IDT 607: Evaluation of Instructional Systems

Project/Program Evaluation

Submitted in partial fulfillment of the requirements for the degree of

Master of Science in Instructional Design and Technology (MSIDT)

By

Jeanne R. Perrone

On

January 7, 2019

To

Dr. Lisa Johnson

Table of Contents

Stakeholder View

The stakeholder approach creates a relationship between a company and its stakeholders. According to Vu and Pham (2014), adopting a stakeholder approach is beneficial in program evaluation because it uses their self-assessment to develop a formative evaluation.   Using a stakeholder approach acknowledges the diversity of individual voices and their power and authority in the planning and implementation of the project.

The stakeholders for this project are what is known as insider stakeholders as they are involved in the field of veterinary medical education with connections to dentistry. These stakeholders support and are involved with dental education in unique ways. The stakeholders were chosen to evaluate the various levels of the program with the possibility of being involved with the course once it formally begins.

Stakeholder 1

Pam Lind, Director of Operations, Vetmedteam.com.

Analysis. Pam Lind is the co-founder and director of operations for Vetmedteam. Vetmedteam provides online education courses for veterinary nurses and staff members. Pat supported the AVDT in the developing phases of the organization by moderating a chat room where the organizing committee could have meetings. She is an education advocate with a keen interest in developing new and up-to-date education courses. Her expertise in the field of online education would be beneficial when we develop the online pre-course.

Perceptions. As the Director of Operations of VetMedTeam.com, the project would be a potential addition to the current dental course offerings. Since VetMedTeam and AVDT have

worked together in the past, VetMedTeam could be a possible platform for the online training program. The participants could register for the course through the site. There are currently two dentistry courses. One course covers basic knowledge, and one covers more advanced dental procedures. In other disciplines, there are certification courses as part of medical or managerial training programs.

Additional dental courses would need to be expanded to provide a unique learning environment to attract learners. Interactivity raised to Level 3 or 4 which uses more animated graphics, voice-over demonstrations, simulations, and scenario-based exercises would engage learners and improve their online experience (Gutierrez, 2012).

Stakeholder 2

Jackson Pendergast, Instructor, Veterinary Technology, Northeast Community College.

Analysis. Jackson Pendergast has extensive experience in veterinary technology education. One of the courses he teaches is veterinary dentistry. He is very open to helping with dental course development. Currently, the CVTEA has updated the skills required for graduation to include taking dental radiographs on anesthetized animals (CVTEA, 2018). Now, training is done on either dental models or specimens. The change in policy will require a shift in the protocol for Veterinary Technology programs as animals will now need to be anesthetized for the students to gain hands-on experience taking dental radiographs. At this time the curriculum has not been developed to compensate for the change as the school year has just begun. Joshua will provide experience working with students which could provide continuing education for veterinary technology students as they enter the clinic setting.

Perceptions. As an instructor in a Veterinary Technology program, the teaching of dentistry has evolved from a small presence covering anatomy and the dental cleaning to full single subject courses being taught on both the associate and bachelor level, and basic dental radiology positioning labs with anesthetized patients. The Veterinary Technician National Exam (VTNE) has increased the number of dental questions causing students to continue their studies.

Since dentistry has an increased presence in Veterinary Technology programs, the need for a standardized dentistry curriculum that could be used in all Veterinary Technology programs. The standardized curriculum would ensure the information and practices would remain current and relevant to what technicians are doing out in practice.

Stakeholder 3

Arlene Krandall, RVT, VTS-Dent., Atlanta Veterinary Dental Services

Analysis. Arlene Krandall has been an active member of AVDT since 2011. She divides her time working in a dentistry practice and providing dental radiography training. She has received positive feedback on her training techniques. Her experience working in a veterinary clinic and input in the hands-on portion of the project would be beneficial.

Perceptions. Along with being a dental radiology trainer, Arlene is also responsible for maintaining the AVDT website. The website has a webmaster from an outside company that makes the changes. The website is currently being updated to have a member's only area. The update should be completed in January 2019.

Currently, the website is a source of information for those interested in the AVDT and a small member's only area to access the directory and post case reports. The expanded member's

only area could be an alternate location for the online portion of the training program. A

member of the AVDT could facilitate the online program. In the future, the website could be the

site for continuing training and support for staff who have completed the online and hands-on

training if the technology would allow for live webinars or live stream consultations. The

service could be a source of donations for the AVDT as part of their dedication to dentistry

education.

