redesigning the high school EXPERIENCE

for College and Career Readiness

A GUIDE FOR SCHOOL LEADERS

Volume 1

"Building a Home and Bright Futures"

Loving High School
Loving, New Mexico

REDESIGNING
THE HIGH SCHOOL EXPERIENCE FOR
COLLEGE AND CAREER READINESS

INTRODUCTION TO THE SERIES

The National Career and Technical Education Foundation (NCTEF) and Microsoft Corporation's U.S. Partners in Learning program have partnered to develop this guide for the series, "College and Career Readiness Program." The series showcases success stories of high schools that are creating a different kind of learning experience. The goals are to engage and educate students and successfully overcome the challenges of students dropping out and lack of preparation for college and career. These schools implement meaningful and relevant programs of study for students aligned to career clusters and 21st century skills. They provide examples and inspiration for other school leaders looking for best practices to guide the same success.

Each guide highlights an innovative initiative designed and launched to give students a high-impact experience within one of the school's programs of study. The initiatives provide a highly visible and tangible activity related to the knowledge and skills required in a career cluster. The goal of each guide is to tell the story of how the school successfully brought the initiative to life, sharing tips and insights for school leaders interested in aligning their curriculum to the Career Clusters model.

About the Partners

National Career Technical Education Foundation

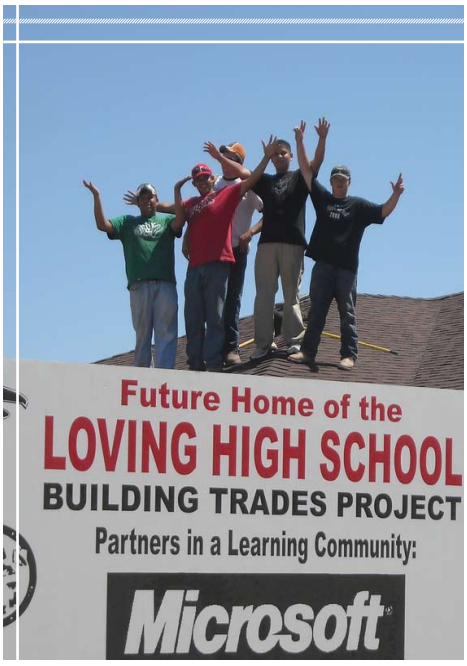
The National Career Technical Education Foundation (NCTEF) is a partner organization to the National Association of State Directors of Career Technical Education Consortium (www.careertech.org) and supports the association's goals and objectives through its 501(c) 3 status. The purpose of NCTEF is to develop and fund activities and programs that are designed to improve the career technical education system at the secondary, postsecondary and adult levels. NCTEF manages the States' Career Clusters Initiative, a nationwide effort designed to transform learning, modernize career technical education and improve student success.

Microsoft Corporation

Through the Partners in Learning (PiL) program, Microsoft is investing its resources—people, partnerships, services, philanthropy, and products—to stimulate positive change in education. Microsoft wants to help develop individuals and academic organizations to support 21st century learning, digital inclusion, and education reform. PiL projects all aim to:

- Create new 21st century learning communities.
- Help existing schools transform into 21st century learning communities.
- Develop skilled and innovative leaders.
- Increase adoption of innovative learning solutions through scale.

Because Microsoft believes that successfully creating and transforming learning communities can only be done through partnership, we work closely with educators, schools, school districts, state departments of education, and other organizations to create diverse projects that can serve as models for the future. For more information visit http://www.microsoft.com/education/uspil/default.aspx.



"We are very fortunate to be able to provide our students with this unique pathway."

- Doug Santo, Instructor

CAREER CLUSTERS

CAREER CLUSTERS ARE GROUPINGS OF OCCUPATIONS USED AS AN ORGANIZING TOOL FOR CURRICULUM DESIGN. INSTRUCTION IN A CAREER CLUSTER PREPARES LEARNERS FOR A FULL RANGE OF CAREER OPPORTUNITIES WITHIN THE CAREER CLUSTER, FOCUSING ON CRITICAL KNOWLEDGE AND SKILLS THAT ARE TRANSFERABLE AS NEW OPPORTUNITIES ARISE AND THE INDUSTRY CHANGES.

