
FACILITATING LEARNING THROUGH INSTRUCTIONAL CONTENT DESIGN

Every significant learning experience in an online course relates in some way to a learner's interaction with discipline-specific content. This chapter focuses on the design of learner–content interactions and applies concepts and principles from the integrated framework for designing the online learning experience. We approach this design aspect by first defining what we mean by instructional content interactions and common starting points for designing online course content. We also bring to light some common challenges and design factors influencing instructional content design in a digital learning environment. And finally, we present some fundamental shifts in designing online content material followed by practical strategies that can enhance learner–content interactions and foster higher levels of engagement and deeper learning outcomes.

Guiding Design Questions

- How can we start designing online content for different course design situations?
- How can we shift our thinking and practice to create pedagogically engaging content using new digital tools?
- How can we incorporate learning experience design strategies to create impactful learner–content interactions?

Beginning the Content Design Process

Online courses are content-rich environments, but instructional content is just one type of information within the online environment. In this

section, we describe the type of content we focus on in this chapter and how instructors and course designers can acquire and develop it for their online courses.

Discipline-Specific Content Interactions

Online instructors provide course content that serves multiple pedagogical purposes that include communicating information about the course, providing guidance and instructions to students, facilitating discussion, teaching new knowledge and skills, and assessing student performance. Our focus, however, centers on discipline-specific instructional content that supports learning objectives. It concerns the design and presentation of the subject matter students in a course are expected to read, watch, listen to, and interact with.

Content for online courses can come from various sources and typically includes a mix of instructor-created, externally published, and curated materials. These materials can come in the form of published books and articles, instructor-produced documents, tutorials, case studies, interactive multimedia, videos, podcasts, live presentations (webinars), and other types of courseware materials. Most instructional content serves an explanatory function, helping learners acquire and enhance discipline-specific knowledge and skills. OERs and open web content produced by educators and subject matter experts constitute a growing source of course content. These open materials typically require repurposing and skillful integration into the curriculum.

The quality of online instructional material is largely determined by its design characteristics and how learners are required to interact with it. The level and type of learner interaction with instructional content ranges on a spectrum from passive rote learning, such as completing assigned readings and watching video lectures, to more active and effortful deep learning as when content material is paired with accomplishing challenging tasks and applying knowledge. In the online environment, learning experiences associated with learner–content interactions are heavily shaped by instructional design decisions around how to best use the affordances and capabilities of various online technologies and integrate these with instructional strategies for presenting content. For example, embedding knowledge check questions with corrective feedback into content presentations enables learners to better calibrate their learning and prevent inflated self-perceptions of what they know. Adding hypermedia links into and around digital documents enables learners to expand their understanding of concepts through related material and alternative modalities.

Starting Points for Online Content Design

The context within which instructors and course designers build online content varies widely depending on their situation. Different contexts involve different design challenges and strategies. Consider the following four course development scenarios and the content design requirements and challenges for each.

Enhance Content Design for an Existing Online Course

In this scenario, an instructor either inherits an online course or teaches an online course that requires content enhancements. Content redesign efforts to enhance the learner experience might include (a) expanding or condensing content, (b) reorganizing and reformatting content, (c) rewriting content for better understanding, (d) using new media to add interactivity, or (e) providing better integration between content units. This scenario usually requires a moderate amount of design and development effort depending on the qualitative improvements desired by instructors and course designers.

Convert and Repurpose Content From a Classroom-Based Course or Some Other Format to an Online Environment

In this scenario, redesign efforts often include rethinking the instructor's role and instructional strategies used to present and package content in an online environment. Content design activities might include repackaging and rewriting print materials and rethinking how to convert instructor classroom presentation materials and other classroom media assets into digital formats. Because the instructor in this scenario does not start from scratch, there is an opportunity to explore different types of learner–content interactions using new media formats and digital pedagogies. However, there are several content design challenges to be aware of in this situation.

Fostering learner engagement and creating flow, coherence, and contiguity of content in an online setting is often more difficult than anticipated. The most common tendency is to try to present content in a similar way to how it was done in a face-to-face course. From a learning experience design perspective, content extracted from a face-to-face course and transposed to the online context often lacks integration of the four dimensions of learning and its design may need to be rethought. Another challenge involves how to convey a sense of instructor presence either around or into the content material.

Curate and Integrate External Content Into a New or Existing Online Course

Content curation involves searching, vetting, and incorporating external learning resources created by other subject matter experts and integrating

them into one's own online course. Resources might include ebooks, podcasts, simulations, games, blogs, entire courses, parts of courses with open use licenses, and other free or commercially purchased learning materials. Content sources may include content repositories or web resources such as YouTube, TED Talks, and OERs. Entire online courses have been built by assembling OERs and open web content. In most situations, it is helpful to enlist the support of campus librarians to assist in content searching, evaluating content quality, and working out copyright agreements with owners of published material and certain OERs.

For external content, the biggest design challenge usually involves integrating it into the online course structure and connecting it with other content units as seamlessly as possible. Externally produced content is often formatted differently, and integration into an LMS interface may be difficult. In addition, external content may not cover all desired material needed for important learning objectives or might contain excessive or unneeded information. Overall, this scenario usually involves a relatively small amount of content design and development work for instructors and course designers depending on the volume and type of materials selected.

