IDT610 (Advanced Instructional Design and Technology II):

Justifying Project Changes

Submitted in partial fulfillment of the requirements for the degree of

Master of Science in Instructional Design and Technology (MSIDT)

By

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To

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Identify Differences from IDT603

Navigational Changes

The unit numbers have been changed to improve navigation. Initially, the course orientation had no unit number. In the testing of the prototype, there were difficulties figuring out their location in the course when sections of the online course had no numbers. The revisions to the prototype course now have the course orientation as Unit 1 with the rest of the units following numerically as planned initially. The end-of-course evaluation filled out by the participants will be the last unit called Unit 6.

Classroom Assessment Tests

In the design proposed in IDT 603, the only assessments planned for were the end of the unit quizzes.   For this MSIDT project, the data will be collected using three types of assessments. The first tool will be in the form of diagnostic assessments specifically a self-instructional reaction evaluation to check for issues with course navigation, and the difficulty of the unit materials a post-course survey for feedback on the participant's experience with the online course. The second tool will be formative assessments using participant feedback. One form of formative assessments will be the use of Classroom Assessment Techniques (CATS).

Angelo and Cross (1993) found that CATs instructors to observe their student's learning through the collection of frequent feedback. The purpose of the feedback is for the teacher to learn about how their students learn and how those students respond to teaching approaches. Though these techniques were designed for in-classroom use as they would be during the face-to-face session of this project but can also be utilized with online students. Li's research (2018) examined both traditional and online faculty in their use of CATs. The results of the study found

that both traditional and online faculty found improvement in student performance and the ability

to locate areas of needed improvement in course content and delivery.

For the prototype project, CATs would be filled out at the beginning and end of each

course activity found in Units 2-5. The two that would provide the most useful results would be

the Muddiest Point and Background Knowledge Probe. As the name suggests, Muddiest Point

would ask the participant to provide feedback on what concept from the unit was the most

confusing (Angelo, 1993, p. 154). This feedback would mean revisiting the unit and making the

adjustment to remove the confusion. Background Knowledge Probe has the participants share

their previous or personal experience with the unit topic (p. 121). This feedback would be

requested before they begin the unit and would ascertain the participants experience with the unit

topic. The results could lead to increasing or decreasing the depth the unit topic would cover.

The Use of Scenario-Based Learning

The benefits of scenario-based learning were introduced during the development of instructional

strategies in the front-end analysis of the project. The participant starts with an online course to

develop the baseline knowledge needed to move into face-to-face training. The instructional

strategy called InterPLAY formed the foundation to integrate the use of scenario-based learning

into both the online and face-to-face course.

Schank, Berman, and Macpherson (1999) developed goal-based scenarios (GBS). This

"learn by doing" approach causes the learner to pursue a goal by practicing target skills and

using relevant knowledge to achieve a goal. The purpose of having an online course before the

face-to-face training in this project is to provide an opportunity for the participant to gain

preliminary knowledge that would increase their confidence upon entering the next part of the

course. GBS design will provide motivating and sensible context and will aid their understanding of the relevance of the skill they are learning.

Stapleton and Hirumi (2014) argue that experiential learning theories assume that learners learn best when they are presented with relevant, meaningful, and engaging challenges. They further explain that emotions and imagination have a direct impact on how and why learning occurs. The InterPlay Model uses three basic conventions: story, play, and game using real-world conditions to incite an emotional investment with the topic. Story, which uses the elements of events, character, and worlds, incite the emotions through the use of plot. Play which uses the elements stimulus, response, and consequence invite participation. Game, which uses the elements of rules, tool, and goals, escalate challenges to increase the risk to elicit achievement.

In the prototype project, the InterPLAY model is actuated through the unit activities. Each unit begins with a goal and set of objectives, which starts the story and provides the quest or goals for learning. Educational videos with corresponding learning resources will provide the baseline knowledge to move into the challenge. Each learning goal for the prototype course will have a scenario which takes the previously learned knowledge and make it relevant to their current environment.

