Marketing and Medicine
Web Based Training

Instructional Design Document

PVARF-10652

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1	Jerry McCorkle	First draft	01/05/07
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1. Introduction

1.1 Project Background

On May 13, 2004, Warner-Lambert, a division of Pfizer, Inc., entered into an Assurance of Voluntary Compliance/Discontinuance with the Attorneys General of 50 States and the District of Columbia to settle allegations that Warner-Lambert conducted an unlawful marketing campaign for the drug Neurontin® that violated state consumer protection laws. Among other things, the settlement provides for a $21 million Consumer and Prescriber Education grant program to be administered by a Special Committee of State Attorneys General pursuant to an Oregon Court Order and an Attorney General Memorandum of Understanding.

Portland Veterans Administration Research Foundation in cooperation with OHSU School of Medicine and with funding from the Attorney General Consumer and Prescriber Education Grant Program are collaborating with Planet Productions to develop a series of e-learning courses. The goal of the education grant program is to provide health care professionals and consumers information relating to prescription drugs, including the way in which the pharmaceutical industry markets drugs.

1.2 Project Description

The Marketing and Medicine project will include three separate e-learning courses, associated testing, evaluations and instructor-led activities. The three courses are on:

- Evidence-Based Pharmaceutical Choices
- The Regulatory Environment
- Interacting with Vendors

References to the “program” in this document include all three web-based courses, the evaluations and instructor-led educational activities. References to the “courses” include only the web-based content.

The title of the program, “Marketing & Medicines” was part of the original grant request and is subject to change. One title that has been discussed is PharmaLogic. Additionally the working titles of the individual courses may be changed to make them more memorable.

1.3 About This Document

1.3.1. Document Overview

This document is part of Planet Productions’ development of the Marketing and Medicine WBT. It includes the audience analysis, needs analysis and goals for the training program. It details the instructional methods Planet will use to achieve those goals. Finally, this document provides an outline and description of the instructional materials required for the final training program. These strategies are in the course outline and description sections.

1.3.2. Document Scope

This document provides a high-level look at the entire training program. It does not include information on technical, graphic, database, or data transfer issues except where they influence the instructional aspects of the training program. For example, if the training program provides for an assessment at the end of the training, the Instructional Design Document would include educational objectives and reporting requirements. It would not include the database or login requirements for retrieving the test scores, or a description of the appearance of the exam.

1.3.3. Intended Audiences

The Instructional Design Document is a communications tool. By reviewing this document, the Marketing and Medicine team can verify that the goals of the training program and the strategies used to achieve them are accurate and satisfy all applicable requirements. This will prevent inaccurate communications or assumptions from compromising the effectiveness of the final training program.

After accurately defining the project, the Instructional Design Document guides the scriptwriter in the development of the script for the course. Other members of Planet's development team also use the Instructional Design Document to help them develop the final training program.

2. Audience Analysis

The pilot audience for this training program is Internal Medicine residents at OHSU. This pilot audience includes approximately 90 people. This group will complete the detailed pre- and post-experience evaluations described in this document. By measuring the effectiveness of the courses with this initial audience, it will be possible to identify ways to make the courses more useful for other and broader audiences.

Following the initial rollout to Internal Medicine residents, the courses will be made available to other groups of residents at OHSU. Eventually all residents may benefit from one or more of the courses in either their original form or customized to better match their specific needs. Additionally a Continuing Medical Education version would be of use to practicing physicians and other health care providers (Physician Assistants, Nurse Practitioners, Pharmacists, etc.)

"All elements of the curriculum and methods of implementation, dissemination and evaluation (i.e., curriculum and related materials, such as syllabi, power point and slides, course reader, journal articles, pre and post test materials, etc.) will be placed in the public domain and made available for use by the public."[1] The suitability for the courses for other audiences will be determined after the initial deployment of the version designed for OHSU's internal medicine residents. The courses will be designed to meet the specific needs of internal medicine residents. By focusing on the needs of this smaller audience, we will be able to deliver material in a meaningful context. To

[1] OHSU Center for Evidence Based Policy statement on Attorneys General Consumer and Prescriber Grants Program

address broader audiences effectively it may be necessary to modify the courses with situations and scenarios that are either more generic or tailored specifically for a secondary audience. For instance pediatricians would be better served if the Interacting with Vendors course portrayed the patient as a child accompanied by her parent. Rather than design a "one-size fits none" approach, we will tailor the courses to exactly fit the primary audience.

This audience analysis describes factors that influence the manner in which the course presents the content. This includes assumptions made about audience learning styles, what motivates them to learn, their pre-existing subject matter expertise, potential barriers to learning, etc.

Planet research conducted by interviewing residents and physicians at OHSU has led to some general impressions that will guide the development of this course. It is impossible to make specific assumptions that are 100% true of all members of any group. These observations are generalizations at best, and describe some of the unique features of the targeted audiences. Generally the audience members are:

- Process oriented. Internal medicine physicians are known as puzzle solvers, applying the logical processes of the differential diagnosis to identify the most efficacious treatment options. They are perceived as nerdy, cerebral people, with the stethoscope (derogatorily known as "flea collar") hanging around their neck.
- Highly educated. A medical resident has already completed undergraduate and medical school studies before beginning their residency.
- Service and academic oriented. OHSU is a teaching hospital. As a result, the altruistic goals of teaching, learning and providing care that improves the lives of patients is central to the mission of the audience. This is in sharp contrast to other more competitive motivations common in the public sector. The research found several people independently state that excellent patient care is their first priority. For that reason, the courses must demonstrate how the skills, knowledge and attitudes demonstrated will enhance patient care.
- Hard working. Residents are driven by many internal and external forces to work long hours providing quality care and ensuring they learn as much as they can to provide even better care. This commitment to excellence in learning and care will provide much of the motivation in the course.
- Very busy. Resources in teaching hospitals are always limited, and recent changes in duty hours have reduced resources even further. This is a challenging time for GME at OHSU.
- More representational than conceptual. Photos, video, text, etc. must be realistic to engage the audience. Obscure metaphors are not as effective for this audience as direct representations reflecting actual experiences.
- Concrete thinkers. Science in general looks for answers. The historical process of proving and disproving hypotheses creates a black-and-white view of the world. There is a right and a wrong. Much of the content of this course is about trade-offs and compromise. The two available choices for information about a drug therapy could both be useful and both be flawed for different reasons. This program is about analyzing the strengths and weakness of resources before using them to guide patient care decisions.
- In their late 20s to early 40s.These are members of what has become known as Generation X. Much has been written about the generational moments and attitudes that define Gen X, but the Sierra Club's president, and Gen Xer, Adam Werbach summed it up well when he said, "Gen X responds to aggressively hip, visual and interactive messages. Want to fight oil drilling in Alaska's Arctic Wildlife Refuge? Set up booths to sell black snow cones." While hip may be a stretch for our nerdy internists, the courses will be visual and interactive.
- Surrounded by pharmaceutical marketing messages and activities. The pens, textbooks, free lunches, samples and other trinkets are just the tip of the iceberg. Pharmaceutical sponsorship of medical journals, training activities and direct to consumer advertising make it difficult to see the scope of industry influence and to prescribe medications in ethical and evidence-based ways without being unduly influenced.

