, but the Teaching Geography website excelled in the remaining areas of navigation, ease of use, aesthetics, interaction/GUI and accessibility. A major weak point for the Brain from Top to Bottom website was stating of software requirements and resources in acquiring software. Navigation was also an issue as there were numerous links scattered ubiquitously, many only identified by the symbol of a globe. The Teaching Geography website, in comparison, portrayed an easier interface with clear, underlined links on the left-hand side, creating a smooth flowing website. Additionally, the jury felt the Teaching Geography website exhibited better balance and proportion making good use of white space while the Brain from Top to Bottom appeared cluttered at times with multiple sidebars.

Pedagogical Results

Results for the website, Teaching Geography were * = 4, # = 7, + = 9, while The Brain from Top to Bottom ranked * = 4, # = 6, + = 7, and 0 = 3.

Both had comparable markings in the areas of learning, relevance, sequencing, scaffolding and assessment, while the Teaching Geography website took the lead in content, motivation and interaction. What stood out for the jury for The Brain from Top to Bottom was the lack of availability for collaboration and interaction. Furthermore, the Teaching Geography website was equipped with sound which complemented the learning process.

Final Results

The final results were as follows:

Teaching Geography, * = 16, # = 24, + = 18

The Brain from Top to Bottom, * = 14, # = 20, + = 19, 0 = 5

As indicated above, based on the ranking the winner of the multimedia award was the Teaching Geography website. The jury concluded that this site outweighed the Brain for Top to Bottom in both usability and pedagogical aspects. See Appendix C for graph.

Conclusion

The appraisal clearly reflects that not all multimedia websites are created equal in design. Hence, they have the propensity to exhibit differences in usability and pedagogical features that correlate to strengths and weaknesses for the learner. Reeves (1994, p. 501) reflects on this by saying, “The need for these design guidelines and evaluation procedures cannot be overemphasized.” By designing an evaluation rubric with criteria with standards and weights, websites can be ranked and insight can be gained to identify the finest of multimedia websites, which in this case was the site, Teaching Geography. The jury would like to thank each applicant for submitting their multimedia presentation. Both sites demonstrated great promise in the realm of academic software and we encourage them to include this appraisal as they undergo formative and summative evaluations of these multimedia websites.

References

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Appendix A

Table 1: Evaluation of interactive multimedia websites according to usability criteria

Key for Weight of Criterion		Definition of Item Rating		
* = very important (very valuable)		* = meets standards		
# = important, relevant (valuable)		# = partially meets standards		
+ = additional, less important (marginally valuable)		+ = marginally meets standards		
0 = zero		0 = does not meet standards		
<i>*Please note that a criterion cannot be scored higher than its given weight.</i>				
Usability Elements				
Criteria	Standards (Operationalization, Items)	Weight of Criterion	Ranking of Item	
			Geography	Brain
Navigation	Can you easily move through the multimedia program?	#	#	#
	Can the user exit the program at will and go back through the program?	*	*	*
	Can the user locate the main menu, help, glossary and site map with ease?	*	*	*
	Can the user easily understand how the navigation options function?	#	#	+
	Do the links and hyperlinks function and are they current?	#	+	#
	Do users have a clear view of where they are and what functions/actions are available for use?	*	*	#
	Ease of Use	Does the program run on the users' current computer?	*	*
	Can the users access the Internet and install the program with ease?	*	*	*
	Does the multimedia program run on the most common browsers e.g. Netscape, Firefox, and Internet Explorer?	*	*	*
	Can all parts of the information found be printed?	*	*	*
	Is it easy to learn all the functions used with the multimedia program?	#	#	+
	Is there a Help Menu for the user to consult?	#	+	+
	Is there a Technical Support Desk for the user to consult?	#	#	+
Aesthetics	Is the content free of spelling and grammar errors?	#	#	#