Design Plan Changes

Integration of Learning Theories

Why is the integration of learning theories in instructional design important? As an instructional designer, the IBSTPI competencies provide the foundation to design high-quality instruction. IBSTPI Competency #2 states: "Apply research and theory to the discipline of instructional

design" (Koszalka, 2013, p. 24). The purpose of learning theories, according to Khalil and Elkhider (2016) is to provide the foundation for choosing the instructional strategy that would be the most effective for the project. The correct instructional strategy can elicit the cognitive processes that best align with the course goals and makes the course effective.

How the Project Will Change?

   Increase interactivity. This project is a form of cognitive apprenticeship, which is an essential aspect of situated cognition. An apprenticeship is a social interaction between a novice and an expert (Situated cognition (Brown, Collins, Duguid), 2017). Just as in an apprenticeship, this project will share the necessary skills, provide interactions and experiences from the facilitator to the participant. The expertise and experience of the facilitator will be passed down to the participant. This form of socio-cultural learning is focused on one set of skills which provides authentic learning because it is relevant to what the participant will be performing in their work environment.

   Provide accessibility options. Assistive technology underscores the philosophy that everyone deserves access to accessible and equitable education. Part of removing a learner's barrier to learning requires the use of assistive technology, which increases learner confidence and gives them the tools to be successful. Assistive technology can offer options when a physical hindrance is present. The technology should include auditory support for students with visual difficulties and visual support if there are auditory issues. There are also equipment options for decreased dexterity.

   For talented and gifted (TAG) students, culturally and linguistically diverse (CLD) and students with special needs, the Center for Applied Special Technology (CAST) believed that to meet the learning requirements for these students. Lever-Duffy and McDonald (2015) discuss

that the instruction has to be targeted to their varying abilities. Based on this observation, CAST has come up with the Universal Design for Learning (UDL). The design helps educators formulate a curriculum that can be used by all students. Technology can be used to research possible resources, as well as; help run the programs needed to teach these students. In short, UDL helps decrease obstacles to increase learning potential.

Add opportunities for feedback. According to McDavid (2013), formative assessments or evaluations are used to provide feedback and advice to which is used to improve the program. Spector et al. (2016) note that the purpose of formative assessment is to support learning. The integration of formative assessments into teaching brings about an improvement in student performance and promote learner skills (p. 58). Formative assessments are critical to an instructor's ability to adapt lessons and check for student understanding.

Adapting lessons and checking for student understanding is necessary for evaluation of this MSIDT project as this will turn into a data collection point in the summative assessment to see if skills are retained in the short and long term. Summative assessments, according to McDavid (2016), looks at whether the program has achieved its intended objectives. The Muddiest Point and Background Knowledge Probe CATS will provide formative assessments for online and face-to-face training. The summative assessment will be in the form of a retrospective survey after the end of the face-to-face training.

Provide navigation tutorial. The target audience for this project will be adult learners. Adult learners will have a different experience in managing an online course. Three out of the four testers worked on a computer or a mobile device daily. One of the testers had basic computer skills. According to an article in CourseArc (2016), 35% of adult online learners leave a course due to their initial experience. This statistic is not only a user experience problem but a

potential barrier to continuing education. The prototype testing showed that all the testers had difficulty finding their way around the course when given a location to find. A second finding showed testers were unable to find their way back to the main course.

Winch and Cahn (2015) found that some adult learners new to online learning or have learned with limited technologies might not find the course intuitively navigable. They found that learners that are provided with a course navigation video did better and tended not to leave the course out of frustration. They also found that learners that use a video tutorial do better than those that do not. Beckford (2015) notes that providing an orientation session helps the students feel more connected to the course.

The resolution to the problem found during the alpha testing is a complete reorganization of the course outline with a corresponding navigation tutorial. The user will be able to: 1) use the course outline to move to any part of the course, 2) figure out where they are in the class by their current course location, and 3) be able to easily find their way back to the main course from a link. Dental Radiology Training: Part 1 will begin with Unit 1, which will be the course orientation and move numerically until the last unit, which will be the course assessment.

Connect course objectives with work experience. When learning to take dental radiographs, much of the target audience will be experiencing these skills for the first time. Learning is seen as knowledge construction as the learner actively builds the new experience into their working memory.

