

EDTC 6325 Educational Communications
E-Learning Module
Radiation Safety and Protection for Radiologic Technology Students

Project Description

This artifact is a self-paced, web-based e-learning course designed for beginning radiologic technology students. It addresses the gap between knowing radiation-protection concepts and consistently selecting appropriate protective actions in realistic radiographic situations. The course contains four modules: Fundamentals of Radiation Safety and ALARA, Occupational Radiation Protection, Patient Radiation Protection and Exposure Optimization, and Applying Radiation Safety During Radiographic Procedures. Learners progress through concise instruction, demonstrations, interactive practice, application activities, knowledge checks, and module assessments. The instructional goal is for learners to apply fundamental radiation-safety principles and select appropriate protective practices to minimize unnecessary exposure to patients, themselves, and others during radiographic procedures.

Project Links

Course Platform: <https://radiology.hahuskil.com/>

Standards Met

This project demonstrates proficiencies in the following AECT standards: Standard 1 – Content Knowledge, Standard 2 – Content Pedagogy, Standard 3 – Learning Environments, and Standard 4 – Professional Knowledge and Skills. The chart below illustrates the performances that fulfill the AECT standards.

AECT 2012 Standards	
Standard 1 – Content Knowledge: Candidates demonstrate the knowledge necessary to create, use, assess, and manage theoretical and practical applications of educational technologies and processes.	
Performance indicators:	Justification
1.1 Creating. Candidates demonstrate the ability to create instructional materials and learning environments using a variety of systems approaches.	<i>Created a complete web-based radiation-safety learning environment integrating instructional content, multimedia, practice, application, feedback, and assessment across four sequenced modules.</i>
1.2 Using. Candidates demonstrate the ability to select and use technological resources and processes to support student learning and to enhance their pedagogy.	<i>Selected and used web-based multimedia, interactive activities, realistic radiographic scenarios, and self-paced navigation to support understanding and application of radiation-safety concepts.</i>

1.3 Assessing/Evaluating. Candidates demonstrate the ability to assess and evaluate the effective integration of appropriate technologies and instructional materials. 1.4 Managing. Candidates demonstrate the ability to effectively manage people, processes, physical infrastructures, and financial resources to achieve predetermined goals. 1.5 Ethics. Candidates demonstrate the contemporary professional ethics of the field as defined and developed by the Association for Educational Communications and Technology.	<i>Aligned formative Check Learning questions and module-level quizzes with stated performance objectives. The revised design uses multiple assessment formats to evaluate knowledge and application.</i> <i>Organized course content, navigation, activities, assessments, and module progression within a consistent web platform so learners can progress independently.</i> <i>Designed the course around professional responsibility for minimizing unnecessary radiation exposure and identified the training as educational support rather than a replacement for supervised clinical instruction.</i>
Standard 2 – Content Pedagogy: Candidates develop as reflective practitioners able to demonstrate effective implementation of educational technologies and processes based on contemporary content and pedagogy.	
Performance indicators:	Justification
2.1 Creating. Candidates apply content pedagogy to create appropriate applications of processes and technologies to improve learning and performance outcomes. 2.2 Using. Candidates implement appropriate educational technologies and processes based on appropriate content pedagogy. 2.3 Assessing/Evaluating. Candidates demonstrate an inquiry process that assesses the adequacy of learning and evaluates the instruction and implementation of educational technologies and processes grounded in reflective practice.	<i>Applied instructional design and radiologic technology content knowledge to create activities that move learners from explanation to demonstration, practice, application, and assessment.</i> <i>Implemented videos, scenario-based decisions, matching activities, knowledge checks, and quizzes to improve learning and performance.</i> <i>Used formative checks and summative module quizzes to examine learner understanding. Instructor feedback was used reflectively to strengthen the assessment plan by adding a more substantial quiz to every module.</i>

