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# INTEGRATED FRAMEWORK FOR DESIGNING THE ONLINE LEARNING EXPERIENCE

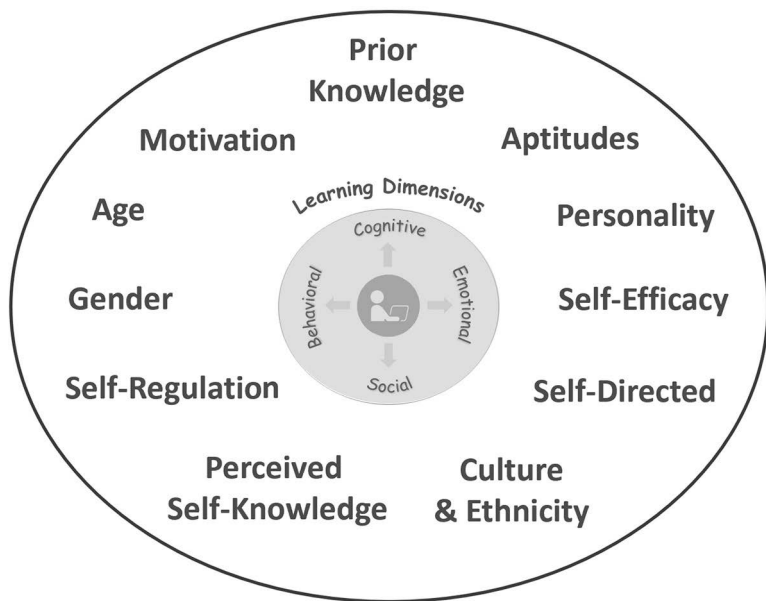
The notion that individuals have “learning experiences” is not new. What is new, however, is a growing interest in “designing” learning experiences. Compared to conventional instructional design, crafting quality online learning involves a shift in the way we think about and develop courses. This shift entails a more holistic and learner-centered way of designing learning for a digital age. We refer to this new mindset and approach as *learning experience design*.

In this chapter, we introduce the integrated framework for designing the online learning experience. Practicing learning experience design requires empathic design and a deeper understanding of the learner perspective. We begin this chapter by looking at several learner characteristics that can influence the design of learning experiences. This chapter includes a set of design principles and strategies as preparation for implementing the integrated framework in practice in subsequent chapters.

## **Learner Characteristics**

Learning experiences within individual learners are highly subjective. What each person brings to a learning situation influences the quality of the experience. Therefore, designing online learning experiences requires a more in-depth understanding of learner traits compared to a conventional instructional design target audience analysis. Learner characteristics represent individual differences that impact internal conditions of learning (Gagne &

**Figure 2.1.** Learner characteristics that influence learning design.



Briggs, 1979). Experience design involves recognizing how these individual differences interact with various aspects of the online course environment. Figure 2.1 shows 11 evidence-based learner characteristics that impact how learners engage cognitively, emotionally, behaviorally, and socially in an online environment.

### *Prior Knowledge*

Prior knowledge is associated with the cognitive dimension of learning. It is an individual's stored knowledge from previous learning experiences. This knowledge is represented in the brain in the form of neural networks (Zull, 2002) or cognitive structures called *schemas* (Sweller, 1994). Individuals have schemas for objects, events, and ideas. Schemas help individuals recognize and describe things. Existing schemas provide a structure for organizing new information (Jonassen et al., 1993) and also serve as catalysts for making thinking and learning more efficient. Learning and meaning-making involve building new schemas and expanding existing ones. Prior knowledge in the form of schemas is one of the greatest factors in predicting a learner's initial success in a learning situation.

Learner-centered design involves recognizing that individual learners differ in terms of their prior knowledge and schemas. Instructional methods

need to adapt to learner differences in prior knowledge (Clark et al., 2006). Course content that may seem simple and straightforward to learners with prior knowledge may be confusing to others whose schemas related to that content are not well formed. Low prior knowledge learners require more redundancy, structure, explicitness, and external support when first exposed to new and complex content. As learners acquire greater expertise, the amount of structure, explicitness, and support decreases.

### *Motivation*

Motivation is closely associated with the emotional dimension of learning but is also intertwined with a person's thinking and behavior. Motivation acts as an internal force that activates, directs, and sustains an individual's attention and behaviors toward achieving certain goals. It influences choices, effort, and persistence. It also underlies a person's level of engagement in performing learning tasks and sets the stage for deep learning to occur. The amount of mental effort invested in a learning task is a reliable estimate of the learner's motivation or involvement in the task (Paas et al., 2005).

Because of the complexities of different learning situations, there is no single formula for motivating all learners. An individual's motivation to learn is influenced by both internal (intrinsic) and external (extrinsic) factors. Intrinsic motivation involves a personal interest and desire to engage in a task, whereas extrinsic motivation involves an outside demand that may include reinforcements, rewards, punishments, or other consequences. Although activating a learner's intrinsic motivation is an ideal goal, a mix of intrinsic and extrinsic motivation should be incorporated in an online course design. Online content and learning activity design need to build in elements of learner interest, relevance, practical application, and challenge.