Career Clusters Framework

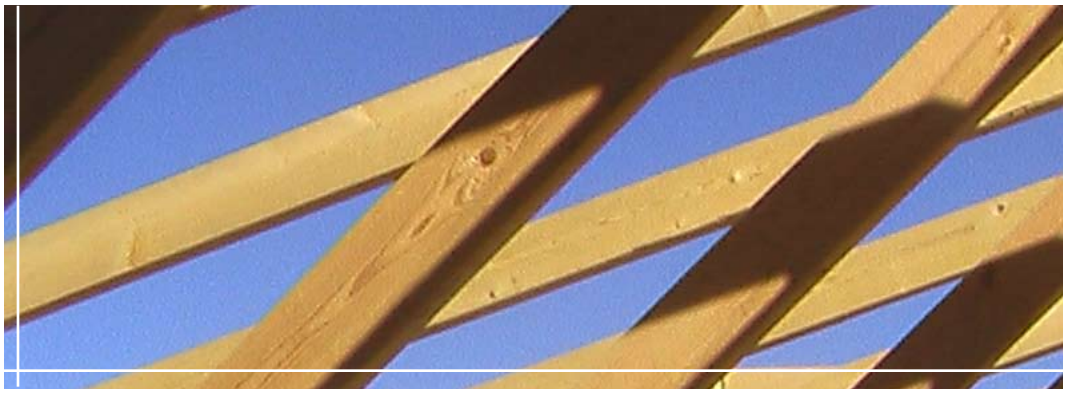
Career Clusters are groupings of occupations used as an organizing tool for curriculum design. Instruction in a career cluster prepares learners for a full range of career opportunities within the career cluster, focusing on critical knowledge and skills that are transferable as new opportunities arise and the industry changes. Nationally, 16 career clusters are recognized with 79 career pathways identified. This collection of career clusters and pathways present a way to categorize thousands of occupations currently available.

The Career Clusters framework is an approach used by schools to orient career exploration and career guidance, select curriculum offering, show relevance of academic courses, and engage community civic and business leaders in partnerships. This approach differs from a system where schools provide instruction on specific occupations, often separate from the general curriculum. Career Clusters is valuable in supporting effective transitions between secondary and postsecondary education by impacting the design of programs of study offered by a school. A program of study is a sequence of instruction consisting of coursework, co-curricular activities, work-site learning, service learning and other learning experiences. Approved programs of study are required for school systems to be eligible for federal Carl D. Perkins funds that support career and technical education.

The Architecture and Construction Career Cluster

This career cluster prepares learners for the array of careers related to the design, build and management of the built environment. Home, commercial and heavy (road) construction are general industries in this career clusters. Architects, engineers, plumbers, electricians, and control systems designers are examples of careers in this cluster. This career cluster identifies three career pathways:

- **Design/Pre-Construction Pathway**: Includes careers that turn concepts for new buildings, homes, roads and other structures into a set of plans. Their plans guide other construction professionals as they continue the building process.
- **Construction Pathway**: Includes careers that build and remodel houses, apartments, industrial buildings, warehouses, office buildings, churches, schools and recreational facilities. This pathway also includes the builders of highways, streets, bridges, tunnels and airports as well as power plants, chemical plants, refineries and mills.
- **Maintenance/Operations Pathway**: Includes careers that determine the optimal placement of machines in a plant, assemble machinery, install machinery, repair machinery and perform preventive maintenance. They detect, diagnose and correct minor problems on machinery. They keep the structure of an establishment in good repair. They maintain the smooth operation of refineries, power plants, chemical plants and mills.



Architecture & Construction

CAREERS IN THIS CLUSTER

- Architect
- Carpenter
- Civil Engineer
- Construction Foreman/Manager
- Commercial Construction Project Manager
- Contractor
- Demolition Engineer
- Drafter
- Drywall Installer
- Electrician
- Electronic Systems Technician
- Estimator
- Equipment/Material Manager
- General Contractor/Builder
- Heating, Ventilation, Air Conditioning and Refrigeration Mechanic
- Interior Designer
- Painter
- Paperhanger
- Plumber
- Project Estimator
- Project Inspector
- Roofer
- Safety Director
- Sheet Metal Worker
- Tile and Marble Setter

LOVING MUNICIPAL SCHOOLS

Architecture and Construction Cluster

Loving Municipal Schools in Loving, New Mexico, began implementing the Career Clusters model in 2004 with the Architecture and Construction Career Cluster as one of seven provided programs of study. The construction of energy-efficient, single-family homes as part of the program drew immediate support from a community in need of quality, affordable housing and career options that provided young graduates an opportunity to stay in the area. Loving school leaders were determined to make the home-building activity a quality, relevant educational experience that aligned to the overall strategic goals for student achievement.

STRATEGIC PLANNING

Strategic Planning – the 6i Process

The 6i process is an effective framework that guides each school in finding the right answers for that particular school. The process allows flexibility for schools to progress through phases at their own pace. The six stages of the process are -

INTROSPECTION	**INVESTIGATION**
INCLUSION	**INNOVATION**
IMPLEMENTATION	**INSIGHT**

For more information on how to use the 6i process in developing and implementing your strategic plan, visit http://www.microsoft.com/education/pil/ISc_6iDevProcess.aspx.

