

WHERE WE GO NEXT

Educators' Thoughts about a New Model for Central Texas Public Schools

**Analysis and Discussion of Ideas
from Skillpoint Alliance's
Educator Colloquium
"Growing Faster Together"**

on

July 26, 2005

Sponsored by:

Advanced Micro Devices (AMD)

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Where We Go Next: Educators' Thoughts about a New Model for Central Texas Public Schools

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The paper is also available for electronic download (PDF format) on Skillpoint's website:
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Foreword by Advanced Micro Devices

AMD strives to be a good neighbor and responsible, involved corporate citizen. Our vision is simple—to change lives for the better—and it permeates everything we do. From our investments in education and basic needs to the technology we innovate, AMD enables individuals to become more productive, engaged members of a global society.

As part of AMD's commitment to the community and focus on education, we have proudly supported Skillpoint Alliance for more than a decade, most recently sponsoring the Educator Colloquium. This unique event brings together industry, education, and community leaders to develop innovative K-12 classroom instruction and helps address the changing education and workforce needs of Central Texas.

Foreword by Region XIII Education Service Center

The climate of accountability that stems from the No Child Left Behind Act and the continued refinement and advancement of the Texas Accountability System is making positive contributions to the 25-year old education reform movement. Schools and teachers are striving for improvement in student learning as well as increased student preparedness for life after high school for all students. School districts and administrators are collecting more—and better—data than ever before about student performance, demographic changes in the student population, and the cognitive hurdles students must negotiate in a technology-pervasive environment. All of this new information is vital to the continued improvement of our region's and state's education system.

However, there's another level of information that is harder to gather. It's information that can radically expedite the tempo of education reform. It's information that can pinpoint trends in teaching effectiveness and the relevance of classroom instructional materials. It's information which, if analyzed carefully, can point the way to solving some of public education's traditional weaknesses. This information is educator input.

In July 2005, Skillpoint Alliance invited key educators and administrators from across Central Texas to share their insights into the strengths and weaknesses of our schools at the first Skillpoint Alliance Educator Colloquium. During the Educator Colloquium, Angelou Economics presented 5- and 10-year economic and job forecast data for the region. Colloquium participants were asked to consider the meaning of these forecasts in the context of the ways in which public education could meet the needs of Central Texas' future economy.

The resulting dialogue among the participants revealed that Central Texas educators were excited for the future. It also revealed that these educators understand the high stakes surrounding Central Texas' economic future. Most importantly, Skillpoint's Educator Colloquium revealed that Central Texas educators have some remarkable ideas for ways to meet these needs. It's information that, when synthesized with assessment data, can point the future direction for Central Texas public education.

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Where We Go Next: Educators' Thoughts about a New Model for Central Texas Public Schools

Abstract

In this paper, Skillpoint Alliance uses the results of its 2005 Educator Colloquium held on July 26, 2005, at which regional Central Texas school district administrators, along with representatives from state and community agencies, explored ideas for how to change the region's schools to prepare its young people to succeed in the 21st century, given the likely economic and workforce situation. This paper is an adjunct to, and extension of, the ideas expressed in this 1-day colloquium, which have application not only to the Central Texas region but also to schools state- and nationwide.

Educators at the colloquium expressed a number of ideas that have profound implications for the future of public education, both in Central Texas and elsewhere, as it moves into a new century. The first is that the current model of schooling is outmoded and needs to be replaced. The second is that, to remedy the disconnect between K-12 education and the "real world" demands on students after graduation, there is a need for productive, peer-to-peer dialogue between education and industry. The third is that there is a need, at all levels, for all stakeholders, including educators, business people, legislators, parents, and community members, to work together to address the problems facing education in Central Texas.

These ideas are supported and elaborated by information from the research literature. Suggestions for effecting change are offered.

Preface

Ideas for this paper grew out of Skillpoint Alliance’s 2005 Educator Colloquium: “Growing Faster Together” held on July 26, 2005, at which regional school district administrators (superintendents, deputy/assistant superintendents, curriculum directors, etc.), along with representatives from state and community agencies, explored how Central Texas’ changing economy will impact the region’s education needs, given the region’s likely economic direction, and what school districts can do now to prepare today’s youth for tomorrow’s economic realities. Breakout sessions at this colloquium addressed the issues of *high school redesign* (its role in our region’s education system), *educator professional development* (how to empower educators to prepare students for the changing economy), and *student transitions* (elementary to middle to high school to college to work).

