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## DESIGNING THE COURSE STRUCTURE AND LEARNER INTERFACE

**T**he first design aspect in the integrated framework for designing the online learning experience focuses on the content structure and the graphical interface of the online learning space. This aspect constitutes the medium or stage within which all learner interactions in the online learning environment occur. The design of this aspect is often transparent to learners, yet it influences the learning experience in multiple ways related to the cognitive, emotional, and behavioral dimensions of learning.

After the course learning objectives and content scope have been determined, instructors and course designers concentrate on how course content units will be structured and presented in an easy, understandable, and appealing way to the learner. Throughout this chapter we will use concepts and principles from the field of UXD and adapt them in the design of the online learning space. We will look first at what is involved in designing a structural framework to support the primary learning goals of a course. After considering common challenges and scenarios involved in designing a course structure, we shift focus to the design of the learner interface and its impact on the learning experience. We conclude the chapter by presenting strategies for designing the online learning environment, applying design thinking and learner-centered design principles.

### **Guiding Design Questions**

- How can we use a course conceptual model to shape and focus the design of the course structure to better accomplish learning goals and meet learner needs?

- How can we design a course structure that is meaningful to learners and organized to better support specific kinds of learning outcomes?
- How can we apply design thinking and UXD to create a learner-centered online course interface?

## From Conceptual Model to Course Structure

As in all human design endeavors, the creation of an online course begins with a conceptual model. Understanding the conceptual model underlying a course and creating a structural framework is the starting point for all course design projects. In this section, we explain how a conceptual model for an online course gives purpose and shape to the course content structure. We will also look at common design challenges and scenarios related to creating the online course structure.

### *Course Conceptual Models*

A conceptual model is a mental image (representation) in the mind of a course creator that serves as a kind of matrix, giving rise to the design of the course content structure and shaping other aspects of the online course environment. The conceptual model envisions certain global attributes of the course that include purpose and main learning goal, what it will do for learners, the form it will take, and how it will look and function.

The conceptual model specifies the course format—if the course will be instructor-led, self-paced, synchronous or asynchronous; the length of the course and timetable structure; and if it is credit or noncredit. For an online course, the conceptual model usually includes ideas about the technology delivery platform, including any LMS and what the course might look like and how it will function. In some cases, it may also allude to preferred instructional methodologies that will be used, such as case study, project, lecture, or simulation approaches.

A not so tangible but probably the most important part of a course conceptual model that directly influences the design of the course structure lies in the primary purpose and learning goal for the course. There are two fundamental types (or categories) of courses based on their primary purpose and instructional goal (Romiszowski, 1981). For the first type of course, the main instructional goal is to acquaint learners with the core knowledge, vocabulary, principles, and structure of a domain or field of study. This type of course is most common in higher education, particularly at the undergraduate level. The structure of this type of course is typically organized around major topics related to the discipline. This contrasts with the second type

of course, in which the primary goal and purpose is aimed at supporting learners in developing competencies and higher order, complex skills, often related to some aspect of a job or professional practice in the real world. This second type of course is common in many graduate and professional schools, certificate programs, and workforce training courses. The content structure of this type of course is typically organized around core tasks that support the acquisition of complex skills.

Most important about this distinction is that each type of course requires a different design for its structural framework. Although many courses ask learners to acquire both knowledge and skills, the primary purpose and learning goal of a course will tend toward one or the other. Courses designed around subject matter and domain knowledge place greater emphasis on “knowing about.” Courses that focus on skill and performance competencies emphasize “knowing how.” As we will see, these orientations influence the design of the course structure and other aspects of a course.

### *Course Structural Framework*

Every course has a structure that holds together all content elements into a unified whole. Most instructors have experience designing a course structure and have a fair degree of latitude in how they do it. Creating a course structure involves first defining the content scope of the course based on learning objectives. Referring to course objectives, instructors identify major thematic units and organize the flow of course content into a logical sequence. Structuring content continues within each unit to the lesson or module level by identifying topics and subtopics.

Designing the structural framework for an online course requires going back to its conceptual model and focusing on the primary purpose of the course. If a course is aimed at having learners attain subject matter mastery in a domain, then the top-level thematic units comprising the course should concentrate mainly on major topics that constitute the subject domain. Topics are determined by the instructor’s understanding of how knowledge is organized within the discipline. This topical structure is typically framed around key concepts, principles, and processes within the discipline. Developing competencies in performing tasks related to jobs becomes secondary to the acquisition of discipline-specific knowledge. Task-focused modules are generally in the form of learning activities, labs, projects, and other learning exercises that serve to reinforce knowledge construction.

Courses where the primary goal is acquiring complex skills and competencies and performing job-like tasks related to real-life contexts require a different type of content structure. In this case, the top-level thematic units

are typically designed around core tasks that support a whole skill. The thematic units will also reflect the sequence of these skill sets based on how expert performers approach the skill as part of a job.

From a learning experience design perspective, a knowledge-topic focused course and a skill-task focused course can promote engagement and deep learning, but for two different purposes. For example, the structural framework of a course in financial planning could be organized in several ways. A course structure could be organized around discipline-specific knowledge that includes topics focusing on key concepts, principles, theories, and models used by expert financial planners. The same course could have a different structural framework organized around the job or skill sets of financial planning. In this instance, the thematic units would center on key tasks and subskills supporting the practice of financial planning. Subunits or lessons might include how to manage cash and credit or how to manage risk and investment strategies, along with task-based practice modules.