VISIONARY LEADERSHIP

IDENTIFYING THE OPPORTUNITY

- Loving Municipal Schools, Loving, New Mexico (see map)
- Community of nearly 1,400 people located in rural southeast New Mexico, 12 miles from Carlsbad
- Until 1986, high school age students from Loving had a dropout rate of 32 to 80 percent when transported to neighboring Carlsbad High School; Loving High School opened in 1987
- Nearly 90 percent of students qualify for free or reduced price lunch
- Student population is 85 percent Hispanic, 14 percent white, and 1 percent other
- Nearly 40 percent of students are English Language Learners (ELL)
- During the 2008-2009 academic year 65 percent of Loving High School students participated in concurrent credit courses
- Built first single-family home in 2008-2009 school year as part of Architecture and Construction Career Cluster

To understand the significance of the first home built by students in Loving High School's Architecture and Construction program, it is useful to look back 25 years to see how far this school and community have come. Until 1986, Loving Municipal Schools was organized as a K-9 district with high school students bussed 12 miles to the city of Carlsbad. In the 1970s and 1980s, the high school graduation rate of students from the Loving school system ranged from 20 to 60 percent. Community leaders believed their children could be better served by a community high school and petitioned the state legislature to reclassify the school as a K-12 district. The change was granted, and the high school opened in 1987. Graduation and attendance rates improved immediately. However, as the area's largest employer – a potash mine – stopped hiring, the community recognized the need to rethink the high school experience and prepare students for viable careers.

In 2004, the school was accepted as a High Schools That Work (HSTW) site, and school leaders worked with community leaders to identify a new vision, mission, and strategic plan for the school. The process, thought to be accomplished after a few meetings, took more than three months and multiple meetings. Superintendent David Chavez explained, "To implement systemic change, the entire community has to be involved and informed. I can suggest ideas and propose new models, but the school board needs to own the vision and strategic plan. Once established, the strategic plan is my responsibility to implement."

Central to the new vision for Loving High School was the adoption of a curriculum with programs of study aligned to the Career Clusters model as adopted by the New Mexico Public Education Department. High school course offerings were reorganized, and partnerships were developed with local colleges and universities to offer concurrent and dual-credit courses to support each of the programs of study. The Architecture and Construction Career Cluster was identified early in the redesign because there were employment and entrepreneurship opportunities for graduates pursuing design-related or construction-related careers in the region.

A 2005 community needs assessment identified the lack of quality, affordable housing as a barrier to economic development. Superintendent Chavez saw an opportunity to meet both school and community needs through the addition of a home construction course as a capstone in the program of study. Students in the course would apply acquired knowledge and skills while building a home that could be sold to a family looking to move into the community.

THE BOTTOM LINE: STUDENT SUCCESS AND 21ST CENTURY SKILL DEVELOPMENT

The impact of this program will not be fully known for several years. However, important factors for student success are already evidenced. Students in this program are engaged in their learning, take ownership of it, and recognize the connection between academics and their career.

Mastery of Standards

The Loving school system, like many in the United States, has invested a great deal of time and energy in designing a standards-driven education for students. The year 2005 marked the completion of the district-wide content standards. With content standards and a standards-driven curriculum in place, school leaders use assessment data to measure the progress of student achievement.

It is important for curriculum and activities in the Architecture and Construction program of study to support the mastery of core content standards. One example is the addition of a dual-credit construction math course offered by New Mexico State University at Carlsbad. John Hernandez, workforce and community development coordinator at NMSU-Carlsbad, saw the opportunity to offer the course as a win for everyone. Students earn college credit and improve critical math skills. Students who complete the course report that they are more confident and successful in the trigonometry course subsequently taken because they had seen and understood real-life examples of trigonometry principles. As a result, school leaders and teachers are discussing options for using the home construction project as a field laboratory for the school's geometry class to capitalize on the relevance of the real-life examples.

Graduation Rate and College Attendance

The average on-time graduation rate of the three most recent ninth-grade cohorts is above 95 percent. The college attendance rate has averaged 60 percent from 2004 to 2009. Stakeholders believe these rates will continue to hold or improve for three key reasons.

