



Educational Leadership

May 2008 | Volume 65 | Number 8

Reshaping High Schools Pages 42-46

How We Reinvented the High School Experience

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A charter school for juniors and seniors shows what school can look like when you just start over.



May 2008

How do we reclaim our students? In as many as one in 10 U.S. high schools, the senior class is 60 percent smaller than the freshman class (Balfanz & Legters, 2004). Accompanying the increasingly overpopulated classrooms and overworked teachers and counselors is a rising disinterest in school among many young adults. Outdated curriculums fail to meet the needs of the new global economy, and teaching methods rely on practices that do little to capture the minds of a multi-tasking, media-saturated generation. For too many teenagers, the public high school's factory model is not working.

But what if we could start over? What if we could raze the current system and begin again? What would a school built for the 21st century look like?

In 1999, two school districts in central California gave a group of educators just that opportunity. Teachers and administrators from the Fresno and Clovis Unified School Districts spent one year creating what became the Center for Advanced Research and Technology (CART), a charter school for high school juniors and seniors. Studying the latest research on teaching and assessment, the team of founders determined that high school students learn best when they see their education as relevant to their lives and the world around them. To that end, career-focused teams enlisted the aid of community organizations and businesses to help develop curriculum. The teachers also knew that they couldn't sacrifice academic rigor—that literature, science, and history are as important to secondary education as cultural relevancy. The CART model was born—a fusion between relevant, career-focused education and college-preparatory, standards-based academic rigor.

What It Looks Like

A CART student interested in law enforcement has enrolled in the Forensics Lab. A team of three teachers—an English teacher, a chemistry teacher, and a physics teacher—have designed lessons, labs, and projects with the theme of forensic science. One lesson requires students to observe, process, and report on a mock crime scene set up in class, complete with dummies, fake blood evidence, and strategically placed items. The chemistry and physics teachers have created stations around the room for students to observe bits of evidence under microscopes, such as hair samples and fabric fibers. The English teacher requires students to document their observations through written notes and eventually type up a report. Meanwhile, students learn the difference between a fact and an inference. One lesson counts toward four classes—English, science, forensics, and technology. The teachers collaborate to prepare and grade the lesson, and the students clearly see the connections among the subjects they study.

Students spend a three-hour block at CART either in the morning or afternoon; they spend the other part of the day at their regular high school. During the two hours between the morning and afternoon CART sessions, teachers have uninterrupted time to plan collaboratively. To enable integration and promote student responsibility, CART shattered one of the most enduring high school rituals—the school bell.

More than 1,300 students, representing the diversity of California's central valley, enroll in one of 14 labs of their choice. Labs include subjects as disparate as psychology and human behavior, finance, biomedical engineering, forensic science, architectural design, computer networking, and multimedia. Most labs offer a two-year program. Students who return to a lab for a second year gain opportunities for more in-depth study and community internships.

Teams of two or more teachers run the labs. One member of each team is always an English teacher, and one member is responsible for the lab-specific course, for which students earn elective credit. On most teams, a third teacher possesses a science or social science credential, which enables students to earn credit for such classes as chemistry, physics, and U.S. history.

CART is fortunate to have its own building, whose oversized classes and conference rooms, professional furniture, and wide, bright hallways make it look completely different from a traditional high school. Students, teachers, administrators, and visitors can easily see what's happening in each classroom through interior windows, which create a fishbowl effect. The atmosphere is professional, productive, and buzzing with activity, sometimes late into the night.

How It Works

Each spring, students in their sophomore or junior year apply to CART. The recommended prerequisites are successful completion of Biology, Algebra I, and two years of English. There is no grade point average requirement. Some of CART's labs receive more applications than there are spots available, in which case a lottery is held. Staff view acceptance to CART as an opportunity for students who may not be experiencing success in the traditional classroom.

Since its inception, CART has attracted students from 14 high schools in the two school districts of Clovis and Fresno. At their home schools, students take classes that CART does not offer, such as math, foreign languages, and physical education. CART teachers regularly communicate with the homeschool counselors, especially when students fall behind on attendance or coursework.

Many of the students who choose to attend CART's morning session, which runs from 7:30 to 10:30 a.m., play sports and participate in other extracurricular activities at their home high schools. The afternoon session, which runs from 12:30 to 3:30, enables students who are behind in credits to take up to eight courses—four at their home school and four at CART. Buses paid for by the two school districts transport students to and from CART, although many students drive themselves.