The dialogue around public education—often partisan and contentious—regularly excludes or disregards the opinions and ideas of actual educators. The Colloquium was therefore designed to seek the input of educators as a means of reframing the dialogue. As a follow-up to the Colloquium and as a way to give agency to the ideas expressed by educators, Skillpoint agreed to author a paper based on analysis of the breakout sessions and to distribute it to education, business, and community stakeholders. This document is the result.

The ideas and analyses that follow are intended to reflect key issues confronting Central Texas educators and school districts as discussed at the Educator Colloquium. The research literature cited in the endnotes and appendices is intended to add context to the colloquium participants’ discussion—to bring the national- and state-level dialogue about school reform, high school redesign, and similar issues within the framework of Central Texas schools and their communities. While Skillpoint Alliance supports Central Texas independent school districts (ISD’s) and educational institutions in meeting their goals and objectives for student success, Skillpoint Alliance does not endorse or support any specific high school redesign or school reform model or product. This document seeks only to provide the Central Texas community with a chance to gain insight into the concerns, questions, and ideas of Central Texas educators as they grapple with the multiple challenges facing them in the current educational landscape.

What follows is a summary of the key themes arising from the breakout sessions, followed by a discussion of these themes informed by the research literature, which is referenced in the bibliography and end notes. Background information about the about the current landscape of education in Central Texas is provided to introduce and frame the discussion. A conclusions section spells out steps that can be taken to bring about change. Appendices provide additional information about Skillpoint Alliance, the Educator Colloquium, and the ideas broached in the Colloquium.

Skillpoint Alliance hopes that this paper can help to promote further discussion and action towards changing Central Texas schools so that they prepare our young people for productive and meaningful lives in the 21st century.

If you would like to discuss the ideas put forward in this paper and/or work with Skillpoint Alliance and its partners to help transform Central Texas education, please contact us:

Phone: (512) 323-6773

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Key Themes from the Educator Colloquium

The following themes were drawn from the comments of Educator Colloquium participants and developed from the research literature:

- ❖ **The current industrial model of schooling is outmoded and needs to be changed.**
 - ◆ Education needs to transition from a model developed for the industrial age to a model better suited to the demands of the information age.
 - ◆ While it is unclear what the postindustrial model should look like, there is beginning to be some general agreement around a number of key ideas, e.g., that students should acquire a range of skills, such as problem solving and working cooperatively, that go beyond the basic skills emphasized in the current paradigm.
 - ◆ As it embraces most of these ideas, the high school redesign movement offers the promise of wide-scale high school reform, if not general education reform.
- ❖ **There is a lack of information provided to educators about the worlds of work and continuing education.**
 - ◆ To remedy the disconnect between K-12 education and the “real world” demands on students after graduation, educators feel that there is a need for productive, peer-to-peer dialogue between education and industry.
 - ◆ Because career and technology education, a component of K-12 education, already has robust connections to business and to higher education, this approach should be included in all educational tracks.
- ❖ **There is a lack of real communication among stakeholders about education reform.**
 - ◆ Central Texas educators feel isolated from the current dialogue regarding the interconnections between public education, postsecondary education, workforce development, and economic development, and as a result desire a stronger, more systemic approach to communicating with these other stakeholders.

The following suggestions to effect change in Central Texas public education are offered:

- ❖ To provide students with the skills they need in the 21st century, change in school districts should include not only the content of instruction but also the way in which instruction is delivered.
 - ◆ Schools should be empowered to offer diverse curricula, with more career exploration options in high school and a variety of education and workforce experiences prior to graduation.
 - ◆ Innovative professional development opportunities should be provided to teachers, emphasizing ways to teach communication, problem-solving, and “applications of learning” techniques.
 - ◆ Businesses and outside organizations should work with school districts to foster greater relevancy in classroom instruction.