### *Self-Regulation*

Self-regulation is a set of metacognitive strategies associated with the behavioral, cognitive, and emotional dimensions of learning. It is the degree to which students are "metacognitively, motivationally, and behaviorally active participants in their own learning process" (Zimmerman & Martinez-Pons, 1988, p. 284). Metacognitive strategies are adopted by learners to monitor, plan, and regulate their learning. Motivation is a sustainer of self-regulation. Self-regulated learners in the online environment tend to be more confident and more engaged in the learning process, with better performance on tests (Puzziferro, 2008). Learning online requires more self-regulation due to the independent nature of the work. Broadbent and Poon (2015) stated,

Students who make good use of their time, are conscious of their learning behavior, are critical in their examination of content and persevere in understanding the learning material despite challenges faced are more likely to achieve higher academic grades in online settings. (p. 11)

### *Self-Directed*

Self-directedness is the learner's ability to guide and direct their own learning with moral, emotional, and intellectual autonomy (Song & Hill, 2007). This learner characteristic is closely associated with the emotional, cognitive, behavioral, and social dimensions of learning. As a personal attribute, self-directedness has been presented from different perspectives. Candy's (1991) perspective encompasses personal autonomy, self-management, and learner control. Brockett and Hiemstra (1991) viewed self-directed as a personal responsibility orientation (goal and process), in which goal orientation centers on "a learner's desire or preference for assuming responsibility for learning" (p. 24). Garrison's (1997) personal attribute involves three dimensions interacting with each other: learners' control of learning context to reach learning objectives (self-management), use of learning resources within the learning context (self-monitoring), and motivation to learn.

The demands of many online courses require learners to be self-determined and self-directed in how they interact with peers and the instructor, communicate with others in a timely manner following established guidelines, and become motivated to participate in meaningful interactions providing thoughtful in-depth contributions. In order to be successful in the online learning environment, learners need to take control over their own learning, be self-motivated, and manage deadlines (Song & Hill, 2007), all of which constitute self-directed learning readiness (Boyer et al., 2006; Kreber, 2004).

### *Self-Efficacy*

Self-efficacy is the personal belief held by learners regarding how well they can perform a task (Bandura, 1997; Huffman et al., 2013). This learner characteristic is linked to the emotional, cognitive, and behavioral dimensions of learning. Learners' self-efficacy shapes their motivation and the particular learning strategies they employ in relation to a specific learning context or activity. When learners feel reasonably confident about reaching a particular goal or accomplishing a particular task, they generally put forth their best effort. Students' effort and motivation often decline in learning situations where they feel incapable.

Low self-efficacy fosters a tendency toward procrastination, which is amplified in an online learning environment. Self-efficacy is difficult to discern in online environments, but lack of self-efficacy is evident when students procrastinate. Procrastinators have difficulty with tactics such as organizing resources and managing tasks for short-term goals. They devote too much time to the wrong tasks and tend to delay the start of long-term tasks (Klassen et al., 2008).

### *Perceived Self-Knowledge*

One characteristic closely associated with the cognitive dimension is an individual's ability to accurately self-judge their knowledge of a specific topic and self-assess their own learning (calibration). It is a metacognitive ability that can be measured in specific learning situations. Accurate self-assessments of one's learning plays a key role in the learning process. If students have inaccurate self-judgments regarding what they have learned and where they need to improve, they will be less capable of effectively guiding and self-regulating their own learning (Dunlosky et al., 2005).

There is a type of inflated overconfidence related to a person's judgment accuracy of what they have learned following a learning event (Dunlosky & Rawson, 2012). Older individuals show a tendency toward greater overconfidence compared to younger individuals (Crawford & Stankov, 1996). Overall, learners tend to hold overly optimistic and miscalibrated views about their acquired learning, which become even more miscalibrated and overconfident when people face difficult tasks—ones for which they fail to possess prerequisite knowledge—than ones for which they do possess that knowledge. Online learners also express preferences for learning methods based on their enjoyment of the learning experience; these often may not be the optimal methods for achieving learning outcomes (Graesser & D'Mello, 2011).

### *Personality*

Personality indicates individual differences in long-standing patterns in the way a person thinks, feels, and behaves. Personality traits have been found to influence individual behaviors in a variety of academic contexts including online courses. The big five personality model has classified five traits to identify the underlying personality structure of individuals: extraversion, emotional stability, conscientiousness, agreeableness, and openness to experience (Costa & McCrae, 1992). Every individual has all five traits in various levels or tendencies.

Cohen and Baruth (2017) looked at personality traits driving learner satisfaction in an online environment and found conscientiousness and

openness to experience to be the most dominant. Conscientious students are likely to meet deadlines for assignments, finish tasks rather than leave them incomplete, put a considerable amount of effort into a task, and apply themselves without continuous supervision (Crozier, 1997). Students exhibiting an openness to experience tend to be intellectually curious, interested in course material, and insightful, all of which contribute to better course performance (Hazrati-Viari et al., 2012). Learners who are more conscientious and open to experience may require less instructional support and external regulation, less human or computerized feedback, and less coaching. It is just the opposite for learners with a less conscientious personality type.

### *Age*

The online learner population is becoming more heterogenous and inter-generational. A typical course might include part-time working adults who are goal-oriented and young full-time students who are self-directed. Instructors and course designers need to create online learning experiences that accommodate a wide range of age differences. A popular trend is the use of generational classification terms such as *digital natives*, *digital immigrants*, *millennials*, or *gen Xers*. However, researchers studying age differences and learning advise against this type of categorization and instead focus on identifying specific generational learner characteristics. Though significant generational distinctions or categories that clearly set apart learners based on digital competencies have not yet been identified (Gallardo-Echenique et al., 2015), there is solid evidence of pronounced psychological differences in learner traits between younger and older learners.