According to Mayer (1999), "constructivist learning occurs when learners actively create their knowledge by trying to make sense out of the material that is presented to them (p. 143)." This statement made a connection with the project. The instructional designer's role is to create learning environments that ensure that the learner can interact with the material that supports

knowledge integration. Mayer discusses that constructivist learners use a variety of cognitive

processes while learning. These processes include connecting with current knowledge,

organizing, and integrating activities into existing knowledge. According to Morrison (2012), it

is also essential to achieve a deeper understanding of the material by providing ways for the

participant to retain the information. The best way for the participant to retain information is to

connect the material with the participant's current knowledge of the topic called generative

learning. Utilizing the participant's existing knowledge helps to relate to the material, which

causes increased motivation more easily.

These theories are essential to this project. The target audience who have little to no prior

knowledge will need the connection between the new skill of taking radiographs, the importance

of taking radiographs with their role in the practice where they work. The connection will

increase learning motivation.

<div align="center">**Identify Differences from IDT607**</div>

The purpose of the evaluation is to examine the effectiveness of programs. According to

McDavid (2013), evaluations provide information to the program development team and their

stakeholders. A successful program must accomplish its planned outcomes. Programs are

evaluated using a series of data collecting tools whose results examine the incremental effects of

the program.

Prototype Testing

The evaluation work in IDT 607 included both the online course and face-to-face training. Since

the face-to-face training was not included in the alpha test, there is no data to include for this part

of the MSIDT project. Once testing begins with the face-to-face training, data will be collected

from the formative and summative assessments planned for Dental Radiology Training: Part 2.

The second evaluation not included in the prototype testing was the use of the CAT assessments. In the alpha testing, participants were given instructions to perform tasks in Unit 1- Course Navigation and Unit 2 – Dental Structures of the Dog and Cat and Unit 6 – Course Evaluation. The tasks tested measured usability by participants with little to no knowledge of veterinary dentistry. The CAT assessments would not provide useful data with these test participants, so there was no data collected. These assessments will be more closely examined when the course is tested to members of the target audience.

Course Evaluation

The course evaluation would examine the usability of the course, challenge level, engagement, and motivation for the participant. Usability questions can be asked both at the beginning and the end of the course. Early responses on usability can allow the designer to make changes when the course is live and determine if those changes brought improvement for the participant. Engagement questions can be used after each unit to determine the level of interactivity and motivation the participant experienced. Results could cause changes to the content and technology used to teach the participant. Content questions can be used at the end of the course to decide if the material brought the right amount of challenge and were easy to understand.

The course evaluation used in the test was well received. Some of the participants felt the design was efficient and straightforward with clear and specific questions. One participant noted that assessment given at the end of the course seemed a little long but appreciated that future users could add comments if they wanted to. Comments were not mandatory. The assessments were found to be easy to fill out and submit. Three of the participants noted that there was too much white space on the document and an unnecessary document flourish that made it appear to have multiple pages.

Unit quizzes

In IDT 607 a plan was presented for the quizzes. At the end of each unit, a multiple-choice quiz would be given to test for knowledge retention. The quizzes will be kept open until the participant achieves a score of 100%. If the number of retakes is high, this could mean the material is too complicated, or the question is not substantiated in the course material, or the question is poorly written. The result trends will be examined to see if any connections can be made.

In alpha testing, the unit quizzes provided mixed results. The free subscription used during the testing had expired, which caused a temporary loss of access. Due to the loss of access, one of the participants was not able to try the quizzes. The remaining participants found the quiz experience very welcoming because taking the quizzes felt more like playing a game using bright colors and motion graphics. User results were presented in a positive light that focused more on learning from mistakes than chastising them. Participant comments included having feedback included with all answers right or wrong, numbering the questions, and adding graphics to some of the questions.

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Design Plan Changes

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Test Participant Profile

For the next round of testing, test participants will be chosen that fit the profile of the typical user. The target audience will be a combination of credentialed veterinary technicians, certified veterinary assistants, and on-the-job trained staff. The staff members will either be currently performing dental procedures or in the process of being trained to perform dental procedures. In some cases, veterinarians will participate in the training. For the testing, veterinary technician students will also be used.

