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DETC 620 Assignment 2

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Introduction

Performing accurate mathematical calculations is a critical skill for nurses. Students who enter the junior year of nursing school come from a variety of disparate preparatory backgrounds (e.g., a four year school, community college, a certificate program). Many students are quite skilled at mathematical calculations while others require remediation. To this end, the University of Maryland School of Nursing has hired McPherson Consulting to evaluate available multimedia products that provide nursing students with an opportunity to enhance their medication mathematical calculation skills. After considering a variety of potential multimedia resources, two runners up were selected by the jury. The following analysis will detail the process used to evaluate these two items, and the final selection subsequent to a critical examination of all elements of each resource.

Multimedia Product Evaluation

The McPherson Consulting group considered several potential tools that may be used to evaluate interactive media including the Numerical Weight and Sum (NWS), the Qualitative Weight and Sum (QWS), and the Learning Object Review Instrument (LORI) (Baumgartner & Payr, 1997; Leacock & Nesbit, 2007). After careful consideration, the LORI tool was selected for this evaluation (Nesbit, Belfer & Leacock, 2002). The LORI tool evaluates learning object in nine areas: content quality, learning goal alignment, feedback and adaptation, motivation,

presentation design, interaction usability, accessibility, reusability and standards compliance (Nesbit, Belfer & Leacock, 2002). Each area is rated on a 1-5 scale (5 high), and an evaluator may select “not-applicable” if they feel unqualified to assess a specific criterion. The McPherson Consulting group used a convergent participation model consisting of two rounds of evaluation conducted by a multiprofessional group including learners, instructors, instructional designers and subject matter experts (Nesbit, Belfer & Vargo, 2002). In the first cycle all evaluators independently rank all learning objects; the second cycle is a synchronous review by all reviewers. Note that item 8 (standards compliance) was deleted because this was not required for the intended purpose of the selected learning object.

Finalist Learning Objects

The first finalist (LO1) is “Med-Calc Tutorial” (Hansen, M., 2009), an interactive multimedia learning object that consists of three modules. The first module covers fractions, decimals, ratios, proportions and percentages. The second module addresses conversion between weight systems, medication administration and dose calculations. The third module covers calculations to parenteral therapy including tubing calculations, intravenous flow rates and general intravenous therapy. There are self-assessment questions with feedback provided through each module, and each module has a quiz that requires the learner identify the correct answer before moving on (although multiple attempts are allowed).

The alternate finalist (LO2) is “Dosage Calculations” from the Medical College of George (N.D.). The description provided online is clear that this multimedia resource is not intended to serve as a stand-alone course, rather it is a compilation of learning objects designed to be inserted into other courses. There are five core areas of content: Doing the math (dimensional analysis and flow rates), syringes and labels, conversions and abbreviations, metric

review, and fractions review. Assessment activities with feedback and included throughout all content.

Evaluation of the Finalists

Asynchronous evaluation of each finalist was completed by all six reviewers (two instructors, one instructional designer, one subject matter expert, and two learners); results are shown in the table. Subsequently, round two was conducted synchronously with all reviewers present; results are also shown in table. Based on this iterative convergence participation model, a high degree of agreement was achieved, and “Dosage Calculations” was selected as the winner.

Med-Calc Tutorial (LO1)								
Item	Instructor 1	Instructor 2	ISD	SME	Learner 1	Learner 2	Average Round 1	Average Round 2
Content Quality	5	5	NA	5	5	5	5	5
Learning Goal Alignment	3	4	3	3	4	5	3.7	3.5
Feedback and Adaptation	1	1	1	3	3	3	2	1.7
Motivation	3	3	3	4	5	3	3.5	3.2
Presentation Design	1	3	1	3	3	4	2.5	2.2
Interaction Usability	3	3	3	3	2	3	2.5	2.5
Accessibility	1	3	2	3	4	3	2.7	2.5
Reusability	4	4	3	3	NA	NA	3.5	3
TOTAL							3.2	3

Dosage Calculations (LO2)								
Item	Instructor 1	Instructor 2	ISD	SME	Learner 1	Learner 2	Average Round 1	Average Round 2
Content Quality	5	5	NA	3	5	5	4.6	4.8
Learning Goal Alignment	5	5	5	5	5	5	5	5
Feedback and Adaptation	3	3	3	3	4	5	3.5	3.2
Motivation	5	5	5	5	4	4	4.7	4.7
Presentation Design	5	5	5	5	5	5	5	5
Interaction Usability	5	4	4	5	3	4	4.2	4
Accessibility	5	5	5	5	5	5	5	5
Reusability	5	5	5	5	NA	NA	5	5
TOTAL							4.6	4.6

Rationale for Winner Selection

While LO1 (“Med-Calc Tutorial”) has many fine features, and is certainly an acceptable learning object for nurses-in-training, there are several reasons why LO2 (“Dosage Calculations”) was preferred. Both learning objects (LO) had similar, accurate content. LO2, however, provided a greater number of self-assessment activities that were more realistic and reflected the learning objectives. Both LO provided feedback on assessment activities, but to a greater degree with LO2. When taking an assessment in LO1, if a learner did not know the answer, there was no option to move forward despite this in the tutorial.

LO2 was exceptional in terms of motivation and presentation. LO1 presented content in a very small font (several reviewers had to increase the display on their computer to visualize) and lacked narration. LO1 had a very clear, visible display, supplemented by a moderately-paced, enthusiastic narrator. Transitions in LO2 were accompanied by a satisfying click (like a slide progressing), and showed excellent use of graphics to illustrate important points. Last, LO2 was highly culturally sensitive. Learners were allowed to select the avatar of their choice in assessment activities; options were varied in terms of patient age and skin tone.

Conclusion

“Dosage Calculations” was chosen by the McPherson Consulting group using a convergent participation model that included educators, learners and subject matter experts. “Dosage Calculations” is a user-friendly learning object that may be utilized as is, or incorporated as needed into other learning activities. Congratulations to the developers of “Dosage Calculations.”

References

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