In designing the learner experience, instructors and course designers need to continually keep in mind alignment between their course's underlying conceptual models and its structural framework. Many online course descriptions claim to teach skills and application but are structured mostly around concepts and principles associated with a skill and only lightly focus on task performance that supports the skill. Learners are likely to experience disappointment when a course description based on its conceptual model is misaligned with its content structure.

### *Online Course Structure Design Challenges and Scenarios*

The underlying conceptual model of most online courses has tended to mirror that of conventional face-to-face classroom-based instruction. In the course virtual space, face-to-face lectures become recorded PowerPoint videos, print-based readings become electronic texts, and group discussions become electronic discussion forums. Many online courses focus on teaching domain knowledge and are timetable-based with content broken down into units organized around lists of topics and subtopics. Not long ago the majority of online courses resembled organized content repositories where learners downloaded and absorbed information related to a subject and then discussed what they read in threaded discussion forums. These types of content-centric designs are now fading but still linger. Breaking from these entrenched traditional course design patterns is not easy. Designing learning experiences in a digital learning ecosystem entails taking advantage of new digital tools and pedagogies and using design thinking to shift the focus of online course content structures from information-centric to more learner-centric. In the

following, we describe challenges instructors often encounter in making the shift to online.

### *Learning Management Systems and Institutional Juggernauts*

Most LMSs have been designed to accommodate online courses that build on traditional conceptual models. One way they do this is by providing limited and one-size-fits-all templates for creating a course structural framework. In many ways, they reinforce the tendency to digitize existing course content and simply make it available to students to access online. Coates et al. (2005) stated that the built-in functions of the LMS can be a reinforcement of teaching as the “transmission of decontextuali[z]ed and discrete pieces of information” (p. 27), due to its text-heavy and linear nature. The kind of learning experiences the LMS fosters is restrictive because the learning activities tend to be organized based on uniform templates. The design of an online course structural framework can become especially challenging when an innovative instructor or course designer has a different conceptual model for an online course and would like to try something new that deviates from the templated LMS-imposed structural framework. Innovative conceptual models may also run headlong into constraints imposed by existing institutional processes for online course development. These often go hand-in-hand with the LMS, emphasizing course production efficiency over the learner experience. Learning experience design often involves pushing the envelope, finding creative ways of working within the constraints of an LMS and institutional processes.

### *Converting a Face-To-Face Course to Online*

In this situation, there is ample opportunity for instructors to give pause and defer the urge to plunge headlong into replicating an existing classroom-based conceptual model and course structure. Instead they can engage in design thinking by getting ideas from others and explore alternative structural frameworks. This may involve gaining a deeper understanding about learners, challenging assumptions about teaching and learning in an online environment, and brainstorming creative solutions. For example, a professor in the process of moving an existing French and Italian Renaissance literature course to the online environment brainstormed with colleagues and course designers about alternative ways to structure the course. Instead of organizing course units around a list of literary genres, he restructured the course units and lessons around various time periods and locations in Renaissance France and Italy. This shift in the course structural framework not only provided a real-world context for unit content but also opened the door for more creative ways to design lessons using a time travel theme. There are numerous

ways to restructure and reframe existing classroom-based content structures to make them more engaging for online learners. When making the shift from a face-to-face to an online course, one design thinking strategy is to regard the classroom course as a good working prototype. This involves first reflecting on course evaluations and feedback from students and identifying what was working and not working and then using this information to rethink how the learning experience could be made better when shifting to a new technology-enabled environment.

### *Designing a New Online Course*

This situation broadens all the opportunities described previously for creating newer and better kinds of learner experience starting from the ground up and taking full advantage of using newer digital pedagogies. A worthy task for instructors and course designers creating new online courses from scratch is to rethink and push the envelope on conventional conceptual models and course structures for online courses. This may be a time to consider course designs that are more task- and competency-focused, that engage learners in more than just acquiring domain-specific knowledge, and incorporate more knowledge application opportunities related to performing practical real-world tasks. It is a good idea for instructors building new online courses to spend some time looking at a variety of examples of different online courses and focusing on their conceptual models and structural frameworks for inspiration. Becoming well acquainted with the design thinking process, the affordances of available technology tools, and collaborating with others are absolutely essential in this type of scenario and often lead to significant pedagogical innovations.

### *Making Changes to an Existing Online Course*

For instructors and course designers with existing online courses, trying to make structural changes can easily become frustrating and a design mess where nothing seems to integrate. In this scenario, the most important thing may be to recognize the existing course conceptual model and structural framework that a course is based on and work as well as possible within the constraints. The best strategy here is to focus on making minor adjustments to the surface layer of the course structure, such as making unit and lesson titles more clear, interesting, and understandable from a learner perspective. The process should involve drawing upon learner feedback from previous instances of the course. Instructors can also identify smaller parts of the course within lessons for making enhancements. These are often not as tightly embedded into the existing course structure and might include new types of learning activities and links to content modules that reside outside

the course. Over time one can continue to make these minor enhancements, and their cumulative effect will result in significant improvements in the learner experience.

