Instructional Roadmap:
Personal Health Online Interactive Textbook

by

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Purpose

The goal of the *Personal Health Online Interactive Textbook* is to create a learning system that uses online technologies to teach personal health. Ideally, the online interactive textbook will improve the quality of feedback to students and the speed at which that feedback is given; provide students with more engaging, relevant learning materials and environments; improve verbal test scores, and measuring positive changes in attitudes and behaviors; and give to instructors course management tools that will enable them to more effectively and efficiently deliver instruction.

The personal health course covers a range of health topics, including stress management, mental health, physical fitness, chronic diseases, infectious diseases, drug and alcohol use and abuse, relationships and sexuality, weight management, environmental health, and aging. For purposes of this paper and in the interest of time, I chose to focus on just one topic: nutrition.

Performance Objectives

The goal of this instruction is to *create a personal nutrition plan based on affordable foods that are enjoyable and promote good health and wellness.* This is a task that is found in the two performance contexts described earlier in my front-end analysis:

- The everyday personal living environments (school, work, play) in which students must apply learned concepts in order to live healthier lifestyles.
- The personal health course in which students must demonstrate mastery of learned concepts in order to graduate from college.

In my task analysis of the nutrition module, I discovered there are four performance objectives that will, if learned by the student, achieve the goal:

- List the essential food nutrients and describe the functions they perform in the body.
- Use the USDA food guidelines to avoid nutritional deficiencies.
- Use consumer tools to make choices about which foods to eat.
- Create a menu of meals that you will eat during a given week.

Instructional Strategy

The instructional strategy of the Online Interactive Textbook is a problem-based approach. Because the high-level goal requires the development of an attitudinal skill (choose to create a healthy menu) as well as an intellectual skill, it is important that the learners develop the ability to apply cognitive strategies to achieve the overall goal. Using Merrill's Component Display Theory[1], the level of student performance is to use and find certain procedures that will enable them to successfully create a healthy menu that they will enjoy.

Sequencing the Online Instruction

Before the attitudinal skill can be learned, the students will need to first learn the concepts that are related to that skill.[2] The Online Interactive textbook will be designed to build that knowledge. It will put the concepts within the context of the problem so that the student, from the start, understands the relevance of the material they will study.

Once the problem is specified[3], the steps to accomplishing the task are identified, as I did in my task\goal analysis (see chart in Appendix A). I identified the sub-ordinate knowledge and skills for each step, which then helped me determine the *progression*[4] of problems (learning objectives) that would be part of the instruction. I would then organize the content by a simple sequence of smaller subtasks, each of which need to be learned in order to accomplish the larger task or problem. The sequence of instruction would follow a left to right, bottom-up progression.

For example, in order to accomplish the first task, "List essential food nutrients and describe the functions they perform in the body," the student would first learn verbal skills, such as *describe the difference between complete and incomplete proteins* and *define amino acids*. They would then use that information to explain a higher-level skill, which would be to explain the importance of proteins. Once the student had mastered all of the skills and knowledge required to perform the first task, they would move on to the second task, "Use the USDA food guidelines to avoid nutritional deficiencies," including the subtasks required to

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[1] Merrill, M.D. (1983). Component Display Theory. In C. Reigeluth (ed.), Instructional Design Theories and Models. Hillsdale, NJ: Erlbaum Associates.
[2] Driscoll, Psychology of Learning for Instruction (New York: Pearson Education, 2005), p. 370
[3] M. David Merrill, A Pebble in the Pond Model for Instructional Design, www.ispi.org, 2002, p. 41
[4] M. David Merrill, A Pebble in the Pond Model for Instructional Design, www.ispi.org, 2002, p. 42

complete that objective. And so it would go until the student masters the knowledge and skills required to create a healthy menu.

Solving Problems in the Classroom

Leading a horse to water does not necessarily mean it will drink. Just because students know the facts of good food doesn't mean they will change their behavior and apply the concepts to their daily lives. For this reason, classroom instruction should include group activities in which students would work together to solve problems. They will share ideas and brainstorm strategies, using the information they learned using the Online Interactive Textbook. Instead of lecturing, the instructor will serve as a guide, facilitating the discussion or posing problems or case studies to the group. In this way, the learners should better understand how to apply the material creatively in a way that is best for them.[5] And, the theory goes, this higher-level of awareness and cognitive thinking will motivate them to eat healthier.

Furthermore, the Online Interactive Textbook will enable the instructor to organize the class this way because it will essentially serve as an interactive lecture-replacement tool. Students will learn online in an engaging, interactive way what they would have otherwise learned through lecture and textbook reading. Students will come to class possessing knowledge that they can then apply to problem solving and creative thinking.

Clustering Content

Because this is typically a 3-credit college course, the content will be clustered into chapters or online modules that can be approximately covered in three-hours of instruction. The content will also be clustered by major topics as they are traditional taught by personal health instructors. That is, nutrition will be covered in one chapter, fitness in another, stress management in yet another, and so on.

My research, which included instructor and student focus groups as well as surveys, found that personal health students are expected to do approximately 1 hour of home work for every credit hour. Because most personal health courses are taught as 3-credit classes, the amount of online work will be limited to three hours per chapter, assuming that one chapter is covered in a week.