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- ◆ All stakeholders in the public education system need to begin thinking of education as continuing after high school through college (PK-16) and beyond (lifelong learning).
- ❖ Industry and education need to work together to provide educators with regular information about economic and workforce trends and to help ensure that curriculum and instruction are aligned with real-world conditions.
- ❖ Intermediary organizations need to expand their efforts to convene stakeholders and to assist in leveraging community resources towards school redesign efforts.
- ❖ All stakeholders—including K-12 and postsecondary educators, business and industry leaders, legislators, parents, and community members—need to work together to help bring about the changes needed in schools to prepare students to succeed in the 21st century.

Background

Current Landscape of Education in Central Texas

Public education in the U.S. is under constant scrutiny. Schools have the nearly impossible task of educating an increasingly diverse student body in the context of an ever-evolving economy, all the while saddled with the responsibility of promoting a more egalitarian society. Despite decades of education reform, ethnic minorities and low-income students still struggle to overcome barriers in the transitions from secondary education to postsecondary life.

Central Texas schools are no exception; in fact, school districts in the Austin metropolitan area are currently experiencing a particularly challenging reality. According to the U.S. Bureau of the Census, between 1990 and 2000, the Austin metropolitan area experienced 48% population growth. During the same period, the share of Austin's Hispanic population increased from around 20% to more than 26%.¹ The Austin Independent School District (AISD), the largest school district in the area, reports that of its nearly 80,000 students, 23% have limited English proficiency, and 59% qualify as economically disadvantaged.²

Add to these demographic realities the pressure from state and federal governments for schools to perform with little or no extra funding. Texas government historically has been a leader in accountability initiatives, and yet the latest state legislative session ended with no additional revenue injected into statewide public education funding.

With the implementation of the federal No Child Left Behind (NCLB) Act of 2002, schools are now more focused on achievement tests than ever before. Test scores and attrition rates show continued

disparities between White and African American and Hispanic students, and between economically advantaged students and disadvantaged students. Unless these disparities are overcome, Texas schools face the threat of losing federal funding for poor performance.

The result of these combined realities is simple: *Less money + more special-needs students = impaired improvement.*

The Achievement Gap Problem

Since the Civil Rights Movement, the disparities between the academic achievement of White students and African American and Hispanic students, and between economically advantaged and disadvantaged students, have been on the national agenda. Desegregation of schools ended “separate but equal” as an acceptable practice for public schools, but the result in many cities has been a self-selected segregation of schools by wealthier families rushing to the suburbs, creating a “separate and unequal” situation.

Attrition and dropout rates are key benchmarks by which the performance of schools is often judged. One glaring indication that schools have not succeeded in closing the gaps for minorities and low-income students is that dropout rates for those students are consistently higher than for their White and higher-income counterparts.

In Texas, the disparity in dropout rates is demonstrated most tellingly by the “Longitudinal Completion/Student Status Rate” indicator calculated by the Texas Education Agency (TEA). This statistic represents the percentage of a particular cohort of 9th-grade students who graduate from high school 4 years later. Although completion rates have increased over time,

there is still a significant disparity between ethnic majority and minority students, as well as between economically advantaged and disadvantaged students.

For example, in 2003-04, Round Rock ISD (the second-largest district in Central Texas) reported that while 92% of its White students graduated high school in 4 years, only 87% of African Americans and 77% of Hispanic students did so. Additionally, only 74% of economically disadvantaged students and 46% of limited-English-proficient (LEP) students graduated in 4 years. These numbers are consistent, varying from 3% to 5%, across many districts in Central Texas.³

Growing Together...or Just Growing?

The broader context of the Austin area's economy adds even more urgency to the task of Central Texas schools. Job growth has succeeded in keeping pace with the explosive population growth the Austin area has experienced in recent decades, the recent "tech bust" notwithstanding. However, projected population growth shows the five-county Austin Metropolitan Statistical Area (MSA) more than doubling in size from around 1,250,000 in 2000 to more than 3,000,000 in 2035.⁴

Arguably, schools are not responsible just for training workers. But schools are undeniably where students acquire many of the skills necessary for them to participate fully in society. As Carnevale and Desrochers (2003) state in *Standards for What: The Economic Roots of K-16 Reform*:

The inescapable reality is that ours is a society based on individual economic autonomy. Those who are not equipped with the knowledge and skills necessary to get, and keep, good jobs are denied full social inclusion and tend to drop out of the mainstream culture, polity, and economy. (p. viii)