There are two streams of research focusing on age differences and academic performance, with implications for the behavioral, emotional, and cognitive dimensions of learning in the online environment: technology utilization and learning capabilities and performance. Age-related technology utilization research shows that there are significant and practical differences in technology use between individuals based on age and time period in which they were born (Gallardo-Echenique et al., 2015; Lai & Hong, 2015). Contrary to popular belief, younger students tend not to use digital technologies more extensively than older students for learning purposes (Bullen et al., 2011; Jelfs & Richardson, 2013). However, learning capabilities and performance differences between older and younger learners are attributable to age-related changes, such as decline in certain mental faculties as people age and manifest differences in technology-related learning tasks.

As individuals age, there are gradual cognitive, emotional, and motivational changes that can vary widely from person to person. Older learners

require more time to perform tasks (Wolfson et al., 2014). Starting in the early 30s, there is a gradual reduction in cognitive processing speed, often related to a steady reduction of working memory capacity.

As individuals begin approaching middle age, they gradually become more negatively impacted by information overload. In addition, older adults experience greater difficulty learning novel material for which they have no existing prior knowledge or schemas. The greater the task complexity, the greater the performance gap between younger and older adults (Oberauer & Kliegl, 2001; Salthouse, 1992). In addition, there are declines with age in executive functioning controlling attention, as well as the processing and integration of new information. Younger learners' executive functions are still in development whereas older adult learners' spatial abilities have begun to decline, particularly those related to large-scale spatial tasks and navigation (Schoenfeld et al., 2010). This has implications for navigating complex virtual spaces.

### *Culture and Ethnicity*

Cultural dispositions and norms associated with learner ethnicity groups constitute an influence mediated by individual difference that can shape a learner's overall experience in online contexts. According to the National Center for Education Statistics, the growing diversity of American college students has shifted, with the proportion of White students decreasing and the number of students belonging to other racial/ethnic groups rising (Snyder & Dillow, 2011). Studies comparing perceptions of students across different ethnic and cultural groups reveal differences in students' perceptions and experiences of online learning.

Cultural differences have been found to impact individual preferences and satisfaction with online learning (Ke, 2010). Many ethnic minority students report fewer positive perceptions and satisfaction with online courses compared to White students (Ke & Kwak, 2013; Xu & Jaggars, 2013). Ethnic groups coming from high-context or collectivist cultural orientations have been found to differ from groups with an individualistic cultural norm. High-context groups include Native Americans, Hispanics, East Asians, and African Americans.

### *Aptitudes*

An aptitude is a natural inborn talent or ability enabling an individual to perform certain types of work or tasks easily and quickly. It is one of the strongest individual characteristics influencing a learner's competency in performing certain types of instructional tasks. Examples of aptitudes that can be measured

include numerical, visual/spatial, verbal/linguistic, kinesthetic, and artistic/musical. Students with high aptitudes in certain areas often show a quicker initial understanding of certain content and tasks. Aptitude has little association with prior knowledge, cultural background, education, or motivation.

Aptitude has implications for the design of online courses and is associated with all four dimensions of learning. For example, learners with higher visual-spatial abilities tend to outperform those with lower visual-spatial abilities while learning with complex visual representations. High spatial ability students benefit more from certain types of visual displays that combine words and pictorial information (Brucker et al., 2014; Mayer & Sims, 1994). There is a need to be sensitive that students in online courses are likely to possess a range of aptitudes related to learning certain types of content and skills. Struggling motivated students can achieve these competencies but may require additional support, encouragement, and scaffolding.

### *Gender*

Research on gender differences related to learning are mixed and are often hotly debated as to whether differences can be attributed to cultural or inborn factors. There is no evidence that there is a distinct male and female brain. There appear to be a few gender differences that can impact online learning, but it is important to keep in mind that there are wide variances between individuals within a gender under the influence of cultural norms and tendencies. It is best to view any apparent gender characteristics as a mosaic of attributes that are shared by both males and females in diverse proportions, with unlimited variation at the individual level.

Studies comparing learning outcomes, performance, and satisfaction between male and female students in the online environment are mixed. Studies have shown that females, compared to males, participate more in online discussions and engage more actively in online learning tasks than male counterparts (Chang et al., 2014). Xu and Jaggars (2013), in examining over 12,000 community college students, found that men had more difficulty adapting to online learning than did women, and although females outperformed their male counterparts on average across all courses, the gender performance gap was stronger in the online context than in the face-to-face context.

Compared to females, males tend to have higher levels of confidence and self-efficacy toward use of technology and the internet, but this is not reflected in superior performance and active involvement in online social interactions. Because female students have higher levels of academic self-efficacy, their overall performance in online courses tends to be slightly better than males



(Chang et al., 2014). Female online students tend to place a greater emphasis on relational and communication aspects of the online environment, particularly with instructors. This shows that male and female students may behave differently in several ways in online courses. It is important to recognize that most learners, women or men, are adaptable and cognitively flexible, especially if motivated.