The written and verbal language will be at an eighth-grade level. (As a point of reference, this document represents a 12th grade reading level. This reading level would be appropriate for a journal article aimed at this audience but is not appropriate for web-based. A simpler vocabulary and sentence structure will help present the concepts clearly and concisely.) This will make the training more effective for learners taking the course under less than ideal conditions, and for those with English as a second language– a potential accessibility concern only for future broader audiences. The simplified English does not imply a simplistic approach. The highly educated professionals of the audience make it very important to address their educational needs. If the training is too simplistic, learners may think it is below them and they will not be able to engage in the learning experience.[2]

Audience research revealed that the HIPAA course Planet developed was well regarded by this audience because of Planet's skillful use of realism, multi-media and the computer-based format. Every indication is that the web-based training designed here will be just as well received.

3. Learning Environment Analysis

Exactly when and where learners will access the courses in this program has yet to be determined. Due to IRB considerations, it ~~will~~ may not be possible to require residents to complete the course and the evaluations without meeting the requirements for human subject experimentation. The principal investigator has proposed making the course recommended instead of required to simplify the review process. The decision to make the course "highly recommended" instead of required has direct impact on the design of the courses. Because this will not be a captive audience, learners must perceive the courses as engaging, easy to use, and educationally valuable.

If the course is not required, residents will complete it on their own time, and conceivably from home or some other location where they have access to Big Brain. Since there is no way to control outside interruptions in these environments, it will be important that the courses be structured in small meaningful chunks that can be used a few minutes at a time. Big Brain bookmarking will also help learners by allowing them to exit a course and return later to the point where they left off.

~~Another concern for the implementation of these courses is the duty hours limitations posed by ACGME. Since no resident can exceed the 80-hour workweek having residents complete these courses on the own time may not be permissible. Planet has suggested that the Internal Medicine program require residents to complete the course and make the tests recommended, suggested, requested or optional. This strategy would allow the investigators to comply with the 80-hour workweek requirement and still comply with the IRB guidelines on human subject experimentation.~~

Comment [h1]: I'm not too worried about work hour limitations. They will be completing the curriculum during their "ambulatory" rotation. This is usually a 40-50hr/wk commitment at most.

If residents do complete the course during work hours it is likely they would do so in short sessions as gaps appeared in their schedule. In this scenario a resident may have 5 minutes before rounds to log on to Big Brain, go to a course and complete a short section. The chunking of the content is even more vital in this setting.

[2] The courses must be professional in content and presentation, and without extraneous, distracting, or "cheesy" ornamentation or humor.

The ubiquitous marketing messages of pharmaceutical companies are a special challenge for this program. Few people comprehend how widespread and deeply ingrained these messages are. In addition to underestimating the breadth of these challenges, attitudes towards the pharmaceutical industry vary widely. While residents have not had much direct contact with drug reps (making them the perfect audience for this program since it will be possible to foster effective behaviors they can carry forward into their careers) physicians in general fall into one of three categories.

- Some are already suspicious of the motives of the pharmaceutical industry and perceive them as adversarial.
- Some appreciate the perks and gifts provided by the pharmaceutical industry and have a sense of entitlement that they have earned the free lunch. Most of these are the ones who report that drug reps have little or no influence on their own prescribing behavior and a little or a lot of influence on others.
- Others are simply not aware of the myriad ways that marketing messages shape the environment in which they work.

During the design and development of these courses all of these attitudes must be considered so that the courses will effectively reach all learners.

4. Instructional Goals

4.1 Program Objectives

At a high level, the goals of the Marketing and Medicine program are to improve prescribing practices by:

1) Educating health professionals at all levels of training about the drug development and approval process;

2) Making health professionals aware of pharmaceutical industry marketing practices and assisting them in developing the knowledge and skills to evaluate those marketing techniques;

3) Making health professionals aware of the conflicts-of-interest created by accepting pharmaceutical promotions, and helping them to minimize these conflicts; and

4) Providing examples and strategies for evaluating existing sources of drug information, and for accessing unbiased sources of information about drugs.

4.2 Purpose of Training

The administrator of this program is hopeful that "curriculum development, dissemination and adoption can have a long-term and sustainable impact on prescribing behavior and consumer health and well-being. By teaching health professional students to prescribe objectively and strategically in an evidence-based, cost- effective manner, future generations of health practitioners will be better prepared to provide the best possible care for their patients. By offering similar training (or re-training) to clinicians in practice, the quality of patient care can be improved."[3]

[3] OHSU Center for Evidence-based Policy statement 2006

It is not possible or even necessary, to match the billions of dollars spent by pharmaceutical companies on marketing their products. The truth sells itself. Patient outcomes depend on providers making informed decisions about drug therapies even in an environment saturated by messages paid for by the drug companies, some of which are misleading or inaccurate. Since the pharmaceutical companies' combined advertising budget exceeds the amount spent in this country on medical education[4] the possibility exists for prescribers to be unduly influenced by the marketing messages of pharmaceutical companies instead of using evidence-based decision-making.

4.3 Level of Learning

While the objectives for the course are all knowledge requirements that can be measured by summative evaluations, the overall goal for the course is to have providers apply critical thinking skills including discovery and analysis of the costs and benefits of different drug therapies. To encourage transfer of these critical thinking skills to their practice the courses will be designed to model effective discovery and analysis and provide opportunities to apply these skills in relevant simulated situations. While evaluations will measure knowledge and comprehension, the courses will require simulated application of the skills knowledge and attitudes presented.

4.4 Learning Objectives

The following learning objectives have been identified by the Principle Investigators. These objectives represent the complete body of knowledge that the three courses will communicate. Because the survey/ evaluation is being developed in parallel with the courses it is possible that not all of these items will be tested. Some of the attitudinal objectives, such as those that require learners to make a value judgment about appropriate and inappropriate marketing strategies may be impossible to measure in a quantitative survey. These items are included in the learning objectives because they will be tracked with qualitative measures and anecdotal evidence.