- The Career Clusters approach appeals to students with a variety of self-perceived interests and abilities. Students who want to be architects have a place next to those who are interested in carpentry because it appeals to their desire to build something. Students may start with an interest in one area and learn they enjoy and have the aptitude for a related career. This flexibility is less restrictive to students who previously were forced to choose between a job-specific vocational track or a college-bound track.
- The availability of concurrent college credit helps students feel more confident in their ability to successfully complete postsecondary programs and increases their likelihood to graduate high school and attend college. A majority of Loving students in the Architecture and Construction Career Cluster share that they are more likely to attend college or another postsecondary training option because they have already earned college credit. Students can earn up to 24 college credits prior to high school graduation. Students interested in earning a state license in carpentry only need to attend one additional year of postsecondary training.
- The inclusion of significant, real-life activities makes school meaningful and engaging for students. Teachers at Loving High School report that it used to be challenging to confront the attitude by some upperclassmen that high school was boring. The same teachers now state that many of the older students are enthused about coming to school and being part of their program of study. School leaders have found, in fact, that high school students are the best advocates for their programs of study to middle school students. As one student stated, "I get to come to school every day and work on this house."

"This opportunity - provided by our school district, Microsoft, and our other partners - has given me a chance to pursue a specialized career right out of high school. "

- Trevino, student

College/Program Completion and Certifications

In a 2008 survey of Loving graduates, 85 percent of those attending postsecondary institutions had either completed or were still enrolled in programs five years following high school graduation. School and community leaders believe that the enhancements made to the programs of study will positively impact these rates.

As an example, after the first year of the home construction course, nearly twice as many students planned to attend postsecondary training than in previous years. Parents credit the success to the commitment by teachers to provide meaningful experiences. Teachers and administrators point to the rigorous curriculum and high expectations of every student, not just those typically identified as college-bound.

INNOVATIVE LEADERSHIP AND TEACHING

Loving school leaders recognized that building a house as part of a school's Architecture and Construction Career Cluster was not a new idea. What distinguishes Loving's effort is how the experience has been used to maximize the educational opportunity for students and how it has been integrated into the larger program of study. The following list highlights activities that make the home-building initiative innovative and effective.

- School administrators cast the vision and empowered the staff – Superintendent Chavez is well informed about the progress and activities of the home-building initiative but leaves implementation decisions up to the principal and teachers. In his words, "My job is to make sure the initiative supports our strategic plan, to gather community involvement and support, to identify needed resources, and then let the team work knowing they can come back to me with ideas or requests for assistance when situations arise."
- Recruitment of a qualified, professional staff person to lead the program – The district hired Mr. Brigido Garcia, an experienced contractor with an alternate teaching certificate to lead the project. He joined Mr. Doug Santo, an experienced building trades instructor who taught many of the introductory courses in the program of study. After Mr. Garcia's first year of teaching and the completion of the first house, he commented, "Everything took longer than I expected. When I was a contractor, I'd just tell someone to do something and they did it. Here, it was important to take the time to show how and explain why we did each process."
- Selection of a rigorous curriculum that aligned to certifications – The addition of the home construction course gave school leaders the chance to revisit the curriculum used in the program of study. Curricula and dual-credit courses were selected to offer students the opportunity to earn one certification while in high school and other certifications and licenses on an accelerated postsecondary path. Students have begun to understand the value of certification. Teachers and counselors report that students ask the question, "Will this course count toward my certification?" when selecting class schedules for subsequent terms.
- Flexible scheduling – Program leaders recognized the challenge they faced in trying to fit the home construction course into a typical 52-minute period. The home building site was more than five blocks from the school, and all of the tools used for the class had to be transported back and forth from the school to the site each day to prevent vandalism and theft. To accommodate the course, the school implemented a multiple-period block for the home construction course. Because Loving High School is small and typically only provides one or two sections of required courses, the entire schedule had to be revised (within a seven-period day) in order for students in the program of study to take all required courses.

TIPS FOR COURSE ARTICULATION

- Review state policies and programs regarding secondary to postsecondary articulation
- Identify postsecondary centers of excellence
- Take inventory of available delivery options
- Seek a Memorandum of Understanding with involved parties
- Partner in local consortiums, if needed
- Be flexible with local program of study curriculum
- Recognize importance of teacher certification and experience

KEYS TO INTEGRATING NEW INITIATIVES

- **Connect to community**: Identify how the initiative addresses a community's identified need, and connect community leaders to the idea in the planning stages to generate further ideas.
- **Tie into strategic and improvement plans**: Recognize the opportunity to use the initiative to advance a strategic or school improvement goal. Minor modification or supplements may be required but will be well worth the effort to show progress on key goals.
- **Engage teachers in identifying opportunities:** When presented the vision for the initiative, many great teachers will be able to think of ways to leverage the project to improve their curriculum and classroom experience.
- **Invest in school counseling efforts**: A new initiative can have unexpected impacts on how students choose courses and identify educational goals. Work with school counselors to discuss ideas to prepare for the changes.

THE AGILITY TO INNOVATE

Once the idea for a home construction project was agreed upon by school and community leaders and a plan was developed and analyzed for costs, the funding plan became a priority. Leaders recognized that the initial cost of new curriculum, tools, construction supplies, architectural drawings, and a qualified instructor with the time needed to manage the build would be greater than the amount available in regular operating funds of the district. Additionally, the school had no available land next to the high school to build a house. The home would need to be built on-location, which meant the need for multiple open lots.