Closing the gaps created by entrenched inequality—in housing, in schools, in economic opportunity, and in employment—is the job of all of our public institutions, not just schools. But if schools, with the help of industry and community members, can really begin to make a difference in narrowing the disparities, will real change be effected in economic opportunity and employment as a result? Schools have been the default institution through which the public intends to spark movement toward more equality. If schools alone have this mission, then schools alone stand to fail. Put differently:

[I]f the standards reform movement cannot fulfill its economic mission to help youth and adults become successful workers, it also will fail in its cultural and political missions to create good neighbors and good citizens. (Carnevale & Desrochers, 2003, p. viii)

High School Redesign

Public education continues to make significant changes through reform in hopes that one day it will find a solution that leads to real progress. The latest reform effort to sweep the nation has the potential to be the most large-scale effort in decades: high school redesign. Central Texas school districts have joined in this effort. AISD, with the help of the Bill & Melinda Gates Foundation, has embarked on a systemwide process for redesigning all of its high schools. Del Valle ISD has received a TEA grant under the Comprehensive School Reform—Texas High School Initiative to address identified needs including curriculum, technology, and professional development.

At this crucial time in the life of Central Texas, the active participation of regional leaders, industry executives, university administrators, and especially community members, is now more necessary than ever. How we work together to make things happen for our schools and our communities is the critical issue.

Introduction

Origin of the 2005 Educator Colloquium

The 2005 Educator Colloquium, which is the basis for this paper, is an outgrowth of Skillpoint Alliance’s commitment to building a strong workforce for the Central Texas community (see Appendix 1). Because an essential component of this workforce is the youth of our community, Skillpoint has for many years concerned itself with education and educators in Central Texas.

In the equation that results in community prosperity (see sidebar – “The Community Prosperity Equation”), **the critical role that**

public education plays cannot be overstated. Community prosperity in a geographic region such as Central Texas includes variables such as forward-thinking economic development strategies, robust workforce development processes, and a world-class education system. Through its extensive contacts with industry, Skillpoint has observed that employers of all sizes—be they large high tech manufacturers such as Freescale Semiconductor, or micro-sized video game studios like Ninjaneering—understand that their ability to be economically successful is tied directly to the education and workforce systems that produce their greatest single business assets: their employees.

The Community Prosperity Equation

The “community prosperity equation” is a way of understanding the interdependencies of various community stakeholders concerned with a community’s economic, social, and cultural growth. Simply stated, the equation is:

$$\text{EDUCATION} + \text{WORKFORCE} + \text{ECONOMIC DEVELOPMENT} = \text{COMMUNITY PROSPERITY}$$

The role of education in this equation is primary; in fact, it can be argued that it is the genesis of community prosperity.

This equation arises from Skillpoint’s decade-long efforts to build a sustainable workforce development system in Central Texas, adopting the principles of Strategic Intermediary Functions as defined by New Ways To Work and the Intermediary Network.⁵ One of these key functions, “Convening Local Leadership,” has afforded Skillpoint Alliance the opportunity to explore the dynamics of robust industry-education partnerships, and it is through this work that Skillpoint has come to understand community prosperity as a function of education systems, workforce systems, and strategic economic development initiatives.

For the community prosperity equation to work, and for a community to make better long-term plans, the community must identify ways to maximize interactions among all the stakeholders, and stakeholders must engage in ongoing, peer-to-peer dialogue with the objective of reaching common ground. For example, when education understands the workforce knowledge and skills needed by the business community, schools can strive to instill the necessary knowledge and skills in their graduates. Conversely, when business understands the administrative, financial, and regulatory boundaries within which schools must operate, businesses can leverage resources to assist schools in achieving their goals within those constraints. Put simply, when all stakeholders place their cards on the table, the direction of the game is plain to everyone.