The assignment of specific learning objectives to the appropriate courses will also take place during script development.

I. Describe the impact of pharmaceutical detailing on physician-prescribing practices.

- **A.** List industry marketing and surveillance practices designed to influence physicians' prescribing of targeted medications
  - **1.** Identify examples of pharmaceutical marketing techniques
  - **2.** Describe how pharmaceutical companies track prescriber habits.
  - **3.** Rate as appropriate or inappropriate the means that industry uses to influence prescriber habits.
- **B.** Recognize bias in selected pharmaceutical promotional materials.
  - **1.** Distinguish a (biased) message intended to advertise a drug from a balanced educational message.

[4] Oregon Attorney General Hardy Myers April 13, 2006 press release

2. Define "publication bias" and describe how this may influence the available literature about pharmaceuticals.

C. Recognize that physicians are subject to industry marketing techniques.

1. Describe the impact of gifts (small and large) on prescribing behavior

2. Describe the impact of advertising on prescriptions for targeted drugs

3. List the ways that access to drug samples affects prescriber habits

4. Describe the relationship between reliance on industry promotion and appropriate use of prescription drugs

5. Distinguish between physicians' views of pharmaceutical marketing techniques on their own, versus other physicians' prescribing practices.

II. Define conflict of interest as it pertains to pharmaceutical marketing.

A. List the ways in which accepting gifts from pharmaceutical representatives undermines the role of physician as fiduciary.

1. Define the conflict of interest between physicians and pharmaceutical companies.

2. Give an example of how interactions with the pharmaceutical industry may impact the credibility of the medical profession in the eyes of the patient/public.

B. Describe how reliance on pharmaceutical marketing may result in patient harm.

1. Identify the potential impact of drug marketing on drug costs to patients

2. Give an example of how reliance on pharmaceutical marketing may result in patient harm

C. Describe ways to minimize conflict of interest.

III. Access and use information about new and existing pharmaceuticals in the medical literature.

A. Ask/Formulate clinical questions related to drug therapy using Evidence-Based resources

1. Formulate clinical questions using a framework that facilitates finding answers

2. Distinguish background from foreground clinical questions

3. Define foreground clinical questions in PICO format

B. Acquire best available evidence

1. Distinguish need for different resources depending on type of question (background vs. foreground)

2. List the order, or "hierarchy" of evidence

3. Demonstrate the ability to answer a clinical question using:
Cochrane databases
Medline Search
ACP Journal Club
Medical Letter
Clinical Evidence

C. Appraise the quality and importance of the evidence

1. Define the McMaster's criteria in the critical appraisal of an article[5]
2. Demonstrate the ability to apply these steps to a particular article
3. Apply the evidence in specific patient care decisions
4. Recognize that clinical decision making involves patient preferences~~,~~ and clinical experience, as well as best available evidence
5. Demonstrate the ability to apply the same evidence based research to a variety of different patients

IV. Evaluate the roles and responsibilities of the FDA in drug approval, tracking and monitoring.

A. Describe the roles and responsibilities of the FDA.

1. Describe the steps to new drug approval
2. Define the 4 phases of clinical research, and demonstrate the importance of each step (e.g., learners should be able to describe that phase II trials are designed for safety and efficacy vs. phase III trials that are designed to evaluate outcomes).
3. Describe the reasons that "accelerated approval" was created.
4. List the ways that post-market surveillance occurs (required reporting, voluntary reporting, Torts, medical literature, etc.)

B. Analyze the strengths and weakness of these processes.

1. Describe the pitfalls of accelerated approval (for example, inappropriate use of this designation, approval of drugs on the basis of surrogate endpoints).
2. List the barriers to adequate post-market surveillance
3. Discuss the role of advisory panels and the potential for pharmaceutical companies to influence FDA decisions.
4. Describe the barriers to timely communication about adverse drug events (ADRs); demonstrate how to access the FDA's Medwatch website and report an ADR.

5. Instructional Strategy

As stated by the principle investigators, the courses must be "learner-centered and active." While the three courses use different approaches for presenting the different topics, they will all share these two primary qualities. Whether

[5] This basic process information like calculating NNT, ARR, etc., may be provided as linked ~~resources~~references and not in the main portion of the curriculum. Other objectives require an understanding of these tools to assess evidence. Thus, if this course were for carpenters, rather than test how well a learner uses a hammer it would test how well she builds a house.

the course takes the form of a first-person multimedia role-play simulation or a game, the first objective will be to engage learners. After a course has captured the attention of a learner it must present useful and relevant information or the learner will not have any interest in, or need for, the course.

The following sections of this document outline the content of each course and describe the manner in which it will be presented.

6. Course Outlines

6.1 Regulatory Environment

The following outline presents a general overview of the content that will be included in the Regulatory Environment course. See the Lesson Briefs section of this document for a more detailed description of this course.

I. Introduction
- **A.** Objectives
- **B.** Overview

II. Scope and History of FDA regulations including fast track approvals (a sidebar)

III. Preclinical Research
- **A.** Description
- **B.** Interpretation (multiple choice interaction)
  1. Feedback (specific to each wrong choice—not required for completion. Sad pill if too slow, bad pill if too fast, happy pill if "just right")
  2. Correct feedback and move forward to next stage

(Repeat the description and interpretation steps for each of the steps in the process.)

IV. Investigational New Drug Application

V. Clinical Research(this could be broken into Phase I through IV)

VI. New Drug Application

VII. FDA review

VIII. Advisory Board review

IX. Post-Market Surveillance
- **A.** Description
- **B.** Interpretation (multiple choice interaction)
  1. Feedback (specific to each wrong choice-- not required for completion. Sad pill if too slow, bad pill if too fast)
  2. Correct feedback and move forward to Conclusion

X. Final Happy Pill successful conclusion, summary, etc.

6.2 Interacting with Vendors

The following outline presents a general overview of the content that will be included in the Interacting with Vendors course. See the Lesson Briefs section of this document for a more detailed description of this course. The nature of this course makes it difficult to describe the outline in detail. Of all the courses in this project, this one will require the most collaboration to define and structure the content.

I. Introduction
- **A.** Objectives
- **B.** Overview
- **C.** Briefly introduce the four characters (resident, attending, patient, drug rep) and the setting (time, place, etc.)