As we move into the next section, it becomes clearer how designing learning experiences is a holistic endeavor, as conceptual models, structural frameworks, and learner interface designs interrelate and impact the quality of the online learning experience.

## **The Learner Interface**

The learner interface is the visual medium between the learner and the technology-driven learning environment. It is shaped by the underlying conceptual model and makes the structural framework of course content units visually explicit to learners.

### *Design Qualities of the Learner Interface*

The design of the interface can enable or constrain the quality of interactions the learner has with content, instructors, and other learners. In observing learner interactions with electronic texts, Swan et al. (1998) found that the various structural features of e-text interfaces affected the meanings learners developed from the content. In addition, Swan et al. (2000) concluded that attributes of an online course's interface design such as consistency, clarity, transparency, and simplicity of course structures increased student perception of learning. These studies show that well-designed interfaces can better support learning and enhance the learning experience.

If an online course interface is overloaded with too many extraneous features and content elements, the learning space can be perceived as less useful and become overwhelming for learners. A learning space with a confusing and difficult-to-understand interface will not be used effectively and efficiently by learners and can negatively impact learning outcomes and the overall learning experience. The learner should be able to enter the online course environment and start using it immediately with little or no guidance. Norman (1990) has noted that the best designed interfaces are the ones that are hardly noticed, that permit the learner to focus on information and tasks rather than the mechanisms used to present the information and perform the task.

Effective learner interface design uses the principles of predictability, consistency, and content formatting. The visual layout of screens should be consistent with the mental models of the learner for how an online course should look and work. Predictability means the learner can accurately predict the outcome of interactions in the learning space. Before clicking on an

object, the learner has a sense of what will happen. Consistency involves similar unit and lesson structures throughout the course represented in similar ways. Content formatting is when content is logically grouped together visually. These three principles help make the online learning experience intuitive and understandable.

### *Function of the Learner Interface*

In the absence of a physical instructor, the online environment depends on a well-designed interface to help guide learners through their learning experience in the course (Lohr, 2000). The learner interface mediates the learner's interaction with course content, the instructor, and other learners. In the fields of HCI and UXD, this is often referred to as the *user interface*. There can be multiple levels of interfaces within any online learning environment comprising the course home page, menu structures for lessons, learning activities, discussion forums, and support resources. For online courses, the thematic units and lesson structure will stand out clearly in the main menu of the learner interface for easy access by students.

In the online environment, instructors and course designers need to become aware of the elements of effective learner interface design to provide a positive learning experience. The goals of interface design are to (a) provide learners with easy access to the information they need to achieve their goals (information architecture); (b) present information in a clear, organized, and easily understandable way (information design); and (c) offer a simple and elegant interface with an appealing look and feel (visual design). Achieving these goals sets the stage for positive learning experiences to occur as learners engage with the other four aspects of the online environment (content interactions, learning activities, social interactions, and assessment and feedback).

### *Information Architecture*

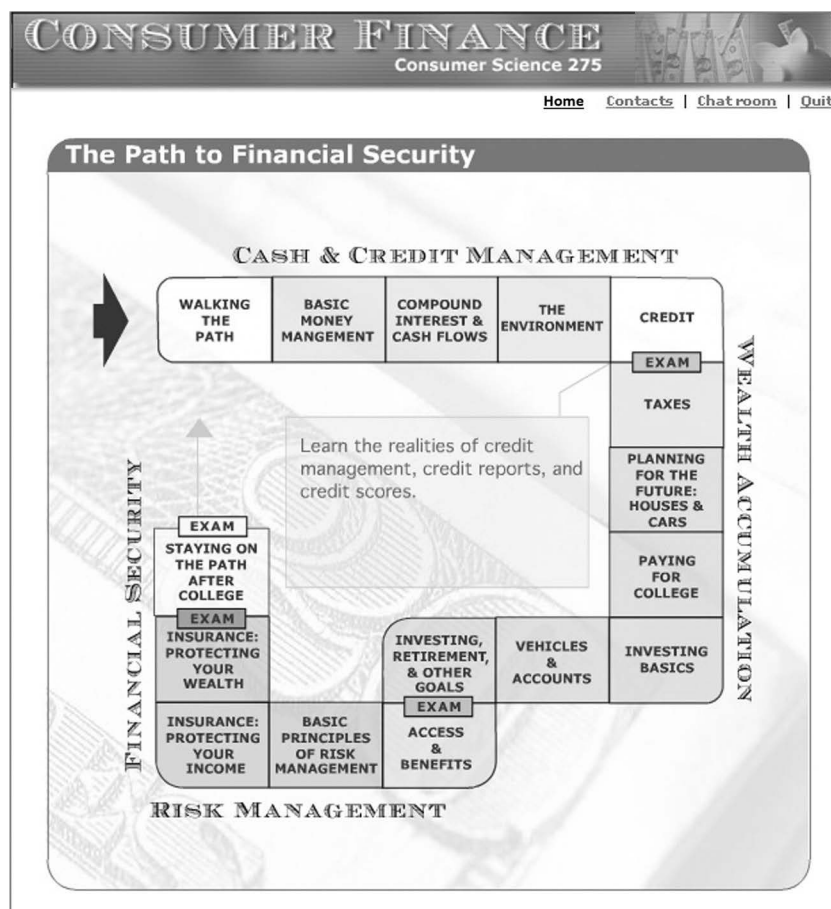
The information architecture builds on the course structural framework. It involves mapping, organizing, and grouping categories of content in order to give the learner a sense of the scope and sequence of the course content. This is especially important for making clear the interrelationships between major content units and secondary-level lesson organization. Although it is not directly visible in the learner interface, the information architecture serves as a basis for developing menu structures for units, learning resources, lessons, and topics. Many course designs are based on bodies of organized knowledge within a discipline that learners need to access to complete assignments. A common information architecture for online courses is hierarchical and sequential. Many course content units and topics are organized around the