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Of course, innumerable other factors exist that impact the prosperity of a geographic region, including government policies, available natural resources, climate, and the social and cultural history of the region. Yet, in those communities where robust, dynamic communication among the *education systems* (primary, secondary, and postsecondary), *workforce development systems* (skills and job training, workforce preparedness programs, and community-level recareering initiatives), and *economic development organizations* (chambers of commerce, local and state organizations) occurs, coordinated through an intermediary organization, there is a tendency for that community to be poised for future success and growth, in economic, as well as in sociocultural, terms.⁶

No one element of this equation takes primacy over another, as each is dependent upon the others for both inputs and outputs. When all three of these components connect—and function—within a community, the seeds for community prosperity are likely to be sown across all parts of the community. As such, the creation and maintenance of true peer-to-peer dialogue between these stakeholders is critical to creating an environment in which a community may prosper.

Over the years, Skillpoint has developed strong partnerships with the independent school districts (ISD's) in Central Texas. Through its association with the ISD's, Skillpoint has noted that teachers of all stripes are the often vital cogs in the region's economic engine. Teachers who nurture our Central Texas youth in the public schools literally sow the seeds of our region's future business, technology, and public sector leaders, teaching the basics of mathematics, science, technology, and communication skills that will enable our children to become the drivers of Central Texas' 21st century. In a very tangible way, public school teachers, and the administrators who support them, directly shape the future prosperity of the entire Central Texas region.

Skillpoint's ever-expanding relationships with Central Texas ISD's have enabled the organization to gain a unique perspective regarding the circumstances in which Central Texas educators find themselves operating. One of its key attainments has been gaining clarity about the challenges Central Texas ISD's face in trying to prepare students for success in college and careers after they exit grade 12.

This understanding has led Skillpoint to engage in a variety of initiatives that aim to explore and address the issues confronting the ISD's. One of these is the High School Graduate Data Center, launched in 2005. A second initiative is the

Quality Educator Development (QED) program. Both initiatives are described in Appendix 1). Part of the QED program, which stemmed from Skillpoint's long-term partnerships with Central Texas ISD's, is the Educator Colloquium, from which this paper derives.

The idea for the colloquium developed from several suggestions by educators, beginning in the late '90's and early '00's, **to create a forum where educators are encouraged to discuss key issues inhibiting education institutions from achieving their goals** in the Central Texas region. Such a forum is a rare, if not unique, occurrence for educators who are more accustomed to hearing prescriptions for reforming education coming from outside their field. Skillpoint conceived of this forum as a complement to the series of successful Greater Austin@Work Summits held in 1999, 2001, and 2003. These summits were regional, industry-led forums in which Central Texas businesses articulated their views about workforce development, education, and their future workforce training needs. While the Greater Austin@Work summits provided the Central Texas community with fundamental insights into the workforce hurdles that schools, postsecondary institutions, and skills training providers must overcome in producing Central Texas' next-generation workforce, they did not, due to their industry-led design, enable Central Texas education entities to engage as peers in the

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conversation, despite their inclusion in the business forums. Skillpoint’s Educator Colloquium was intended to continue these communitywide conversations and to elevate the “voice” of Central Texas education to the level of Central Texas business.

Structure of the Educator Colloquium

Skillpoint’s Educator Colloquium was designed to present an insider’s look into the direction the Central Texas economy will take over the next decade and an opportunity for education leaders to ponder the ways in which the region’s education entities—elementary, secondary, and postsecondary—would need to change in order to continue preparing Central Texas citizens for success in the region’s future economy.

The Educator Colloquium consisted of two primary sections: a *regional economic and workforce forecast* prepared by Angelou Economics, a highly respected economics firm based in Austin; and three *breakout sessions* where key issues that are barriers to student success in the 21st century would be discussed through the lens of the Angelou Economics forecast.

The three breakout sessions were:

- Educator/Staff Professional Development (PD),
- Successful Student Transitions, and
- High School Redesign.

Participants also heard a presentation of a *model professional development system* by an administrator from Round Rock ISD.

Prior to the Colloquium, by way of advanced readings, participants were furnished with three reports relevant to the purpose of the Colloquium that would help inform the discussion in the breakout sessions. The three reports (summarized in Appendix 2) were:

- *Grow Faster Together: Or Grow Slowly Apart;*
- *Crisis or Possibility? Conversations About the American High School;* and
- *Standards for What? The Economic Roots of K-16 Reform*

Angelou Economics’ Forecast for Central Texas

Chris Engle, Vice President and Senior Analyst for Angelou Economics, prepared an extensive and broad-ranging analysis of what is in store for the Central Texas economy in the next decade.