Stakeholder 4

Kristen Walker, CVT, VTS-Dent., Tampa Bay Veterinary Specialists

    Analysis. Kristen Walker has been an active member of the AVDT since 2015. Like

Amy, Katie divides her time working in a dentistry practice and providing dental radiography

training. For being a new AVDT member, her feedback from trainees has been exemplary due to

her unwavering enthusiasm. Her experience working in a veterinary clinic and input in the

hands-on portion of the project would be beneficial.

    Perceptions. As a dental radiography trainer, Kristen would evaluate the program for

completeness in content delivery. The online content would be assessed for alignment starting

with the course outcomes and ending with testing at the end of each unit. Next, she would

investigate that the information gained in the online course will transfer to the face-to-face

training. The online training is to standardize and equalize the knowledge levels among the

participants. The standardization will ensure there will be little time loss because a participant

will have to catch up.

As a face-to-face training facilitator, Kristen will be in charge of providing the hands-on training demonstrations. Kristen will also observe the participants as they repeat the steps of the demonstration and make suggested changes.   A rubric is planned for the project and will be used to standardize the required outcomes for participants to complete the course. Kristen would use the rubric to follow the outcomes and observe the participant's successful completion. Kristen would also provide comments on the usefulness of the rubric and whether the outcomes are being addressed. The rubric levels will provide the metric points for data collection during the program evaluation.

Problem Statement

The development of effective skills and techniques for taking dental radiographs using the proper positioning of the digital sensor will improve the assessment and diagnosis of pathology. Surveys collected from trainers revealed a training gap that caused participants to be less successful during the first training and when they apply their newly learned skills. The lack of success is attributed to three tasks:

1. **Demonstrating correct placement of the sensor.**

    Inadequacies in identifying anatomy and lack of attention will cause the participant to position the sensor in the mouth incorrectly. The difficulty is the result of inadequate knowledge of anatomy or lack of attention during the training demonstration.

2. **Demonstrating correct angulation of the tube head.**

Incorrect angulation of the tube head will result in a non-diagnostic radiograph due to the tooth image being elongated or foreshortened. The challenge is translating a simplified positioning concept to hands-on training and subsequent mastery.

3. **Identifying solutions to errors found on the finished dental radiograph.**

Participants become frustrated when they must repeat x-rays. Focusing a portion of the training on identifying errors improves problem-solving skills.   Correctly solving the cause of the error will diminish the need to perform repeat x-rays.

Project Scope and Goals

The scope of this project is to develop dental radiography training. The focus of the training is 1) taking radiographs of all tooth types in the dog and cat, 2) taking radiographs with a minimum of technical errors, 3) prepare participants to start performing full mouth radiographs on anesthetized patients in the workplace.

Driver. Take diagnostic dental radiographs of all tooth types in a dog 50% of the time.

Driver. Take diagnostic dental radiographs of all tooth types in a cat 50% of the time

Restriction. Correcting technique errors should not take more than three attempts.

Restriction. By the end of the four-hour classroom training.

Project Preliminary Scope

The preliminary scope statement defines the purpose of the project. The statement will cover the organization, risks, cost, schedule, technology, and resources needed to reach completion

(Fageha, 2016).   The scope of this project is to train veterinary medical and surgical staff to take digital dental radiographs of the dog and cat.

Objectives.

1) Development of practical skills and techniques for taking dental radiographs using the proper positioning of the digital sensor. Learning to take dental x-rays in the dog and cat has a steeper learning curve than when learning to take them on people due to differences in oral anatomy.

2) Improve radiograph assessment skills. The participant is required to understand what constitutes a diagnostic dental radiograph. Producing radiographs that are diagnostic before the veterinarian reads them expedites the procedure.

Constraints.

1) The project will not enable the participant to master taking dental radiographs of the dog and cat. Mastery comes after regular performance of this skills yields a <10% error rate.
2) The project will not cover anesthesia for the dental patient.
3) The project will not cover procedures for studies of the skull, sinuses, or the temporomandibular joint.
4) Due to state laws on x-ray safety, the project is not intended for training staff members younger than 18 years of age.

