

Behavioral Learning Theory

Detailed Design Plan

About this document

6.25.2017

Version: .3

SAP Course #

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Behavioral Learning Theory Design Plan

The purpose of the document is to present the detailed specifications for the Behavioral Learning Theory module. It will be used for review and approval by all stakeholders. The purpose of the document is to present the plan for the learning experience design for review and approval by all stakeholders.

Learning Experience Description

In November 2014, the Federal Railroad Administration (FRA) published 49 CFR Part 243 which requires railroads:

- To develop and submit a training program to FRA for approval;
- To designate training qualifications for each occupational category of employee; and
- To conduct periodic oversight of their employees.

As part of the training program, railroads must have Designated Instructors (DI) that have “adequate knowledge of the subject matter under instruction and, where applicable, has the necessary experience to effectively provide formal training of the subject matter” (49 CFR 243.5). To meet this requirement, Trains has identified the need to qualify our instructors in the following areas.

- Subject Matter Expert
- Training Delivery
- Training Design

To qualify instructors in Training Delivery and Training Design, Trains has identified the requisite competencies and they are provided in Attachment 1. Moreover, Trains is working with our partners to create courses to develop instructor Training Delivery and Training Design competencies. The courses to be designed and developed for **Training Delivery** are:

- Learning Theory I
- Facilitating Learning
- Evaluating Learning I

The courses to be designed and developed for **Training Design** are:

- Learning Theory II
- Instructional Design Theory and Practice

Detail Design Plan

- Instructional Development Practice
- Evaluating Learning II

The purpose of this Design Plan is to provide a specification for the design and development of a module titled Behavioral Learning Theory to be taught as part of the Learning Theory I course.

Upon successful completion of the learning experience, the employee will be referred to as a:

Designated Instructor: A person designated as such by an employer, training organization, or learning institution, who has demonstrated, pursuant to the training program submitted by the employer, training organization, or learning institution, an adequate knowledge of the subject matter under instruction and, where applicable, has the necessary experience to effectively provide formal training of the subject matter.

Delivery Method

This module will be taught in hybrid format. Lecture will be provided via remotely (eLearning/distance learning) but practical exercises will be conducted via Skype or similar communication technology.

Course Length

The Behavior Learning Theory lesson is estimated to take five hours and 20 minutes.

Note: This is an **estimated** duration for the training; it may change as the learning experience is developed, implemented, and evaluated.

Deliverables

- Facilitator Guide
- Participant Guide
- PowerPoint Presentation
- Various handouts

Room Set-Up

In an ideal learning environment, the tables will be arranged in pods to help facilitate organic learning and relationship building between the learners. If this can't be accomplished, a U-shaped formation or a table shaped for groups is recommended. The goal is to foster collaboration, not impede it.

Participant Description

Job Title	Avg. Age	Avg. Years of Trains Experience	Education	Sex	Total # of Instructors
Career Professional	35.34	5.14	90% Post High School	56% Male	37
Sr. Career Professional	45.86	10.78	85% Post High School	73% Male	120
Combined	40.6	9.48	87% Post High School	69% male	157

Prerequisites

Prior to enrolling in the Training Delivery curriculum, participants must already be identified as a Subject Matter Experts (SME) in their respective fields and be employed as a Trains Trainer.

Objectives

The following table outlines what the learning experience aims to achieve.

- Business outcome – the goal(s) the business must meet
- Terminal objectives – the employee job performance needed to enable business goals
- Enabling objectives – the knowledge, skills, and attitudes of the participant needed to enable performance

Business Outcome	Terminal Objective	Enabling Objectives
<p>For training to be effective it must be properly designed, delivered, and implemented. Therefore to increase the effectiveness of our training, Trains is developing the ability of our instructors to properly deliver training.</p>	<p>At the completion of this module, participants will be able to apply behavioral learning theory in the delivery of training.</p>	A. Explain Thorndike’s idea of incremental, not insightful learning.
		B. Apply Thorndike’s idea of belongingness.
		C. Discuss Thorndike’s Law of Readiness and Law of Effect.
		D. Apply Thorndike’s identical elements theory of training transfer.
		E. Explain what Skinner defined as operant conditioning.
		F. Discuss Skinner’s ideas on reinforcement and punishment.
		G. Apply Skinner’s ideas on learning.
		H. Describe Pavlov’s idea of conditioned response.
		I. Apply Pavlov’s idea of dynamic stereotype and generalization.
		J. List challenges associated with Pavlov’s theories.
		K. Apply Guthrie’s One Law of Learning.
		L. Explain Guthrie’s idea of learning and practice.
		M. Apply Guthrie’s Regency Principle and methods for breaking habits.

