

# Chapter 12

## Technology–Supported Constructivism

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### EXECUTIVE SUMMARY

*This chapter asserts that the processes used in on-line, computer-based distance learning are a natural fit for constructivist learning. Learners today may be too dependent on teacher-centered instruction; the independent problem-solving required of the learner in on-line learning may be more likely to stimulate a deeper grasp of concepts under study. This case study was conducted with five face-to-face meetings and an online course management tool. While the enrollment of seventy-two new teachers appeared unmanageable, the use of on-line learning communities helped to personalize the course. The chapter includes an overview of constructivist approaches to instruction, citing both classic and contemporary experts, and continues with a description of how technology was used to support constructivism. The chapter concludes with an analysis of specific technology tools that can enhance different stages of constructivist learning.*

### ORGANIZATION BACKGROUND

The College of Education in the University of Nebraska at Omaha serves the metro area of Omaha, Nebraska. Partnerships for course delivery are often formed between the College and its urban and suburban districts. These courses

are delivered to in-service teachers for graduate program credits.

### SETTING THE STAGE

The course described in this chapter was a collaborative effort. A suburban school district of metro Omaha, Nebraska, was interested in their newly inducted teachers receiving advanced training in

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three instructional approaches: Madeline Hunter (in Hunter, 2004), Robert J. Marzano (Marzano et al., 1988; Marzano, 1992; Marzano et al., 2001), and differentiation. The district was willing to pay the tuition of the teachers and provided two staff members to assist with the course. The University offered the three-credit course titled “Productive Approaches”. Two or three University instructors participated in the delivery of the course during each of the two semesters examined here.

### CASE DESCRIPTION

Take a moment to consider the common experience many newcomers have with distance learning. If it is their initial experience with learning on-line, the first reaction is often confusion or shock. There is a sense of isolation in comparison to traditional schooling modes. Learners’ comments indicate that they feel lonely, even abandoned. There is often an expression of floundering or being adrift without a rudder. Some are just not sure how to behave, what to do first, what to do next. These emotions have been expressed by students of all ages but the discomfort appears to be especially acute for individuals who call themselves “people” persons and those who have little experience with technology.

While our first instinct is to try to assuage our learners’ discomfort, perhaps it is time to consider whether it is malaise that will promote the growth needed in our learners at this point in time. If we look more closely at this adjustment period, we might recognize Jean Piaget’s (1985) process of adaptation at work. As we emerge from the pall of standardized tests and recognize the dire need for higher levels of understanding and analytic capabilities, perhaps we will find that one of the most powerful combinations for reintroducing introspection and independent scholarship is through constructivism powered by modern technologies. The applications available today have the potential to help learners not only equal

traditional learning, but to improve learning if used in combination with research-proven constructivist strategies (Duska, 1975; Jonassen, 1991, 2000; Strommen & Lincoln, 1992; Blumberg, Everson, & Rabinowitz, 2004).

Consider the tools that modern technology can offer in the Richardson’s (1997) description of Piagetian-style constructivist instruction to achieve higher conceptual levels:

*In order to reach these higher levels. Students must be actively engaged in reconstructing their existing understandings by restructuring their cognitive maps. The teacher encourages this in two ways: facilitating an environment in which students undergo a certain amount of cognitive dissonance, and devising tasks that hopefully lead to a reorganization of existing cognitive maps. By and large, this has been translated into instructional practices such as hands-on activities (for example, the use of manipulables); the engagement of students in tasks that are meant to challenge their concepts and thinking processes; and certain forms of questioning that dig deeply into students’ beliefs, turn the beliefs into hypotheses, and provide a non-threatening atmosphere in which those beliefs may be examined. (p. 5)*

The nature of the on-line and distance learning experience seems a logical fit for this emphasis on individual construction:

1. Technology-based learning requires the learner to shift into an independent mode of learning that is not nurtured by the average modern classroom (Goodlad, 2004).
2. The “cognitive dissonance” experienced by the learner in this new environment forces the learner to develop new schema, new modes of learning, new “habits of mind” (Marzano et al., 1988) that move the responsibility for learning from the teacher to the student.

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