Appendix A

Synopses of Case Study Sites

Interior Design

The interior design class was an elective course taught in a comprehensive high school under the auspices of the state’s Regional Occupational Program (ROP). A heterogeneous ability group of tenth to twelfth graders was enrolled. The ROP affiliation meant that the class was taught by a vocational teacher and was geared toward providing entry skills employment training, career exploration opportunities, and preparation for higher education in a related skill (e.g., architecture). In addition, the class fulfilled a fine arts credit that students needed for graduation.

We studied this class during the 1989–1990 school year as part of our previous research project on generic skills (see Stasz et al., 1990). We observed students carrying out a class project that involved completing a contemporary interior design for a Victorian-era house. Students were told to research the original house and its design tradition, draw the house, draft the floor plan, select furnishings and coordinate colors, and prepare boards to display their proposed design. The majority of students worked in groups of four to six, although several students worked individually. Grades were awarded for the project, with the expectation that while some tasks would be completed by individual members (e.g., the floor plan and the drawing), other tasks (e.g., the furnishings selection) would be a group product. The project grade served as the final exam grade. Students were given six weeks to complete the project.

Landscaping/Horticulture

Like the interior design class, the landscape class was an elective class in a comprehensive high school under the auspices of the ROP. The eleventh and twelfth graders in this class were in the lower quarter to third of the school’s student ability distribution. This class did not have the typical ROP profile. It was taught by an academic teacher who had an interest in landscaping and a botany degree. The class combined landscape with lessons in horticulture, which permitted students to complete a science credit toward graduation. Several
students needed this class to graduate because they had failed the regular biology course.

The horticulture portion of the course was taught in a lecture format and covered topics such as elementary botany and plant propagation. The bulk of class time was spent outdoors performing various landscaping tasks on the school grounds (the mild southern California climate permitted this activity even during the winter months). After student-selected groups proved unsuccessful, the teacher assigned students to work groups. Sometimes groups selected tasks, but more often the teacher assigned them. After assignment, students gathered the tools they needed and dispersed to various parts of the campus, depending on their job for the day. The “work crews” of two to four students typically had a simple, single task, such as “lollipopping” trees, watering plants in the greenhouse, or weeding around plantings in specific areas. The teacher made the rounds, visiting each work crew during the course of the period to answer questions, demonstrate proper technique (e.g., pruning roses), and monitor students’ behavior. The majority of students did very little work and some did none at all. The teacher spent much of his time dealing with students’ emotional behavior; several could be counted on to act out in ways that interfered with the teacher’s ability to teach and other students’ ability to learn or complete their work. Students were graded for their work on a point system, which seemed inconsistently awarded. Students could be awarded points individually or as a group; they often argued with the teacher about points received. These points were allegedly used to determine a class grade, in addition to a written exam at the end of the course. Students did not appear to take this exam seriously. The potential this class might have had to teach generic and job-specific skills was squelched, in part, by students’ behavior problems, low motivation, and lack of interest and by the teacher’s and school’s low expectations for them.

**English**

The English class was a senior-level college-prep advanced composition class in the same comprehensive high school as the landscape class. It was taught by the landscape teacher, who was also certified as an English instructor. Thus, we had the unusual opportunity to observe the same instructor teaching two completely different subject areas to different groups of students. This was a required class, but students could choose among several English classes. The course met graduation requirements as well as the state college/university requirement.1

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1All of the schools in our study are in California. In this state, many courses like math, English, and science are “two tiered.” A “lower”-tiered course may count toward high school graduation but
The instructional focus of the second semester of this class was literary criticism. Students read several books by modern Latin American fiction authors and were required to write research papers on the use of “magical realism” and a topic of their own choosing (e.g., magical realism and women, or magical realism and time). Over the course of the semester students read three books, did library searches, and wrote a paper. The paper counted for most of the class grade. The teacher had several high-level goals for the students, including the development of critical thinking skills and learning to be comfortable with their own ideas and the writing process. Students also learned to conduct library searches, use class members as resources, and construct a bibliography. All of these skills were aimed at preparing students for writing assignments in college. Although each student wrote an individual paper, students worked in groups to discuss themes in the literature (e.g., magical realism), get feedback on their ideas, and share articles they had located at the library. The teacher did not lecture during this semester but conducted the class like a seminar or discussion group. His role was to guide and facilitate students through the writing process and, in his words, “to instill a love of literature.”

Electronics

The electronics class was a vocational class in the same comprehensive high school as English and landscaping. A heterogeneous mix of ninth to twelfth grade students enrolled, with varying amounts of electronics background. All of the students were male. Students taking this class fulfilled an elective requirement for graduation but did not receive any academic credit. The instructor had over twenty years of experience teaching industrial arts, complemented by master’s degrees in fine arts and industrial arts. He was certified as a mathematics teacher and taught algebra I.