weeks in a semester. This takes the form of content unit menus that resemble a text outline of topics based around dates. This architecture may be effective for representing, breaking down, and organizing a large body of content for easy access. However, from a learner perspective, it can often appear like a disconnected list of topics to get through and check off, fostering a learning process focused on rote content memorization.

The information architecture is represented through the learner interface and can serve a dual purpose. It can provide not only a visual topical structure but also a meaningful framework for learners to form an internal representation of the flow of the course content units, making the learner's journey through the course content more meaningful, application-focused, and motivating. Figure 3.1 shows a design of the main menu for an online

**Figure 3.1.** Main menu for an online course in consumer finance.



course in consumer finance. Notice how the course content is structured around a process involving four phases (Cash & Credit Management, Wealth Accumulation, Risk Management, and Financial Security). The course structural framework is based on a process using the analogy of a “path.” As learners move through the course, which is based on a game board design, the underlying conceptual model, structural framework, information architecture, and interface design are tightly integrated, providing a more meaningful main menu screen.

From an information architecture perspective, learner-centered design involves understanding how course content can be visually structured, often in creative ways, so learners can access, absorb, process, and derive meaning from it.

### *Information Design*

Information design occurs at a more granular level and focuses on communicating and presenting content so learners can understand information more easily and use it to perform tasks. Good information design ties content elements together and, if done well, is transparent or hardly noticed because well-designed content makes sense. It also involves selecting and using the best modality or medium for presenting different kinds of content based on the type of content and how learners need to use it in the course.


Several approaches can be used to improve the understandability of online course content pages in ways that support the cognitive dimension of learning and create more satisfying learner–content interactions. Horn’s (1998a, 1998b) method of structured writing encourages the use of information maps and blocks as a way to visually organize informational elements of a topic. Structured writing distinguishes between flat and blocked text. Flat text, often referred to as a “wall of words” and common in much academic writing, consists of lengthy paragraphs that are not visually organized in a way that readers can see from its surface the structure of its contents. Blocked text makes the structure of text content more explicit through chunking large bodies of text into smaller units which are labeled. Blocked text is easier to comprehend and to find specific information in a document and is presented in a way that learners become more inclined to read. Figure 3.2 illustrates how blocking of text content and visual layout of screen content can enhance the learner experience at the cognitive dimension of learning.

### *Visual Design*


Visual design refers to the graphic treatment of interface elements encompassing what the learner sees and interacts with in the online learning space. This includes the look and feel of text, images, and media objects on every

**Figure 3.2.** Information design of the learner interface.

## Best Practices



### Agree on Ground Rules



Ground rules are agreements about expected behavior in meetings. The purpose of ground rules is to make explicit the group's norms about how team members will interact, thus preventing or reducing misunderstandings and disagreements. Ground rules may differ greatly by department, committee, or group, but they should always contribute to the group's ability to work together effectively.

#### How to establish ground rules

Each group creates its own ground rules. All groups violate their own ground rules sometimes, and it is the chair's or facilitator's role to remind the group. Keep the ground rules close by. It's important that ground rules represent a consensus and are agreed upon by the entire group. They should be reviewed and updated periodically.

Some common ground rules are:

- Turn off cell phones
- Treat other members with respect, even in the face of disagreement
- Send a substitute if you cannot attend
- Bring a handout when you are making a proposal for action
- Arrive on time

#### Agreeing on how decisions will be made

Another type of ground rule is agreeing in advance how decisions will be made. The most common ways that decisions are made in committees or groups are through majority rule (voting) or consensus. Both methods have their strengths and limitations. Voting is expeditious, although a simple majority may not bode well for implementation.