CART brings together students from a wide variety of home situations and ethnic backgrounds. The 14 high schools that feed CART serve both inner-city and suburban neighborhoods. From the most affluent families to those that are homeless, CART students learn about others who are very different from themselves.

The blended demographics of both school districts result in CART's current demographic makeup: 53 percent white, 28 percent Hispanic, 14 percent Asian, 4 percent black, and 1 percent other. The partner school districts represent a study in contrasts: 81 percent of students in the Fresno Unified School District are eligible for free and reduced-price lunch, as opposed to 26.7 percent of students in the Clovis Unified School District.

CART Design Principles

Determining how best to help a CART student learn begins with the basic premise that for many of them, "high school falls into two general experiences: painful or irrelevant" (Crawford & Dougherty, 2006, p. 6). Five design principles intended to dispel students' apathy toward their education guide every stage of learning and instruction at CART.

Cognition

The group aspect of projects encourages students to communicate with one another about how best they learn. For example, last year, the English and Interactive Game Design instructors gave their students the opportunity to design a video game from start to finish. The project was less about the final product than about developing the students' understanding of how artists, programmers, managers, and other specialists work together to create a final product. The instructors briefed students on the various roles involved in designing a game, and students assigned themselves to teams on the basis of their strengths. A core team of student project managers set deadlines for the class; teachers met with the students once each week to ensure they set realistic goals and made progress. The project forced students to reflect on their strengths and weaknesses, the ways they interact with others to solve problems, and how they work and learn best. Students came to realize that they are useful, necessary, and valid participants, not just in their own learning but also in that of their fellow group members.

Academics

A meaningful and rigorous academic curriculum serves as the foundation for each CART lab. The vehicle for learning shifts from teacher-directed lessons to student-directed projects. Students study not only the content of a subject but also the skills essential to research and problem solving. Using Understanding by Design (UbD) to organize and execute projects (Wiggins & McTighe, 2005), teachers write understandings and essential questions for each project on the basis of state standards and lab goals. The UbD framework, rather than a textbook, guides daily activities and assessment.

To illustrate, the Product Development Lab, Robotics and Electronics Lab, and Architecture Lab collaborated on a massive project. Teachers posed one essential question to the students: How might we build a viable theme park based on Michael Crichton's book *Jurassic Park*? The English teacher led the students through the novel, noting the details and specifications that would guide the park's design. Working in small specialized teams, students created their own businesses. Architecture students designed the buildings, landscaping, roads, moats, and bridges. Engineering students designed power, desalinization, and waste treatment plants for the island. Robotics and Electronics students took charge of the locks, security system, fire alarms, and electric gates. One key understanding, which the teachers did not initially anticipate, was the importance of communication. Students had to use technology to communicate because they attended CART at two separate times during the day and were enrolled in labs on opposite sides of the building.

The CART model also promotes students' ability to synthesize academic material and transfer skills across the curriculum. For example, students in the Law and Policy Lab write a legal brief that meets academic standards in English and government while connecting both subjects to law. CART students see how English relates to their elective interests and that all their coursework is connected.

Real-World Connections

Career-specific projects provide relevant experiences that connect students to the content. Many projects culminate in a major presentation. Students have the opportunity to share their findings, learning processes, and understandings in front of their teachers, panels of community mentors, or the public. For example, a group of students worked collaboratively with the California Department of Fish and Game to collar and track mule deer along a proposed river development site. Students presented their findings at a San Joaquin River Conservancy State Board meeting.

Internships and partnerships also provide real-world connections. One group of finance students recently interned with Sanwa Bank, creating a feasibility study for a new branch in Clovis. Second-year biomedicine students spend one day each week at Children's Hospital Central California. They shadow nurses in the pediatric intensive care unit, learn how to use medical technology, and scan medications. In the Environmental Science Lab, students take care of a pond and greenhouse on campus, as well as work with environmental experts on projects throughout the San Joaquin Valley. By getting involved with local partners, students become

active participants—rather than passive observers—in their learning.

Technology

CART seeks to redirect our already digitally native students—who regularly use cell phones and social networking Web sites—toward a professional use of technology, which will give them a competitive advantage in the modern workforce. Technology must be seamless, woven throughout each lab's curriculum. For example, the Forensic Science and Biotechnology Lab uses Vista 2D for crime-scene simulations and FACES 4.0 to create sketches of potential suspects, the very software that police departments and crime labs use across the United States. Training for teachers is also necessary to keep them apprised of the latest applications in a continually changing field.