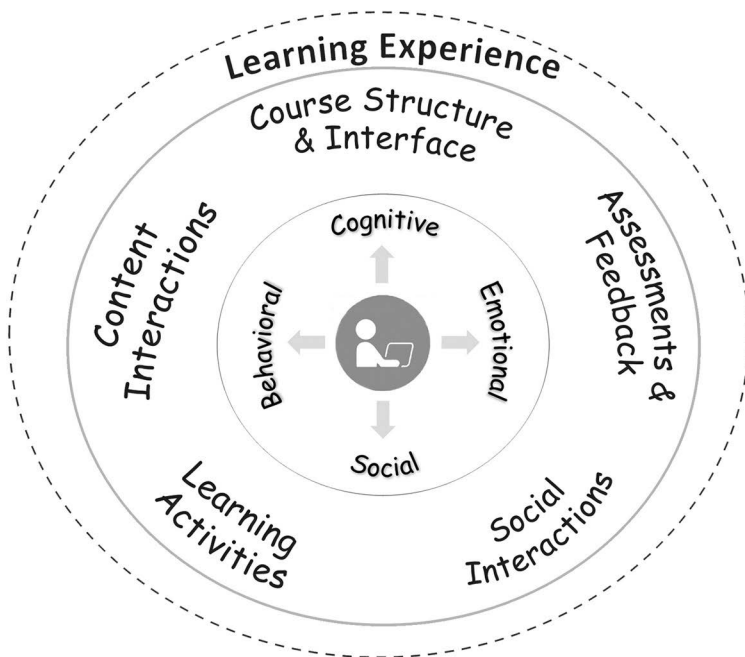
## **Integrated Framework for Designing the Online Learning Experience**

Our proposed framework comprises four interrelated learning dimensions: cognitive, emotional, behavioral, and social. The design of learner-centered learning experiences involves using these dimensions to guide the design of various aspects of the online course environment. The framework also identifies five design aspects of the learning environment that learners encounter and interact with in their journey through an online course. These aspects serve as focal points for instructors and course designers to enhance the learning experience. They include (a) course structure and interface, (b) content interactions, (c) learning activities, (d) social interactions, and (e) assessments and feedback. The design of each aspect is shaped by elements from each of the four dimensions. The aim is to provide instructors and course designers with a practical, holistic, and evidence-based framework for achieving learner-centered design goals. The skillful application of this framework can result in more meaningful, engaging, and deep learning experiences for online learners. Figure 2.2 shows the integrated framework for designing the online learning experience and how the four dimensions interact with the course design aspects.

## **Dimensions of the Learning Experience**

The inner circle of the integrated framework depicts the interplay of the cognitive, emotional, behavioral, and social dimensions of learning that comprise the learning experience. These dimensions need to be approached both separately and as a unified whole. Each dimension comes into play in various degrees through learner interactions within the online environment as they encounter the five online course aspects. For example, when learners engage in certain learning activities involving group collaboration, the social dimension will assume primacy whereas the other three dimensions of learning remain active but to a lesser degree. Similarly, when learners are

**Figure 2.2.** Integrated framework for designing the online learning experience.



interacting with complex content, the cognitive dimension will dominate but could involve to a lesser extent the behavioral and social dimensions of learning. The emotional dimension often underlies and permeates just about every type of learning experience. The most impactful learning experiences are intentionally designed to integrate the four dimensions, in various combinations, in almost every aspect of the online learning experience. Let's examine each of these dimensions and their contributions to the learner experience. Note that the framework refers to a learning experience; courses comprise multiple interconnected learning experiences.

### *Cognitive Dimension*

Bloom's taxonomy of learning objectives, developed in 1956, continues to be one of the most well-known and used frameworks for educators in designing learning programs and courses (Bloom & Krathwohl, 1956). The taxonomy is composed of three domains of learning: cognitive, affective, and psychomotor. The subject matter and learning objectives for most online courses focus primarily on the cognitive dimension. Incorporating the cognitive dimension into the learning experience design process involves understanding a few related concepts: deep learning and cognitive capacity.

### *Deep Learning*

Online courses strive to engage learners on a cognitive level through various types of interaction with the course content, instructor, and other learners (Moore, 2013). A learner's invested cognitive effort when involved in these interactions significantly impacts learning outcomes. Two types of learning orientations related to cognition have been addressed in educational psychology: shallow learning and deep learning (Graesser et al., 2010). Shallow learning, often referred to as surface learning, involves memorization of new ideas, phrases, facts, and information. It results in minimal depth of conceptual understanding and cognitive processing. In contrast, deep learning occurs when learners fully exercise mental resources in order to comprehend complicated material, understand complex concepts, solve problems requiring analysis and synthesis, and make difficult decisions by drawing on discipline-specific knowledge and experience. According to Graesser and D'Mello (2011), "Deep learning occurs when there is a discrepancy between the task at hand and the person's prior knowledge and the discrepancy is identified and corrected" (p. 2). Their research also reveals that deep learning is often accompanied by discomfort, which when managed properly by instructors compels learners to exert more cognitive effort.

### *Cognitive Capacity*

Learning is highly dependent on the cognitive processes learners bring to bear on a learning task. It requires an ability to select, organize, and connect new information with existing knowledge stored in long-term memory (Mayer et al., 2008). A major challenge for all learners stems from an inherent limited capacity of memory resources, particularly working memory. Working memory imposes a serious limitation on how much new information a person can take in and process before it can be assimilated and stored in long-term memory for later recall and use. Working memory is a precious cognitive resource that is highly susceptible to overload.

Cognitive overload typically occurs when learners are presented with large amounts of new content or required to study highly complex subject material (Sweller, 1994). Online courses that are content laden can be cognitively taxing and require specific design strategies to avoid overloading a learner's processing capacity. For example, Mayer et al. (2008) have found that conceptual understanding of complex material can be negatively impacted when too many details are presented during the initial stages of learning new content. To manage cognitive load, instructors should introduce complex material by first ensuring learners grasp the conceptual and qualitative aspects of the topic and then gradually scaffold details and quantitative information.