2.4 Managing. Candidates manage appropriate technological processes and resources to provide supportive learning communities, create flexible and diverse learning environments, and develop and demonstrate appropriate content pedagogy. 2.5 Ethics. Candidates design and select media, technology, and processes that emphasize the diversity of our society as a multicultural community.	<i>Structured a supportive self-paced environment with consistent navigation, immediate feedback, retry opportunities, and progressively more applied learning.</i> <i>Used clear language and multiple forms of content and interaction to support learners with varied clinical experience and technology proficiency.</i>
Standard 3 – Learning Environments: Candidates facilitate learning by creating, using, evaluating, and managing effective learning environments.	
Performance indicators:	Justification
3.1 Creating. Candidates create instructional design products based on learning principles and research-based best practices. 3.2 Using. Candidates make professionally sound decisions in selecting appropriate processes and resources to provide optimal conditions for learning based on principles, theories, and effective practices. 3.3 Assessing/Evaluating. Candidates use multiple assessment strategies to collect data for informing decisions to improve instructional practice, learner outcomes, and the learning environment. 3.4 Managing. Candidates establish mechanisms for maintaining the technology infrastructure to improve learning and performance. 3.5 Ethics. Candidates foster a learning	<i>Created an instructional product based on learner-centered principles: concise content, demonstration, active practice, realistic scenarios, immediate feedback, retry opportunities, and aligned assessment.</i> <i>Selected processes and resources appropriate for beginning radiologic technology students, including visual demonstrations and simulated decisions that connect online learning to laboratory and clinical practice.</i> <i>Used multiple assessment strategies. Each module includes formative Check Learning questions and, after revision, a 10-question Module Quiz using multiple-choice, matching, and True/False items.</i> <i>Developed a consistent web-based infrastructure for four modules, including reusable navigation, sequencing, activities, assessment sections, and completion steps.</i> <i>Promoted health and safety by</i>

environment in which ethics guide practice that promotes health, safety, best practice and respect for copyright, Fair Use, and appropriate open access to resources. 3.6 Diversity of Learners. Candidates foster a learning community that empowers learners with diverse backgrounds, characteristics, and abilities.	<i>emphasizing ALARA, patient protection, occupational protection, and safe decision-making throughout the learning environment.</i> <i>Supported learners with different levels of clinical and technical experience through clear navigation, concise text, visuals, demonstrations, interactive practice, self-paced review, and retry opportunities.</i>
Standard 4 – Professional Knowledge and Skills: Candidates design, develop, implement, and evaluate technology-rich learning environments within a supportive community of practice.	
Performance indicators:	Justification
4.1 Collaborative Practice. Candidates collaborate with their peers and subject matter experts to analyze learners, develop and design instruction, and evaluate its impact on learners. 4.3 Reflection on Practice. Candidates analyze and interpret data and artifacts and reflect on the effectiveness of the design, development and implementation of technology-supported instruction and learning to enhance their professional growth. 4.4 Assessing/Evaluating. Candidates design and implement assessment and evaluation plans that align with learning goals and instructional activities. 4.5 Ethics. Candidates demonstrate ethical behavior within the applicable cultural context during all aspects of their work and with respect for the diversity of learners in each setting.	<i>Used instructor guidance as part of the iterative design process. Feedback on assessment led to a substantive revision of the evaluation structure across all four modules.</i> <i>Reflected on the initial design and recognized that a few Check Learning questions alone provided limited evidence of achievement. The assessment structure was strengthened by adding a dedicated 10-question Module Quiz to every module.</i> <i>Designed assessments aligned with course goals and module objectives. Formative Check Learning items provide immediate feedback, while the Module Quiz provides a more systematic end-of-module evaluation.</i> <i>Maintained a professional safety focus and designed course decisions and assessment activities to reinforce responsible radiologic practice and respect for diverse learners.</i>

Modifications Made

The project was revised during development in response to instructor guidance and reflection on the strength of the assessment plan. In the initial implementation, each of the four modules included a Check Learning section containing a few questions. These questions served as a formative evaluation method by allowing learners to check their understanding before completing the module.

Based on instructor guidance, the evaluation design was strengthened by adding a separate 10-question Module Quiz to each of the four modules. The Module Quiz was added as Section 7 in the module learning path, after Check Learning and before Complete Module. Each quiz uses three question formats: multiple choice, matching, and True or False. This revision provides a broader and more systematic measure of learner understanding while retaining the shorter Check Learning activity for formative feedback.

The modification also improved alignment between the developed course and the course syllabus, which specifies a quiz for each lesson/module and emphasizes assessment of understanding and application. The revised learning path therefore separates formative evaluation (Check Learning) from the more comprehensive end-of-module evaluation (Module Quiz). The link for the platform is the same, therefore the premodification link is still the same with the updated link reflects the up-to-date version. This change reflects growth in my understanding of assessment design and the importance of using multiple assessment strategies rather than relying on only a few knowledge-check questions.

References

- Dick, W., Carey, L., & Carey, J. O. (2015). *The systematic design of instruction* (8th ed.). Pearson.
- Tessmer, M. (1993). *Planning and conducting formative evaluations: Improving the quality of education and training*. Kogan Page.