The Western Commerce Bank in Carlsbad was the first partner to offer assistance. The bank, recognizing the value of the project, offered an interest-free line of credit to the program for construction materials, releasing funds as construction progressed and using the sale of the home as a means to repay the line of credit.

Superintendent Chavez contacted the district's state legislators to describe the plan. Both representatives committed to seeking appropriation dollars to help the school acquire the lots and construction materials needed for the project. A state appropriation of $146,000 was approved by the New Mexico legislature the following year, and the project started in motion.

At about the same time, Superintendent Chavez was made aware of a unique partnership between Microsoft Partners in Learning, the New Mexico Office of the Governor, and the state Public Education Department (PED) to develop innovative education programs where technology was an appropriate solution. A decision was agreed upon to further develop the work of the PED's Rural Revitalization Initiative – a program that supports academic achievement, 21st Century skills development, and economic vitality in rural communities. Loving school system put together an application and was awarded a three-year grant worth more than $200,000 in software and cash to purchase curriculum, hardware/software, professional development, and other resources required to support the program's goals and objectives.

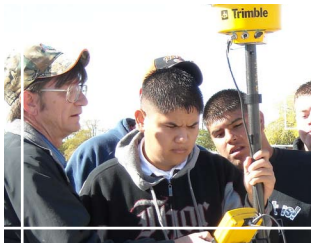
Another resource emerged in the form of in-kind professional architectural and engineering services from staff members at the U.S. Department of Energy's Waste Isolation Pilot Plant (WIPP) located in the area. Learning of the project, WIPP officials allowed interested staff to spend up to 40 hours assisting the project in producing the final architectural drawings needed to gain necessary permits and to guide the construction effort. This donation of service saved the project approximately $15,000 and gave the students an opportunity to interact with professional architects and engineers.

With the state appropriation, the Partners in Learning grant, donated services, a line of credit, and operating funds from the district, the home construction project was initiated with a target of launching the first home build for the fall of the 2008-2009 academic year.

PARTNERSHIPS THAT MAKE A DIFFERENCE

A key learning of the project was that partnerships need to be developed throughout the life of the project. Some partners assist in the development of the strategic plan, while others step in once the project is initiated. Some partners assist in the start-up and planning costs, while others provided expertise and support at various stages of the work. The following is a summary of the partnerships critical to this effort.

- As mentioned earlier, the project has been assisted greatly by local professionals in the Architecture and Construction Career Cluster providing time and service to contribute to the project. WIPP engineers assisted with architectural drawings, and local subcontractors took extra time to demonstrate skilled procedures while completing their jobs on the home construction.
- NMSU-Carlsbad partnered with Loving High School to offer dual-credit courses that articulate with the courses offered locally in the Architecture and Construction program of study. The program employs a curriculum and teaching materials developed by the National Center for Construction Education and Research (NCCER). The NCCER curriculum includes certificates recognized nationally in the construction industry. NMSU-Carlsbad staff provided insight and assistance on curriculum and instruction delivered at Loving High School. NMSU-Carlsbad was awarded a three-year $500,000 grant from the U.S. Department of Labor for community-based job training to support the construction trades building program.
- The local Habitat for Humanity council recognized the opportunity to grow a new generation of skilled volunteers committed to providing affordable housing. As such, the local council provided technical assistance, effort, and connections to other community assets as students built the home. The council also offered a special invitation to the students to participate in Habitat's special events.
- An early challenge was finding suitable open lots in Loving on which to build homes. The property used for the first home build was purchased from an individual. Two other lots were purchased for the construction of the next two homes. The district exchanged property with the Village of Loving that could eventually be used for the construction of 4-15 additional homes.



THE IMPACT AND IMPORTANCE OF TECHNOLOGY FOR 21ST CENTURY LEARNING

Loving High School has understood the importance of providing students the tools necessary for the 21st Century and has supported the integration of appropriate technologies through the use of a distance learning lab for classes from area colleges and partnering high schools, technology modules for junior and senior high school students, and required use of technology by students in senior projects.

The partnership with Microsoft in this project immediately extended the possible uses of technology to maximize the impact on student learning. Microsoft provided Loving High School with software applicable to their project needs. Visio Professional, a computer-assisted drawing application, is used by students to practice the fundamentals of drawing floor plans and reading blueprints. And Project Professional is used by students to develop timelines, tasks, and resources for the management of the home construction project.