Assumptions. The project will be completed in 30-90 days

Product Organization. The project will be managed by the Academy of Veterinary Dental

Technicians (AVDT). It will include Veterinary Technician Specialists in Dentistry (VTS-Dent)

and external stakeholders chosen by the AVDT.

Deliverables.   This document will describe the objectives of the current training

program used by VT Dental Training. Within the overall course, the document will also cover

the current course units and their timing needs.

Scope of Course

Goal. The goal of this course is to provide dental radiograph training to veterinary staff.

Developing practical skills that last past the training event will efficiently integrate dental

radiograph capabilities into the dental service of a veterinary clinic.

Target Audience. 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 the in the process of being trained to perform

dental procedures. In some cases, veterinarians will participate in the training.

Design Time/Milestones. Performance analysis and an analysis of the target audience

for each training assignment will be completed in two weeks. The objectives will be written to

address the needs found in the performance analysis and the target audience analysis. Material

development will take two – four weeks. A beta test and pilot of the project will bring the

development of the completed design in two – four months.

Logic Model

According to the W.K. Kellogg guide (2004), the logic model is a way to systematically and visually present your program. The systems concept is key to design a logic model properly. McDavid (2013) describes the open system approach which consists of a series of "means-end linkages." Means-ends linkages. These means-ends linkages are affected and affect their environment an important consideration when designing a logic model. The logic model of a program shows how the program works by studying the theories, plans, and outcomes involved. The Kellogg guide compares the logic model to a roadmap or a picture of how the program will look and how likely the program will achieve their intended outcomes

The visual diagram or flow chart of the logic model describes the sequence of activities thought to move one forward and how these activities are linked to the results of the program. The diagram is commonly read from left to right describing the program basics from the planning stage to the results. Choosing activities need to be done so they will impact the expected result. The impact is achieved by applying "if…then…" statements to connect the parts of the program through each stage (p. 2). Using the systems approach, "if" refers to the activity and "then" refers to the outcome and eventual impact on the project. For this project, the outcome or "then" is to train participants to take dental radiographs correctly. The project activities or "ifs" are linked and designed to achieve each one of the outcomes.

There are two phases of the logic model diagram – the planned work and the intended results. The planned work is the resources you will need to implement your program. Resources or inputs are the objects needed to begin the process. Activities are the tasks one needs to

perform with the previously gathered resources. The second phase or intended results has three steps. The intended results phase lists all the program's desired results.

The first step is outputs. Outputs are results from the activities performed in the during the first phase. The next step is outcomes. Outcomes are the specific changes or benefit each output attains. The last step is impacts. The impact is the vision or results you are trying to achieve once all the previous steps are accomplished – the reason for each step.

MSIDT Evaluation Project

The development of effective skills and techniques for taking dental radiographs using the proper positioning of the digital sensor will improve the assessment and diagnosis of pathology. The scope of this project is to develop dental radiography training for staff members of veterinary clinics.   During the initial analysis of the project, surveys collected from trainers revealed a training gap that caused participants to be less successful during the first training and when they apply their newly learned skills. The focus of the training is 1) taking radiographs of all tooth types in the dog and cat, 2) taking radiographs with a minimum of technical errors, 3) prepare participants to start performing full mouth radiographs on anesthetized patients in the workplace.

According to Shakman and Rodriquez (2015), there are three categories of logic models: 1) the theory approach model emphasizes assumptions and looks at how and why a program might work, 2) the outcomes approach model highlights activities and program implementation, and 3) the activities approach model tracks outcomes and are best used for monitoring and management. The theory approach model is more conceptual, and the outcome and activities

approach models are more applied. These three approaches can be blended to fit the needs of the program which would be beneficial for the project (W.K. Kellogg Foundation, 2004).

The first step in building the logic model is to demonstrate the progress of the project. According to Kellogg (2004) program implementation should be filled out with the outcomes first. Designating outcomes or the intended results as the program is being designed allows the assessment of the project's progress.

Description of Components

Resources/Inputs

Online pre-course. To accomplish the activities needed for this project, the following resources are necessary:

- First year's funding ($11,000)

- Veterinary clinics who request training in dental radiography for their staff members.

- A course authoring system for the design and development of the online pre-course.

- Lesson plans for the online pre-course.

