Do not quench your inspiration and your imagination; do not become the slave of your model.

– Vincent van Gogh (1853-1890)

In our final chapter, we present a didactic model for online science instruction based upon best practices in both science education and online education coupled with insights from the diverse and substantial literature reviewed in previous chapters. Our goal is to present the reader a process flow through key course design steps bringing together original learning design structures with sensible paradigms from the literature. The general structure of our model is comparable to the three-part convention described by Hegarty-Hazel (1990) that includes planning, design and implementation phases.

In our model (Figure 13.1), the planning phase involves three key components including consideration of the society-level values that guide science education, settling on and targeting the individual-specific purpose, and establishing learning activities that evaluate and accommodate learner profiles. In our second, design phase, learning objectives and science content are formulated and the key epistemological and pedagogical positions that
will guide implementation are resolved. In the third phase, a course model is implemented through the consideration and selection of appropriate and available technology, deciding on collaboration modalities, establishing assessment means for learners and assembling practical work activities. Our model’s fourth phase, redesign, emphasizes a design-study (i.e., iterative) approach to course development. We have designed worksheets to guide the use of this model and these are located in the chapter appendix. The worksheets can be used as both a checklist to identify the impetus of instructional design as well as an instrument to settle on key objectives for an online science course or activity. They can also be used to work out the specific approaches and content.

Figure 13.1. A didactic model for the development of effective online science courses (Copyright Downing & Holtz)
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