In addition to these software programs, students will use laptops on-site for the home constructed during the 2009-2010 school year. Access to files, online resources, and software programs at the build location will help students see the implications of integrated technology in the daily life of professionals. The site will have a secure, wireless network installed that will allow the students and Mr. Garcia access to the school's server so project files, email messages, and other shared resources are available at the construction site.

The homes, too, are designed to incorporate new technology. The home designs include a number of features that provide for energy-efficiency and optional integrated technology. The homes being built will have infrastructure in place to support solar energy panels and smart electrical grid technology, should the homeowner choose to upgrade. Instructors work to ensure that students realize the importance of using technology to improve efficiency, conserve energy, and meet the demands of future clients and employers.

"The program has helped me understand the many avenues in the construction field."

- Quesada, student

ENACTING CHANGE

IN THE REAL WORLD

Major initiatives often face unexpected challenges because they typically involve a large change to a given system. Implementing the home construction initiative at Loving High School was not without its own unplanned issues. Responses to these issues were, in large part, a key indicator of the likely success of the initial effort.

- Permits/licensing – Construction on the home was delayed by nearly two months. The original timeline did not include the time needed to obtain the required permits and licenses issued by state and local authorities. The process was a valuable lesson for students in proper planning and knowing existing rules and regulations. Mr. Garcia used the time to have students practice material estimating and budgeting for the home, which was an area not originally addressed and proved to be important and useful for students' usage of algebraic skills. Practicing these skills has been incorporated into the revised curriculum. Permit application now begins the summer prior to the beginning of a new home.
- Weather delays – More often than expected, weather conditions prevented students from working at the construction site. This deferment delayed production schedules. Mr. Garcia used the experience to teach students how to adjust project plans and timelines.
- Legal issues related to schools buying land and selling homes – Selling public property to private parties proved to be more challenging than expected due to existing state regulations. The district was required to the sell homes at an appraised fair market value, which can be difficult to accurately measure in remote rural communities. When the appraised value appeared to be higher than what was thought to be an acceptable selling price, the school worked with officials to re-evaluate the appraisal and establish the procedures to sell the home to a private party.
- Liability insurance – The addition of the home construction initiative had the potential to expose the school to additional risks. Mr. Chavez worked with their insurance representative to add needed liability coverage given the nature of activities related to the project.
- Vandalism and theft – Even with the outpouring of student and community pride in the home construction effort, both vandalism and theft were issues that arose. The school erected a fence around the house to prevent unauthorized access and used a donated supply trailer to haul tools and materials to and from the work site.
- Initial lack of a qualified professional to help lead the home build – Leading a professional-level home build while teaching high school students skills and concepts requires an instructor with a unique set of talents and experiences. Hiring Mr. Garcia, an experienced home building contractor with an ability to engage students, was a critical step in this initiative.

KEY ISSUES TO

SUSTAINING INNOVATION

The home building initiative proved to be a valuable addition to the learning experience at Loving High School. Sustaining the initiative requires planning and commitment. Lessons learned, in large part, parallel those learned with other innovations introduced in a school system.

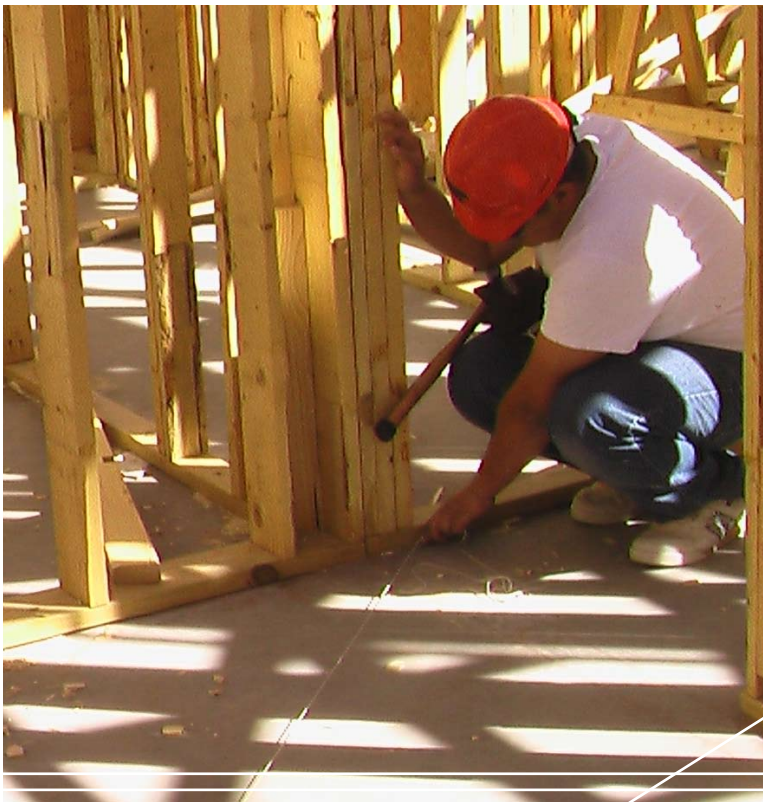
- Know what will work in your community – Residents of Loving identified the need for quality, affordable housing before the idea for the home-building initiative took root. As a result of early buy-in and ongoing communications, community support for the effort has been overwhelming.
- Define the ongoing resource needs – Superintendent Chavez knows that ongoing expenses are much more difficult to fund than start-up costs. He has worked with program leaders to accurately define the annual cost of the home-building initiative so they can identify revenue sources and amounts needed to keep the initiative viable far into the future.
- Stay focused - Ms. Fran McCarthy, dean of students, replied that the most important lesson learned has been, "Streamline, streamline, streamline." The school had to continue to focus on the things it could do very well and not accommodate every idea for a new project. She credits this mindset with the success of the home-building initiative in having a major impact on the success of the Architecture and Construction program of study.
- Develop engaged leaders who own the vision – "I led the process, but they own the vision." That statement from Superintendent Chavez highlights an essential component to long-term sustainability. He believes that when he chooses to retire, the initiatives and plans put in place will continue because the school board will be hiring someone to carry out their plan, not introduce a new plan. That will likely mean a lot of new homes – and new career paths – built in Loving, New Mexico.