In his presentation to the colloquium attendees entitled “The Future of the Austin Economy and its Workforce,” Engle discussed a variety of topics germane to the region’s economic direction, including the following:

- Major drivers in the overall U.S. economy, including gross domestic product (GDP) trends, unemployment rate, energy prices, housing starts/market, defense spending, and the trade deficit;
- The relationship between these macroeconomic drivers and regional economic drivers, including regional job growth trends, venture capital funding, job creation forecasts, and the region’s current and emerging economic assets;
- Industry sectors expected to expand over the next decade;
- Fast-growth occupations and their changing education requirements; and
- Target industry sectors toward which Austin and Central Texas leaders should focus their economic development, workforce development, and educational efforts.

Key findings in the Angelou Economics report included the following:

- ◆ **Although education demands are increasing for all entry-level jobs and careers in traditional industry sectors, the majority of new jobs will be in the service industry and will require an associate’s degree.**
- ◆ **Schools that offer diverse curricula, with more career exploration options in high school and a variety of education and workforce experiences prior to graduation, will best prepare students for Central Texas’ future economic realities.**
- ◆ **Lifelong education is critical.** Central Texas’ current and emerging industry sectors will continue to change rapidly, **demanding an adaptable workforce that** may not be skilled in any one particular area, **but is capable of moving from one industry sector to another** with minimal retraining or education.
- ◆ **Entrepreneurial enterprises will create the greatest amount of wealth,** not factory or manufacturing jobs. Thus, **students who graduate with entrepreneurial experiences and problem-solving skills are more likely to achieve success** in Central Texas over the next decade.

In his closing remarks, Engle asked the colloquium participants to consider whether their ISD’s, administrators, boards of trustees, and parents understand how close the relationship is between a region’s economic success and its education system. He quoted Carly Fiorina, former CEO of Hewlett Packard, to make his point: “Keep your tax incentives and your highway interchanges; we will go where the highly-skilled people are.” He closed by encouraging the participants to consider how they might engage their learning communities and peers in discussing these important issues, in order to better prepare today’s youth for success in Central Texas over the next decade.

Breakout Sessions

Upon the completion of the Angelou Economics forecast, the Educator Colloquium participants were asked to choose one of three breakout sessions for further discussion. These breakouts comprised the following topics:

- *Educator/ staff professional development (PD):* In light of the Angelou Economics presentation, what issues need to be addressed to empower educators to prepare students for the information-driven economy?
- *Successful student transitions:* What are the challenges to preparing students for the information-driven economy outlined by Angelou Economics as those students move from primary to secondary to postsecondary education?
- *High school redesign:* Given Central Texas’ likely economic direction, what role can/should the high school redesign movement and the push for “21st-century skills” play in our region’s education system?

The three breakouts were facilitated by Region XIII Education Service Center staff and Skillpoint Alliance staff, using the following method to organize participant discussion:

- *Observation*—“What did you hear?”
- *Reaction*—“How did that make you feel?”
- *Implications*—“What does this mean for the issue at hand?”
- *Decisions*—“What are the next steps or suggestions for progress?”

The facilitators documented participants’ comments and provided the results to Skillpoint Alliance. *An analysis of participant comments, coupled with information from the research literature reflecting educational trends and issues from a national context, is the substance of this paper.*

The More Things Change...What Educators Said

An Outdated Model of Schooling

During the breakout session titled, “High School Redesign,” Skillpoint posed the following question to participants and asked them to approach the question through the lens of the Angelou Economics presentation:

Given Central Texas’ likely economic direction, what role can/should the high school redesign movement and the push for “21st-century skills” play in our region’s education system?

Reacting to information about the economic direction of the region, Central Texas educators made observations pointing to a belief that **the current education system simply is not meeting the needs of students today and, based on the Angelou Economics forecast, will not meet the needs of students in the future.**

These educators felt that the mission of high schools was “confused” or “frustrated” in light of the career and employment opportunities after high school and college. Much of the curriculum currently in place at the high school level lacks a direct connection to the world of work or to continuing education—the key issue of relevance. Because of this disconnect between the curriculum and student options after public education, the educators’ comments suggested, in fact, that **the model on which high school is premised is outmoded.**

In addition, educators observed that the dearth of emphasis on teamwork and communication skills—throughout the curriculum—served to distance the high school education experience further from the demands students would encounter after they leave the education system. One participant noted that, even among the lowest-paying

service jobs that will be available over the next 10 years in Central Texas, “two of the key skills are teamwork and communication.”