II. Resident begins by meeting the patient
- **A.** Patient in waiting room
  - **1.** Identify the marketing messages in the scene (click on hotspots activity)
  - **2.** Patient muses in soliloquy on undue influence by drug companies
- **B.** Patient meets with resident
  - **1.** Patient asks if Vigerox® is right for her
  - **2.** Resident reviews resources on drug (drug company literature, "unbiased" study, etc.)
  - **3.** Resident decides to check with the attending
  - **4.** Attending points to flaws, bias, and misleading statistics
  - **5.** Resident communicates results of research to patient

III. Resident continues by meeting the drug rep
- **A.** Peek inside the drug rep's laptop to see the type and amount of information s/he has collected on the resident
- **B.** Drug rep starts by giving the resident a token gift
  - **1.** Show patient's attitude about these gifts
  - **2.** Show attending's attitude about gifts
    - a) Provide additional resources to support claim (sidebar)
  - **3.** Accept the gift or not
    - a) Either way, the story continues. There is no right or wrong.
- **C.** Drug rep discusses breakthrough medication Vigerox® and offers samples
  - **1.** Show resident's thoughts on value of samples (help patients)
  - **2.** Show attending's thoughts on samples (hard to track and inventory, lead to more expensive prescriptions, etc.
    - a) Provide additional resources to support claim (sidebar)
  - **3.** Resident decides whether or not to accept the sample
    - a) Provide feedback on the consequences (good and bad) of the decision

IV. Resident attends a training event sponsored by the drug company
- **A.** "Thought leader" (who is being paid by drug company) presents information on treatment options that is thinly veiled sales pitch
- **B.** At end presenter briefly understates disclosures
- **C.** Resident identifies this as a potential conflict of interest
- **D.** Resident discusses this with attending who points out other biases such as publication bias, sponsorship and control of studies, advertising in journals, etc.

V. Summary, conclusion, etc.

6.3 Evidence-Based Pharmaceutical Choices

The following outline presents a general overview of the content that will be included in the Evidence-Based Pharmaceutical Choices course. See the Lesson Briefs section of this document for a more detailed description of this course. The questions and answers that make up this course will be developed in the script-writing phase of the project. The following is a description of the structure for the course, not a description of the content of the course. The number of questions that make up the course depends on the depth and complexity of each question. We will include as many questions as possible while staying within the limit of 20 minutes of content.

I. Introduction
- **A.** Objectives
- **B.** Overview
- **C.** Description of game play, rules, etc.

II. Ask first challenge question
Answer the question or use a lifeline first

Answers
- **A.** Answer A
  If correct, reward and continue
  If incorrect, provide feedback
  and ~~game over~~retry or continue
- **B.** Answer B
  If correct, reward and continue
  If incorrect, provide feedback
  and retry or continue~~game over~~
- **C.** Answer C
  If correct, reward and continue
  If incorrect, provide feedback
  and retry or continue~~game over~~
- **D.** Answer D
  If correct, reward and continue
  If incorrect, provide feedback
  and retry or continue
  ~~game over~~

Lifelines
- **E.** Ask an attending
  1. Additional steps (question phrasing, where to start…)Provide lifeline hint
  2. Go back to choose an answer
- **F.** Conduct a MEDLINE search
  1. Additional steps (question phrasing, where to start…)
  2. Provide lifeline hint
  3. Go back to choose an answer
- **G.** Refer to handout from drug rep
  1. Additional steps (question phrasing, where to start…)Provide lifeline hint
  2. Go back to choose an answer
- **H.** Check the PDR
  1. Additional steps (question phrasing, where to start…)Provide lifeline hint
  2. Go back to choose an answer
- **I.** Check Cochrane database
  1. Additional steps (question phrasing, where to start…)Provide lifeline hint
  2. Go back to choose an answer

III. Ask Second challenge question
Answer the question or use a lifeline first

IV. -- ??. Repeat structure for each question

~~**V.**Game over conclusion (After each incorrect answer feedback)~~
- ~~**A.**Importance of evidence-based decisions, etc.~~
- ~~**B.**Start over at the first question~~

~~**VI.**~~**V.** ~~Winning c~~Conclusion (after final correct choice)
- **A.** Importance of evidence-based decisions, etc.
- ~~**A.**~~**B.** Congratulations, fanfare, etc.

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~~B.~~C. Summary and review
~~C.~~D. Homework: Assign case study to discuss in Friday afternoon ambulatory clinic.

7. Lesson Briefs

This section provides a brief look at the courses to describe the treatment, interactions, and content included in each of the sections of the above outlines. The course scripts will formalize and elaborate this section of the document. Each course is described separately below.

7.1 Regulatory Environment

The regulatory environment course will be approximately 10 minutes long in total. To complete the course a learner must help a hypothetical medication through the approval process. A navigational challenge paradigm (such as a physician's version of a ~~tightrope~~ Shoots and Ladders game board, ~~-~~or rollercoaster the learner must traverse) will provide a functional metaphor for the approval process.

Learning Objectives associated with this course are listed under "Evaluate the roles and responsibilities of the FDA in drug approval, tracking and monitoring." on page 10.

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The goal is to give the learner a healthy skepticism about the FDA and the process of drug approval. This will allow providers to understand the role of the FDA and be able to critically appraise a drug even though it is already approved and on the market. The objectives listed under "Evaluate the roles and responsibilities of the FDA in drug approval, tracking and monitoring" apply specifically and solely to this course.

The course will use the seven-step approval process to structure the content. The steps are:

1. Preclinical Research
2. Investigational New Drug Application
3. Clinical Research
4. New Drug Application
5. FDA review
6. Advisory Board review
7. Post-Market Surveillance

By examining potential pitfalls, and influence by drug companies at different stages learners will explore the meaning and purpose of each stage and some of the ways it can fail.

Early in the course, background information on the history and scope of the FDA and links to the FDA and related sites will define the parameters of drug approval. For example, the fact that herbal remedies are not subject to FDA scrutiny points to important limitations to the Agency's mandate. The course will also present background on the fast-track approval process. To keep the length of the course to 10 minutes and focus on the material that will have

the greatest impact on learners, much of this background information may be presented in the form of articles or other resources external and/or internal to the course.

In a perfect world, a new drug is developed, studied and approved quickly enough to ensure that the benefits it offers are available in a timely manner. Many fast-tracked anti-retroviral medicines fall into this category. In the real world, the review processes sometimes fail to identify potential adverse drug reactions and the new drug can end up doing more harm than good. On the other end of the spectrum, potentially helpful medications are never made available, or made available only after they are mired too long in red tape.