The online environment includes a number of features that may divert cognitive resources away from learning. These features include (a) an emphasis on text-based communication, requiring more time and effort to generate and comprehend content, (b) use of LMS with interfaces that impose a less than user-friendly structure for accomplishing tasks such as navigating the course and accessing content, and (c) course software tools requiring considerable cognitive overhead to learn and use. All combined, these technology-related factors in the online environment can increase the cognitive burden imposed on learners above and beyond simply assimilating critical course content.

Those aspiring to become skilled learning experience designers need to adopt a type of cognitive empathy with learners. This requires first a sensitivity to the cognitive processes and demands imposed on learners as they interact with course content, instructors, and other learners via technology. Second, instructors need to emphasize deep learning and manage cognitive load to prevent learners from becoming overwhelmed when presented with large amounts of new content or complex subject matter.

### *Emotional Dimension*

There seems to be a widespread awakening to the once neglected emotional side of the human experience. Developers of various products and services are increasingly recognizing the importance of emotional design (Norman, 2004, 2016) to enhance the experience of users, customers, patients, and patrons.

For decades, the emotional dimension of learning has been largely ignored and rarely discussed by instructors and course designers in higher education. Yet research in the learning sciences has begun to confirm what many teachers have suspected—that most impactful and meaningful learning experiences are imbued with emotions. Research shows that deep learning cannot be achieved through cold cognition (independent of emotional involvement) and that most learning events involve an intricate interplay between cognition, affect, motivation, and social interaction (Graesser & D'Mello, 2011; Pekrun, 2011; Tyng et al., 2017).

Both positive and negative emotions can facilitate learning. Enjoyment and feeling good are not always positively correlated with deeper learning. Jackson and Graesser (2007) reported that students who are confronted with complex learning tasks often have the lowest ratings of enjoyment in conditions where they learned the most. Positive emotions such as delight seem to emerge after a period of at least moderate struggle when goals are met and problems are solved. The most profound learning activities involve

just the right amount and type of challenge and deliberately designed confusion (D'Mello et al., 2014). Negatively charged emotions can be beneficial only to the extent that they promote deeper engagement with subject matter and can be managed and resolved successfully (Loderer et al., 2018). Online learners want their learning experiences to be enjoyable, engaging, and interesting; however, it is more difficult for instructors in a virtual setting to gauge the emotional climate of the course, to determine individual reactions to learning activities, and to rapidly detect when confusion might turn to frustration leading to a downward spiral of disengagement. There are three facets of the emotional dimension of learning in online course design that deserve attention: aesthetics, emotional presence, and motivation.

### *Aesthetics*

Based on research into human–computer interaction (HCI) and affective computing, users respond at a visceral level to the aesthetic features of interface designs. Users tend to express greater satisfaction and higher levels of motivation in using applications that have aesthetically appealing interface features (Meyer, 2017). According to Norman (2004), “attractiveness produces positive emotions, causing mental processes to be more creative, more tolerant of minor difficulties” (p. 60). In their review of research on emotions in technology-based learning environments, Loderer et al. (2018) concluded that designing an aesthetically appealing online learning environment is an essential element of emotionally sound design. Learning environments that incorporate emotional elements through look, feel, and aesthetics can induce emotions that affect learner performance and cognitive processes including improved comprehension (Plass & Kaplan, 2016): “The effectiveness of instructional design will depend on the extent to which it takes into account the pervasive and motivating nature of emotions and their natural interconnections with cognition” (p. 134). Creating aesthetically pleasing course sites and learning materials is not just gratuitous fluff. It is an integral ingredient for accentuating natural human emotions that occur within almost all well-designed learning environments.

### *Emotional Presence*

Cleveland-Innes and Campbell (2012) defined *emotional presence* as “the outward expression of emotion, affect, and feeling by individuals and among individuals in a community of inquiry, as they relate to and interact with the learning technology, course content, students, and the instructor” (p. 283). One way to convey a sense of emotional presence in online learning environments is through the use of personalized and conversational language in both

instructional text and multimedia content. Mayer et al. (2004) showed the positive impact of incorporating emotional elements into learning materials through the use of the personalization principle. Infusing course content with a personal tone and feel can result in heightened levels of learner engagement, motivation, and improved learning outcomes (Reichelt et al., 2014). Also, the increased use of video by instructors, in the form of recorded video messages and live video conferencing, adds a new level of personal expression and emotional presence to online communications.

### *Motivation*

There is a strong emotional undercurrent associated with motivation and learning. Instructors know the joy and gratification of working with highly motivated learners as well as the challenges and frustrations of working with less motivated individuals. Positive emotions such as excitement, interest, and confidence and negative emotions like frustration, confusion, and boredom often ebb and flow throughout an entire course. Such feelings influence a learner's invested mental effort, which is a reflection of their motivation or involvement in performing learning tasks (Paas et al., 2005). Even under optimal learning conditions, where instructors provide clearly written and well-organized content, deep learning will not occur without the internal condition of learner motivation (Bolkan et al., 2016).

In the online environment, learner motivation is much more difficult for instructors to monitor and influence than in a face-to-face classroom setting. In an online course, it is easier for learners to procrastinate and avoid in-depth interactions with subject material and members of the learning community. Michelle Miller (2014), a cognitive psychologist who teaches online, recommended in her book *Minds Online* that online instructors need to develop at least an informal game plan for motivating their learners. She advised that instructors and course designers "think like psychologists, getting into students' mental processes to figure out how to spark the forces that move them" (p. 167). Instructors need to devote more attention to the learners' emotional journey throughout an online course and incorporate motivational elements into each of the five aspects of course design.

