Book review:

Teaching as a design science

(2012; Diana Laurillard; Routledge)

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In *Teaching as a Design Science* the well-known author Diana Laurillard presents an interesting expansion of her Conversational Framework theory (Laurillard, 2002). Both books aim to improve teaching-learning practice by offering optimized examples of good instruction in specific contexts. However, in *Teaching as a design science*, Laurillard goes a step further: she merges her well-known framework with the emerging research trend of pedagogical patterns to justify the view not only that teaching and design are similar, but that teaching should be conceived and practiced as a design science.

The benefits of teachers acting as design scientists can be summarized by the statement that their practice is improved if they are able to set up principles. Following, representing, and sharing these principles allows fruitful collaboration on efficient pedagogic practice. Instead of teachers working on their own trying to do their best with their classrooms as isolated instructors, they can conceive their practice as an opportunity for innovative collaboration with other teachers. Laurillard describes several ways that to achieve this.

First of all, teachers should be aware of what it takes to teach and what it takes to learn. The main challenge of a teacher is to facilitate the progress of diverse learners towards a common learning outcome. This implies being prepared to respond to what learners bring to the learning context. Learners bring experiences from both formal and informal contexts, with a mix of skills, conceptions, motivations, and feelings related to these experiences. Teachers have the responsibility to make the connection between more systematic formal learning and more spontaneous, informal, everyday experience. They also need to experience the learning process themselves, and not to rely on prescriptive guidelines that tend to be too generic and not practice-oriented. This approach combining theory and practice is described in terms of pedagogical patterns.

To develop an effective pedagogical pattern, the teacher-designer should have a good knowledge of different learning approaches, such as learning through acquisition, through inquiry, through discussion, through practice, and through collaboration. The author gives a detailed account of each one of these, and also offers a connection to the Conversational Framework, suggesting ways in which digital technologies can expand and enhance the learning experience. After that, she provides examples of how to develop pedagogical patterns. The concept of design patterns proposed in the field of architecture by Christopher Alexander and his colleagues (Alexander et al., 1977) has been increasingly used for learning purposes. The key elements of a design pattern are the "problem," the "context," the description of the "solution," and the fact that the pattern has the explicit aim of externalizing knowledge (Goodyear, 2005; Mor & Winters, 2007). Laurillard, again, goes further than that. Her goal is not to offer a repository of already proposed pedagogical patterns, as other authors have already done, but to help

educators understand what they need to know in order to design their practice. She offers a more complete version of design patterns for teaching, which consists of a series of context and pedagogy descriptors. The learning cycles proposed by her Conversational Framework are smoothly integrated to describe the activity sequences in the section on pedagogy. Tools and resources also form an important element of this pedagogy, whether they refer to conventional means such as handouts and questionnaires, or to digital resources such as virtual simulations. She also illustrates how to transfer the content of one pattern into another context with similar learning goals and resources, thus providing evidence of the interdisciplinarity that the patterns allow for.

In summary, *Teaching as a design science* provides a solid and practical overview of the most innovative recent theories of teaching and learning, integrating them successfully into a single pioneering approach, namely, that of conceiving teachers as design scientists. This view is easy to accept if we recall what the founder of Design Science, Herbert Simon (1969/1996: 129), claims: "Everyone designs who devises courses of action aimed at changing existing situations into desired ones." What is difficult to conceive, though, is how an educator can actually learn how to design and share his/her practice with other teachers-designers. The pedagogical patterns approach is the best tool to be used for such an attempt as it originates from the field of design. However, this approach is still in its infancy and requires further years of practice to enable proactive authors, such as Laurillard, to provide reflective guidance in an easy-to-apply way, and innovative educators to deeply understand the design criteria involved in such a complex but potentially highly rewarding process. The need to incorporate design into teaching is becoming more evident and most especially in blended learning higher education contexts in which instructors are asked to integrate new digital technologies in their existing teaching practice in order to achieve high-order learning goals. This book gives us an idea of what it takes to plan a teaching activity using any types of tools and resources in a way that ensures effective learning.

References

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