CHAPTER 2

Developing Quality Virtual Courses: Selecting Instructional Models

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AFTER COLLABORATING WITH TEACHERS in developing online courses for middle and high school learners for more than a decade, I realized that a development model is the linchpin of quality e-curriculum design. Generally, a development model is a plan or flowchart structuring instruction and producing a unified series of related instructional activities (Plotnick, 1997). A critical decision for the e-learning institution is to identify key pedagogical concepts and instructional models that will ensure consistency and quality of e-courses and serve as a road map for e-curriculum designers that have varying educational backgrounds.

Consider Susie, a brilliant veteran teacher who has accepted the new challenge of developing an Advanced Placement English literature and composition course. From 20 years of teaching, Susie knows her content, state standards, and AP guidelines, but what does she know about designing for online instruction? Where does she begin? In this chapter, join Susie as she looks at the learning theories and development models of Robert Gagne, John Keller, Harold Bloom, Jay McTighe, and Grant Wiggins to see what they can contribute to the development of inquiry-based e-learning.

First, Susie thinks about global e-learning perspectives.

As educators consider the challenges and opportunities in our ever-changing, interdependent world, Jones (1997) advises that we examine what to teach, how to teach it, what constitutes learning, and where learning should take place. Jones suggests that it is the tools of technology today that will "empower individuals through education by giving them the means to convert information into knowledge, understanding, and wisdom" (p. xxiii). The Internet offers another place where learning occurs. Thus, educators have the challenge of moving from teaching within walls to teaching with no borders.

While there are many differences between teaching in the face-to-face classroom and teaching online, there are just as many similarities. An e-learning teacher considers the elements of quality instruction in any arena and adapts them to the virtual environment. Educational theories and solid instructional practices that have been applied and tested over time are essential resources to assist educators in creating quality online courses.

As Hargreaves (1994) points out, "Teachers don't merely deliver the curriculum. They develop, define it, and reinterpret it, too. It is what teachers think, what teachers believe, and what teachers do at the level of the classroom that ultimately shapes the kind of learning that young people get" (p. 54). Just as there is no right or best method of instruction in the traditional classroom, there is no right or best development model for an online course. However, researching and implementing a model that aligns with the educational beliefs of the instructors and the goals of the institution is the best way to ensure informed, quality instruction.

After thinking about perspectives on e-learning, Susie now wonders how to construct effective lessons for the Web-based environment. As she thinks about this new challenge, she raises these essential questions:

- *To what extent should online teaching mirror face-to-face teaching?*
- *How can educators use their own experience as well as the precepts of educational theorists to create quality online courses?*
- *To what extent will the institution's instructional principles be reflected in the online courses?*

Ah, assistance is here. She attends a professional development session, with pedagogy as the first item on the agenda. Discover with Susie how the learning theories and instructional models of Robert Gagne, John Keller, Harold Bloom, Grant Wiggins and Jay McTighe can contribute to the development of inquiry-based e-learning.

Although not a comprehensive study of learning theories or development models, the brief descriptions below outline the key learning theories or models that have shaped the development of online instruction at Spokane Virtual Learning (SVL). For SVL, the educational philosophy of creating student-centered, inquiry-based, interactive instruction has been usefully guided by the following models.

Gagne's Nine Events of Instruction

Any serious discussion of inquiry-based curriculum development models must consider the work of Gagne (1985). Gagne's instructional model has been implemented in course design at Florida Virtual School and, now, at Spokane Virtual Learning. Gagne suggests "Nine Events of Instruction" that function as a development model for any instructional context:

1. Gaining Attention (Reception)
2. Informing Learners of the Objective (Expectations)

3. Stimulating Recall of Prior Learning (Retrieval)
4. Presenting the Stimulus (Selective Perception)
5. Providing Learning Guidance (Semantic Encoding)
6. Eliciting Performance (Responding)
7. Providing Feedback (Reinforcement)
8. Assessing Performance (Retrieval)
9. Enhancing Retention and Transfer (Generalization)

These events are closely tied to cognitive theory and research on how the brain uses and stores information. Gagne's theory provides the essential conditions for learning and serves as the basis for designing instruction and selecting appropriate media (Gagne, Wager, Golas, & Keller, 2005). These Nine Events of Instruction offer course developers an effective guide or checklist for each module or unit. For example, to address event No. 1 and grab the attention of the learner, the developer could use a quote, a provocative or rhetorical question, a cartoon, a joke, and so forth.

By following Gagne's model, Susie and her colleagues can consistently create engaging experiential instruction.