Media, Learning Resources, and Materials

All media, learning resources, and materials included in this learning experience are listed in the Training at a Glance section. The list below contains items that the Course Manager/Lead Instructional Designer needs help obtaining.

- One Facilitator Guide
- One Participant Guide per learner
- Sign-in sheet
- Pens or pencils
- PowerPoint presentation
- Projector
- Flip chart paper
- Markers
- Computer
- Extension cord(s)
- Reference material:
 - Merriam, S. B., & Bierema, L. L. (2013). *Adult learning: Linking Theory and practice*. Hoboken, NJ: Jossey-Bass. (great reference for instructors notes, visuals, etc).
 - Olson, M., & Hergenhahn, B. (2013). *An Introduction to Theories of Learning* 9th Edition. Boston, MA: Pearson. (use this book for building out the instructor notes on the Facilitator Guide).

Instructional Strategies

Trains values our employees and believes they deserve a fully active and engaging learning experience, which results in greater learning and safer work. The instructional strategies chosen to foster this type of learning experience are described below. Please see the *Training at a Glance* section for where these strategies are employed within the training.

Instructional strategy	Description
Formative assessment	A deliberative process used during instruction that provides actionable feedback that is used to adjust ongoing teaching and learning strategies to improve learners' self-assessment and reflection.
Lecture / deductive exposition	The facilitator presents clear and concise information in a purposeful way that allows participants to easily make connections from one concept to the next. This strategy helps participants stay focused on the topic at hand.
Think-pair-share	Participants think individually about a topic or answer to a question; each participant shares their thoughts with a partner; each pair then shares the ideas with the class. Discussing an answer with a partner serves to maximize participation, focus attention, and engage participants.

Assessment Strategies

All assessments (presentations) for this program will be based on the objectives identified in the *Objectives* section.

Assessment strategy	Description
Performance assessment	Participants perform a task (presentation) in front of an observer rather than select an answer from a ready-made list.

Evaluation Strategy

The levels of evaluation applied to the project should, in large part, reflect the needs of the stakeholders. Determine with the client which levels should be measured. For any levels not used, type No plan to measure at this time in the Solution goals column.

Evaluation goals		Solution goals <i>How will success be measured?</i>	Collection method <i>How will the data be collected?</i>	Source(s) <i>Who/where will the data come from?</i>	Timing <i>When will the data collection happen?</i>	Responsible <i>Who is responsible for collecting the data?</i>
1	Reaction <i>Did they like it?</i> Obtain participant reaction to program and materials					
2	Learning <i>Did they learn it?</i> Validate participant achievement of learning objectives					
3	Application <i>Did they apply it?</i> Determine whether newly-acquired knowledge and skills are being applied to the job					
4	Business impact <i>What difference did it make?</i> Determine whether learning impacted business results					

Module 1: Behavioral Learning Theory

The purpose of this module is to present key behavioral learning theories and theorists.

Lesson One – Edward Thorndike (1874-1949)

Enabling Learning Objectives (ELOs)

At the completion of this lesson, participants will be able to:

- A. Explain Thorndike's idea of incremental, not insightful learning
- B. Apply Thorndike's idea of belongingness
- C. Discuss Thorndike's Law of Readiness.
- D. Discuss Thorndike's Law of Effect.
- E. Apply Thorndike's identical elements theory of training transfer.

Methods of Instruction

Lecture (20 minutes)

- Background
 - Prolific researcher
 - Research centered on studying how animals learn
 - Learning is building neural bonds/connections between stimulus and response (connectionism)
- Learning is incremental, not insightful
 - Learning occurs in very small systematic steps rather than in huge jumps
- Belongingness
 - Things that are related or “belong together” are easier to learn than things that don't.
- Law of Readiness
 - When someone is ready to perform some act, to do so is satisfying.
 - When someone is ready to perform some act, not to do so is annoying.
 - When someone is not ready to perform some act and is forced to do so, it is annoying.

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- Revised Law of Effect
 - Reinforcement increases the strength of a connection, whereas punishment does nothing to the strength of the connection.
- Spread of effect
 - When someone gains satisfaction with a response, it increases the probability of getting that response. It also increases the probability of getting responses that surrounded the initial response.
- Identical elements theory
 - More training transfers when the situations have similar (or familiar) elements

Practical Exercise (60 minutes total – 5 minutes for directions; 25 minutes for activity; 30 minutes for report out)

- Present slide and state – We are going to practice applying Thorndike’s ideas to a training scenario that is in your Participant Guide. Once you are in your small groups, you’ll have 25 minutes to work to complete the exercise. After completing the exercise, we’ll get back together and each group can report out on their respective work.
 - Practical Exercise #1 – 25 minutes
 - Read the scenario
 - Answer the questions
 - Choose someone to report out to the class
- After 25 minutes, gather the group back together and review their solutions to the scenario.