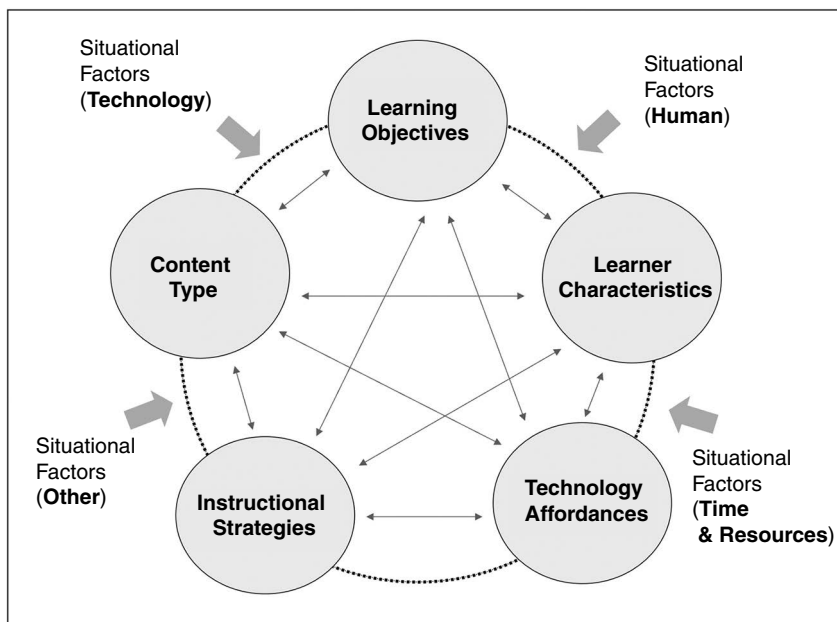
Creating Online Content From Scratch

Developing new online content from the ground up with no previous course to build from requires comprehensive content research, design, and development. However, this scenario can provide opportunities to design new types of learner–content interactions and learning experiences, taking advantage of new digital technologies and pedagogies. It can often result in the most innovative learning designs for learner–content interactions. It can also involve a significant amount of design and development effort and probably should not be undertaken without instructional design, production, and technical support.

For all the scenarios described, the design thinking process can guide the content design and development process. This might include practices such as collaborating with learners, colleagues, and course designers throughout the design process using ideation, rapid prototyping, and testing out new content design approaches.

Factors Influencing Online Content Design Decisions

Every time a learner interacts with course content there is an opportunity to shape the learner experience for better or worse. The design thinking process begins by focusing on the learner experience and considering how other elements of the online learning environment influence that experience. We have

Figure 4.1. Factors influencing online content design decisions.

identified several factors of which to be cognizant when making design decisions about learner–content interactions. If we were to get inside the heads of skilled learning design thinkers and observe how they approach making content design decisions, we would likely notice them focusing on five key factors (illustrated in Figure 4.1 and discussed in the following subsections).

Learning Objectives

Developing course learning objectives is the starting point for all content design work. Learning objectives serve as pointers to the behaviors and cognitive skills learners will need to demonstrate. Objectives also indicate the type and scope of content learners need to acquire and how they will interact with it on the cognitive, behavioral, and social dimensions of learning. Having clear objectives for each unit, lesson, assignment, and learning activity guides content design efforts.

Without clear objectives, course content can become unfocused, excessive, and lead to unproductive learning experiences. The design of impactful learning experiences encourages emphasizing higher-order learning outcomes that connect knowledge with doing, essential for deep learning. In the integrated framework for designing the online learning experience presented in this book, it is assumed this crucial front-end step has already been completed.

Learner Characteristics

Recognizing and accommodating individual differences in learners is an essential part of learner-centered design. Apart from courses that use advanced adaptive learning systems that tailor content based on learner performance, it would be impractical to custom design course content around the needs of individual learners. However, two learner traits that instructors and course designers may be able to reasonably account for in their online content designs are prior knowledge and motivation.

Clark et al. (2011) outlined numerous evidence-based strategies and techniques for designing instructional content for low and high prior knowledge learners. Key strategies center on the cognitive dimension and the existing schemas and mental models learners possess related to the material to be taught. Differential approaches to content design can impact learning outcomes for low and high prior knowledge learners. For example, highly structured and organized content presentations for a topic can benefit low prior knowledge learners but often degrade learning for individuals with more background knowledge and experience on that topic. This is referred to as the “expert reversal effect” (Sweller et al., 2003). In addition, motivational and emotional elements, incorporated within and around content material, can stimulate and sustain learner attention and mental effort. This factor relates mostly to the cognitive and emotional dimensions of learning in the integrated framework for designing the online learning experience.

Content Type

Course content consists of a variety of different types of information. There are six dominant information types that comprise most educational content which includes facts, concepts, procedures, principles, structures, and processes (Horn, 1989; Williams, 1977). These distinct information types require differential approaches and design strategies to communicate effectively. For example, content that involves structural information consisting of component parts of a system or spatial relations, as in a microscopic or physical structure, is best represented through visual illustrations. Similarly, content involving processes are best conveyed through diagrammatic representations and flow charts. Conceptual information requires definitions that highlight critical attributes with examples and nonexamples (Horn et al., 1969). Identifying the type of information to be conveyed within course units and topics (considered in tandem with learning objectives) enables instructors and course designers to match content type with the most efficient and optimal way to represent it for learners. The type of information also influences media selection. This factor is concerned mostly with the

cognitive dimension of learning within the integrated framework for designing the online learning experience.