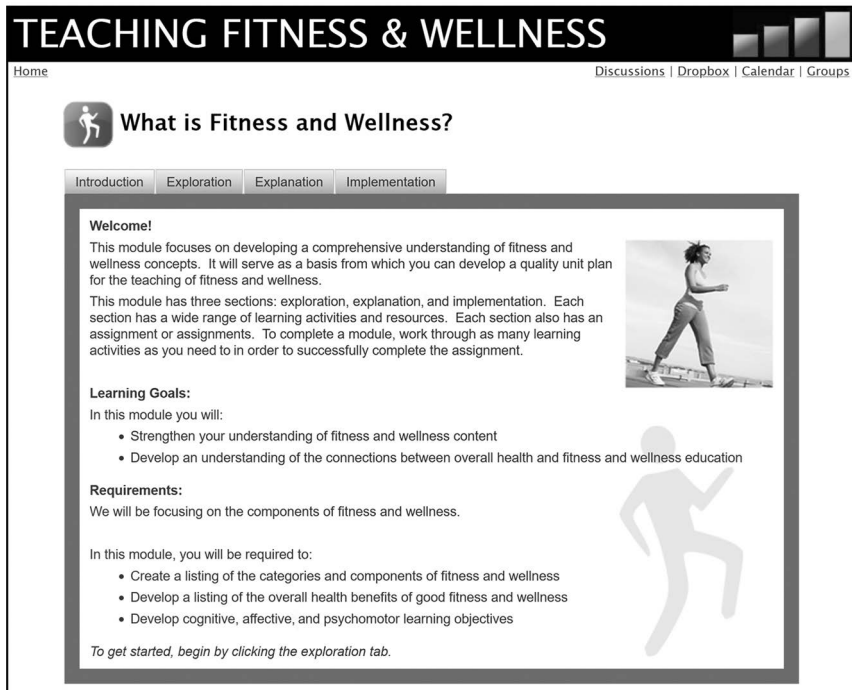
Consensus may take longer to achieve, but can create high levels of support for implementation. A group is considered here to have reached consensus when it finally agrees on a choice and each group member can say:

- "I believe that others understand my point of view"
- "I believe I understand others' points of view"

screen. All visual content has shape, line, color, spatial composition, and form and is part of the visual design. The visual design of the learning space is a layer that is built on top of the information architecture and information design, which initially are devoid of color and visual aesthetics. The look and feel of how informational and navigational elements are rendered and arranged on the screen can impact the learner experience on the cognitive, behavioral, and emotional levels.

The aesthetics (or visual appeal) of a course can influence how learners will judge their experience and enjoyment throughout the course (Lindgaard et al., 2006). The first intuitive reaction to the online course design affects how learners perceive relevance, trustworthiness, and value (Fessenden, 2017). Therefore, a positive first impression of the course site based on the design layout, color, content prioritization, and so on can set the tone for the

**Figure 3.3.** Visual look and feel of the learner interface.



entire learning experience. Figure 3.3 provides an example of a visual look and feel of a learner interface. It embodies a simple and elegant design.

The look and feel of the online course can bring content, functionality, and aesthetics together, contributing to learner satisfaction and the overall learning experience. When designing an online course, it is essential to consider the emotional experiences of the learners (McEvoy & Cowan, 2016). Incorporating emotions into the course design requires empathy for the learner to intentionally create an experience that activates an emotional response.

Kahneman (2015) stated that there are two systems in which individuals process information. System 1 is the automatic system. This system is involuntary and involves little effort, but senses simple relationships or identifies patterns. System 2 requires attention and involves consciousness, awareness, and control. In System 1, the learner assesses the relevance of the course, quickly scans for significant course content, and tends to prioritize course aspects judged to be of high importance. Therefore, first impressions about the online course through the course interface can set the stage for the entire course.

The interface of the course can anticipate learner needs and guide the learner toward desirable learning. It is in System 1 that the learner perceives

the aesthetics and the value of the course site (Kahneman, 2015). If the course site is aesthetically pleasing, the learner will feel like returning to the course and appreciating the learning activities. A course site that has poor visual design—no colors, too many different fonts, lack of contrast, and competing or extraneous graphics—may overwhelm the learner and undermine relevant course content and activities. Being sensitive to the design of the look and feel of the learner interface can serve to enhance the online learning space in a way that is attractive and appealing for the learner.

### *Interface Design Factors Influencing Learner Satisfaction*

Chang and Tung (2008) stated that perception of usefulness, quality design, and ease of use are factors influencing online learner motivation (or behavioral intention) to use the online learning space. When learners enter and begin using the online learning space, they make tacit or implicit judgments regarding each of these factors contributing to their overall experience. The interface design needs to convey quality. The content needs to be framed and organized in ways that appear relevant and useful to learners. The potential constellation of interactions embodied in the learner interface needs to be user-friendly and simple to use.

Perceived usefulness and ease of use of the online learning environment lead to greater learner satisfaction with the learning experience, which contributes to increased persistence. Joo et al. (2011) found that perceived usefulness and ease of use impacted learner satisfaction more so than elements of social presence. This underscores the importance of a learner-friendly interface design and a structural framework that clearly communicates the relevance and practicality of the course content.

Learner interactions with the course interface impact their perception of the functionality, usefulness, and the ease of use of the online learning space, all of which impact motivation for continued participation in the online learning experience. Cho et al. (2009) stated that learner interface design is one of the most important aspects impacting the learning experience. Interface design comes into play at the course, lesson, and learning activity levels in online courses.

In the eyes of the learner, the interface is the face of the learning space. Ideally, it works on all four dimensions of learning to create a learner-centered experience. At the cognitive level, the learner can get a sense of the structure, flow, and form of the course content. It presents content in a concrete visual way, so that the learner can interact with and move through the learning space. At the cognitive and behavioral levels, the interface provides learners with the right amount of relevant content at the right times through the course to accomplish tasks. At the emotional level, the interface shows value

in the learner's mind early on and throughout the course. The learner can see content flows and progress forward to achieve course goals and become more motivated to engage in learning activities. At the social level, the interface provides a personalized look and feel and a sense of presence such that the individual does not feel isolated and alone.