- Video and graphics programs for the online pre-course presentations.

- Learning management system that will provide the online pre-course.

Face-to-face training session. To accomplish the activities needed for this project, the following resources are necessary:

- A trainer for the session. The trainer needs to have advanced veterinary dental radiography skills.

- Lesson plans for the face-to-face training session.

- A bound training manual that corresponds with each training unit. Each activity will be

  presented in a step-by-step format.

- Cadaver specimens of a dog and cat head.

- Dental models in the form of a cat and dog real bone skull and clear acrylic mouth

  models that show the full tooth.

Activities

   Online pre-course. To accomplish the activities needed for this project, the following

resources are necessary:

- Activities that encourage participants to identify the oral anatomy of the dog and cat.

- Activities that encourage participants to read a dog and cat dental chart correctly.

- Activities that encourage participants to identify and explain the components of a dental

  x-ray generator.

- Activities that encourage participants to realize the importance of radiation safety in

  dentistry.

   Face-to-face training. To accomplish the activities needed for this project, the following

resources are necessary

- Activities that encourage participants to identify the components of a diagnostic dental

  radiograph.

- Activities that encourage participants to identify and find a solution to correct technical

  errors.

- Activities that encourage participants to place the sensor in the correct location in the dog

  and cat mouth to obtain the requested radiograph.

- Activities that encourage participants to operate the protractor on the dental x-ray tube

  head to choose the correct angle for the needed radiograph.

Outputs

Online pre-course. Once accomplished, these activities will produce the following evidence

of competency:

- After taking the course unit and quiz, 100% of participants will be able to identify oral

  anatomy structures in the dog and cat.

- After taking the course unit and quiz, 100% of participants will be able to read a dog and

  cat dental chart.

- After taking the course unit and quiz,100% of participants will be able to translate a dog

  and cat dental chart from the Modified Triadan Numbering System to the Anatomic

  System.

- After taking the course unit and quiz, 100% of participants will be able to identify and

  correctly explain the functions of the dental x-ray generator.

- After taking the course unit and quiz, 100% of participants will be able to explain the

  necessity of dental x-ray safety.

- After taking the course unit and quiz, 100% of participants will be able to list the steps

  needed to practice dental x-ray safety.

Face-to-face training. Once accomplished, these activities will produce the following

evidence of competency

- 90-100% of participants able to identify the components of a diagnostic dental

  radiograph.

- 90-100% of participants able to identify and find a solution to correct technical errors on a dental radiograph.

- 90-100% of participants able to correctly operate the dental x-ray generator.

- after the training demonstration, 90-100% of participants can place the sensor in the correct location in the dog and cat mouth to obtain the requested radiograph in three attempts.

- After the training demonstration, 90-100% of participants can operate the protractor on the dental x-ray tube head to choose the correct angle for the needed radiograph in three attempts.

Outcomes

Online pre-course. The accomplishment of these activities will lead to the following changes

- 100% of participants will attain competency in dog and cat dental anatomy.

- 100% of participants will attain competency in reading and translating of the dog and cat dental chart.

- 100% of participants will attain competency in dental radiographic equipment.

- 100% of participants will attain competency in dental x-ray safety.

- 100% of participants will complete the preparation needed to enroll in face-to-face training.

Face-to-face training. The accomplishment of these activities will lead to the following changes

- After training is complete, 90-100% of participants will be able to operate a dental

    radiograph generator and dental x-ray software correctly.

- After training is complete, 90-100% of participants will practice dental x-ray safety.

- After training is complete, 90-100% of participants will be able to correctly position a

    sensor and align the angled tube head to the sensor in the dog and cat mouth that

    corresponds to the area of the mouth that requires radiographs within three attempts.

- After training is complete, 90-100% of participants will be able to assess a dental

    radiograph as diagnostic. If the radiograph is non-diagnostic, 90-100% of participants

    will be able to find a solution to correct the technical error(s).

- After training is complete, 90-100% of participants can begin taking full mouth

    radiographs on patients under anesthesia in 30 minutes or less.

Impact on Project

Online pre-course. If the activities are accomplished, the participants in the online pre-course will begin their education in veterinary dental radiology. Many veterinary staff members have taken little to no coursework in veterinary dentistry either because working in a veterinary clinic is a new experience or they have changed roles within the clinic. Rose (2017) states that cross-training provides an opportunity for staff members to understand another's duties and to better grasp the mission of that clinic.