Keller's Motivation Model

Along with Gagne's Nine Events of Instruction, Keller's (1987) Motivation Model offers the developer an uncomplicated guide for motivating the learners, an especially important element in virtual courses. This model is known as Keller's ARCS model:

Attention—refers to establishing and maintaining curiosity and learner arousal

Relevance—refers to linking the learning situation to the needs and motives of the learner

Confidence—refers to learners' attributing positive learning experiences to their individual behavior

Satisfaction—refers to developing the desire to continue the pursuit of similar goals

Keller's ARCS model will assist Susie in creating motivating instructional activities.

Harold Bloom's Hierarchy of Thinking Skills

Bloom's (1984) taxonomy classifies instructional tasks beginning with the rote levels of knowledge and comprehension and moving upward in the critical thinking tasks of Application, Analysis, Synthesis, and Evaluation. By considering Bloom's taxonomy, a basic element in the educator's toolbox, the developer can create activities that tap different levels of the cognitive domain.

Susie, as a developer of Advanced Placement English literature and composition, thinks about the necessity of creating instructional tasks that will require analysis, synthesis, and evaluation. On the checklist provided by her curriculum specialist, Susie sees that these higher-order thinking activities should occur in 98% of the course.

Grant Wiggins and Jay McTighe's Understanding by Design (UBD)

Although Wiggins and McTighe (2005) refer to the process as "backward design" and emphasize that UBD is not a step-by-step design model, the framing of the curriculum with the essential questions and enduring understandings offers a specific process for developers. The authors emphasize that it is less important where designers begin but extremely important that they end up with a logical, coherent design.

Next, Susie, equipped with learning theories, state benchmarks, and AP standards, creates what her virtual program calls the UBD Course Plan. In stage 1, as guided by the UBD backward design, Susie makes decisions about learning outcomes and pens the open-ended essential questions, enduring understandings, and goals that will direct the learning throughout the course. Susie completes stage 1 by stating what students will know and be able to do at the end of the course.

UBD Course Plan

Stage 1—Desired Results

Understandings

What will students understand (about what big ideas) as a result of the unit?

Students will understand that

- literature provides a mirror to help us understand ourselves and others;
- writing is a form of communication across the ages;
- literature reflects the human condition;
- literature deals with universal themes, for example, man versus man, man versus nature, man versus self, man versus God.

Essential Questions

What arguable, recurring, and thought-provoking questions will guide inquiry and point toward the big ideas of the unit?

- How does literature help us understand ourselves and others?
- How has writing become a communication tool across the ages?
- How does literature reflect the human condition?
- How does literature express universal themes?

Course Goals

1. To carefully read and critically analyze imaginative literature.
2. To understand the way writers use language to provide meaning and pleasure.
3. To consider a work's structure, style, and themes as well as such smaller scale elements as the use of figurative language, imagery, symbolism, and tone.
4. To study representative works from various genres and periods (from the 16th to the 20th century) but know a few works extremely well.
5. To understand a work's complexity, to absorb richness of meaning, and to analyze how meaning is embodied in literary form.
6. To consider the social and historical values a work reflects and embodies.
7. To write focusing on critical analysis of literature, including expository, analytical, and argumentative essays, as well as creative writing, to sharpen understanding of writers' accomplishments and deepen appreciation of literary artistry.
8. To become aware through speaking, listening, reading, and chiefly writing, of the resources of language: connotation, metaphor, irony, syntax, and tone.

Student Knowledge and Abilities

Students will know

- literary terms and techniques,
- literary modes and genre,
- literary time periods,
- literary themes,
- classic authors, and
- literary critical theory.

Students will be able to

- perform close/analytical reading,
- conduct and compose literary analysis,
- construct thesis and provide support,
- write imaginative and imitative literature,
- write essays as required of college-level writers, and
- determine significance and discuss finding.

Susie's work in stage 1 reveals a keen understanding of desired learning outcomes for the course. In stage 2, she makes decisions about what tasks will allow students to show that they have attained the knowledge and skill required.

Stage 2—Evidence of Assessment

Performance Tasks

- Timed essays based on past AP prompts
- Essay questions as required of college-level writers
- Reading/responding to/analyzing novels, drama, fiction, nonfiction, and poetry
- Imaginative writing including, but not limited to, poetry, imitative structures
- Literary analysis papers—expository and persuasive
- Personal essay
- Graphic organizers, double-entry journals, paragraph responses, questions

Figure 2.1 Sample performance task and student work from Susie's course

Responding to Fiction

After reading *Frankenstein*, students post in the discussion thread three to five questions they have about the novel. Students select two questions from two different classmates and post possible answers in the discussion thread.