"I facilitated the process, but this community owns the vision and strategic plan."

- David Chavez, Superintendent

"You have to streamline. Stay focused on the important things."

- Fran McCarthy, Dean of Students



Find additional guides from this series at:

www.careerclusters.org/publications.php

or

www.microsoft.com/education/uspil/downloads/

RESOURCES TO ENACT CHANGE

The following are free resources available from the States' Career Clusters Initiative.

Career Clusters Brochures

These brochures provide a an overview of the careers and fields of study in the career cluster. Each brochure discusses employment outlook and encourages students to prepare for both college and career by exploring career clusters of interest and establish an educational plan.
http://www.careerclusters.org/resources/web/16ccall.php?action=brochures

Sample Plans of Study

The sample plans of study can be used by schools to identify the academic courses, CTE courses, and other experiences or activities that can contribute to careers in a pathway. The plans of study become excellent guidance and planning tools.
http://www.careerclusters.org/resources/web/pos.cfm

Critical Components for Implementation of Career Clusters - Local Rubric

Those school systems successfully implementing Career Clusters have identified 15 critical components for success. This rubric helps school leaders evaluate progress in implementing Career Clusters and establish objectives for further development.
http://www.careerclusters.org/publications.php

Knowledge and Skills Charts

What are the learning outcomes expected for careers in each area? National advisory committees have developed and maintained Knowledge and Skills Charts for each of the 16 Career Clusters and 79 Career Pathways. Each chart identifies the knowledge and skills common to all careers in that cluster/pathway.
http://www.careerclusters.org/resources/web/ks.php

Student Career Interest Survey

Looking for a career guidance tool that allows individuals to respond to questions and identify the top three Career Clusters of interest based on their responses. This pencil/paper survey takes about fifteen minutes to complete and can be used in the classroom or for presentations with student audiences.
http://www.careerclusters.org/ccinterestsurvey.php

Microsoft Corporation's US Partners in Learning program has developed free tools and resources to support education.

Career Forward

You want your students to be able to compete in the global economy, be an entrepreneur, and financially literate but may not have the bandwidth to deliver. Offer them Career Forward. It's online, emotionally-engaging, media rich, and can be used in the classroom or as a stand-alone course.
http://nroc.careerforward.org/careerforward/

Establishing Public/Private Partnerships

States, districts, and schools all agree that the private sector can help them think through cost efficiencies and want to understand how to leverage business expertise. This paper walks through how to form successful education/business partnerships and get the most out of the relationship.
http://www.microsoft.com/education/public.mspx

Scale Online Tutorial

The best way to save money is to offer existing programs to more students without increasing costs. This is thought of as "scaling up success." This planning tool walks through the process of scaling an existing program across schools, districts, and even states.
http://www.microsoft.com/education/demos/scale/index.html

Education Competency Wheel

How much time and money does your HR office spend on hiring, training, incentives, and recruiting systems? This competency wheel offsets these costs by outlining four professional proficiency levels for each of the 37 competencies and self-assessment guides to measure professional ability.
http://www.microsoft.com/education/competencies/default.mspx

Innovative Teachers Network

To help teachers feel less isolated, encourage them to sign-on to the Innovative Teachers Network – a collaboration tool that encourages and fosters collaboration. While on the site, teachers can learn about the annual Innovative Teachers Forum hosted by Microsoft.
http://www.innovativeteachers.com/

