The ID CaseBook
Case Studies in Instructional Design

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Case Study 6

Denny Clifford

by Peggy A. Ertmer and Katherine S. Cennamo

Denny Clifford, an independent instructional design (ID) consultant, had never felt so bewildered—Dr. Cynthia Oakes was one of the most complex clients he had ever worked for! Clifford wasn’t sure if this was due to the differences in their ages, gender, or educational experiences, or simply due to the nature of the project, but he found himself completely incapable of carrying on a meaningful conversation with Oakes. They just didn’t seem to speak the same language!

Clifford was an experienced design consultant—he had worked for a video production firm for the last five years and was an Air Force technical designer/trainer prior to that. He had created a wide variety of instructional materials, including computer-based lessons, multimedia simulations, and distance education courses. Although Oakes had personally requested his help with the development of a set of innovative materials for middle school science teachers, this was the most difficult job he had ever accepted. Originally, he had thought that his basic understanding of science and technology would be a distinct advantage compared to other projects he had worked on; now he wasn’t so sure. Maybe if he understood a little bit more about Oakes’ teaching philosophy he wouldn’t be so confused.

Oakes, a professor of science education at the local university, believed wholeheartedly in the constructivist approach to teaching and learning. Clifford learned, early on, that this translated into an aversion to such words as objectives, criterion-referenced test items, directed instruction, and right answers. Still, Oakes had requested Clifford’s assistance in creating some instructional materials to help local middle school teachers teach in a manner consistent with science reform initiatives.

As in most middle schools, students at the local school change classes for instruction in various content areas; thus certain teachers are responsible for teaching science to multiple groups of students each day. Although some of these teachers have a real interest in science, most are simply assigned to teach science without much training or interest in the topic. Several years ago, Oakes received a large grant to develop science materials for this group of teachers.
As a national leader in the area of science education, Oakes developed an innovative curriculum based on a social constructivist view of learning. Quite simply, the curriculum consisted of a set of "problems" for students to solve. Oakes introduced the curriculum in local workshops where she explained her constructivist philosophy and provided an overview of the materials. The curriculum was wildly popular, leading to multiple requests from other school districts for Oakes to present workshops and inservices at their locality.

Now, Oakes has received a large grant to develop professional development materials for this audience. Money does not seem to be a concern; however, she has introduced a number of constraints to the project.

First, Oakes indicated that the purpose of this project was to help middle school science teachers: (1) generate multiple ideas from their students about how to solve a scientific problem, (2) listen to and make sense of the students' ideas about science, and (3) know what to do with these ideas (i.e., respond in ways that valued the students' ideas and provided opportunities for them to explicate their problem-solving strategies). Oakes didn't really care what specific content from the science curriculum Clifford focused on; instead, she wanted the teachers to learn an alternative way of teaching science to middle school students—that was the content she was most interested in teaching! In fact, she wasn't interested in teaching her content at all. She simply wanted to provide opportunities for teachers to "explore issues related to reform-based science teaching" in a "socially supportive" environment.

Second, Oakes believed deeply in the effectiveness of her approach to developing scientific reasoning. From earlier discussions, Clifford learned that science lessons typically began with pairs of students working on a problem from the curriculum and ended with them sharing their problem-solving strategies and solutions with the whole class in a large-group discussion. It didn't matter to Oakes if the middle school students gave the right answers to the problems; her interest was in developing the problem-solving process, not achieving particular learning outcomes in terms of content. In fact, she mentioned that there were no absolute right answers, since "all knowledge is socially constructed." And she wanted teachers to develop their pedagogical knowledge of science teaching in a similar manner.

Third, Oakes was particularly sensitive to her participants' needs. She was well aware that classroom teachers were extremely busy people. She was hoping to provide instruction in a format that allowed teachers to work on their own time, possibly at school or home. Of course, she expected that teachers would start utilizing innovative approaches to science instruction in their own classrooms.

Fourth, Oakes didn't have the time, or the desire, to conduct a series of inservices or workshops for the local teachers. She had done this a number of times over the past few years and was no longer interested in continuing in this vein. Her main interest was research. She was deeply interested in the effects of the curriculum on students' scientific thinking.
Typically, she provided extensive follow-up for each teacher who partici-
pated in her workshops. She observed their classes weekly and followed
these with individual meetings in which she discussed her observations.
In fact, she had published numerous articles in which she discussed chil-
dren’s learning in her problem-centered science curriculum.