Aesthetics play an important role when designing the look and feel of the online learning environment. Tractinsky et al. (2000) concluded that the perceived beauty of a software product increased positive perceptions of its usability in their study. Thus, what is designed well in terms of usability and practicality will be perceived as attractive and desirable (Hassenzahl, 2004; Tuch et al., 2012).

It is important to have a balanced design strategy for the look and feel of online learning spaces that adheres to a "simple and elegant" design principle. This takes into consideration what Lavie and Tractinsky (2004) called the classical aesthetics dimension, which "emphasize[s] orderly and clear design and [is] closely related to many of the design rules advocated by usability experts" (p. 269). These considerations guide the design decisions around look and feel.

## **Strategies for Creating an Online Course Structure and Learner Interface**

Design thinking is used in creating both the course structure and interface from a learner perspective. It is a creative and iterative process that often begins with initial and sometimes fuzzy ideas that get refined over time. We offer several design thinking strategies beginning with designing the course structure followed by strategies for designing the learner interface. But first you need to determine the primary goal and purpose of the course based on the conceptual framework.

### ***Determine Primary Goal and Purpose of the Course Based on the Conceptual Model***

The course conceptual model shapes the structural framework for the online course, which in turn shapes content elements of the learner interface. If the primary aim of a course is to have learners acquire knowledge of a domain or academic subject area, then the course content structure can be organized around thematic units corresponding to major topics within the discipline (i.e., concepts, principles, processes). If the primary aim of a course is to have learners acquire skills and competencies for performing complex tasks, such as those related to a profession, then it is often best to organize the content structure around thematic units that reflect constituent subtasks (i.e., smaller

**TABLE 3.1**  
**Aligning Course Goal/Purpose With Thematic Unit Structure**

<i>If primary course purpose/goal is:</i>	<i>Then use this type of thematic unit:</i>
Knowledge of domain subject matter for a discipline of study	Major <b>topics</b> focusing on key concepts, principles, structures, or processes within the discipline
Performance of skills and complex tasks related to aspects of a job or profession	Core constituent <b>tasks</b> supporting the performance of a whole skill or complex task (part of a job or larger skill set)

skill sets related to performing more complex operations). Table 3.1 provides a simple heuristic for aligning a course's primary learning goal, expressed in the conceptual model, with the design of its structural framework.

### *Design a Meaningful and Organized Course Structure for Learning*

Well-designed courses make their structural framework explicit to learners by organizing the course content into major thematic units that follow a logical sequence and where the interrelationships of units are made clear (Fink, 2013). Although there is no one best way to create an online course structure, we offer four strategies that apply design thinking to make the course structure more understandable and meaningful for learners and, just as important, more tightly focused on course learning goals.

#### *Focus on Core Topics or Tasks*

The starting point or foundation for building course content structurally aligned with the course's primary purpose and goal is to begin listing and sequencing the major thematic units based on the primary course goal. This can take the form of a simple skeletal outline on paper or a whiteboard.

Because design thinking is an iterative process, the initial list of thematic units should be regarded as a first draft. This high-level scope and sequence might include from seven to nine thematic unit titles, depending on the scope and length of the course. From here, instructors can begin to flesh out titles for subunit topics or tasks at the lesson or module level. The focus is on the big picture, not getting mired in content details. It is like zooming out with a camera and focusing on the structure of an object. The key is to sequence or arrange units so they clearly build on one another in a way such that learners would be able to integrate topics and tasks with preceding ones as the course unfolds. Topics can be sequenced based on chronology, simple to complex, or fundamental topics to more complex ones (Fink, 2013). van Merriënboer and Kirschner (2018) proposed a model for teaching complex

skills and tasks in which a task unit's lesson structure consisted of (a) supportive information that explains how to approach problems and tasks in a skill domain, (b) procedural information that specifies how to perform routine aspects of a task, and (c) whole-task and part-task practice exercises.

### *Get Feedback and Refine*

One key principle to learner-centered design using design thinking is to avoid coming to closure too quickly with initial ideas. A first draft course structural framework is only a starting point in need of refinement and will benefit from input from others. Being open to exploring alternative ways to structure and title course content units in ways that are meaningful and make sense for learners is key to a course design that is learner-focused from the top down. To aid in adopting a learner perspective, good instructors and course designers often sketch out on a whiteboard or flip chart the major unit, topic, and module content structure as if they were menu items within a course interface. The idea is to step back and consider how a learner might think and feel coming into the course and viewing the flow of unit thematic titles and underlying module subtopics. Learner-centered design is participatory, and getting feedback and ideas from not only colleagues but also several learners can only make it better. Because these are very rough skeletal sketches, it is easy to cross out items, rename them, and draw arrows to move items around. This entire process can be done rapidly, probably in less than an hour.

### *Explore Different Organizational Strategies*

The course thematic units will reflect the most important topics and tasks experts in a domain feel are most important or fundamental for achieving a course's primary learning goals. Instructors or course designers should always consider alternative ways to structure course units, subunits, lessons, and modules using the design thinking strategy of brainstorming to explore and refine initial ideas. For example, alternative course structural frameworks might be built around a step-by-step process so that by the end of a course learners will know how to do something or create a product. Unit and lesson structures could incorporate sets of principles that experts in a discipline follow. Other approaches might involve having lesson content modules revolve around a series of case studies or scenarios where learners practice making decisions as an expert might do in real-world settings. As instructors or course designers continue iterating and refining the top-level course structure, framework ideas will emerge about how lessons and modules could be designed or structured. These ideas should all be captured and refined at the appropriate time.