Digital Citizenship and Creative Content

Intellectual Property is a critical 21st century issue we all face. Help students understand creative rights and how to be good digital citizens with this online curriculum.
http://www.digitalcitizenshiped.com/

Digital Literacy Curriculum

Digital skills are the key to 21st century jobs. Offer skill development to your students by pointing them to this outstanding curriculum. From using the Internet, to sending e-mail, to creating a resume, the Digital Literacy Curriculum helps you develop the essential skills you need to begin computing with confidence.
http://www.microsoft.com/about/corporatecitizenship/citizenship/giving/programs/up/digitalliteracy/default.mspx

SAMPLE PLAN OF STUDY

This sample plan of study shows the courses suggested to a student interested in the Construction Pathway of the Architecture and Construction Cluster. The plan emphasizes college preparation and career-related courses and activities that position the student for success in the construction field. Loving High School developed a plan of study modeled from this national sample.

To download this sample in either PDF or Microsoft Excel® format, visit www.careerclusters.org/resources/web/pos.cfm. Sample plans of study for all 16 Career Clusters and 79 pathways are available.

SAMPLE

Architecture and Construction: Construction

Career Pathway Plan of Study for ▶Learners ▶Parents ▶Counselors ▶Teachers/Faculty

*This Career Pathway Plan of Study (based on the Construction Pathway of the Architecture and Construction Career Cluster) can serve as a guide, along with other career planning materials, as learners continue on a career path. Courses listed within this plan are only recommended coursework and should be individualized to meet each learner's educational and career goals. *This Plan of Study, used for learners at an educational institution, should be customized with course titles and appropriate high school graduation requirements as well as college entrance requirements.*

EDUCATION LEVELS	GRADE	English/ Language Arts	Math	Science	Social Studies/ Sciences	Other Required Courses Other Electives Recommended Electives Learner Activities	*Career and Technical Courses and/or Degree Major Courses for Construction Pathway	SAMPLE Occupations Relating to This Pathway
	Interest Inventory Administered and Plan of Study Initiated for all Learners							
SECONDARY	9	English/ Language Arts I	Algebra I	Earth or Life or Physical Science	State History Civics or World History	All plans of study should meet local and state high school graduation requirements and college entrance requirements. Certain local student organization activities such as SkillsUSA are also important including public speaking, record keeping and work-based experiences.	• Introduction to the Built Environment	▶Carpenter ▶Code Official ▶Concrete Finisher ▶Construction Engineer ▶Construction Foreman/Manager ▶Construction Inspector ▶Contractor ▶Design Builder ▶Drywall Installer ▶Electrician ▶Electronic Systems Technician ▶Equipment and Material Manager ▶General Contractor/Builder ▶Heating, Ventilation, Air Conditioning and Refrigeration Mechanic ▶Mason ▶Painter ▶Paperhanger ▶Plumber ▶Project Estimator ▶Project Inspector ▶Project Manager ▶Roofer ▶Safety Director ▶Sheet Metal Worker ▶Specialty Contractor ▶Superintendent ▶Tile and Marble Setter
SECONDARY	10	English/ Language Arts II	Geometry	Biology	U.S. History		• The Language of Architecture and Construction • Information Technology Applications	
SECONDARY	11	English/ Language Arts III Technical Writing	Algebra II	Physics	Economics Psychology		• Safety, Health and the Workplace Environment • Principles of Construction	
SECONDARY		*College Placement Assessments-Academic/Career Advisement Provided*						
SECONDARY	12	English/ Language Arts IV	Construction Math or Statistics	Chemistry			• Applications in Construction	
	Articulation/Dual Credit Transcripted-Postsecondary courses may be taken/moved to the secondary level for articulation/dual credit purposes.							
POSTSECONDARY	Year 13	English Composition English Literature	Algebra Trigonometry	Physics	American Government or History Psychology/ Interpersonal Skills	All plans of study need to meet learners' career goals with regard to required degrees, licenses, certifications or journey worker status. Certain local student organization activities may also be important to include.	• Advanced Plan Reading • Construction Ethics and Legal Issues	
POSTSECONDARY	Year 14	Speech/ Oral Communication	Business Accounting Pre-Calculus or Calculus	Environmental Science	Sociology Business Law		• Technical Applications in the Construction Industry • Construction Internship	
POSTSECONDARY	Year 15	Continue courses in the area of specialization.					• Continue Courses in the Area of Specialization	
POSTSECONDARY	Year 16						• Complete Construction Major (4-Year Degree Program)	

League for Innovation in the Community College CCTI College and Career Transitions Initiative

NCTEF

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SAMPLE

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http://www.microsoft.com/education/uspil/default.aspx.