Instructional Strategies

Instructional strategies involve pedagogical approaches used to present content and facilitate a learning process. The quality of learner–content interactions in the online environment is heavily influenced by an instructor’s choice of instructional strategies. In fact, the purported benefits of using certain digitally enabled multimedia to deliver instructional content often has more to do with the instructional strategies used than with the technology (Clark & Feldon, 2014). The following instructional strategies serve as broad influences in the design and presentation of online content:

- *Inductive strategies* include problem-based, inquiry-oriented, guided discovery, and project-based learning. Instructors and course designers can create content interactions that prompt learner curiosity, spark discovery, and encourage deeper thinking. In using this strategy, content supports learners as they address challenging questions, analyze case studies, or engage in social discourse around a topic. This strategy can integrate the four dimensions of learning around learner–content interaction.
- *Didactic strategies* involve direct instruction and packaging of online content presented in the form of structured explanatory presentations such as live webinars, videos, or recorded PowerPoint lectures and readings. This strategy emphasizes the cognitive dimension of learning and is most effective when learners have an intrinsic or immediate need for the information presented.
- *Active learning strategies* involve learners in “doing-type” activities (Horton, 2012) in which content interactions are paired with completing certain learning activities. These strategies call for different approaches to designing learner–content interactions and attempt to alleviate the passive and rote learning tendencies of most conventional learner–content interactions. This strategy can integrate the four dimensions of learning around learner–content interactions. It is used more extensively in designing learning activities, covered in the next chapter.

In the online environment, hybrid forms of content interactions that combine new digital media formats with a blending of instructional strategies enable the creation of more impactful learning experiences that many instructors and course designers have yet to recognize.

Technology Affordances

Designing learner–content interactions can take advantage of the capabilities of new digital media and technologies in presenting and packaging online course content. Newer software tools enable instructors and course designers to author their own courseware materials, creating modules and lessons that use a range of digital media formats. Video, hypertext and hypermedia, podcasts, graphics, data visualization, interactive multimedia (games and simulations), and virtual reality can be used alone or in combination in crafting engaging learner–content interactions.

There are many new technology-enabled options for creating online content interactions that can revitalize outdated strategies such as the infamous recorded PowerPoint lecture. One key strategy, discussed later, involves understanding the kinds of learner–content interactions inherent in the capabilities of new technology tools and using these in a hybrid way to enhance the learning experience. One caution though about new instructional technologies: it is easy to become enamored with features of technology tools and slip into a technology-centered mindset, losing sight of a learner-centered focus.

Situational Factors

Considering all the factors influencing online content, there are other situational factors that come into play in making content design decisions. These situational factors include, but are not limited to, three main categories: technology, human, and time and resource.

Technology

This factor refers to the technical aspects of an institution's learning ecosystem, which includes an LMS and available content design tools. Both provide capabilities and constraints on how content material can be presented, packaged, and accessed by learners. For example, an LMS can provide efficient ways to create, display, and access content, but can impose rigid constraints on how instructors and course designers can create content and how learners can interact with it. The same goes for rapid content development tools, whether commercial or home grown, that need to integrate with the LMS.

Human

This factor refers to people and the processes they adopt in online course development and design. When crafting learner–content interactions using new digital tools, the contributions of technical and design support staff can be invaluable in designing learning experiences. However, we need to underscore that applying learning experience design principles requires a

significant shift in thinking and practice. Some support staff may be locked into established content design processes and practices that are not learner-centered or learning experience design-focused. It is common to encounter resistance from colleagues and campus leaders who support learner-centered and learning experience design in theory but not so much in practice.

Time and Resources

At first, efforts in designing and developing more learner-centered content material may require additional time and resources. There is an ROI factor that needs to be seriously considered. The payoffs of adopting learning experience design practices will be greater learning gains, increased learner engagement, and improved learner satisfaction with their coursework. These are often difficult to measure. Design efforts should focus first on specific learning goals and types of course content that could result in the greatest learning gains and quality enhancements of the learning experience. The general rule is to invest in the design of content interactions around complex content material that students most often struggle with involving higher-order learning objectives.

There is no one best way to design learner–content interactions for the online environment. Considering the different starting points for course content design and the five factors, each course design situation is unique and the need for design thinking is fundamental for developing the best possible solutions. Those desiring to put into practice the integrated framework for designing the online learning experience need to make several shifts in the way they think about and approach the design of learner–content interactions. This we cover in the next section before delving into specific design strategies.

Five Shifts for Designing Impactful Learner–Content Interactions

Well-designed online course content incorporates learning experience design principles that lay the groundwork for increased learner engagement and deeper learning. We now identify and briefly describe five key shifts that instructors and course designers need to make in their thinking and practice to craft more pedagogically effective learner-centered content for online courses. In the next section, we present several design strategies that build on these shifts.

A Shift From Fragmentation to Integration of Learner–Content Interactions

Fragmentation of the learning process can occur at all levels of online course design. The fragmentation of the learning experience can be first noticed

at the course structure and interface aspect, then extending to the design of instructional content. Course units and lessons often consist of lists of assignments, readings, resources, and other content materials arranged around topic categories. The interconnections and coherence between disparate content elements within lessons will make perfect sense to instructors and experts in the discipline; but to novice learners, who have yet to acquire mental models related to the domain, these relationships may not be so obvious. Constructing knowledge from multiple content sources requires cognitive integration or cross-learning between different course materials and related topics (Rouet & Britt, 2014). Many learners, however, are unable to automatically make these connections and are often unaware of their own weak conceptual associations. Medina (2014) referred to this as the “binding challenge,” where discrete content elements appear fragmented to novice learners and not bound together into cohesive neural networks or cognitive structures. Addressing this type of content-cognitive fragmentation requires extra effort on the part of instructors and course designers to make the connections explicit for learners.