It seemed to Clifford that Oakes was willing to find a way to meet the
need for the workshops but wasn’t interested in delivering them. In fact, it
seemed that she had not really thought much about how to “package”
the instruction. Clifford wondered if much of her previous “instruction” on
the curriculum had occurred during one-on-one meetings with the
teachers. Although she did not want to spend her time conducting work-
shops, Oakes indicated that she was willing to meet with teachers for an
occasional half day to “share experiences and stories.” But of course,
that would be impossible if the program were eventually distributed
nationally, as she envisioned. With the large number of requests for work-
shops, Oakes just didn’t have time to do it all. That’s why she contacted
Clifford—to design some other way to distribute the information.

At Clifford’s last meeting with Oakes, she made it quite clear that she
expected him to provide a list of suggestions regarding his proposed
materials and delivery method at their next meeting, scheduled within a
week’s time. Yet, to date, Clifford hasn’t completed any of his normal ID
tasks. For example, he hasn’t been able to develop a list of objectives or
assessment instruments. He has no specific content to work with; Oakes
seems to be the only subject matter expert available; in fact, he doesn’t
even have a list of learner characteristics. Despite having had four meet-
ings with Oakes, Clifford hasn’t been able to obtain the information that
he normally gets from clients at the start of a project.

On reflection, however, Clifford realized that the following possible
resources, mentioned in conversations with Oakes, may provide him with
some direction, or at least a starting point:

- A list of 24 teachers who had completed the workshops in previous
  years. Many of these people were teaching in local schools and, for
  the most part, were still practicing the techniques they had learned.
- A box of videotapes, labeled by observation date, of these
  teachers in their classrooms as they were gaining experience
  with this approach.
- A copy of the grant proposal that funded the development of the
  materials for teachers.
- A list of local teachers who expressed interest in learning to teach
  science in a new way.
- A couple of articles that had been written by both Oakes and a
  former participant who was entering her fifth year of teaching sci-
  ence in a manner advocated by Oakes.

He does have his notes (see Figure 6.1) from these meetings and the
resources provided by Oakes, but the information still seems only remotely
Figure 6.1 Clifford's Notes from Meetings with Oakes

- Group discussions are important to allow opportunities for kids to create shared meaning of scientific ideas.
- Productive discussions allow kids to develop their scientific reasoning, to articulate their ideas, and to reflect on their reasoning and the reasoning of others.
- Teachers need assistance in becoming good discussion facilitators.
- Teachers need continual support while in the process of changing their practice.
- The teacher's role is critical in fostering students' ability to develop skills in scientific reasoning.
- Teaching in a manner consistent with reform initiatives requires a shift away from traditional teaching and a change in teacher practice.
- Change in practice is especially important in terms of conducting successful class discussions during science, which are critical to the success of this approach.
- Teachers lack the time and social support necessary to reflect on their practice.
- Materials are targeted for both new and experienced teachers, reinforcing teaching in a manner consistent with reform initiatives in science education.
- Participants should have already accepted the need for a learner-centered practice.
- Participants enroll voluntarily, so they usually have a positive attitude toward developing their practice. May have some anxiety about trying something new. Important to create trust and a nonjudgmental environment.
- Want participants to reflect on classroom practices of their own and others, and to develop action plans for continual development of practice.

related to his assignment. How is he going to deliver effective instruction when he can't seem to begin designing it?

**Invoking ID practice via the Denny Clifford case**

1. Describe the communication barriers operating in this case. Suggest strategies for circumventing or eliminating those barriers.
2. Describe how the identified resources can be re-purposed to address specific ID needs.
3. Recommend appropriate media, delivery mode, and instructional strategies for meeting the specific needs of a widely dispersed target audience. Justify your recommendations.
4. Draft an instructional strategy for a sample lesson that introduces these teachers to a constructivist approach to science teaching.
5. Suggest strategies to facilitate a mutually beneficial relationship between people with behavioral and constructivist points of view.