Practical Exercise #1

The Shipping Department bought five different pieces of equipment and Ted has been assigned to instruct the crew on the proper use of each piece. Ted knows there is a lot to learn because they've never had equipment like this in the Shipping Department before, but he's already very busy with his other work assignments. He wants to get this assignment done quickly, but he knows he also needs the training to "stick".

1. How might Ted structure his instruction knowing that learning is incremental, not insightful?
2. Based on Thorndike's idea of belongingness, how should Ted organize the instruction for the pieces of equipment?
3. How could Ted apply Thorndike's identical elements theory to help the training "stick"?
4. Now that Ted has figured out how to organize the instruction and hopefully make it "stick", what can he do to help the crew be ready to learn?

Total Lesson Time: 1 hour 20 minutes (20 minutes lecture; 60 minutes practical exercise)

Lesson Two – BF Skinner (1904-1990)

Enabling Learning Objectives (ELOs)

At the completion of this lesson, participants will be able to:

- A. Explain what Skinner defined as operant conditioning.
- B. Discuss Skinner's ideas on reinforcement.
- C. Discuss Skinner's ideas of punishment.
- D. Apply Skinner's ideas on learning.

Methods of Instruction

Lecture (20 minutes)

- Background
 - Prolific researcher
 - Arrange the environment to change behavior
- Conditioning
 - Operant (Type R)
 - Emphasizes the response
 - Most of Skinner's work is in this area
- Learning
 - Learning proceeds most effectively if:
 - Information is presented in small steps;
 - Learners are given rapid feedback concerning the accuracy of their learning; and
 - Learners are able to learn at their own pace.
- Reinforcement
 - A reinforcer is anything that increases the probability of a response recurring
 - Positive reinforcers – presenting stimuli
 - Negative reinforcers – removing stimuli

- Controlling reinforcement, controls behavior
- Punishment
- Either taking away something an organism wants, or giving it something it does not want
- Temporarily suppresses behavior
- When punishment removed, rate of behavior returns to original level
- Alternatives to punishment
 - Change circumstances that lead to undesirable behavior
 - Let organism perform undesired behavior until satiated
 - Ignore it
 - Let time pass
 - Reinforce behavior incompatible with undesirable behavior

Practical Exercise (60 minutes – 5 minutes for directions; 25 minutes to work; 30 minutes for report out)

- Present slide and state – We are going to practice applying Skinner’s ideas to a training scenario that is in your Participant Guide. Once you are in your small groups, you’ll have 25 minutes to work to complete the exercise. After completing the exercise, we’ll get back together and each group can report out on their respective work.
- Practical Exercise #2 – 25 minutes
 - Read the scenario
 - Answer the questions
 - Choose someone to report out to the class
- After 25 minutes, gather the group back together to review their solutions to the scenario.

Lesson Three – Ivan Pavlov (1849-1936)

Enabling Learning Objectives (ELOs)

At the completion of this lesson, participants will be able to:

- A. Describe Pavlov's idea of conditioned response.
- B. Apply Pavlov's idea of dynamic stereotype.
- C. Apply Pavlov's idea of generalization.
- D. List challenges associated with Pavlov's theories.

Methods of Instruction

Lecture (20 minutes)

- Background
 - Prolific researcher
 - Experiments with dogs and salivation
 - Classical conditioning
- Excitation and inhibition
 - As events are experienced they either excite or inhibit cortical activity
 - Pattern excitation or inhibition called “cortical mosaic”
 - Areas that are active together form temporary connections and “fire” when the others “fire”
 - Dynamic stereotype is a stable cortical mosaic
 - Hard to change, resistant to new conditions

Detail Design Plan

- Irradiation and Concentration
 - Sensory information is projected onto an area of the brain causing excitation
 - Some excitation spills over to neighboring brain areas – irradiation of excitation
 - Generalization
 - Similarly, sensory information is projected onto an area of the brain and is inhibited or discriminated
 - Some inhibition or discrimination spills over to neighboring brain areas
 - Concentration

Practical Exercise (60 minutes total – 5 minutes for directions; 25 minutes for activity; 30 minutes for report out)

- Present slide and state – We are going to practice applying Pavlov's ideas to a training scenario that is in your Participant Guide. Once you are in your small groups, you'll have 25 minutes to work to complete the exercise. After completing the exercise, we'll get back together and each group can report out on their respective work.
 - Practical Exercise #3 – 25 minutes
 - Read the scenario
 - Answer the questions
 - Choose someone to report out to the class
- After 25 minutes, gather the group back together and review their solutions to the scenario.