One shift needed to design more integrated learner–content interactions is to provide greater explicitness as to how disparate content materials interrelate. This also includes providing greater transparency about an instructor’s intention behind having learners engage with specific content (Felten & Finley, 2019). With complex content, many learners benefit from external supports to facilitate integration of knowledge acquired from separate content sources into more holistic mental models (Rout & Britt, 2014). Design strategies that support content integration can come in the form of embedding brief consolidation material and activities in and around content elements to promote integration (Britt & Sommer, 2004). The need for these types of integrators becomes more acute as online instructors and course designers incorporate OERs, which come from multiple sources into their courses. One strategy that addresses this content fragmentation issue is the use of pedagogical wrappers as content integrators. They are presented to learners prior to a content interaction or learning activity. They not only provide learners with information about how topics and content material interrelate but also make an instructor’s pedagogical intent for a specific content interaction more explicit and meaningful to learners.

A Shift From Broad-Brush to Finely Targeted Content

In online courses, where it becomes easy for instructors and course designers to provide links to a vast digital repository of information, learners often become overwhelmed with content. In addition, instructors and course

designers often invest considerable time and effort developing supplemental custom content. Examples might include PowerPoint lecture recordings, videos, podcasts, tutorials, and live virtual presentations. The bulk of this content consists mainly of explanatory information. In an information-rich digital learning ecosystem, online instructors and course designers need to become more strategic in selecting and developing course content.

This strategy shift involves focusing explanatory content acquisition and development on specific types of information that provide the greatest ROI in terms of learning gains and meeting student learning needs. It is important to acknowledge that learner interactions with the most explanatory instructional material, regardless of media format, generally produce minimal learner engagement and minimal learning gains (Wittwer & Renkl, 2008). However, Wittwer and Renkl (2008) discovered an exception to this phenomenon. Explanatory presentations can have a greater instructional impact if they specifically focus on teaching concepts and principles that support higher-order thinking and are tightly coupled with challenging learning tasks. In contrast, learning gains are lowest when explanatory material focuses on facts and information that are not task-related. Explanations of concepts and principles, two of the information types mentioned previously, are especially valuable for learners during the initial stages of acquiring new knowledge and skills.

This shift represents a quality over quantity strategy in providing instructional content. Offering a smaller number of finely tuned content materials, focused on teaching essential concepts and principles and how to apply them to various course-related activities and tasks, should underlie the process of curating and producing custom instructional content. Instructor-created PowerPoint lectures, information-based tutorials, and reading material containing extraneous “nice to know” information should be rethought and replaced with more modular content units that explain complex concepts and principles. Becoming more targeted at specific types of information in providing custom instructional content can mitigate some of the information overloading which has become characteristic of many online courses.

A Shift From Decontextualized to Contextualized Content

Instructors and course designers frequently emphasize covering as much subject material as possible and look for the most efficient ways to do this. Consequently, instructional methods often lean toward presenting subject matter as decontextualized abstract knowledge, skills, concepts, and definitions removed from situations and contexts in which the knowledge is applied (Grabinger & Dunlap, 1995). This is not a matter of knowledge being taken

out of context as much as it is that most course content presented to learners has no context. The downside is that if the knowledge learners acquire is not explicitly connected to relevant problem-solving, tasks, and application activities, it remains inert and disembodied.

This shift in designing learner–content interactions involves making greater efforts to link course content material with relevant real-world situations. The instructional strategy supporting this shift is referred to as *contextualization* (Giamellaro, 2017). Infusing context into the presentation of content can be achieved when instructors and course designers deliberately incorporate stories, case studies, scenarios, simulation games, challenging tasks, and problem-based learning activities into their courses. It can also be accomplished through content material that includes multiple examples of how key concepts and principles are applied in real-world situations. Instructional content designed around walkthroughs of how an expert thinks about and approaches a variety of discipline-related problems is another contextualization strategy. Explanations of technical concepts can be more meaningful when instructional content is presented in ways that refer to simulated or real-world events. In courses that are more skill- and competency-based, content is almost always linked to supporting tasks and job performance. Such strategies foster greater cognitive, behavioral, and emotional engagement and can also interconnect with the social dimension of learning through group sharing of learning experiences.

A Shift From Single Media to Hybridized Media Content

Learner–content interactions in the online environment are technology-mediated and use a variety of digital media formats and instructional methods to convey course information. New digital tools for producing media content enable the creation of richer, more interactive kinds of content material than ever before. Given the plethora of available digital tools, online course content often falls short of taking advantage of the capabilities and affordances of tools that go overlooked by most online instructors and course designers.

One of the barriers to innovation in online content design is the result of functional fixedness caused by outmoded notions of instructional media. In this digital age, the distinctions between different media types have become blurred and conflated. Old media classification schemes rooted in an audio-visual-text paradigm no longer serve well in an internet-based digital learning ecosystem. For example, the internet, as the new dominant medium, can use and integrate all other media types as its content. In turn these new digital media types can use multiple other media types as their content. For

example, internet video is now interactive and 3D, an amalgam of narrated PowerPoint slides, animations, television broadcasts, webinars, vodcasts, educational films, and recorded and live classroom lectures. Likewise, digital documents, web pages, blogs, and wikis can include embedded multimedia elements into their pages, including videos, animated charts and graphics, voice recordings, and quiz questions. Case studies and scenarios, typically associated with text-based documents, when converted to digital formats, can include embedded videos, graphics, question-answer objects, hyperlinks to related information, and branching. These new hybrid instructional content genres can provide learning experiences that seamlessly integrate all four dimensions of learning, providing learners with more engaging and impactful content interactions. Tools to create these digital content materials require minimal technical expertise and are available to most online instructors and course designers, either free or reasonably priced, with content seldom used to its full potential. For those interested in creating richer and more impactful learning experiences, this emerging media hybridization marks a time for new aspirations and standards for digital content design.