### *Behavioral Dimension*

The online learning environment evokes a variety of behaviors associated with learners' technology-mediated interactions with content, people, and course-related software. The behavioral dimension of learning focuses broadly on observable learner actions or what they "do" in the online environment. This dimension can be linked to certain mental activities that drive behaviors such

as making decisions in interactive simulations, learning games, and scenarios. It encompasses performing tasks, practicing, exploring content, navigating the course website, and responding to people and situations in the virtual space. There are two aspects of the behavioral dimension from a learning experience design perspective that are important: learner interaction with technology and learner application of knowledge.

### *Learner Interaction With Technology*

In the online environment, learners interact with technologies and tools within a digital learning ecosystem. Clicking objects on the screen, scrolling, eye focusing, and tasks performed related to accessing and interacting with content are just a few behavioral examples. HCI research has contributed to a better understanding of the human experience in various types of computer-based environments and how user interfaces can be designed to make frequently performed actions and tasks easier and more efficient (Norman, 2005; O'Brien & Lebow, 2013). In addition, work in the field of user experience design offers strategies applicable in designing learner-centered information architectures for online environments (Garrett, 2011). Design strategies from these related fields can be applied to almost every aspect of the online course space.

### *Learner Application of Knowledge*

The behavioral dimension aligns with the practice of writing learning objectives in observable behavioral terms that focus on doing, producing, and demonstrating knowledge and skills—closing the gap between thinking and doing, knowing about and knowing how. Learners take newly acquired knowledge and apply it through learning activities involving choices, decisions, solutions, and artifacts as outcomes of what they can do with their newly acquired knowledge. Conversely, a “learning by doing” strategy can be used where learners acquire knowledge and skills as they perform challenging tasks. Online learning activities that emphasize the behavioral dimension often adopt active learning strategies used in many face-to-face and blended courses. Practice activities, interactive case scenarios, virtual laboratories, and games and simulations are all examples of how the behavioral dimension of learning can be accentuated to promote application of knowledge in the online environment.

### *Social Dimension*

In the online environment, there is a need to adapt certain senses (e.g., vision, hearing, and touch) to connect with others and create a sense of closeness. For example, in the online environment we cannot touch objects or

smell or taste food. There is a need to create a perceptual experience that happens at the cognitive, emotional, and behavioral levels. Mind, emotions, and behaviors come together in a dynamic interplay, creating the perceptual presence, a sensory experience of “being there” and “being together” with others (Lehman & Conceição, 2010, p. 7). This involves a *social experience of presence*, which Lehman and Conceição (2010) defined as having “a sense of being with others and responding to each other” (p. 16). The social dimension of learning involves two main types of social interactions: learner interactions with the instructor and learner interactions with other learners.

#### *Learner Interactions With the Instructor*

The quality of an online learner’s interaction with the instructor has been found to be one of the most essential elements that determine a student’s perception of learning in the online environment (Marks et al., 2005). Instructor–learner interactions help mitigate feelings of isolation and disconnection. Instructor presence can facilitate and model critical discourse and provide constructive feedback. Baker (2010) found a statistically significant positive relationship between instructor immediacy or responsiveness and perceived presence, particularly in courses that used synchronous interactions. Ladyshewsky’s (2013) study showed how the role of the instructor can influence student satisfaction when social presence, driven by the instructor, appears to drive learning quality.

Part of learner experience design involves becoming aware of discrepancies between what instructors believe to be important to learners and what learners value most from their interactions with their online instructors. An accurate understanding of learner expectations and desires is an important factor in designing more satisfying and motivating social learning experiences. Dennen et al. (2007) discovered that many instructors orient their interactions with learners around course content and learners’ ability to demonstrate their knowledge of course content. However, student data reveal other criteria that instructors should heed. These factors included (a) responding to learner-initiated communication in a timely manner, (b) demonstrating continuous presence in course discussion forums, and (c) explicitly stating expectations for discussion behaviors including examples and models. Skilled discussion facilitators also recognize that it is not the volume or amount of instructor communication that matters most but rather the frequency and quality of the content conveyed.

#### *Learner Interactions With Other Learners*

This social dimension has to do with how well learners participate in online learning mediated by technology and feel they are together with others. The



learner experience from a social perspective is quite unique in the online space. Contrasted with a face-to-face environment, the online space “requires psychological, cognitive, and emotional connection to feel, think, and behave in a way that is appropriate for the online environment” (Lehman & Conceição, 2014, p. 17).

One important component of the social dimension in the online environment is relationship-building through the creation of a learning community. Garrison et al. (2003) developed the community of inquiry model, which involves three elements in the online learning experience: cognitive presence, social presence, and teaching presence. Cognitive presence is the ability to start, create, and validate meaning through reflection and dialogue with others. Social presence involves personal and emotional connection to the learning community. Social presence can promote cognitive presence through the expression of thoughts, ideas, and feelings as they relate to others while learning together. Teaching presence is the instructor’s influence in initiating, facilitating, and monitoring learner interactions with other learners, which is key to enhancing the quality of the social dimension of the online learning experience.