Others in the group also noted this discrepancy, contributing to the overall feeling among the participants that **high school as it is currently configured is not effective in preparing students for life after high school.**

The implications of these issues on the question at hand—how can the high school redesign movement be leveraged to prepare students better for future success?—seemed to revolve around a desire among these Central Texas educators to change the prevailing mindset in the community about the scope of education. There was a great interest among the participants in driving a rethinking of the entire education system, beginning with parents and current educators, to change the paradigm that regards the education system in Central Texas as composed only of grades K-12. “We should be thinking pre-K through 16,” one educator stated, while another suggested that “in Central Texas, there needs to be greater discussion on building sustainable communities, which will lead to system change” in the education system. Also needed are “meaningful partnerships with industry in the community,” the educator continued. There was a specific request from one participant to make the goal of high school redesign be “to change the mindset with help from government and business.”

The consensus was that this paradigm shift was crucial to the success of the high school redesign movement in Central Texas, but that educators could not be left alone to change the paradigm; they want and need help at a policy level from legislators and direct and indirect community support from business leaders.

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One aspect of this breakout that was somewhat unexpected was the absence of a call for significant funding increases in order to address the disconnect between what the “real world” needs and what high school offers students. Although the issue of funding came up, there was no consensus that bringing additional resources to bear—either through building more schools or buying more instructional equipment—would, by itself, begin to address these issues. Instead, there seemed to be a strong desire to “quit throwing good money after bad,” i.e., to discontinue funding a model of public education that all the participants felt was no longer relevant to the world in which its students live. The participants appeared to believe that leadership among the legislative and business communities would be the lynchpin that ensured the success of the high school redesign movement.

Lack of Information Provided to Educators About the Worlds of Work and Continuing Education

As touched on in the High School Redesign breakout session, the Educator Professional Development breakout arrived at the suggestion that, if the Central Texas education system were truly to become responsive to the future needs of students in the region’s economy, **stronger “peer to peer” relationships would need to be established between the education system and industry, on the one level, and between individual educators and industry professionals on a more granular level.**

The key question put before the Educator Professional Development breakout group was:

In light of the Angelou Economics presentation, what issues need to be addressed to empower educators to prepare students for the future economy?

One educator’s reaction to the information presented in the Angelou Economics forecast was visceral: “[There’s a] huge gap between the core curriculum and what is needed by all students in a class!” This declaration drew much agreement. One participant observed that “the textbook doesn’t provide the problem-solving” needed for the development of the key skills of communication and analysis that would be in greatest demand by all employers in the future economy. When prompted to connect these observations to the current state of educator professional development, suggestions included the following:

- Teachers at all experience levels desire industry mentorships or partnerships.
- Teachers voiced a need for ongoing guidance on how best to apply key concepts covered in the text books to “real-world” circumstances.
- There is a strong need for smaller classes in order to conduct more applied or hands-on learning activities. The educators emphasized that the dynamic for problem-based learning cannot occur when class sizes number above 20 students.
- Strong principals are more effective at changing teacher attitudes about professional development than district- or government-level initiatives.

Yet perhaps the most telling comment was made by an elementary educator:

*All I know is **school**. I went through school and then went straight to work in a school. We don’t know what businesses and other workplaces are like!*

Nearly all the participants expressed their agreement with this remark and, from this point on, the conversation turned to ways in

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which to change the educator culture to encourage teachers to be more engaged in learning about the practical applications of what they teach. The themes of rigor and relevance continuously arose during the conversation, resulting in a consensus that stronger peer-to-peer relationships at the system level between education and business, and at the individual level between industry professionals and classroom educators, was likely the best way in which to initiate change within Central Texas' educator professional development systems.