A Shift From Cognitive Dominance to Emotional and Behavioral Interplay

Despite best efforts to present content material in an organized and clear way, learners who are not motivated tend to perform poorly on knowledge acquisition tests (Bolkan et al., 2016). Cognitive engagement, necessary for deep learning, is interwoven with and fueled by emotional factors related to motivation (Feldon et al., 2019). Although this fact has been known by educators for decades, it is rare to see it applied seriously to learning design in higher education, especially in online courses. Keller and Burkman (1993) insisted that instructors and course designers need to consider the emotional appeal of every part of an instructional message, beginning when a learner first encounters the content and extending throughout the entire interaction. Educational game designers apply this principle such that the learner-player experience goes hand-in-hand with all content interactions.

This shift toward achieving greater cognitive and emotional connections in content design brings into play connections with the behavioral dimension of learning. The behavioral dimension is rooted in both cognitive processes and emotional undercurrents. In their research on the “Knowing–Doing Gap” in business organizations, Pfeffer and Sutton (2000) faulted higher education courses that consist mainly of content assimilation followed by graded discussion forums. They argued that these instructional approaches, also common in online courses, emphasize “sounding smart” over doing and

action. As reported in chapter 1 of this book, the gap between what course graduates know and what they can do with their acquired course knowledge extends into the professional work world with negative repercussions.

The most impactful learning experiences occur when instructional content is designed in ways that arouse and sustain interest, promote invested mental effort, and connect knowing with doing. Adding to this, opportunities for learners to engage in social discourse during and after their content interactions provides for a balanced interplay of the four dimensions of learning, resulting in more holistic and fulfilling learning experiences. Next, we look at several strategies and examples in which these shifts in approaching the design of learner–content interactions can be implemented.

Strategies for Designing Learner–Content Interactions

In this section, we present several strategies and examples for crafting instructional content that builds on the design shifts from the previous section. We will look at strategies for content integration; media and method hybridization; contextualization; and combining the cognitive, emotional, and behavioral dimensions into content design. These strategies are not to be approached as prescriptions but rather starting points requiring design thinking to adapt and apply to a variety of learning design situations.

Use Pedagogical Wrappers to Integrate Content

Many online courses display lists of assigned content materials (readings, videos, tutorials, and online resources) that from a learner's perspective can appear as an arbitrary list of tasks to check off. In the previous section, we showed how learners often struggle to see critical interrelationships and connections between disparate content material and topics that to them may seem loosely connected. Instructors and course designers, however, can provide metacognitive support through incorporating pedagogical wrappers into and around assigned content interactions. These serve a priming and integration function to help learners engage more deeply with course material and better integrate the knowledge they acquire. Pedagogical wrappers also help students understand, from an instructor perspective, the pedagogical rationale, relevance, and learning goals for content-related assignments and activities (Felten & Finley, 2019).

Pedagogical wrappers in online courses can come in different forms. They often take the shape of concise text-based descriptors presented before a learner engages in an assigned content interaction or learning activity. They

Figure 4.2. Ways for designing meaningful learner-centered pedagogical wrappers.

The What-Why-How Wrapper Formula

The content of a pedagogical wrapper concisely answers three questions. (A two- to three-sentence descriptor for each question is often sufficient.)

1. **What** is the subject or topic of the assigned content material?
2. **Why** has it been assigned, and what is its relevance and connection with other course materials and learning objectives?
3. **How** should content be approached, and what's most important to focus on? (If learners need to focus mainly on a few sections or portions of a reading or video, let them know it.)

For complex content material or learning activities, pedagogical wrappers can be more elaborate, containing statements of learning objectives. Also consider including a list of questions students should be able to answer following the assignment to encourage purposeful reading, viewing, or listening.

Message Style and Tone

Conciseness is important. Time invested in writing pedagogical wrappers should be proportional to the complexity and importance of the learning material or activity. If an item is too long and formalized, learners will likely not read it. Make it interesting by using a personal and conversational writing tone and style that conveys instructor presence.

can be spatially positioned on the course website proximal to links that open assigned course material, and in some cases placed within the content itself. For more complex content material and a more personalized approach, a brief instructor video or audio recording can introduce the content. Pedagogical wrappers have several core attributes, which are outlined in Figure 4.2.

Creating concise pedagogical wrappers requires minimal time and resources. They not only help learners better connect and integrate related instructional content but also encourage instructors and course designers to be more explicit and learner-centered in how they design learner-content interactions. We encourage online instructors and course designers to experiment with creating pedagogical wrappers using various media formats and personal approaches.

Integrate Rich Content Interactions Through Hybrid Multimedia and Instructional Methods

Earlier we underscored the pedagogical limitations and shortcomings of explanatory instructional content. However, most studies revealing poor learning outcomes from explanatory instructional material have focused mainly on conventional single media approaches and didactic instructional methods. The design shift discussed previously involves media hybridization where new digital pedagogies enable the creation of instructional content that interweaves multiple media formats and instructional methods. The key to the hybridization strategy involves capitalizing on the strengths of different media for conveying specific content types and content interactions in combination with instructional methods that support learning objectives.

Figure 4.3 shows the screen from a hybridized online content module in which several design attributes can be noted. Throughout the content module instructor presence is conveyed through personalized text with photos, video, and audio recordings. The modality of instructor communication can change throughout a module depending on the type of content to be communicated and the learning task.

Media elements used on any page (text, graphics, videos, and audio) are selected and crafted based on the type of information and cognitive

Figure 4.3. Science microlearning module.