The rationale for the change in testing participant is to allow more of the course to be included in the test. This change will enable the data to be collected on the assessment tools and make any necessary revisions before the final release.

CAT Assessment Effectiveness

The CAT assessments were not included in the alpha testing prototype. The alpha test focused more on navigation and usability. In the next phases of testing, the whole course will be examined by the testers, and the CAT assessments will be included. The data collected from the results will be integrated with the course evaluations and the quizzes to measure: 1) the background knowledge of the participant, 2) if the objectives are being met by the participant, and 3) if there is content in the course units that are difficult to understand.

Course Evaluation

A self-instructional reaction evaluation, such as the one developed by Piskurich (2015, pp. 321-324) would be used at various points during the course when the questions would provide a comprehensive response. This evaluation will examine the difficulty of course navigation and course materials. Questions in this evaluation focus on usability, engagement, and content. In alpha testing, a few of the questions were reviewed by test participants. In the next phase of testing, test participants will take the course and be ready to fill out the full course evaluation.

Quiz Revisions

The test participants suggested that images and feedback be added to the quizzes. Feedback will be added to each answer justifying the reason whether they are right or wrong. Images can be added to the feedback as points of reference or as an additional resource. Once all the questions

have been added to the bank and tests have been run, information and instructions for taking the quizzes will be added to each appropriate unit.

As there are a limited number of test questions that can be asked, the risk to exam security comes into play. Since the learning theories and instructional strategies of Dental Radiology Training: Part 1 are about connecting the learning to the participant's job skills, a potential solution would be to integrate the unit assessments into the activities and course content, rather than a formal quiz. The results of the questions could still be collected, but they would be a part of the learning exercise which would build the new experience into their working memory which is found in constructivist learning (Mayer, 1999).

Data Collection Using Evaluation Models

The CIPP model. The CIPP Model is a framework that provides formative and summative assessments. The model is commonly performed with the confines of the organization. The model evaluates context, input, process, and product. Stufflebeam (2005) explains that the formative and summative evaluations look at particular questions. The formative assessment examines what needs to be done, how it should be done, is it being done, and is it succeeding? The summative evaluation studies: 1) if the right participants were reached, 2) if the participant's needs were met, 3) if the gains were sustained and 4) if the gains were transportable and adaptable for effective use elsewhere. The focus of the CIPP Model is to find ways to improve and strengthen.

The fact that the CIPP model uses both formative and summative evaluations to collect data which is a goal for assessment for this project. The evaluation objective questions Stufflebeam (2005) mentions in the formative and summative assessments would provide valuable insight into the effectiveness of my project. The summative assessment measures how

well the participants were using the training in their work environment. This feedback will be collected in two points of the training: 1) after the online course and 2) after Dental Radiology Training: Part 2 at three and six months.

The Success Case Method (SCM). The Success Case Method measures how well a training program or an initiative is working. The method, according to Brinkerhoff (2005), identifies those factors that make the program successful and those factors that make the program unsuccessful. Participants are revisited after the training to see whether the training skills were relevant or successfully performed at their work. The results are then divided into those participants that are completing the skills and those that were not successfully performing those skills. The most and least successful are then interviewed to acquire details as to why they were successful and unsuccessful. These results are compiled into a story-based presentation.

The Success Case Method, like CIPP, revisited participants after the training was completed. What is unique about the Success Case Method in comparison with CIPP is the post-survey interview to dig deep into nature and the extent of their success or failure. First, the data from the interviews can bring out details that the course evaluation, the online course, or the face-to-face training didn't cover. Second, the goal of the evaluation is to record the very best that the program is producing to establish its effectiveness and the value of the skills taught. This method would be an excellent way to determine the effectiveness of this project.

An evaluation plan that combines looking at the whole program such as CIPP while examining the successes and failures would make a beneficial feedback loop that continues to bring learning opportunities for the instructional designer and effective programs for the participants.

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