### *Avoid Fragmentation*

In designing course content structures attention should be given to avoiding fragmentation, whereby units and lessons seem disconnected and learners lose a sense of cohesiveness and interrelationships of the parts to the whole. Integration occurs when top-level thematic units not only have flow and cohesiveness but also include connections to the whole skill or knowledge domain when learners are engaged in lesson unit content. To prevent this sense of fragmentation, it is often a good idea to have the first unit of the course provide an overview of the whole course subject or skill performance to show how the parts (units, lessons) interrelate and integrate. Also, the course structure should include units or lessons devoted to whole-topic and whole-task integration.

Developing a learner-centered course structure from the ground up lays a foundation for starting the design of the online course learner interface.

### *Design a Simple, Usable, and Appealing Learner Interface*

The learner interface is a learner-facing layer that makes visible the course structural framework and information architecture. It involves the design of screen layouts, the way information is presented, and the look and feel of the entire course site. For many instructors, much of the learner interface design is provided by the LMS, for better or worse. Instructors and course designers will need to work with the tools and templates provided with their particular LMS, which may consist of fairly limited interface design options. With this in mind, we provide several strategies from the field of UXD that incorporate design thinking practices into the interface design process. Readers, particularly those constrained by an LMS, are recommended to adapt and incorporate elements of these strategies into their interface design process wherever possible.

### *Build on the Information Architecture*

Before beginning work on the learner interface, the course information architecture with its underlying structural framework must be fleshed out at the course unit and lesson topic levels. This could be in the form of a skeletal outline or even a rough sketch of how the course units and lessons might be visually structured. It is also a good idea to have at least one lesson-level content structure mapped out that represents how most lessons in the course will be structured and organized. A sample lesson should also include example content elements such as lesson introductory material, prototype media material, worksheets, and other major lesson elements that occur in other lessons. The online course environment will also contain other components, not directly related to course instructional content, that will also need to be accessed by students frequently in the interface. These are usually linked to from the course homepage and often provided by the LMS. These might

include links to the course syllabus; a list of members of the course community; a course announcement panel; and links to resources, grades, and other common online course services. A list of all these components is needed to start the interface design process. In cases where a course website already exists to be redesigned, all of these components can be identified on the existing site. Also, in the case of redesigning an existing course interface, it is useful to view the current design as a prototype.

### *Start With Sketches*

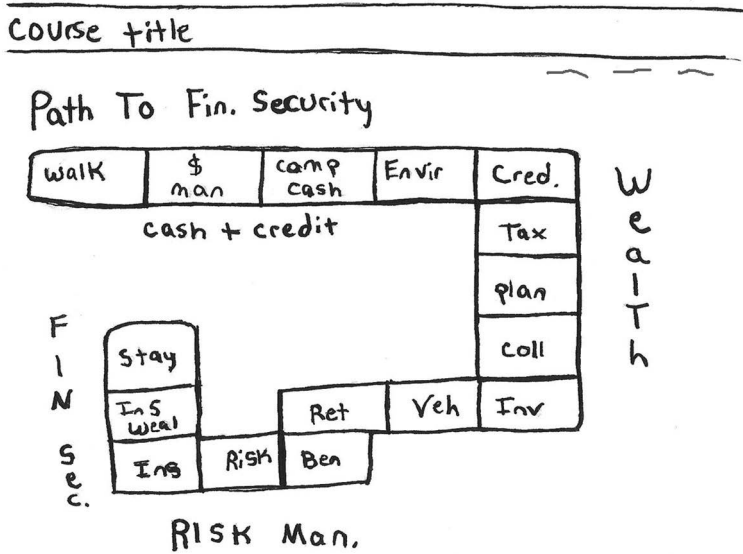
Learner interface design begins by sketching out ideas on paper or a whiteboard of what the ideal interface for a particular course will look like and how it might function. These sketches have often been referred to as storyboards or mockups. Most course designers now refer to them as *wireframes* (Garrett, 2011). Wireframes are used to envision preliminary screen designs in order to (a) visualize the layout of screens for the course homepage, unit and lesson menus, lesson activity pages, and other content-related pages; (b) envision and refine the design of screens that include combinations of text, graphics, audio, and video content; and (c) show how navigation between various sections of the course environment will work.

Wireframes are rough sketches used to work through design ideas and are not concerned with colors, fonts, specific images, or look and feel. The goal is to iterate and explore ideas of how the course content structure and other components will be presented from the outside in, or how the learner will see and interact with them. Even if there is an existing online course to be redesigned, wireframes can be used to represent the desired types of changes to be made. Figure 3.4 shows an example of an early wireframe sketch for the interface design of the consumer finance course depicting the top-level course structure lesson level. These are created very quickly and discarded for new ones when design changes are proposed.

Using wireframes helps to keep the learner perspective in the forefront of the designer's mind at all levels of the course. By having sketches of ideal learner-centered interfaces for different parts of the course, LMS templates often can be tweaked or workarounds can be developed to at least get closer to the ideal design depicted in a wireframe.