Epidemiological Study

Data Inquiry

“Okay, now we need to analyze some data and address several critical questions. I have some data sources on the right that we’ll use. Click on them to enlarge. We’ll go through the inquiry process together. Please do your best in answering the questions and I’ll give you feedback.”

Begin Inquiry

Data Sources (click to zoom in)

Summary Report of Cases in Bangladesh, 2001-2010				
Year	Place	Number of cases	Male N (%)	Fed N (%)
2001	Moharipur	13	6 (46)	9 (69)
2002	Naogang	12	7 (58)	6 (50)
2004	Gaolanda, Rajbari	31 (12+19)	23 (74)	23 (74)
+cases from different areas				
2004	Fardipur	36	21 (58)	27 (75)
2005	Tangail	12	7 (58)	11 (92)
2007	Thakurgaon	7	5 (71)	3 (43)
2007	Kushtia	8	3 (38)	5 (63)
2008	Manikgonj	4	3 (75)	4 (100)
2008	Rajbari	6	5 (83)	5 (83)
2010	Fardipur	11	5 (54)	9 (84)
	Isolated cases*	6	3 (50)	3 (50)
Total		146	88 (60)	106 (73)

Outbreak Map

Luby, et al., 2009

Disease frequency throughout year

engagement necessary to maximize learning of specific content (Clark et al., 2011). Video material is not used continuously on every page but is reserved for content involving dynamic processes. Instructional text is used frequently on slides where the content interaction calls for slower and deeper processing. When instructor text is used in place of video or audio, the tone and style is informal and conversational. Although these content modules are often linear, frequent changes in how content is presented along with different types of learner–content interactions sustain learner attention and reduce boredom and habituation (Keller & Burkman, 1993; Simon, 2016). This approach contrasts with other common online presentations that consist of a steady stream of similarly formatted slides coupled with continuous audio or video commentary. Interactions with different information types are interwoven into content that includes charts, graphs, diagrams, animations, videos, and periodic knowledge check questions with feedback. Reflection prompts, links to more detailed content, and embedded elements from the web can also be interwoven, creating a rich learner–content interactive experience.

The digital hybrid design strategy overcomes many of the pedagogical deficiencies mentioned earlier with explanatory presentations. These modules can be packaged in the form of hypermedia documents or slide-based formats. The key to creating pedagogically robust online explanatory presentations requires a holistic design mindset that integrates lesson content types and objectives, instructional strategies, and technology affordances.

Increase Cognitive Engagement and Motivation Through Emotional Design

Research-based principles for designing online learning content focus mainly on message design strategies for managing learner cognitive load (Clark et al., 2011; Mayer, 2014). This bias toward the cognitive dimension of learning overlooks the essential emotional dimension in learning design. Efforts to improve the clarity and organization of instructional content to support better cognitive processing are only half the story (Calvo & D'Mello, 2011). Arousing and sustaining learner attention and provoking effortful mental processing are rooted in the emotional dimension of learning and expressed through motivation. Traditionally, motivation has been viewed primarily as the learner's responsibility. However, in learning experience design, it is also the instructor's responsibility to activate the emotional dimension to improve cognitive engagement.

One of the most comprehensive research-supported strategies for building motivational elements into the learning design process is the attention, relevance, confidence, and satisfaction (ARCS) model developed by Keller

(1999). Applying ARCS as a strategy for incorporating emotional and motivational elements into the design and presentation of online content can include some of the following strategies.

Attention

Before learners engage with content material, stimulate interest and curiosity and challenge or introduce incongruity, mystery, or conflict around the content. Some of this can be done in the pedagogical wrappers around the content material.

Relevance

Before presenting the instructional content, emphasize how the material has meaning and is related to learning goals and student interests. Motivation increases when course assignments are worded and framed around student personal goals (Vansteenkiste et al., 2006).

Confidence

As learners interact with challenging and complex content, instructors and course designers need to be sensitive to certain learner characteristics such as self-efficacy. Learners who have self-doubts about their abilities to understand certain content material need encouragement to persist throughout a learning task. Simply informing students upfront, before interacting with difficult content, to expect some struggles often helps mitigate the debilitating effects of low self-efficacy (Felten & Finley, 2019).

Satisfaction

In addition to extrinsic reinforcement for completing content-related assignments, providing students with opportunities to apply what they have learned promotes feelings of satisfaction. This underscores the interconnection among the cognitive, emotional, and behavioral dimensions of learning emphasized throughout this book.

Expanding on Keller's (1999) strategies for capturing and sustaining learner attention, recent research in cognitive studies and neuroscience has shown that inducing states of curiosity in learners can have positive influences for learning. When content material is presented in ways that include elements of surprise, novelty, gaps in knowledge, and moderate levels of complexity, learning and memory retention are improved (Oudeyer et al., 2016). Curiosity activates systems in the brain related to learning and induces motivation to acquire knowledge about a topic (Kidd & Hayden, 2015). Building curiosity and mystery around course content can be introduced in pedagogical

wrappers and sustained by instructors through periodic nudges in discussion forums to stimulate learner–content engagement at a deeper level.

One emotional and motivational letdown for many learners as they encounter instructional content is how learning objectives are presented at the outset of a learning interaction. Most objective statements are written using terms learners have yet to fully understand until they complete the assignment. Objectives are written primarily for the instructor and course designers as tools to aid in course design. Not that learning objectives should be discarded; the problem is that most objectives pertaining to instructional content are not written in a learner-centered way. The objectives used by course designers can be translated and written in ways that provoke interest, curiosity, and a perception of relevance to learners about what the content material will do for them. Why not introduce a content-related assignment with some challenging questions, a puzzling compelling problem, or describe a mystery that the content will help clarify?