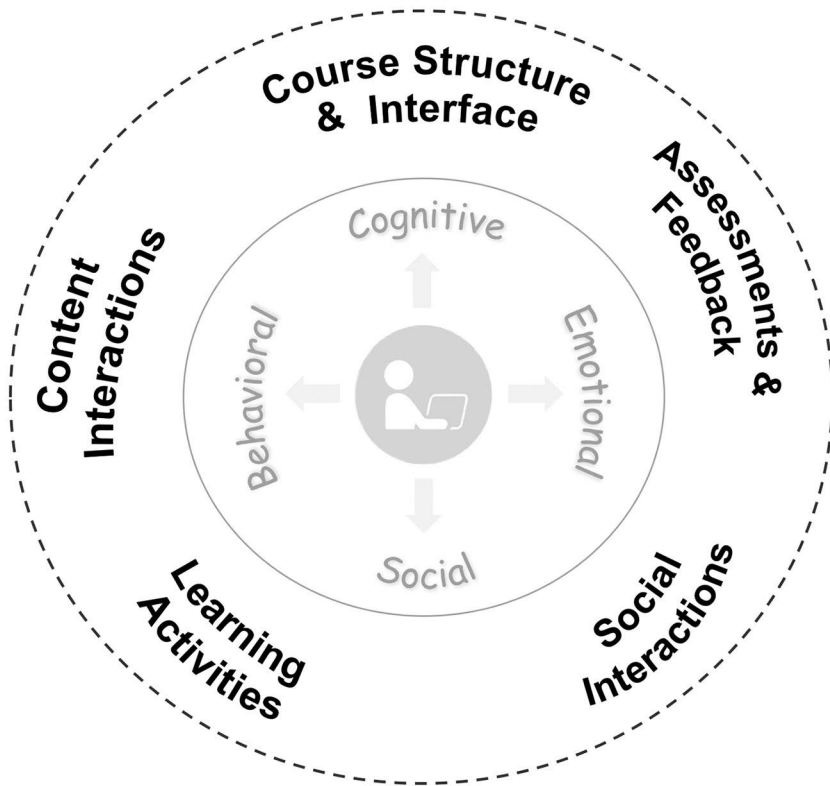
## **Course Design Aspects**

The integrated framework identifies five design aspects of the online learning environment that instructors and course designers can use as focal points in their efforts to enhance the learning experience. Online course learning experiences are shaped by the interplay of these five aspects supported by the four dimensions of learning. Figure 2.3 shows the five course design aspects. A brief description of each aspect is provided next.

### ***Course Structure and Interface***

This aspect is the medium through which course content and social interactions take place involving instructors and learners. This aspect has design features that are heavily influenced by the LMS. The online course structure refers to the organization of course-related content into units, lessons, modules, resources, and other digital learning materials. The learner interface is the visual medium between the learner and the technology-driven learning environment. The interface displays content through a variety of page layouts, each with a particular look and feel that also contain clickable items such as menus and navigational controls. These elements combine to form a cohesive whole, providing a stage upon which individuals interact with content and people in the virtual space.

**Figure 2.3.** Course design aspects.



*Content Interactions*

This aspect pertains to the design of course content material specifically for instructional purposes. Much of it involves the work of an instructor creating, organizing, structuring, and presenting content both synchronously and asynchronously using various media and message design strategies. Content can be presented to learners in the form of written documents, online learning modules and tutorials, case studies, multimedia presentations, videos, podcasts, and synchronous presentations (webinars). Well-designed content interactions engage learners and, most importantly, promote deep learning.

*Learning Activities*

Using the integrated approach to online course design, conventional assignments can often be reframed and expanded into learning activities, where they take on a more comprehensive form as “learning experiences” in and of themselves. Learning activities can be designed to accomplish higher-level

learning objectives involving analysis, application, synthesis, and evaluation, integrating a number of learning tasks. They can be purposefully and skillfully designed to actively engage learners at the cognitive, emotional, behavioral, and social dimensions of learning. By exploiting the potential of new digital pedagogies and technologies, online learning activities can incorporate optimal levels of challenge, contextualization (linkage to real-world situations), story and narrative, active learning, and learner agency and choice.

### *Social Interactions*

The social interaction aspect of online course design includes technology-mediated interpersonal communications between individuals, groups, and instructors to facilitate learning. These include discussion forums, emails, instructor messaging, and chats that occur around and are related to formal course subject matter (content interactions). These interactions can provide instructor coaching, mentoring, and guidance while enhancing instructor–learner and learner–learner connections that promote engagement and deep learning. Instructor-managed social interactions involve design skills including the use of personalized communication and projection of copresence, intimacy, and immediacy.

### *Assessments and Feedback*

Learning assessments are integral to the entire learning experience design process and are embedded within course content, learning activities, and social interactions. They are formative and run throughout the online course, providing detailed representations of learners' progress and achievement. Feedback constitutes any messages from an instructor, formal or informal, in response to a learner action (Mason & Bruning, 2001). How instructors design and provide feedback in an online setting impacts learner motivation and self-confidence—and learning outcomes.

## **Learning Experience Design Principles and Strategies**

Learning experience design requires online instructors and course designers to cultivate a learner-centered mindset, always being sensitive to the cognitive, emotional, behavioral, and social learning needs of learners. We offer five core principles that guide design decisions for each of the design aspects in the integrated framework for designing the online learning experience. These principles are incorporated into the design strategies throughout this book. They should be in the foreground of the experience design process and help integrate the four learning dimensions and the five design aspects into a holistic experience.

### *Cognitive Design Principle: Design Learning Experiences for Cognitive Engagement*

Designing learning experiences draws on evidence-based guidelines to understand how individuals process and assimilate new information and apply it to learning tasks. Learning experience design is also concerned with how learners leverage cognitive processing demands as they engage with different kinds of content and learning interactions. The following strategies can help promote cognitive development:

- Managing cognitive load in how complex content is designed and presented
- Accommodating certain learner characteristics related to the cognitive dimension of learning
- Selecting appropriate media formats that effectively make learning more efficient
- Creating intuitive interfaces, menus, and content structures
- Conducting social interactions that reinforce cognitive engagement
- Promoting learner–content and learner–instructor interactions that promote deep learning
- Providing assessments and feedback that cognitively challenge and stimulate learners

These strategies focus on crafting learning interactions in ways that help learners use their cognitive capacities efficiently and effectively to accomplish learning goals.