	Are the fonts, graphics and icons properly sized and easy to read?	*	*	+
	Does the multimedia program exhibit balance and proportion throughout?	#	#	+
	Is streaming or videos used in the multimedia program clear and visible?	#	#	#
	Is there restraint in the use of animation and graphics?	#	#	#
Interaction/Graphic User Interface (GUI)	Are the colors, text, font, animation and graphics used in a way that promotes understanding?	*	*	*
	Are the links and menu buttons etc. consistently placed throughout the program?	#	#	+
	Is the content well organized on the multimedia screen?	#	#	#
	Does the content meet W3C standards for individuals with disabilities?	*	+	+
Structure and Sequencing	Is there a site map that gives a detailed overview of the program?	#	#	#
	Are there clear information headings separating the pages and sections of the multimedia program?	#	#	#
	Does the multimedia program exhibit prerequisites for learning or show levels of difficulty?	#	+	#
Implementation	Does the multimedia program create and encourage learner motivation?	*	*	*
	During normal use is there a minimal amount of error messages or failures?	*	*	*
	Can the student work at their own pace with no Professor oversight?	+	+	+
Adaptability	Can the multimedia program be updated and adapted to include new content; along with teaching and learning requirements?	#	#	#
	Is it possible to incorporate all aspects of the multimedia into classroom activities?	*	*	*
	Is it possible to save and reenter the instruction at any time?	#	#	#
Accessibility	Are minimal software/hardware	#	#	0

	requirements stated?			
	Are there resources for assisting in acquiring minimal software/hardware requirements?	+	+	0
	Is the multimedia program designed for mobile learning?	#	+	+
Satisfaction	Multimedia program creates and maintains learner motivation and interest.	#	#	#
	Does the multimedia program contribute to further learning in the area of multimedia?	+	+	+
	The user's perceptions, feeling, and opinions of the system are satisfactory.	+	+	+
	Does the user feel they've learned or added more to their knowledge bank?	#	#	#
Total Usability Elements (38)		*13 #21 +4	*12 #17 +9 0-0	*10 #14 +12 0-2

Appendix B

Table 2: Evaluation of interactive multimedia websites according to pedagogical criteria

Key for Weight of Criterion		Definition of Item Rating		
* = very important (very valuable)		* = meets standards		
# = important, relevant (valuable)		# = partially meets standards		
+ = additional, less important (marginally valuable)		+ marginally meets standards		
0 = zero		0 = does not meet standards		
<i>*Please note that a criterion cannot be scored higher than its given weight.</i>				
Pedagogical Elements				
Learning	Does the product provide opportunity for real world problem solving and authentic tasks?	#	#	#
	Are there provisions for quick feedback and interactivity?	*	#	#
	Is the material content up-to-date?	#	#	#
	Does it still apply?	#	#	#
Content	The subject material is accurate and adequately covered.	*	*	*
	The information presented is concise; not overwhelming to avoid confusion.	*	*	*
	Are graphics, diagrams or audio allowances to ease cognitive load and to assist with recall, concepts and application	*	*	*
	Is there capability for print, text and audio?	#	#	+
Relevance	The content of the program is relevant for teaching and learning in the subject area.	#	#	#
	Are features in place to allow for authentic case based or reflective learning?	+	+	+
Motivation	Can a mix of technologies be incorporated to expand the learning plan?	#	#	#
	Are features of relationship building and collaboration available?	#	+	0
Interactions	Are there elements in place to assist with information exchange?	*	+	+
	One way (synchronous) support			
	Two Way (asynchronous) support	*	+	0

	Digitized speech	+	+	0
	Visual aids	+	+	+
Sequencing	Are their opportunities for redundant or embedded concepts or practice?	+	+	+
	Are there higher to lower order features or vice versa to aid in learner control of learning domain?	+	+	+
Scaffolding	Are materials flexible and tutor assistants available to support learning styles, and increase participation?	*	+	+
Assessment	Does the system allow for formative and summative evaluations by learners? Ex: Self evaluation/testing and reflective evaluations	*	*	*
Total Pedagogical Elements		*8 #7 +5	*4 #7 +9 0-0	*4 #6 +7 0-3

Appendix C

Garph 1: Item totals versus item rating