Forum: Discussing *Frankenstein* **Times Read**: 37

Subject: My questions

1. Is the story she relates (in the introduction) about Darwin true? Did he actually reanimate something?
2. What did Mary Shelley's parents write? She mentions them as having "distinguished literary celebrity," but she never relates what they were famous for.
3. Why did Shelley decide to tell her story in a series of letters?
4. Why did Frankenstein's monster decide to burn himself to death instead of just throwing himself in the ocean?
5. If Frankenstein was brought up in such a loving and caring household, why would he try to create life without thinking about the consequences first? Wouldn't he, with his upbringing, have morals?

(One student's answer to question 5):

In response to #5... I think it was the fact that Frankenstein was so carefully and correctly brought up that led him to carelessly create life. As he had lived without the recognition of much pain or suffering, or even of the unpleasantness of life, it seems rather natural that he would be interested first in his own successes and either discount or even not contemplate the concept of real human sufferings. He was also a "science" person...acting, really, from a scholarly standpoint, not an emotional, touchy-feely standpoint. Obviously, the life creation was not really "careless"—rather, pretty carefully and scientifically planned, but it lacked the foresight to anticipate the suffering and seclusion the monster would feel.

Susie has outlined key performance tasks students will need to do to show evidence of reaching the desired outcomes. From the one sample activity and student responses, students seem engaged, and they are definitely thinking at the highest level of Bloom's taxonomy. In stage 3, she sequences these activities in a logical order and creates the students' learning plan or syllabus.

Stage 3—The Learning Plan

The entire syllabus or learning plan is not listed here. However, Unit 5 (Fig. 2.2) illustrates how Susie incorporates the pedagogical perspectives gained from her workshop to organize the unit study. Note how Susie, remembering Gagne's event Nos. 1 and 4, and Keller's ARCS, engages students in the study of Hamlet with a quotation from the text and with essential questions. In responding to these essential questions, students will demonstrate Bloom's higher-order thinking tasks of analysis, synthesis, and evaluation. As with any effective lesson plan, Susie gives students clear expectations or objectives.

Figure 2.2 Partial learning plan from Susie's course

Unit 5: The Tragedy of Hamlet, Prince of Denmark (5 weeks)

"For anything so overdone is from the purpose of playing, whose end, both at the first and now was and is, to hold, as 'twere, the mirror up to nature, to show virtue her own feature, scorn her own image, and the very age and body of the time his form and pressure." *Hamlet, Prince of Denmark*. Act III. Scene ii.

- Why is *Hamlet* considered by many as Shakespeare's greatest achievement?
- How did the religious, scientific, and cultural beliefs of the Elizabethan age influence Shakespeare in the writing of *Hamlet*?
- How and why is the character of Hamlet depicted as the most complex in English literature?
- What is Hamlet's essential question?

Unit Expectations:

- Study includes great chain of being, Shakespeare's language, form and function of tragedy.
- Essay test/timed writing using 1993 and 1994 question No. 3 from AP English Literature and Composition Exams.
- Literary analysis paper (formal, persuasive essay).
- Composition skills: language conventions, clear thesis, incorporation of apt textual support, introduction necessary for audience, strong concluding paragraph.

Along with the learning theories outlined and illustrated above, Susie's developers' workshop highlighted the seminal research on online learning by North Central Regional Educational Laboratory (NCREL). Below is a brief synopsis of the four design principles in the NCREL research that Susie applied in the development and teaching of her online course.

Instructional Design Principles

Developing quality curriculum for the virtual environment (as it is for face-to-face environments) is challenging and time consuming. Finding an appropriate model or design plan with solid pedagogy can make it much easier to develop curriculum that engages the learner and has consistency and quality.

Four basic principles simplify the complexities of instructional design (Kemmis, Atkin, & Wright, 1977):

1. **Frequency of Interaction.** Increasing the frequency of interaction between the learner and online lesson-learning materials generally increases a student's engagement and retention of content.
2. **Complexity of Interaction.** Interactions in an online learning environment vary in complexity and sophistication and generally fall into the following five categories:
   - Simple recognition (true/false or yes/no)
   - Recall (fill-in, free recall, or matching)
   - Comprehension (multiple choice, substitution, paraphrase, or short answer)
   - Problem solving (simulations or modeling)
   - Knowledge construction (project-based outcomes, research, or products from creative activity)
3. **Feedback Content and Quality.** Online courses should offer students substantial feedback on all tests and work products. Online feedback provided in the online learning environment can be simple judgments indicating correct or incorrect answers, or it can be complex responses that include diagnosis or remediation, or both. Diagnostic or remedial online feedback promotes better outcomes than feedback simply signaling that a response is right or wrong.
4. **Balancing Comprehension and Significance.** Information provided in an online learning environment can be either easy or difficult to comprehend based on its density and complexity. In general, screens displaying too much information (text or graphics) can be difficult or confusing to read or interpret. However, information that is overly simplified may be perceived by the reader to be trivial or even irrelevant. Achieving a reasonable balance between excessive complexity and trivial simplicity seemingly has more in common with judgments about aesthetic worth that might be applied by artists and artisans than it does with any kind of objective science (Blomeyer, 2002).