The online course is meant to prepare the participants to transition into their face-to-face training seamlessly. The purpose of providing the online course is to adjust the participants so that everyone can enter the face-to-face training with similar skill sets. This tactic can reduce the need to spend time during the face-to-face training catching up participants who have fewer

dental skills. The course units provide the learner with dentistry skills and knowledge they can also use throughout their career.

       Face-to-face training. If the activities are accomplished, the participants in the face-to-face training will retain the learned skills to be able to start taking radiographs on their dog and cat patients. Veterinary team members are commonly required to take radiographs, both full body, and dental (AVMA, 2017). This practice allows the doctor to spend more time providing diagnostics and treatment. Commonly the veterinarian will assess the radiographs after completion.

       The training allows the participants to gain hands-on experience performing dental x-ray positioning of all teeth in the dog and cat. After training is complete, participants will be able to safely perform full mouth dental x-rays on the dog and cat with little to no supervision. According to the American Animal Hospital Association (2013), full mouth radiographs are a part of the comprehensive oral health assessment and treatment (COHAT), and veterinary staff members are responsible for performing the imaging. The images are taken at the beginning of the procedure so that the veterinarian can make adjustments to the treatment plan. The patient is under general anesthesia to avoid blurry images, and sensor damage should a patient bite down on it. The impact of providing dental x-rays increases diagnostic accuracy. The impact of having trained staff is the ability to perform the dental radiographs efficiently which decreases time under anesthesia.

       The 10% of participants that are unsuccessful with the training require additional training support which will be investigated if the evaluation proves the statement is true. If the statement is true, an interactive online service could be set up to provide support to participants who

struggle with positioning after training is complete. For IDT 606, the idea for an interactive

online service was conceived. The service could be provided through a website with a paid

subscription or service fee. Resources would require the employment of a trainer and

administrative staff to provide services.

Diagram

The logic model for the MSIDT project can be found in Appendix A. The diagram provides a

visual layout of the dental radiology training project for the Ashford University MSIDT program.

The visual layout takes the previous sections of this document and provides a systems approach

linking the program activities to the outcomes. The diagram is the final part of this project

program evaluation document. Feedback and changes will be integrated into the next phase of

the evaluation process for IDT 607. The diagram was developed using Microsoft Visio.

References

AVMA. (2017, March 15). *New resources promote reducing radiation exposure*. Retrieved from

    JAVMA News: Practice:

    https://www.avma.org/News/JAVMANews/Pages/170315k.aspx

CVTEA. (2018, July). *AVMA.* Retrieved from Accreditation Policies and Procedures of the

    AVMA Committee on Veterinary Technician Education and Activities (CVTEA):

    https://www.avma.org/ProfessionalDevelopment/Education/Accreditation/Programs/Page

    s/cvtea-pp.aspx

Fageha, M. A. (2016). Identifying stakeholders' involvement that enhances project scope

    definition completeness in Saudi Arabian public building projects. *Built Environment*

    Project and Asset Management, 6(1), 6-29. doi:10.1108/BEPAM-06-2014-0030

Gutierrez, K. (2012, July 16). *Levels of interactivity in eLearning: Which one do you need*.

    Retrieved from Shift Disruptive ELearning:

    https://www.shiftelearning.com/blog/bid/190140/Levels-of-Interactivity-in-eLearning-

    Which-one-do-you-need

Holmstrom, S. B. (2013). 2013 AAHA dental care guidelines for dogs and cats. *Journal of the*

    American Animal Hospital Association, 49(2), 75-82.

McDavid, J. H. (2013). Understanding and applying program logic models. In J. H. McDavid,

    Program Evaluation and Performance Measurement: An Introduction to practice.