Building emotional and motivational elements into and around instructional content interactions often requires some creativity and design thinking. Making a deliberate effort to go beyond a cold cognitive approach and motivating learners throughout their content interactions is a fundamental strategy for designing engaging and impactful learning experiences.

Add Context to Content Through Stories and Scenarios

There are numerous strategies for designing engaging and impactful online learning experiences around instructional content. For example, Allen (2011) emphasized the four core elements of context, challenge, action, and feedback. A core principle underlying this strategy is the contextualization of instructional content that draws on real-world situations. An integral part of a contextualization strategy is the use of story to provide a compelling narrative within or around instructional content. Horton (2012), however, observed that despite their widespread use in classroom courses and the enrichment they contribute to learning experiences, online instructors and course designers seldom use stories.

Stories in and of themselves are often insufficient for conveying a complex subject matter and facilitating higher-level learning objectives. To be pedagogically effective, they need to be skillfully and tightly interwoven into the design of instructional content and learning activities. Given their potential to activate both the cognitive and emotional dimensions of learning and serve as a catalyst for social discourse, online instructors and course designers should make greater efforts to incorporate stories into instructional content interactions. We offer three strategies as starting points.

Integrate Stories Into and Around Instructional Content

Horton's (2012) eLearning design model identified several situations where stories can be most effectively used in content presentations. He recommended that stories be used to demonstrate applicability of the content, provide concrete instances and examples of the subject matter, and humanize content by showing its relationship and impact on people. Stories can be used in conjunction with online reading assignments. They can emotionally enrich material that has a pedantic and "cold cognitive" quality, adding relevance and interest to content.

Stories used in online courses can be developed by instructors based on their own professional experiences or obtained from recorded interviews with experts. The stories can be embedded within content material or linked from course topic and content units. However, a story disembedded from a related content unit in the form of a stand-alone digital recording or text requires integration and connection with related content material and tasks. To have a significant pedagogical impact on learning and performance, stories, like stand-alone pictures, need to be explicitly connected to course content and learning objectives. The most common narrative forms used in education include stories told by experts, case studies, scenarios, narrative-based simulation games, and vignettes.

Interweave a Story Throughout the Lesson's Content

Some instructors have used a story-centered approach in their course designs, in which a central narrative runs through an entire lesson's content (Paulus et al., 2006). The example in Figure 4.4 illustrates a unit of an online course centered around a fictitious case-based story anchored in an authentic real-world context. A short narrative is presented at the outset of the lesson, which unfolds as learners proceed through the unit. The narrative establishes a context involving characters and challenges that are further developed and integrated into lessons. Course content such as important concepts and principles are illustrated and given context through characters and the challenges presented in the story. At certain junctures in the lessons, the narrative becomes more complex and learners are presented with tough decisions which learners deliberate in discussion forums. The story narrative unfolds throughout the lesson and questions are posed by instructors on how the content (concepts and principles) can be applied in similar real-world situations. Integrated stories like this can provide a compelling and emotionally charged context for learner-content interactions involving both conceptual learning and knowledge application.

Figure 4.4. Real-world context introduced by short narrative.

Lanesha Johnson Case
Cross Cultural Health Care - Case Studies

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Case/Story


This case focuses on a family living in an urban community. As you read through this story, pay special attention to the various social, cultural, and emotional factors that influence the child's treatment.

The Case of Lanesha Johnson

Lanesha Johnson is a 12-year-old firestorm—teetering on that edge between childhood and adolescence. Her temper, much like her asthma, is persistent. When Lanesha blows into clinic, it's like she's dragging her Grandma Marietta along, even though it's the other way around. Marietta tries her best as Lanesha's legal guardian, but she's got a lot on her hands: she's also raising her 10-year-old grandson Marcus and caring for her aging mother, Lillian.

Lanesha is a seventh grader in a predominantly African American school where her desk often sits empty. She's been out of school with asthma 14 days this year, many of which coincide with Lanesha's serious seasonal allergy problems. She spends at least one night a week awake with a nighttime cough and has wheezing and coughing fits about 4 days out of the week. All this distraction probably doesn't help with Lanesha's grades, and she's failing half of her classes.

Lanesha shows up in clinic regularly with empty medicines (her daily controller and quick relief asthma meds) and complains about her Grandma Marietta's lack of responsibility in refilling them. Marietta doesn't have a financial problem buying medicine—all costs are paid by Medicaid—but she never can explain why she doesn't get refills. She just says that it's Lanesha's responsibility anyway.



Things to consider about this case

There are several issues to consider about this case. You will explore these issues more

Add Context Through Crafting Compelling Scenario Narratives

The primary mental model in story design is the situation model (Busselle & Bilandzic, 2008). Focusing on challenging situations related to a discipline is a good place for instructors to begin in creating stories for their online courses. Stories based on a situational model can be referred to as scenarios or case scenarios. Crafting story narratives that go beyond simply arousing interest and motivation is typically not a skill set for many instructors and course designers.

One practical strategy for developing narrative content for scenarios, specifically aimed at higher-level learning goals and complex job-related tasks, involves the use of the 7Cs framework (Bundy & Howles, 2017). This framework can be used in a variety of online instructional contexts and can serve as the backbone for creating instructionally robust content interactions. Scenarios can be enhanced by incorporating interactive elements using the digital hybridization strategies presented earlier.