After teaching her online course for a year, Susie speaks out on several of these design principles. To the Frequency of Interaction, Susie adds that increasing the interaction between the learner and the instructor favorably impacts student engagement and student understanding of concepts. On the aspect of Feedback Content and Quality, Susie emphasizes that feedback in the online environment is a crucial instructional resource for formative assessment. If students receive specific feedback detailing both what was done well and suggestions for improvement, they know how to move their understanding of the concept to the next level. As Susie states, this specific, detailed feedback allows learners to take responsibility for the learning.

Susie shared one student's comments about feedback in her online course: Amanda stated that she liked "the fact that my online classes are faster when it comes to giving me feedback about my work than the majority of my school-based classes."

In addition to the learning theories and the research from the North Central Regional Educational Laboratory presented during the developers' workshop, Spokane Virtual Learning instructors focus on the comparison and contrast of teaching face-to-face and teaching online. First, teachers reflect and record elements of a quality, student-centered, face-to-face course, then compare those with the following list of elements of a quality online course, which I compiled from my 11 years of developing and reviewing e-curriculum.

Table 2.1 Elements of a quality online course

• Interaction	• Choices
• Easy access	• Prerequisites
• Ease of use	• Student access
• Clear objectives	• Audience-appropriate material
• Course syllabus	• Timely feedback
• Measurable objectives	• Tech help desk/human contact
• Quality evaluation	• Learning resources (Web libraries)
• Outline of time management	• Built-in monitoring systems (self-checks—students/teacher)
• Estimated time for each activity	• Links to student services (tutorials, writing labs, etc.)
• Effective virtual reality/simulations for real-life skills	• Layered content
• Links and resources	• Student authenticity/academic integrity
• Current and relevant content	• Student evaluation/feedback on course
• Multiple modalities	
• Engaging, robust curriculum	

At the end of her first year teaching her online course, Susie recorded the following observations:

AP English Literature and Composition Course Outcomes

Satisfactory results:

- *84% of the students completed the course with a grade of C or better*
- *75% of the students earned a passing score (3 out of 5) on the Advanced Placement Examination in English Literature and Composition, with 15% of those students earning a score of 4*

Unsatisfactory results:

- *1% of the students earned a D*
- *16% of the students dropped the course*

Revise the course to improve navigation and to provide more student engagement, especially by adding more choice in ways for students to demonstrate competency.

Future Trends

According to Gautsch (2000), director of the Center for Scholarly Technology Teaching and Learning Services, incoming University of Southern California students are more digitally sophisticated than previous generations of undergrads—and some faculty may not be fully prepared to deal with this fact and take advantage of it.

> *For a good portion of their youth, our current students have used computers, e-mail, the Web, interactive multimedia, cell phones, and instant messaging in almost all facets of their daily lives. While young students may not think of these everyday tools as 'technology,' it's easy to recognize the influence these technologies have had on their personalities, attitudes, expectations, and learning strategies. They multitask and expect 24/7 access to information with zero tolerance for delays. They think nonlinearly and learn through lurking, discovering, experimenting and experiencing. (n.p.)*

In describing the incoming higher education students, Gautsch characterizes the students leaving high school. K–12 teachers must be aware of the millennial generation and present provocative, engaging, online learning options, not textbooks online.

Conclusion

Today's technologies are changing how we learn and teach, but for quality instruction a fundamental design process (such as the one described in Gagne's Nine Events of Instruction) remains a bastion of learning and teaching. Continual advancements in technology will equip the online teacher with abundant resources for the creation of student-centered learning environments. Most important, though, these new technologies should be coupled with solid learning theories to ensure that K–12 online teachers offer quality instruction that accommodates the unique abilities, interests, and needs of all students. A student-centered classroom is not an "incidental pedagogical choice but a choice that shapes how and what students learn and crucially how they learn to learn" (Katz, 1993, pp. 2–3).

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