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[5] Driscoll, Psychology of Learning for Instruction (New York: Pearson Education, 2005), p. 362

Instructional Media and Delivery Methods

I plan to use all five types of multimedia in the Online Interactive Textbook: text, graphics, audio, video, and animation. As I mentioned above, I also plan to utilize electronic (web), print, and traditional classroom resources. Multimedia, particularly video and animations are important because they will help engage students, explain difficult concepts, and make the material relevant. For example, I imagine producing a video that follows a student through a semester-long behavior change project during which they attempt to follow a more nutritious diet. The video, which would be edited into short segments, would include interviews with the student asking her how well she is doing, what barriers she is encountering, what are her successes and failures. In this way, other students can relate to her and understand the realities of behavior change and how to manage the challenges.

Instructional Materials

For copyright reasons, most of the instructional materials of the Online Interactive Textbook will need to be created from scratch. An instructional designer will work with a subject matter expert and a writer to create the instructional design for the Online Textbook. The instructional materials will include pre-instructional activities, practice activities, a print reference, assessments, and a capstone project.[6]

Pre-instructional Activities

The pre-instructional activities that will be included in each module of the Online Interactive Textbook are motivational devices, learning objectives, and a pre-test.

Motivational Devices

Each module will begin with a short video introduction designed to grab their attention and pose the real-world performance goal of the instruction, thereby making it relevant to the student. A narrative will describe the benefits to the student for achieving the goal and will relate the objective to the student's prerequisite knowledge of food.

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[6] Walter Dick, Lou Carey, and James Carey, *The Systematic Design of Instruction, 6e* (New York: Pearson Publishing, 2005), p.

Learning Objectives

Learning objectives will be listed at the beginning of each module. This will help focus the learner's study and set his or her expectations.

Pre-Test

Each module will include a pre-test that will include a mix of prerequisite knowledge as well as knowledge that they will learn later. Feedback will be given to the student to telling them what they know and don't know. This pre-test will serve two important purposes. First, it should give the learner the confidence that they can accomplish the tasks the course will require of them using their prerequisite knowledge. Second, it will give them a clear idea of what they don't know. (Remember: Many students enroll in the course thinking they learned it all in high school.) And three, the pre-test feedback will reinforce what they already know as well as introduce them to the concepts they will learn in the module.

Practice Activities

The student will be given a variety of activities, each reinforcing a learning objective. Through this active learning process, students will use the print reference to complete the practice activities. The activities will be varied (multiple choice, drag and drop, visual identification, short essay, and discussion board) and will be attached to appropriate media, including graphics, video, or animations. For example, a student would watch a short video of a person grocery shopping. At the end of the video, the student will be asked 2 or 3 questions about the food choices that were made in the video. Most of the practice activities will be auto-graded so that the instructor does not have to spend a lot of time grading the homework. The auto-graded activities will provide feedback to the students, explaining whether the answer was wrong or right and why.

Print Reference

A brief print reference will supplement the Online Interactive Textbook. The print reference will include all of the fundamental concepts. The students will use the print reference to complete the online activities. The print reference will be one-color and include a minimal pedagogy.

Assessments

Each module will include two kinds of assessments. The first assessment, which will be graded, will measure verbal knowledge and intellectual skills. The second assessment, which will not be graded, will measure attitudes and behaviors towards nutrition. This second assessment would come in the form of a worksheet that the student would complete and it will ask a variety of questions about their eating habits. Both the verbal test and health assessment would be submitted to the instructor online.

Project (Transfer of Learning)

Each student would have to complete a final project that would prove that he or she achieved the goal. In this case, they would need to create their own personal nutrition plan and support it with references to the concepts. Applying the concepts to their own performance setting will help the learner retain the information and transfer the knowledge and skills to different contexts.

Delivery System

These are the components of the delivery system I plan to use in the Online Interactive Textbook:

Hybrid Web-Based Instruction: The Online Interactive Textbook for personal health will use an instructor-facilitated web-based instruction. Students will still attend a traditional classroom for at least part of the time, but they will be required to complete assignments and assessments online. Class time will be spent not on lecture, but on team activities and discussion.

The reason for the web-based system is so that students can complete and submit homework to their instructors online. Because the pre-test and most practice activities will be auto-graded, students will be able to receive immediate feedback, something that instructors are not able to do on an individual basis. This should help students learn and encourage them to come to class prepared. As a result, students can better participate in team activities and classroom discussions.

Online Course Management System: The web-instruction will be supported by an online SCORM-compliant course management system that will include a variety of tools that will

help instructors manage the course. These include a grade book, class listing and enrollment, online testing, and communication devices.

Print Reference: The print reference would supplement the online interactive textbook. It would include all of the fundamental concepts and would be used by the student as a resource to complete the online activities.

From student focus groups, I have found most students do not want to read ebooks – traditional books that are available in static pages electronically. As a result, the primary vehicle for delivering the fundamental concepts will be a brief print reference. However, most of the pedagogical elements, most of Gagne's steps of instruction, will be presented online. Students will use the print reference to solve online problems.

Instructor's Manual and Classroom Activity Guide: Instructors who use the Online Interactive Textbook would receive an instructor's manual that would help them incorporate the online system into their lesson plan. An activity guide would provide a list of in-class activities and discussion that would replace the traditional lecture format.

References

Walter Dick, Lou Carey, and James Carey, *The Systematic Design of Instruction, 6e* (New York: Pearson Publishing, 2005)

Marcy P. Driscoll, *Psychology of Learning for Instruction* (New York: Pearson Education, 2005)

M. David Merrill, *Component Display Theory*, Instructional Design Theories and Models, C. Reigeluth, editor (Hillsdale, NJ: Erlbaum Associates, 1983)

M. David Merrill, *A Pebble in the Pond Model for Instructional Design*, www.ispi.org, 2002