NCMCO

NATIONAL CONSORTIUM FOR MISSION CRITICAL OPERATIONS

Evidence Based Design Model and Implementation

Introduction

Course design for the Mission Critical Operations program is based on the MCO competencies that have been specified by Subject Matter Experts (SMEs). The SMEs have been chosen as representatives of their respective fields based on skills, knowledge, and experience. Both the Operations Technology and Information Technology groups (the major parts that make up the MCO program) are represented and both have completed a Job Task Analysis. From the Job Task Analysis workshops we were provided lists of domains (categories) that serve as evidence as to what our curriculum needs to address. The two main categories of materials created are newly created and supplemental materials.

Newly Created Materials

Newly created materials include Open Educational Resources such as modules, partial courses, courses intended for use combined with other materials (either existing or newly created), or complete full length (semester long) courses.
Supplemental Materials for Existing Courses
Supplemental materials include games, puzzles, videos, infographics, multi-media presentations, study-aids, modules, and other OER created to be combined with and to enhance existing courses.

Rationale

Since all of the materials produced from our grant are intended for Creative Commons Licensing, i.e. – items created will be Open Educational Resources, the importance of designing and evaluating materials in a way that is applicable to OER is of utmost importance.
A method of evaluating resources according to the quality, relevance, and pertinence are provided by the set of rubrics is from the Temoa organization, and is simply called “Rubrics to Evaluate Open Educational Resources (OER)”. Although this set of rubrics was originally designed for the potential user of an open educational resource to use when deciding which resources are best, this serves well as the type of evaluation needed in our situation. (The set of rubrics uses a scale that includes “N/A” for occasions when the rubric is not applicable. There are seven rubrics. The link to the pdf file is: http://www.temoa.info/sites/default/files/OER_Rubrics_0.pdf .)
Having chosen evaluation criteria that are tailored to OER, we have also tailored the design model to fit this application. The evidence-based design model created to complement the Temoa rubrics follows.

What We Need to Convey (Analyze)

Once a course, an OER, or other piece has been determined as something that is needed, the domains from the SMEs (in their JTA workshops) are aligned with the purpose of the piece. Specific competencies (things that can be tested) belonging to these domains are matched with the course/item purpose. Evidence-based goals, objectives and assignments are then developed based on these competencies.

Who We Want to Reach (Analyze)

The piece is then designed with the incumbent and future mission critical operation technician in mind. (For example, to take into consideration that some students come to us knowing some material already and some needing to know the workplace terminology, glossaries or lists of terms and their definitions are provided.)

Planning the Design (Analyze)

The following items are also considered in planning the design:

- Desired outcomes
- Learning constraints such as:
- Time constraints
- Limitations inherent to the delivery method
- Time considerations (How long until this piece is due? Etc.)

Design and Development

(Select the delivery method, if it has not already been specified.) While keeping in mind the subject, the learning objectives, and the students, apply instructional strategies and implement visual and technical design strategies. Develop the instructional material/item using the checklists below.

Content Quality

Design the content with attention to quality. During design and development, use the following quality checklist:

- Check for and correct any errors or omissions.
- Correct anything that could be misconstrued.
- Make sure content is supported by evidence or logical arguments.
- Verify that key points are emphasized and contain appropriate detail.
- Verify that content is represented in a culturally balanced manner.
- Is the material objective?

Motivation

Design the content in a manner that motivates the student and helps them become more interested. During design and development, use the following motivation checklist:

- Does this material have the potential to motivate the student and generate interest?
- Verify that the piece offers reality-based content.
- Will use of this piece make it likely that a student will show more interest in a topic?

Presentation Design

While designing and developing it is important to remember that the way a resource is presented to the student has a direct bearing on student outcome. While designing and developing the item use the following presentation design checklist:

- Does the design of information give adequate information?
- Is the item organized in a way that facilitates effective identification of elements in the resource?
- Is text clearly written and readable?
- Verify that any graphs or charts are correctly labeled and sorted.
- Make sure that animations and videos include narrative.
- Check for and correct any writing that is not clear and concise.
- Verify that color, music, and design are attractive, but do not detract from or interfere with the objectives.

Usability

If a resource is hard to use or does not work then it is ineffective. During the design and development of materials, use this usability checklist:

- Is the item easily navigated and intuitive?
- Verify that all instructions are clear.
- Does the design (user interface) inform the user how to interact with the item?
- Does the user interface perform consistently and predictably?

Accessibility

If our students are unable to use our resource, it is ineffective. We must provide a resource that is accessible and is designed with flexibility. Resources should be accessible from a variety of devices. While designing and developing materials use this accessibility checklist:

- Verify that information is presented in such a way that those with special needs will have access to it.
- Check to be sure that an item is accessible from a variety of mobile devices to provide flexible access from anywhere and correct any issues with accessibility.

Educational Value

The items and resources created should provide useful information on the subject it is to address. Items should make use of examples and demonstrations. Providing the proper information as well as putting it into context for the student and helping the student to apply this knowledge are all important aspects of our design. While designing and developing items use this educational value checklist:

- Verify that content is correct and relevant to the subject.
- Verify that examples or other ways for students to think about a concept are given.
- Does the user have an opportunity to use what they have learned or demonstrate it?
- Is there an opportunity for students to apply what they learn?
- Be sure that biases are avoided.
- Verify that learning objectives are clear.

Verify that all key topics are not only defined, but also have activities, self-check opportunities, or some other method of allowing a student to use the information and put it into context. Incorporate any existing resources that would add value. Create the prototype of the resource. Apply desired graphic design theme to entire piece.

Implementation

When appropriate provide training to faculty on how to use Open Education Resources and similar items. Make sure instructors are aware of any resources available to their students for using the LMS. Verify that everything is available and functional. Update materials as needed, making sure that corrections are made (as needed) and additions are made to OER that require updated information over time. (This is an ongoing process.)

Evaluation

The “Temoa Rubrics to Evaluate Open Educational Resources (OER)” will be used as the main method for evaluating the resources created.