The course will also point out how the profit-seeking goals of Pharma can conflict with the goal of providing safe and effective therapies. The goal of Pharma is to get the drug to market, not just to begin delivering valuable treatments sooner, but with the longest time remaining on patent possible. A list of ways that Pharma uses to prolong its patent life could lead to the pitfalls in the game. Thus, when a learner lands on a "protected patent" space Pharma could:

- Sue the generic makers for patent infraction because they made a different pill that was the same color to automatically get a patent delay just by suing, or
- Include children in the study group –for a geriatric drug therapy– to get a 6 month patent extension) and the learner would go back three spaces or lose points. Landing on the Orphan Drug Act space would provide a bonus (and description of the Act's remedies) in contrast to the penalty of the "protected patent" spaces.

Comment [h2]: This whole paragraph is a great addition. Thanks!

Since the risks and benefits of a new drug cannot be known when the approval process begins it will be useful to track the progress of a hypothetical drug (Vigerox®[6]) through the entire process. By demonstrating knowledge of the approval process, and navigating the hazards along the way learners will be able to shepherd the pill from the research lab where it is developed into post-market surveillance. In keeping with the "fair and balanced" approach for these courses, the learner will need to choose appropriate and necessary actions along the way to prevent premature or delayed drug approval. At each stage of the process, learners will demonstrate the purpose and meaning of each step. For instance, what can you know about the safety and efficacy of a drug that has completed Phase II clinical trials? A learner must accurately identify the significance of the stage to progress unscathed. Understate ("The drug has not yet been tested on humans to determine toxicity"), or overstate ("The drug has been proven effective in treating the condition(s) listed.") the significance of the step and the learner falls off the tightrope.

Then the learner will have to make critical choices that will (more or less successfully) address the challenges present at each step of the process. For instance, can you predict that the advisor to the FDA might have ties to the drug company?

If the learner demonstrates their knowledge of the process and avoids all of the pitfalls of over-regulation and undo industry influence, they can make the new miracle drug available quickly and safely. If they misstep along the way

[6] As noted, Vigerox® is not a real drug. We will want to be very clear that the people, products and activities portrayed are entirely fictional and not based on real people, products and companies.

Vigerox® may turn out to be a dangerous or ineffective therapy that is approved for use even though it should not have been.

The goal of the "game" is to get "good" medicine to market quickly and identify "bad" medicine so that it is not approved. Skip a step, overestimate the safety of a medication given its current approval status, or allow industry influence to compromise the process, and the learner will immediately receive feedback indicating that unnecessary ADRs are forthcoming. Require too much review, decide to halt approval when an approval step was actually successful, etc., and your red tape keeps the needed medication from the market. Either extreme results in unnecessary patient suffering. Of course the correct choices will provide feedback that briefly describes the dangers that were avoided and focuses on the fact that they are progressing well towards providing optimal care.

An illustrated caplet character will accompany the learner through the course. When it is approved correctly, it is happy to begin treating illness. When approved too soon it begins treating patients, but they experience ADRs– bad pill. When approved too late it languishes in red tape– sad pill. The pill will not narrate the course, nor will it have a voice. It will only provide a visual metaphor to help illustrate the process. The nature of this content will allow the course to effectively use a "do over" functionality. Each misstep will provide either the bad pill or the sad pill outcome and feedback as to why the choice made was too restrictive or too lenient. The learner will then be able to go back to the decision point and try again to make the correct choice.

The main path through the course follows the approval process, ending with post-market surveillance. Accurate and complete reporting of ADRs by physicians (using the FDA Medwatch website) during post-market surveillance ensures that the FDA can act quickly to restrict the use of medications when necessary. Ending with this message will reinforce the need for providers to participate fully in post-market surveillance. This actionable objective is a good parting message for this course.

The course will use a largely guided linear structure to guide learners through the process. Additional resources, background information, and remedial information (presented if a learner makes an incorrect choice) will all be asides from the main course. More than half of the 10 minutes of content will be included in the main path, with other content not tied directly to the learning objectives presented as optional sidebars.

~~Since most of the content is in the main path and only feedback for incorrect choices will be optional content, t~~The tracking of "main path" and optional content will function as described below in the Interacting with Vendors course ~~will not be required~~.

Comment [JM3]: Though it is not required, the pill bottle could be added to this course to provide another level of uniformity to the three courses. It would basically track how many mistakes you made, so it would only be of value if someone was trying to fail to see all of the extra feedback. Thoughts?

Comment [h4]: I like the idea of uniformity, but I agree that this might be positive reinforcement of "negative" behavior (as opposed to the other modules where exploring the sidebars is an optional activity, not resulting from a wrong answer). We could still use the pill bottle though if they do explore a sidebar (like reading about FDA history for example). Lets discuss.

7.2 Interacting with Vendors

The Interacting with Vendors course will be approximately 30 minutes long. This course is about helping people make informed ethical decisions. It is not about telling people what is ethical. Ultimately, everyone's moral compass is different, so the objective is to provide information and let learners make their own decisions about where their line is and what feels right for them.

The Learning Objectives associated with this course are listed under "Describe the impact of pharmaceutical detailing on physician-prescribing practices." on page 8 and "Define conflict of interest as it pertains to pharmaceutical marketing." on page 9.

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This course will present realistic scenarios that include interactions between a patient and a resident, a drug rep and an attending physician. The suggested paradigm is to present a single series of interactions as a story that unfolds as the course progresses. By switching the point of view from character to character, the learner will be able to "play" all of the characters. By having the learner see the story from the drug rep's point of view (by clicking on the ubiquitous drug rep laptop), she can see how the drug rep collects surprising amounts of personal data on prescribers. By looking through the patient's eyes, she can see the impact of samples on the price, safety and efficacy of prescriptions. By assuming the role of the attending physician, the learner can benefit from the experience and objectivity that the attending offers.

This course will use two separate types of interaction. Learners will be able to "dig deeper" to explore situations in more depth. Learners will also have to make decisions at critical junctures in the story.

While we originally envisioned this course as a series of videos, an animated and narrated photographic portrayal would provide the realism of video while providing the added benefits of more flexible navigation, and allow integration of hotspots for interactions. ("Identify all drug marketing visible in this photo.") Additionally, the use of professional actors provided by Planet Productions for the voices and actual medical personnel for the pictures will provide an added level of realism since it will not require acting of non-professional actors provided by PVARF, who will instead serve as models for the still photography.

The basic story presented here is fairly brief and simple. A resident meets with a drug rep, a patient and her attending. The power of the story lies in the analysis of, and reflection on, the interactions.