Seven Components of the Framework

1. Challenge
2. Context

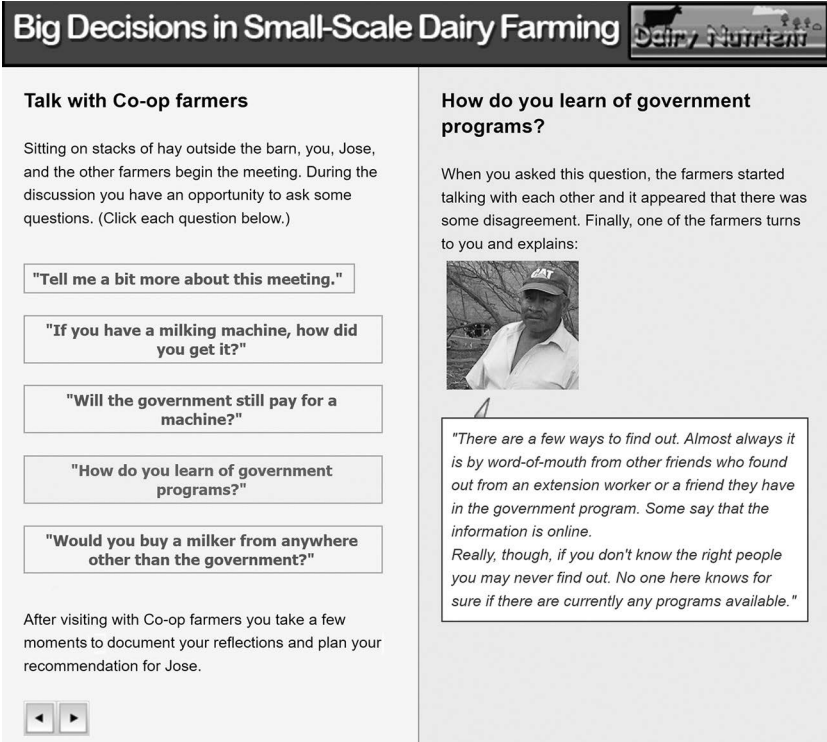
3. Characters
4. Content
5. Choices
6. Consequences
7. Connections

Applying the 7Cs framework to create an instructional narrative begins by focusing on the learning objectives for a course lesson or unit. Objectives are reframed and converted into *challenges* that are situated within a real-world *context*. Interactive case scenarios always include *characters* with the learner assuming an active role as a central character. Various characters infuse the scenario with a personal dimension and add real-world depth and complexity to the context and challenge. Throughout the scenario decision-making is part of the narrative. Learners are asked to draw upon and apply discipline-specific course *content* and if needed acquire additional knowledge to aid in making informed decisions. At key junctures in the scenario, learners are asked to make *choices* reflecting their decisions. Depending on how the scenario is designed, feedback regarding learner decisions is provided either within the scenario through characters or through an instructor-guided discussion forum where learners share their decisions and reflect on possible *consequences*. A key role of the instructor when designing and implementing these scenario-based learning activities is to facilitate and build *connections* to foster deeper learning and promote knowledge transfer between the scenario experience, course content, and linkages to real-world situations portrayed in the scenario. Figure 4.5 shows a screen from an interactive case scenario where learners acquire knowledge for making decisions as they engage in an authentic situation.

The 7Cs framework is intended as a design aid for instructors and course designers who want to contextualize course content by crafting their own compelling story narratives. Simple case scenarios can be created with a variety of available software tools including PowerPoint. Skillfully designed case stories integrate all four learning dimensions, providing engaging and memorable learning experiences without the expense and complexity of developing games and simulations.

Content Is Not Enough; It Is in the Interaction Design

Through content interactions learners construct knowledge and develop skills. The development or enhancement of online content can involve repurposing of existing content, curation of external resources, and creation of custom material. The design of online instructional content can be influenced by a

Figure 4.5. Sample episode of an interactive case scenario.


Big Decisions in Small-Scale Dairy Farming Dairy Nutrition

Talk with Co-op farmers

Sitting on stacks of hay outside the barn, you, Jose, and the other farmers begin the meeting. During the discussion you have an opportunity to ask some questions. (Click each question below.)

"Tell me a bit more about this meeting."

"If you have a milking machine, how did you get it?"

"Will the government still pay for a machine?"

"How do you learn of government programs?"


"Would you buy a milker from anywhere other than the government?"

After visiting with Co-op farmers you take a few moments to document your reflections and plan your recommendation for Jose.

◀ ▶

How do you learn of government programs?

When you asked this question, the farmers started talking with each other and it appeared that there was some disagreement. Finally, one of the farmers turns to you and explains:



1

"There are a few ways to find out. Almost always it is by word-of-mouth from other friends who found out from an extension worker or a friend they have in the government program. Some say that the information is online. Really, though, if you don't know the right people you may never find out. No one here knows for sure if there are currently any programs available."

combination of factors including learning objectives, learner characteristics, content type, instructional strategies, technology affordances, and situational factors. The design shifts and strategies that underlie providing pedagogically robust learner–content interactions for online courses require design thinking that elevates the learner perspective above or at least on equal footing with “covering content.” It involves strategies for better content integration, using pedagogical wrappers to connect content, integrating rich content interactions through hybrid multimedia and instructional methods, increasing cognitive engagement and motivation through emotional design, and adding context to content through stories and scenarios. Foundational to all of this is the ability to think holistically about the learner experience. Integrating the cognitive dimension with the often-neglected emotional dimension, linking content to behaviors and performing tasks, and incorporating social interactions around what has been learned are key ingredients for crafting engaging and deep learning experiences in the online environment.