Practical Exercise #3

1. From an early age, we teach children that red means “stop” – red lights, red stop signs, red burners on stovetops, etc. Pavlov’s idea of dynamic stereotype suggests that teaching someone to react differently to red, after being conditioned to stop, will be very hard. Come up with two ways to help employees learn that red means “go” when they are at work. Explain exactly how you would help them change their thinking so that when they are outside of work red means stop; but when they get to work, it means go.
2. Using Pavlov’s idea of generalization, identify an existing response employees have, and how could that understanding be used to teach something similar.
3. Long time employees of the ACME Company have been conditioned that attending training means sitting and “tuning out”. When the new trainer arrives he is irritated by this behavior and begins punishing employees that don’t participate. What does Pavlov’s research say the new trainer should do? What does Thorndike’s research suggest the trainer do?

Total Lesson Time: 1 hour 20 minutes (20 minutes lecture; 60 minutes practical exercise)

Lesson Four – Edwin Guthrie (1866-1959)

Enabling Learning Objectives (ELOs)

At the completion of this lesson, participants will be able to:

- A. Apply Guthrie's One Law of Learning.
- B. Explain Guthrie's idea of learning and practice.
- C. Apply Guthrie's Regency Principle.
- D. Apply Guthrie's methods for breaking habits.
- E. Explain Guthrie's idea of training transfer.

Methods of Instruction

Lecture (20 minutes)

- Background
 - Believed all scientific theories can and should be explained using plain, simple words
 - No math
 - No technical jargon
 - Placed great emphasis on practical application of his ideas
 - Only one experiment
- One Law of Learning (also known as Law of Contiguity)
 - If you do something in a given situation, you'll likely do the same thing the next time you encounter that same situation. However, it's situational – sometimes conflicting or incompatible tendencies
- One-Trial Learning
 - Learning is complete after only one pairing between the stimuli and the response
- Regency Principle
 - In a particular circumstance, whatever we did **last** (that was successful), we will tend to do again if encountering the same circumstances

- Learning and Practice
 - Movements – simple muscle contractions (learned all or none)
 - Acts – made up of large number of movements
 - Must be available in differing environmental conditions
 - Require practice
 - Aren't learned in one trial
 - Skill – Large collection of acts/habits that achieve a certain result in many and varied circumstances
 - Lots and lots of practice with many repetitions
- Forgetting
 - Occurs when an alternative response to a stimuli is learned rather than the original response
 - All forgetting is due to interference
- Breaking Habits
 - Threshold method
 - Find the cues that initiate the bad habit and practice another response in the presence of these cues
 - Fatigue method
 - Do the act/habit until exhausted by it
 - Incompatible response method
 - Present the stimuli that causes the undesired response and a strong stimulus that causes a response incompatible with the undesired response
- Punishment
 - Only effective when it results in a new response to the same stimuli
- Transfer of training
 - Practice the exact behaviors in the exact conditions that are going to be demanded

Practical Exercise (60 minutes total – 5 minutes for directions; 25 minutes for activity; 30 minutes for report out)

- Present slide and state – We are going to practice applying Thorndike’s ideas to a training scenario that is in your Participant Guide. Once you are in your small groups, you’ll have 25 minutes to work to complete the exercise. After completing the exercise, we’ll get back together so that each group can report out on their respective work.
 - Practical Exercise #4 – 25 minutes
 - Read the scenario
 - Answer the questions
 - Choose someone to report out to the class
- After 25 minutes, gather the group back together and review their solutions to the scenario.

Ownership and Maintenance

The Course Manager is responsible for the design, development, and maintenance of this learning experience and serves as the primary point of contact for all interested parties including executive sponsors, stakeholders, subject matter experts, regulators and trainers. The Course Manager is responsible for following the approved Enterprise Instructional Design processes which allows stakeholders critical opportunities to provide input and engage in the creation of the learning experience. In addition, the Course Manager is responsible for maintaining the course and performing regularly scheduled reviews to ensure the course is up-to-date. The review cycle will be a standard process initiated by the Learning Management Platform. Maintenance activities will be closely coordinated with stakeholders and subject matter experts to ensure the needs of the business are met. Other than when an emergency maintenance of the course is required for example a safety-critical or regulatory-compliance issue, this course will be reviewed:

- Annually
- Every two years