Seeing things from another's point of view will be one way the course encourages reflection. At one point in the story for instance, the drug rep may provide the resident with samples of a new medication. If the resident chooses to accept the samples because they are a benefit to patients, the attending will provide feedback that points to the fact that drug samples in fact end up costing patients more and are potentially more dangerous.Throughout the course links to references proving or refuting key points will be available. Thus when the resident is deciding whether or not to provide samples to her patient the course will present "Summary of three studies of the effect of patient samples on patient drug costs." The learner is not required to review the supporting reference but it is available (as an external link to one of the references listed in the References section of the course. At another point

in the story, the drug rep offers the resident a Vigerox® pen/ clock/ etc. To point to how these trinkets shape public perception that doctors are all in the pockets of drug companies the course could present the patient speaking honestly with her doctor about her misgivings about all the "free" stuff her doctor has openly accepted, and how she would not accept that type of behavior from a politician so why should she have to accept it from her doctor? Alternatively, perhaps she would point out that she is uncomfortable with the fact that her health insurance is underwriting golf junkets. Either way, the course must communicate idea that everyone is susceptible to marketing tactics, and few believe they are.

The hot spot activated sidebar is the other main method this course will provide more in-depth analysis. When reviewing the literature on the effectiveness of Vigerox® the resident may perform a literature search that shows three studies "and no others" with a visual indication that "and no others" is a hot spot. Clicking on this spot will reveal that drug companies have been known to suppress the publication of "negative" trials. ~~The~~ All three courses ~~course~~ will track how many ~~sidebars~~ screens a learner ~~explores~~completes by adding a "pill" to a pill bottle counter persistent throughout the courses.~~,~~ This will provide a simple visual indication of the depth of engagement in the courses. If for instance a course includes 35 screens, and 25 of them are on the main path through the course it would be possible to complete the course with a pill bottle that displays "25 of 35". ~~In~~ In the example above when the learner finishes reviewing the information on the suppression of negative clinical trials the course will add another pill to the bottle. Describing the function of the pill counter will hopefully encourage learners to explore the course more fully as they "fill the prescription," by seeking out sidebar resources and exploring multiple choices. ~~add a "pill" to a pill bottle counter persistent throughout the course. Providing learners with a goal of a certain number of pills hidden throughout the course will hopefully encourage learners to explore the course more fully as they "fill the prescription."~~ The number of pills collected ~~would not be tracked or reported.~~ will be reported as the course score on Big Brain so that course administrators can track the number of screens completed for each course. ~~It could be self-reported by learners on their post-event evaluations to provide a measure of the depth at which they engaged the course.~~ In this way, the amount of change in pre- and post-evaluations for learners could be compared against the depth of their course engagement. It is expected that learners with the most pills in their pill bottles would also demonstrate the greatest benefit from the course.

It is important to note that the drug rep and the pharmaceutical companies are not villains. Used appropriately they are helpful partners.

7.3 Evidence-Based Pharmaceutical Choices

The evidence-based pharmaceuticals course will include approximately 20 minutes of content. The goal is to teach learners how and where to access non (or less) biased resources to obtain answers to their clinical questions. The Learning Objectives associated with this course are listed under "Access and use information about new and existing pharmaceuticals in the medical literature." on page 9.

This course will be closely tied to in-person educational events. ~~It is possible that t~~The course will make use of the electronic Journal developed for the Competent Physician course to facilitate ~~the~~ communications between learners and instructors. For this course the Journal will be called the Notebook. Since the ~~Journal~~ Notebook is not available to others outside of OHSU's Big Brain-hosted environment, the course may suggest the use of a paper notebook if the electronic Notebook is not available. ~~would be more portable if it directed~~ This would encourage a broader audience~~learners~~ to ~~simply~~ write down questions, responses, and research results so they can share them during the group sessions.

To make the course as engaging and interactive as possible it will ~~take the form of a game~~include game elements. It will be modeled functionally on the TV show Who Wants to be a Millionaire, but ~~would be~~ set in the context of a physician analyzing findings, seeking additional information, and making decisions about safe and effective drug therapies. ~~Perhaps~~The title could be, "Who wants to be an Evidence-Based Prescriber."

The "contestant" in Who Wants to be an Evidence-Based Prescriber keeps playing even if she gets an answer wrong. There is no game over. And instead of showing a nervous contestant and a game show host, the course will show a resident faced with a series of decisions. Only the structure of the original game show is retained as a paradigm for presenting the question, answers and feedback. This will be done by the using the point of view of the resident's inner voice to describe the thought process.

Comment [h5]: This is great. Thanks!

After the requisite introduction and brief explanation of the course, rules, etc., the game begins.

Throughout the game the course presents the resident facing a series of questions of increasing difficulty and complexity. These may be full foreground and background questions, or they may be intermediate questions like evaluating the significance of a particular piece of evidence or rating different resources by the value they provide. For example, a question might ask, "Review the drug company report and patient information, then decide whether the medication described is a good choice for a particular patient." When the questions are presented the course will show the resident in the type of environment where she would normally be considering these questions– a patient encounter, a peer consult, independent research, etc. –After reviewing the background information (by thinking out loud about the question at hand), the learner is presented with four options to choose from. The choices are presented as if the resident is playing a game show in her head, presenting the four answers and the lifelines. If the learner is uncertain what to do, or if the information presented is insufficient, the learner may choose to have the resident use one of her "lifelines." These additional resources would include things like ask an expert consultant (who happens to be biased because he is on the payroll of the drug company, and provides misleading information) or a Medline search. Some of the lifelines like the Medline search would require additional correct choices (phrase

the question in the correct format) in order to get truly helpful information. Like in the TV show, a learner has a limited number of lifelines, and they can use each one only once per game. This will allow the course to illustrate the correct resources to use for different situations.

After selecting any choice the learner views the immediate feedback for that choice, but does not learn if it was the optimal response. That is the learner sees the consequences but not the evaluation. The learner is free to "try on" as many of the answers as she wants before she declares that it is her final answer (by clicking the "that's my final answer" button.