### *Get Early Feedback and Revise*

The main purpose for creating wireframes is to get early feedback from others regarding the vision for an online course environment. This is similar to what an architect does when they show clients a blueprint of what a building structure will look like and how it will function before it is built. These prototype designs will need to meet the needs of both students and instructors, so it is important that they be shown to students who will be taking

**Figure 3.4.** Course and lesson levels wireframe.

or have previously taken the course to get their feedback and ideas. The wireframes can also be used for feasibility checking purposes with LMS support specialists and learning designers to see if and what design ideas can be implemented given the existing technology toolkit.

#### *Consider Navigation and Wayfinding*

An online course interface involves user navigation starting at the course homepage and continuing into units that have nested lesson pages with links to other content, resources, and learning material. Course navigation is associated with information architecture and involves wayfinding. Wayfinding relates to how learners can navigate and move through the interface intuitively to find needed information and accomplish tasks. It starts at the top course homepage level and extends downward into lessons and throughout the entire course space. As wireframes become increasingly refined through successive iterations, they should gradually add wayfinding elements into their design. These include icons, arrow buttons, titling, labels on objects to help convey location, and other navigational controls in the interface designs.

#### *Design Content Elements for Understandability*

This strategy relates to information design, which spans a broad spectrum of message design features at all levels of the online course environment. When creating content to facilitate learner understanding, instructors or course designers need to become more sensitive to some of the following aspects

of information design and use them effectively to help learners focus their attention on important information and understand the content better:

- Color used to highlight and focus learner attention on important content elements
- Format and presentation of textual material on content pages using chunking and text blocking strategies
- Arrangement and grouping of screen elements such as using bullets and white space to visually separate different information elements
- Topography such as bolding of important words and providing descriptive labels for text blocks
- Strategic placement and integration of words and graphics on the screen so learners process information in an integrated way
- Orderly and familiar arrangements of content material within different sections of the interface, used consistently throughout the site

Instructors creating their own content will likely benefit from Horn's (1998a, 1998b) principles of structured writing mentioned earlier. Chunking and blocking strategies for instructional text material can be used consistently on lesson content pages to improve readability and comprehension. Information blocks may be used for presenting concepts, principles, processes, and procedures and can incorporate diagrams, tables, flow charts, and a variety of graphical elements to aid in the presentation of ideas.

### *Create Functional Prototypes to User Test*

At some point in the interface design process the time comes to transition from paper wireframes and mockups to semiusable prototypes on the computer screen. These prototypes should have the major structural components of the various course pages in place. These prototypes should not be graphically polished and many of the course content elements may still be in development. The course homepage including top-level unit menus and lesson-level menus should be completed, along with at least one lesson in rough draft form depicting its structure and key informational elements and possibly including placeholder text and graphics. The purpose of a functional prototype is to show others, particularly students, and have them use it to perform simple, common tasks typical of a real course. One useful strategy is to ask users to "think aloud" as they look at and explore the course site, encouraging them to freely comment on what they see and how they feel, assessing the intuitiveness of the navigation and whether the interface provides all the information they need. Prototyping is an iterative process and adjustments and modifications can be made in the interface quickly between different user testers until a satisfactory learner experience is achieved.

*Enhance the Graphical Look and Feel*

One of the final phases in the interface design process involves what many interface design professionals call the “surface layer” of the user experience (Garrett, 2011). This is where aesthetics related to the visual treatment of text, graphics, and the fine-tuning of navigation elements come into play. Most LMSs offer limited capabilities in customizing the look and feel of online course interfaces. Course designers may be required to use standardized templates for their institution. However, there are still opportunities for enhancing the graphical layer of the interface. It is a good idea to have a person with some graphic design skill review the entire interface to give advice and, if possible, “polish up” some of the interface’s graphical elements related to color usage, look and feel of navigational controls, and any multimedia material used to present content material.

**The Holistic Mental Model of the Course Structure and Learner Interface**

Following many of the design principles and strategies covered in this chapter will help set the stage for a more learner-centered design of the online course environment. The learner experience in an online course is often viewed as a journey that is significantly influenced by the design of this aspect of the online environment. To summarize what we have covered in this chapter, an ideal learner journey into the course structure and interface could be described as follows:

Learners enter the online learning space and immediately notice the major structural elements of the environment starting with how the course content units are meaningfully structured and titled. It makes sense and flows logically. Learners begin exerting cognitive efforts and easily form a coherent mental model of how the learning environment is organized and how it works. They know where they are in the virtual space and can easily find their way around. Learners notice how information is clearly arranged on screens by scanning titles, headings, and pictures and noticing meaningful patterns. They can easily understand the content. Learners feel emotionally comfortable about the look and feel (aesthetics) and organization of the space, forming positive impressions about the space as one they feel good about revisiting frequently. Learners move about on the site at the behavioral level using navigational elements by clicking links and exploring functions that seem intuitively clear. They can quickly and easily get from one point in the environment to another. Learners seek out opportunities for social interactions in the virtual environment, especially the presence of instructors and peers. Overall, the course structure and learner interface design has met the needs of learners on all four dimensions of learning. The stage has been set for engaging and deep learning experiences to take shape.