### *Emotional Design Principle: Design Learning Experiences for Emotional Connection*

Designing impactful online learning experiences should incorporate affective elements to promote learner engagement and increase invested mental effort (Plass & Kaplan, 2016). Enhancing learner motivation increases engagement and activates cognitive processes that lead to deeper learning. Placing emotions and motivation in the foreground is one of the biggest shifts in the practice of learning experience design. Emotions are drivers of learning (Pekrun, 2011); cognitive and emotional elements are inextricably bound together in almost every learning experience. Learning experience design pays particular attention to affective elements that have been shown to positively impact learning and learner satisfaction. Strategies that evoke emotional connection include the following:

- Incorporating aesthetic and visually appealing features into the course interface
- Integrating motivational elements that arouse curiosity, challenge, and relevance
- Using a personalized communication style in content design and social discourse
- Writing learning objectives in ways that learners understand while sparking their interest
- Incorporating instructor feedback throughout the course to inspire, encourage, and motivate learners

These strategies focus on design efforts to activate and sustain learner interest and motivation to allow fuller engagement with every aspect of the online course experience.

### *Behavioral Design Principle: Design Learning Experiences That Connect Knowledge to Application*

The quality of the knowledge learners construct at the cognitive level often remains unknown to the instructor and others in the online course environment. The gold standard for assessing learning outcomes is for learners to demonstrate what they can do or how they can apply their knowledge. This principle involves active learning and practice. Learners perform various tasks repeatedly, receiving corrective feedback until they achieve mastery. The following strategies can augment the behavioral dimension of online learning:

- Designing learner interfaces that permit easy navigation and access to course materials
- Crafting content that provides retrieval practice and scaffolding for supporting the performance of certain learning tasks
- Creating learning activities that involve active and generative learning tasks focused on application of higher-order knowledge and skills
- Integrating knowledge application and skills into social learning activities
- Embedding performance-type assessments, practice exercises, and game elements into learning activities

These strategies focus on bridging the cognitive, emotional, and social dimensions of learning with opportunities for learners to apply and practice what they have learned.

### *Social Design Principle: Design Learning Experiences That Support the Social Needs of Learners*

Skillful design of online social interactions can alleviate the feelings of isolation and disconnection that the online environment may create due to the absence of physical presence. Designing online learning experiences that encourage copresence, intimacy, and immediacy activates the social and emotional dimensions of learning. Social interactions are the medium for keeping learners motivated and intellectually curious to learn. Strategies that support the social needs of learners include the following:

- Establishing a personalized, safe, and open social climate for intellectual conversations
- Creating an intuitive and personalized interface around virtual social interactions
- Connecting learners to content, instructor, and other learners through personalized communication
- Promoting deep learning through social engagement
- Sustaining and influencing learner motivation through instructor feedback and presence

These strategies focus on social interactions involving discourse between instructor and learner and among learners that build on cognitive, behavioral, and emotional dimensions.

### *Integration Design Principle: Design Learning Experiences by Integrating the Four Learning Dimensions*

There is a tendency in many online courses for content elements, learning activities, assessments, and social interactions to appear fragmented and disconnected from each other. This fragmentation is apparent in the way online courses present lists of loosely connected content and tasks. Learning experience design emphasizes a more holistic design where content units, learning activities, social interactions, and assessments are more closely interconnected and learning goals are made more transparent to the learner. Strategies for creating holistic learning experiences include the following:

- Using pedagogical wrappers around content units, learning activities, social interactions, and assessments to make explicit their relevance and interconnection
- Interweaving the four dimensions of learning into the design of content units, learning activities, social interactions, and assessments

- Incorporating content that integrates multiple media formats and learning strategies
- Integrating social interactions with content modules and reading assignments

These strategies focus on thinking holistically about the design of learning experiences.

### **Implementing the Framework for Designing the Online Learning Experience**

We cannot emphasize enough that learner empathy is the foundation of learner experience design. It is best achieved by the instructor or course designer taking on the perspective of the learner and addressing design deficiencies through talking and listening to learners and understanding their characteristics and needs. Learners respond positively to experiences that bring satisfaction and relevance to their work and life. Making course content relevant to learners' personal goals through manageable, meaningful, and active learning activities can create engaging and deep learning experiences. Focusing design efforts on the structural framework and learner interface, content interactions, learning activities, social interactions, and assessments and feedback can create a space that stimulates the active construction and application of knowledge. Underlying and supporting these design aspects are four learning dimensions (cognitive, emotional, behavioral, and social). These dimensions are interrelated as they build on each other to increase frequency and duration of flow experiences throughout an online course. The following five chapters will focus on each design aspect and strategies for creating a holistic learning experience.

The integrated framework is intended to help instructors and course designers make the shift from conventional content-focused course designs to a learner-centered design. One key pedagogical goal of learning experience design is to promote learner engagement and deep learning. For those interested in updating or revising an existing online course, we recommend identifying one or two course aspects most in need of improvement based on learner feedback. It is always best to use learner feedback in identifying where design deficiencies exist. For those developing new online courses or converting a face-to-face course to the online environment, we recommend focusing on each course design aspect in the order that best suits the course project management process.