Personalization

In many ways, personalization forms the foundation for the CART model. Students often report that their relationship with teachers is the most appealing feature of their CART experience. The schedule enables teachers and students to spend significantly more time together than in a traditional high school and to work together to design self-directed projects. In addition, each student has access to at least three teachers in one room. By contrast, traditional classes sometimes have more than 40 students to one teacher, severely limiting the influence that a teacher can have on a student.

Lessons Learned

The road of significant high school restructuring is rarely smooth. Since the school's inception, CART's staff has had to struggle, revise, and reframe the practical aspects of its reform model, with a focus on four key areas.

Teacher Quality and Professional Development

Arguably the most crucial element to significant reform is having a core group of professionals with a shared vision for the reform. CART began with 16 academic teachers charged with re-creating the high school model; 32 teachers are currently involved in the process. The team-teaching, integrated model of CART places significant demands on teachers, not to mention the time commitment required to restructure curriculum using UbD frameworks.

CART must deal with the reality that few teachers come from preservice programs ready for such a practice. In addition, few veteran teachers have had the opportunity to grow professionally in a truly collaborative model. Currently all teachers at CART, regardless of their experience level, are involved in individual professional development plans, schoolwide professional development, and a wide variety of conferences. One common expectation from the administration is that all teachers become proficient in the language of UbD and CART design principles.

Conflict Resolution

CART found that attention to conflict resolution was a crucial component of its reform. The integrated, team-teaching atmosphere at CART forces teachers to work together closely each day. The teachers have to come to a consensus on classroom management and on planning and grading procedures in addition to working through personality differences. Often this means applying leadership principles that seek out open, honest communication, even if significant disagreements result. CART also employs a research-based collaborative teacher-leadership model in which elected teacher representatives sit with administrators in strategic as well as tactical meetings (Marzano, 2003).

Recruiting Students from Diverse Backgrounds

CART recruits students from all ethnic and economic backgrounds across geographic areas that include significant urban blight. Originally, student enrollment from socioeconomically disadvantaged communities was much lower than anticipated. CART staff realized that it takes

more than good facilities and an interesting curriculum to attract and retain students from all cultures. Strategic initiatives involve using personal connections to recruit students from diverse communities; teachers also visit and build relationships with specific schools.

The results of such efforts are encouraging. Students coming to CART from urban schools experience tremendous growth and gain confidence. We typically hear remarks like, "I didn't know that I could participate as an equal with students from across town until I came to CART." In a survey that CART students take when they enter the program, 60 percent indicate that they plan to attend a postsecondary school. Students are surveyed once again as seniors: Over the past three years, 95 percent have indicated postsecondary plans.

Dealing with Legacy High School Structures

CART learned early on that regardless of its nontraditional makeup, at some point it must interface with legacy high school structures. The two partner school districts end their first semesters four weeks apart; CART schedules its annual student showcase in between. During the showcase, students display their work for parents and the community. The Forensics Lab has learning stations set up, where students teach visitors how to take fingerprints or analyze gun shots. At one showcase, a group of psychology students studied the effects of math anxiety on students who had not passed the math portion of the California High School Exit Exam.

Although CART teachers often use authentic assessments in a project-based context, they still need to assign grades. This is an area of struggle each year. In addition to the grades students receive in their home schools, students receive four separate grades from CART, one from each subject taught in the lab.

A Bold Reinvention

Although a great deal of stress among teachers and administrators currently stems from pressures to raise standardized test scores, far more is at stake. A generation of students faces a world with uncertain economic futures and rapidly changing job opportunities. The challenge to educators is to take bold steps toward reshaping education.

The payoff we have experienced with CART outweighs the roadblocks. The home schools in our two partner districts are beginning to implement changes that mirror CART's design principles. Teachers and administrators from several schools have visited CART to learn about our integration model and how to plan project-based learning while remaining standards based. A high school in Fresno redesigned an existing program in business and economics to feed into CART's Economics and Finance Lab.

The payoff with students is even higher. Ninety-five percent of CART graduates report beginning some form of postsecondary education. CART's attendance rate is 2.5 percent higher than attendance at traditional high schools. Students' grade point averages increase across the board after the students enroll at CART. For two years in a row, 100 percent of CART seniors passed the California High School Exit Exam. Frequently these are students who previously earned *Cs* and *Ds*, those for whom the traditional model has not worked.

In some cases, students arrive at CART lagging far behind their peers in terms of literacy, graduation credits, and social skills. But they find a home in a place that respects the individual and values relevancy. For these students, the future is now, and their success depends on our willingness to boldly reinvent the way we help them learn.

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