Use of an Instructional Design Model in Validating an Online Animated Case-Based Systems Thinking Module

By
Ann M. Stalter, PhD, RN., M. Ed, Wright State University; Dayton, Ohio, USA
Carol M. Wiggs, PhD, RN, CNM, AHN-BC, The University of Texas Medical Branch, Galveston, Texas, USA
Disclosure

Both Drs. Stalter and Wiggs have no actual or potential conflicts of interest in relation to this program or presentation.
Objectives

Upon completion of this presentation, participants will:

1) Recognize that systems thinking is an important variable for medical error prevention within nursing education and practice
2) Describe how an interactive module using Articulate StoryLine2 can engage student learning of systems thinking
3) Examine the use of Analyze, Design, Develop, Implement, and Evaluate (ADDIE) model in validating an online animated case-based systems thinking module.
Outline of Presentation

1. Background
2. Purpose
3. ADDIE
4. Methods & Instruments
5. Data Analysis & Results
6. Discussion & Recommendations
7. Questions
A decade ago, medical errors caused more than 98,000 preventable deaths (Makary & Daniel, 2016).

Today, medical errors are the third leading cause of death in the United States (Makary & Daniel, 2016).

Medical errors are not unique to the United States (U.S.), but occur globally with an estimated one million patients dying across the world due to preventable health care errors (Godschalk, Hartel, & Sbrenzy, 2017).

The increasing error trend is linked to Inadequate Organizations Systems or Processes to Improve Safety and Quality (Emergency Care Research Institute, 2017).

Researchers in quality and safety assert a crucial need for systems thinking education among nurses and healthcare professionals (Stalter, Phillips & Dolansky, 2017).

Innovative animated case-based instruction involving online education is an example of best teaching practice (Mayer, 2014).
Purpose

to retrospectively determine if the Analyze, Design, Develop, Implement, and Evaluate (ADDIE) model of instructional design was used effectively to develop and test an e-learning systems thinking module.
ADDIE

- Instructional design model
- Developed by Florida State University to form instructional systems
- has been applied to curriculum development activities to determine need for revision (Branson, Raynor Cox Furman & Hannum, 1975)
- ADDIE is an acronym for five phases
Analysis

- knowing intended audience preferences
- creating task lists
- defining how the learners will view content
- defining the project’s overall goals so that the designer can classify the information to make the content more applicable for audience use.
**Design**

**Interactive Module with Articulate StoryLine2**

* Theory driven: Employs Wiggins and McTighe’s (2011) Practical Inquiry Model

* Leads learners to “think” and “do” from the onset

* Faculty Presence: A two minute introduction and 6-30 second feedback videos between 3 minute mini-lectures

* Learner focused: Participants are engaged with ADA compliant learner outcomes

* Pre and Post-testing offers learners with understanding what material needs to be mastered

**Question 1 of 4: I am aware of the concept of systems thinking from a theoretical perspective.**

- No, not at all
- Somewhat
- Yes, without a doubt

* Scoring provide interpretive feedback and redirects learners
Development

- activities such as self-learning the software
- balancing the role of subject matter expert (SME)
- blending use of multiple tools
  - photo and video editing
  - sound mastering
  - publishing and server tools fundamental to a final endpoint
Implementation

- determines if materials are appropriate and function for audience use
- testing and editing preliminary concepts are key to mitigating errors under realistic conditions.
Evaluation

- Summative and formative assessments determine if materials achieve desired goals (Instructional Design Expert, 2016).
Methods & Instruments

● A mixed method design involved a record audit review
  ○ Instructional designer’s journal and calendar entries
  ○ Learner pre and post test results
  ○ Learners’ perspectives of the systems thinking module from discussion boards within a learning management system.

● A researcher designed checklist based on seminal work by Danks (2011)
  ○ determined if ADDIE steps and key activities were evident

● An interactive pre and posttest
  ○ determined if learners (n=8) increased in systems thinking knowledge
Data Analysis & Results

- Content from instructional designer’s journal, calendar and course discussion boards were analyzed to determine if key activities occurred.
- Frequency statistics validated which steps were followed.

<table>
<thead>
<tr>
<th>ADDIE Key activity</th>
<th>Themes from multiple instrument sources</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis- Assessment</td>
<td>“Nurses prefer interactive online courses”</td>
<td>100%</td>
</tr>
<tr>
<td>Design- Expert panel</td>
<td>“Mini lectures and Big ideas focused learning”</td>
<td>100%</td>
</tr>
<tr>
<td>Development- Team</td>
<td>“Technology behaved as designed”</td>
<td>90%</td>
</tr>
<tr>
<td>Implementation- student trial</td>
<td>“A drag and drop didn’t function properly” “Audio was out of sequence”</td>
<td>90%</td>
</tr>
<tr>
<td>Evaluation- two levels, including peer review</td>
<td>Formative- slide by slide, trigger by trigger, layer by layer, scene by scene Summative- pre &amp; post test scores improved</td>
<td>Pre-test 0-55% Post test 85-100%</td>
</tr>
</tbody>
</table>
Discussion & Recommendations

- 100% of key activities were evident in each ADDIE step
- Learners increased systems thinking knowledge.
- Recommendations were primarily technology-related

Read the facts about the case on the left. Select the DITH letter on the puzzle that corresponds to each fact in order to reveal more about Mrs. Smith's current status.

The Case of Mrs. Smith

A Root Cause Analysis was completed and it revealed:

- Mrs. Smith's son usually takes her to his house every other weekend.
- The aide thinks the son does not like to toilet, bath and put Mrs. Smith to bed. They are concerned about neglect.
- Mrs. Smith loves going to her son's house.
- The nurses share that Mrs. Smith's son does not come to care conferences during the week.
Questions 7
References


References (cont.)