    Thousand Oaks: Sage Publications, Inc. Retrieved from https://content.ashford.edu/

Rose, R. (2017, July 19). *How to achieve veterinary team success through synergy: Tips to make*

    your practice run more smoothly. Retrieved from Veterinary Practice News:

    https://www.veterinarypracticenews.com/how-to-achieve-veterinary-team-success-

    through-synergy/

Shakman, K. R. (2015). *Logic models for program design, implementation, and evaluation:*

    Workshop toolkit. Washington, D.C: U.S. Department of Education, Institute of

    Education Sciences, National Center for Education Evaluation and Regional Assistance,

    Regional Educational Laboratory Northeast & Islands. Retrieved from

    http://ies.ed.gov/ncee/edlabs

Vu, M. P. (2014). Training of trainers for primary English teachers in Viet Nam: Stakeholder

    evaluation. *The Journal of Asia TEFL, 11*(4), 89-108. Retrieved from

    http://urn.kb.se/resolve?urn=urn:nbn:se:umu:diva-106991</div>

W.K. Kellogg Foundation. (2004). *Using logic models to bring together planning, evaluation,*

    and action: Logic model development guide. Battle Creek: W.K. Kellogg Foundation.

    Retrieved from

    http://www.bttop.org/sites/default/files/public/W.K.%20Kellogg%20LogicModel.pdf

Appendix A: Logic Model

Online Pre-Course

Resources	Activities	Outputs	Post Course Outcomes	Impact
First year's funding ($11,000)	Activitiea that encourage participants to identify the oral anatomy of the dog and cat.	100% of participants able to identify oral anatomy structures in the dog and cat.	100% of participants will attain competency in dog and cat dental anatomy.	Prepare the participant to seamlessly transition into their face-to-face training.
Veterinary clinics who request training in dental radiography for their staff members	Activities that encourage participants to correctly read a dog and cat chart.	100% of participants able to read a dog and cat chart.	100% of participants will attain competency in reading and translating the dog and cat chart.	Standardize the skill level of participants.
A course authoring system for the design and development of the course	Activities that encourage participants to identify and explain the components of a dental x-ray generator.	100% of participants able to translate a dog and cat dental chart from the MTN System to the Anatomic System.	100% of participants will attain competency in dental radiographic equipment.	
Lesson plans		100% of participants able to identify and correctly explain the functions of the dental x-ray generator.		Provide dental skills and knowledge participants can use beyond training.
Video and graphics programs for presentations	Actvities that encourage participants to realize the importance of radiation safety in dentistry.	100% of participants able to explain the necessity of dental x-ray safety..	100% of participants will complete the preparation needed to enroll in the face-to-face training.	
Learning Management System		100% of participants able to list the steps needed to practice dental x-ray safety.		

Face-to-Face Training

Resources	Activities	Outputs	Post Training Outcomes	Impact
Trainer with advanced dental radiography skills	Activites that encourage participants to identify the components of a diagnostic dental radiograph.	90-100% of participants able to identify the components of a diagnmostic dental x-ray.	After the training, 90-100% of participants will be able to assess a dental radiograph as diagnostic. If the radiograph is non-diagnostic, 90-100% of participants will be able to find a solution to correct the technical error(s).	Participants will retain the skills to be able to take dental radiographs on their own patients.
Lesson Plans	Activities that encourage participants to identify and find a solution to correct technical errors.	90-100% of participants able to identify and find a solution to correct technical errors.	After the training, 90-100% of participants will be able to operate a dental radiograph generator and dental x-ray software.	Allows participants to gain hands-on experience performing deental x-ray positioning on all the teeth of the dog and cat.
Bound training manual with activities in a step-by-step format.	Activities that encourage participants to place the sensor in the correct location in the dog and cat mouth to obtain the requested radiograph.	90-100% of participants able to correctly operate the dental x-ray generator.	After the training, 90-100% of participants will practice dental x-ray safety.	
Cadaver specimens of a dog and cat head		After the training demonstration, 90-100% of participants can place the sensor in the correct location.	After the training, 90-100% of participants within three attempts, will be able to correctly position a sensor and align the angled tube head to the sensor that corresponds to the area of the mouth that requires radiographs.	Training staff to take dental radiographs increases efficiency which decreases patient time under anesthesia.
Dog and cat skulls and acrylic models	Activities that encourage participants to operate the protractor on the dental x-ray tube head to choose the correct angle for the needed radiograph.	After the training demonstration, 90-100% of participants can operate the protractor on the tube head to choose the correct angle.	After the training, 90-100% of participants can begin taking full mouth radiographs on patients under anesthesia in 30 minutes or less.	Safely perform dental radiographs with little to no supervision.