Comment [h6]: Good idea

Incorrect choices provide feedback as to where the learner went wrong, and the consequences, (ADRs, etc.). For instance, just because the information provided by the drug company said the drug was effective, it does not mean that it is more effective than other available therapies. Correct responses to the core questions are rewarded ~~by permitting~~with feedback explaining why it was the correct choice and the positive therapeutic outcomes that resulted. A modest game show-inspired "bells and whistles" feedback will reward the learner as she~~to~~ continues to the next level. ~~This implies that an i~~Incorrect choices would not result in a "game over" for the learner, but would provide the option to try again or move on to the next question. ~~who would then have to start over from the beginning to complete the course. This strategy could risk frustrating learners if the questions are too hard. The alternative to this strategy would be to imbed the content from the correct choices into the feedback for the incorrect choices.~~ In that way a learner could continue through the course even though they make mistakes along the way. The real risk for failure at this "game" is an increase in ADRs and poor patient care. ~~Given that the stakes are so high, it seems appropriate to require a learner to start over if he makes a mistake that would compromise patient care. The other option for punishing incorrect choices would be to provide a "do over" functionality as described in the Regulatory Environment course. Of course, this would not be in keeping with the suggested paradigm for this course. A game that a player cannot lose is not really a game at all.~~

After completing the game, learners will be asked to apply the research skills and resources introduced in the course to one or more clinical situations they have recently encountered. This actual practice will reinforce the skills presented in the online course. For instance, "In your journal (either electronic or paper-based) describe a clinical situation you recently encountered, the decision you made about treatment, and the steps you took to reach that decision. Now use one or more of the resources described in this course to gather additional information. What is the PICO-format question you started with? What did you discover? Did the available evidence support or refute your course of action? Be prepared to discuss this assignment."

8. Course Evaluations

8.1 Learner Evaluation

The ultimate goal of the web-based training is to help physicians make better (evidence-based and ethically acceptable) prescribing decisions.

The Level Two measure (see Appendix A) of the effectiveness of the curriculum will be accomplished by comparison of pre- and post-tests completed by the pilot audience. These will measure knowledge, attitudes and self-reported behavior of residents before and after exposure to the curriculum.

The existing evaluation will be refined for this use. The pre-and post-tests may be administered using Survey Monkey or another third-party tool. Alternatively, if OHSU goes ahead with proposed changes to Big Brain that would provide pre-and post-test functionality for courses, and if that functionality will meet the needs of this program, the pre-and post-test could be hosted on and reported by Big Brain.[7]

Institutional Review Board approval for the use of these evaluations may be required to protect the rights and privacy of the "human subjects." IRB approval and compliance will be addressed by the principle investigators. It may be necessary for instance to have participants agree to have their test results analyzed and published, and to de-identify all evaluations.

8.2 Course Assessment

This is the Level One evaluation of the courses. (See Appendix A) Learners will complete a brief assessment of each course upon completion. The course assessments will consist of questions such as "This training contained enough information to be effective," or "The course was easy to use." and responses such as "Strongly Agree/Agree/Disagree/Strongly Disagree." OHSU and Planet will collaborate to develop the course assessments to ensure that they evaluate aspects of the training that will help refine any future versions of the training.

The course assessment will use existing standard Big Brain functionality. See the course assessments currently on Big Brain for examples. Details of the capabilities of Big Brain course assessments can be provided if necessary.

8.3 Reporting and Analysis of Assessments

The reporting and analysis of course assessments (and possible later the pre-and post-tests) will use existing standard Big Brain functionality. See the administration of course assessments currently on Big Brain for examples. Details of the capabilities of Big Brain course assessments can be provided if necessary.

[7] Big Brain pre-and post-test functionality is being considered at the time of this writing. It has not been approved or fully defined, and those decisions are outside the scope of this project. For that reason the Survey Monkey hosting will be considered the preferred option until such time Big Brain is proven capable of the required functionality.

8.4 Tracking Learner Progress and Completion

Learners' progress in the courses will be tracked by Big Brain. (Registered, Incomplete, Complete.) Completion of each course will be determined by the learner "touching" each of the required screens in that course. For instance, a screen may contain a sidebar that further illustrates a point, or provides additional background. That screen may not be necessary for course completion.

~~It may be~~The principle investigators have asked for ~~helpful to provide~~ a progress tracking mechanism that would indicate to the ~~learner~~ learner and to course administrators the depth to which the learner has explored the self-directed content. ~~One recommendation that is currently being explored is the inclusion (potentially in all three courses) of a~~To that end all three courses will include a pill bottle progress tracker (separate counters for each course will be displayed in different colors to avoid confusion) as described previously in this document (see Interacting with Vendors on page 18). Each time a learner completes a ~~required~~ny screen~~, or if they take the time to review an important sidebar,~~ a pill ~~(found at the bottom of the screen)~~ will be added to their pill bottle, showing a translucent bottle as empty, half full or full behind a text-based counter reading X of Y, where X= number of screens completed[8] and Y= total number of screens in the course. Each course will describe the functionality of the pill bottle and define how many pills are required to complete the course/ fill the prescription.

The course will use the number of screens completed as the course score. The learner and course administrator can then see the raw number of screens completed in Big Brain. The courses will have to explain that the number listed as the score on their Learner Detail page in Big Brain is not a score in the normal sense, but a measure of the amount of a course they have completed.

~~This is currently envisioned as a self-reported feature that would not be reported or tracked otherwise. Learners could self-report on the post-test how many pills were in their pill bottle~~Using the number of screens completed to provide an indication of how thoroughly ~~they~~ learners reviewed the curriculum adds a degree of flexibility in what will be required to record course completion. ~~This information could be useful in determining if the learners that reviewed more of the course also showed more improvements over their pre-tests.~~

Comment [AD7]: Recording a score is an existing function of Big Brain and as a result, requires very little work to identify the number of screens completed as the score. Planet recommends this method, as it does not require a change order.

Comment [h8]: How hard/expensive would it be to track this? There is potential for error/bias if we let people enter this info themselves…

8.5 Limitations of Tracking and Reporting

The web-based curriculum will be portable so that it can be shared with interested parties and organizations, but Big Brain hosting, reporting and administration of the courses will not be available to those using the courses if they are not hosted on ~~outside of~~ OHSU's Big Brain. This could limit the ability of these groups to track the use and effectiveness of the courses. The courses will be developed to meet SCORM guidelines so they could be hosted on other Learning Management Systems at a later date.

[8] A screen is considered completed once all audio plays through and all screen elements are displayed.