In electronics, students engaged in two basic types of activities that built on what they had learned the previous semester. All students completed about twenty laboratory assignments, which typically consisted of assembling various components to construct an electronic device (e.g., a digital clock circuit), testing the assemblage, and answering questions or solving problems. The series of experiments were designed to show the students how all the component parts and circuits of computer electronics work. The experiments taught the basic or enabling skills that were used later in more advanced work in the class. Students worked in pairs or small groups on these labs. They could work on them in any

| not be counted for admission to state colleges or universities. Those that do count typically meet college and university requirements for public and private institutions in other states as well. |
order and at their own pace, provided that they finished all experiments within the specified time frame. A second activity involved more advanced electronics: Students solved problems that they were given or had to identify the problem and find a solution. For these activities they worked on computers, a CNC machine, and a robotic arm. The different activities accommodated the students’ diverse skill levels and backgrounds and permitted the teacher to teach both basic and advanced electronics in the same class. Students also completed projects that varied according to their skills and interests. The teacher circulated through the class to check on each group’s progress, offer help and suggestions, provide instruction, check their lab sheets, and so on.

**Mechanical Drawing/Manufacturing**

The electronics teacher also taught mechanical drawing/manufacturing and architectural drawing (see below). A heterogeneous group of ninth to twelfth grade students were enrolled in this vocational class. The class counted for math credits toward graduation but not toward college admission requirements.

During the first semester, the class learned the techniques of mechanical drawing, or drafting, and completed a curriculum of progressively more difficult technical drafting assignments. The second semester, the entire class participated in a manufacturing project—design, prototype, and production of thirteen complex wooden toy trucks. The class was organized like a small manufacturing firm, with students taking roles of team members on a design, drafting, prototyping or production team. Some students with particular skills were assigned to specific teams; other students selected a team to join. Each student worked on a single team; teams were required to interact in various stages of the process. The teacher basically assumed the role of a general manager, who worked with groups and individuals at various stages of the process to help them solve problems, design tools, evaluate their work, and so on. A second-year student assumed the role of shop floor supervisor. He had taken the class the previous year and had worked on the truck’s early design and initial rough drawings during the first semester. During the second semester, he acted as a consultant and informal liaison between groups, answered questions, and sometimes helped groups to finish tasks. Students generally looked to the teacher and student “floor supervisor” for leadership and expertise. Students were graded during the first semester on their drawings and during the second semester on their participation in and contribution to the manufacturing project.
Architectural Drawing

The architectural drawing course, like electronics and manufacturing courses, was a vocational elective. Students received a practical arts credit that counted toward graduation but not toward college admission requirements. A heterogeneous group of ninth through twelfth grade students composed this class.

The course was structured to teach students about the practice of architecture and to challenge first- through fourth-year architecture students. During the first semester, first-year students learned basic skills (e.g., how to design a simple, one-story house). In the second semester, each of these students designed a personal dream house on an assigned plot of an actual development in Oregon and completed a full set of floor plans and renderings. Once the assignment was given, the student has to organize his or her time to meet teacher-specified deadlines and complete the project. A small number of veteran (second- through fourth-year) students worked on more complex design problems, primarily self-defined. Some second- and third-year students worked in groups as in larger architectural firms. These projects included public-use buildings (e.g., a preschool or community center) and required building a model.

Although students typically worked independently, first-year students often used more advanced students as resources, much the way that junior and senior workers might interact in a firm. The teacher assumed the role of a critical client, who challenged students’ design decisions along the way. The atmosphere was such that students were free to make design choices, and that either the teacher or other students could criticize those choices. Students were graded on their design ideas, quality of drawings, effort, and amount of individual growth or improvement.

Chemistry

The two separate chemistry classes we observed were taught in an academy program in a comprehensive high school. The academy is a school-within-a-school that offers a special three-year program organized around an occupational or career area (e.g., health, finance, or space technology). (Academies typically have smaller class sizes [about 20 students] than the rest of the school and a small cadre of teachers who work with the students over the three years of the program.) Students in this academy had mentors and work experience in a local firm and were required to engage in community service. The students were a heterogeneous group of tenth graders; this was their first year in the academy.
The chemistry class met college entrance requirements. The teacher determined that a few students were unable to complete the course at the college-prep level. These students received science credit toward graduation, but not toward college admission.

These two classes were block scheduled to meet twice a week for two consecutive periods and once for a single period. During the two-period block, the teacher went over the homework assignment in the classroom and lectured on any new material. Then students went to a lab to work on standard chemistry experiments. The labs were short, well-defined tasks with detailed descriptions of both the equipment/materials to use and the procedures to follow. Students worked in pairs on the labs, recording observations on their lab sheets, and following other instructions. The teacher typically stayed out of the students’ way but was available to answer questions or hand out materials. When students finished the lab assignment, they worked on answering problems that used data from the lab. The teacher walked students through these problems. Those problems not finished in class were assigned as homework. Performance in labs determined part of the students’ grades. In addition, the academy also used a mastery criterion: Students must take proficiency tests until they pass with a grade of “C” or higher.