9. Program Description

9.1 Delivery Medium

The technical specifications document will describe the hosting, delivery and tracking of the web-based training in detail. Planet will use the instructional and reporting requirements here as the basis for defining the technical specifications for the course. The following requirements have been identified:

- Learners will access the course from the OHSU Intranet. Broadband connectivity will allow the use of higher quality media. If a learner accesses the courses using a dial-up connection they may experience download delays.
- Hosting, security, and tracking are all dependant on existing Big Brain functionality.
- The courses will make extensive use of on-screen text, photographs, and graphics with voice-over narration. The on-screen text will summarize or highlight the narration and not just duplicate it
- The Big Brain Journal allows residents to complete an electronic record of their thoughts, feelings, plans, practices, etc. The learner prints the electronic journal so that it can be shared with program directors as a teaching tool.
- The course will present the scenario simulations using a mix of available media to ensure their realism.
- The courses will share a glossary that defines important terms. Every instance of all g~~To minimize distractions g~~lossary terms will be displayed in a contrasting color and ~~not be~~ hyperlinked to the appropriate spot in the ~~it~~ glossary. Closing the Glossary (or References) returns the learner to their previous position in the course.
- The courses will share an extensive ~~resources~~references section that will include additional material elaborating on the material presented. It will no doubt include links to the other projects being developed under this Voluntary Compliance/ Discontinuance.
- Big Brain will track start and completion dates, and course assessment responses.
- A menu will allow for direct navigation to all portions of the course, and bookmarks will save learners' place so they can resume where they leave off.

Appendix A: Kirkpatrick's Four Levels of Evaluation

Assessing training effectiveness often entails using the four-level model developed by Donald Kirkpatrick (1994). According to this model, evaluation should always begin with level one, and then, as time and budget allows, should move sequentially through levels two, three, and four. Information from each prior level serves as a base for the next level's evaluation. Thus, each successive level represents a more precise measure of the effectiveness of the training program, but at the same time requires a more rigorous and time-consuming analysis.

In Kirkpatrick's four-level model, each successive evaluation level is built on information provided by the lower level.

Level 1 Evaluation - Reactions

Just as the word implies, evaluation at this level measures how participants in a training program react to it. It attempts to answer questions regarding the participants' perceptions - Did they like it? Was the material relevant to their work? According to Kirkpatrick, every program should at least be evaluated at this level to provide for the improvement of a training program. In addition, the participants' reactions have important consequences for learning (level two). Although a positive reaction does not guarantee learning, a negative reaction almost certainly reduces its possibility.

Level 2 Evaluation - Learning

Assessing at this level moves the evaluation beyond learner satisfaction and attempts to assess the extent students have advanced in skills, knowledge, or attitude. Measurement at this level is more difficult and laborious than level one. Methods range from formal to informal testing to team assessment and self-assessment. If possible, participants take the test or assessment before the training (pretest) and after training (post test) to determine the amount of learning that has occurred.

To assess the amount of learning that has occurred due to a training program, level two evaluations often use tests conducted before training (pretest) and after training (post test).

Level 3 Evaluation - Transfer

This level measures the transfer that has occurred in learners' behavior due to the training program. Evaluating at this level attempts to answer the question - Are the newly acquired skills, knowledge, or attitude being used in the everyday environment of the learner? For many trainers this level represents the truest assessment of a program's effectiveness. However, measuring at this level is difficult as it is often impossible to predict when the change in behavior will occur, and thus requires important decisions in terms of when to evaluate, how often to evaluate, and how to evaluate.

Level 4 Evaluation- Results

Frequently thought of as the bottom line, this level measures the success of the program in terms that managers and executives can understand -increased production, improved quality, decreased costs, reduced frequency of accidents, increased sales, and even higher profits or return on investment. From a business and organizational perspective, this is the overall reason for a training program, yet level four results are not typically addressed. Determining results in financial terms is difficult to measure, and is hard to link directly with training.

Level four evaluation attempts to assess training in terms of business results. In this case, sales transactions improved steadily after training for sales staff occurred in April 1997.

Winfrey, E.C. (1999). Kirkpatrick's Four Levels of Evaluation. In B. Hoffman (Ed.), Encyclopedia of Educational Technology. Retrieved December 29, 2006, from http://coe.sdsu.edu/eet/Articles/k4levels/start.htm

Appendix B: Levels of Learning, Bloom's Taxonomy

The following table is a summary of Benjamin Bloom's classification of "the goals of the educational process". Bloom headed a group of educational psychologists who developed a classification of levels of intellectual behavior important in learning. This became a taxonomy including three overlapping domains: the cognitive, psychomotor, and affective (see Anderson & Krathwohl, 2001; Bloom & Krathwhol, 1956, Gronlund, 1970).

Remember: Recall of data.	**Examples:** Recite a policy. Quote prices from memory to a customer. Knows the safety rules. **Key Words:** defines, describes, identifies, knows, labels, lists, matches, names, outlines, recalls, recognizes, reproduces, selects, states.
Understand: Understand the meaning, translation, interpolation, and interpretation of instructions and problems. State a problem in one's own words.	**Examples:** Explain in one's own words the steps for performing a complex task. Translates an equation into a computer spreadsheet. **Key words:** comprehends, converts, defends, discusses, distinguishes, estimates, explains, extends, generalizes, gives examples, infers, interprets, outlines, paraphrases, predicts, rewrites, summarizes, translates.
Apply: Use a concept in a new situation or unprompted use of an abstraction. Applies what was learned in the classroom into novel situations in the workplace.	**Examples:** Use a manual to calculate an employee's vacation time. Apply laws of statistics to evaluate the reliability of a written test. **Key Words:** applies, changes, computes, constructs, demonstrates, discovers, executes, manipulates, modifies, operates, predicts, prepares, produces, relates, shows, solves, uses.
Analyze: Separates material or concepts into component parts so that its organizational structure may be understood. Distinguishes between facts and inferences.	**Examples:** Troubleshoot a piece of equipment by using logical deduction. Recognize logical fallacies in reasoning. Gathers information from a department and selects the required tasks for training. **Keywords:** analyzes, breaks down, compares, contrasts, diagrams, deconstructs, deduces, differentiates, discriminates, distinguishes, identifies, illustrates, infers, outlines, relates, selects, separates.
Evaluate: Make judgments about the value of ideas or materials.	**Examples:** Select the most effective solution. Hire the most qualified candidate. Explain and justify a new budget. Compare two penguin training techniques and assess which is most effective. **Keywords:** appraises, assesses, compares, concludes, contrasts, criticizes, critiques, defends, describes, discriminates, evaluates, explains, interprets, judges, justifies, relates, summarizes, supports.
Create: Builds a structure or pattern from diverse elements. Put parts together to form a whole, with emphasis on creating a new meaning or structure.	**Examples:** Write a company operations or process manual. Design a machine to perform a specific task. Integrates training from several sources to solve a problem. Revises a process to improve the outcome. **Keywords:** categorizes, choreographs, combines, compiles, composes, creates, devises, designs, explains, generates, imagines, modifies, organizes, plans, rearranges, reconstructs, relates, reorganizes, revises, rewrites, summarizes, tells, writes.

This educational program strives for a level of learning that will allow learners to **apply** concepts and evaluates their ability to **understand** them. See the Apply and Understand sections above.