One aspect of the Angelou Economics report that caused significant pause for this breakout group was the collection of statistics indicating that the greatest number of new jobs that will appear in Central Texas over the next 10 years would require not a bachelor's degree but an associate's degree. While the entire colloquium population seemed startled by this forecast, the Educator Professional Development breakout participants seemed most intrigued by the implications of this information. Many of the participants felt a strong disconnect existed between the messages inherent in the high-stakes assessment environment and statewide college-enrollment campaigns, and the fact that associate's degrees are often a key stepping stone to student success in postsecondary education. "Many teachers just aren't aware that an associate's degree is what many employers need"; instead they indicate that the emphasis from administration is placed exclusively on preparing students to pass high-stakes testing and to pursue a higher level of education. The participants further indicated that this message begins at the middle school level, if not in the last two grades of elementary education. If the message were to change, it would need to begin with a concerted effort among middle school educators through mentoring or exposure experiences that encourage bringing more "real world" applications into core academic instruction. In fact, many of the

participants felt that if more of the emphasis in educator professional development systems were placed on making connections to industry and to providing teachers with more resources to bring relevance into the classroom, a great hurdle would be overcome in preparing students for success in the 21st century in Central Texas.

This breakout group made some specific recommendations to Skillpoint, and asked Skillpoint to convey them throughout the Central Texas region for consideration by all the ISD's and education institutions:

1. Professional development models should emphasize ways to teach communication, problem-solving, and "applications of learning" techniques.
2. ISD's should work with outside organizations and businesses to bring relevance-focused staff development to the campus.
3. ISD's should provide ongoing support for staff development that creates an environment encouraging industry mentorships and support for relevancy-centered professional development during the academic calendar.
4. ISD's should take the lead in establishing fruitful connections with community businesses and industry to encourage greater relevancy in classroom instruction.

Lack of Substantive Communication Among Stakeholders About Education Reform

The breakout entitled "Student Transitions" was asked to explore the following question in light of the Angelou Economics forecast:

What are the challenges to preparing students for the information-driven economy as those students move from primary to secondary to postsecondary education?

This question proposed analyzing the way in which students transition from one education level to the next and offering ideas and suggestions for addressing barriers to student progress as they move through the education continuum in Central Texas.

Immediate observations regarding this topic and the Angelou Economics forecast revolved around the implication in that report that while a greater number of actual jobs in the future will require only an associate's degree, the higher-paying jobs—of which there will still be some growth but not as much—continue to require a higher level of education attainment. Incumbent in this trend is a sense that the level of raw knowledge needed to be successful with a bachelor's or higher degree in the future would require students to pursue lifelong learning; the Angelou Economics forecast suggests that the quantum leaps in technology today will only continue to accelerate, demanding a greater breadth **and** depth of knowledge among the whole of future professionals and business employees.

The implication of this prediction for the student transitions question is that all three of the elements in the community prosperity equation (education, workforce development, and economic development—see sidebar “The Community Prosperity Equation”) must now work in greater concert if the Central Texas education system is to be successful in creating citizens who will drive tomorrow's economy.

To this point, one educator remarked that, were the public education system in Central Texas to continue successfully with its current strategy of preparing students for high-stakes testing and for college afterwards,⁷ the Angelou Economics forecast suggests there

might not be enough degree-appropriate jobs for those who achieve a 4-year degree: “If everyone goes to college, then they all won't get jobs based on that report!”

Nearly all of the participants in the Student Transitions breakout indicated that the lack of effective communication initiatives and strategies—be they economic forecasts such as provided by Angelou Economics or open, proactive lines of dialogue between groups of educators and industry leaders—will continue to limit the education system's success in preparing students for success in the 21st century.

One omission of the Angelou Economics forecast that was evident to all the colloquium participants, but to the Student Transitions breakout participants in particular, was its failure to address the linkages between emerging populations in Central Texas (i.e., immigrants and first-generation citizens) and their role in driving the region's economic development. This linkage becomes relevant in conjunction with the anticipated rapid growth in the service jobs sector, for which the emerging populations are likely to supply the workforce.

Participants noted a lack of business input to schools on the skills needed for success in this sector that acknowledged future employees' cultural backgrounds. The participating educators also noted a lack of input from industry regarding its needs or desire to ensure diversity throughout the workforce. It was not clear to these breakout participants that Central Texas employers were concerned about the changing demographics of the Central Texas workforce pool, nor that employers were engaged in supporting education or economic development initiatives designed to facilitate the engagement of emerging populations in a way that would ensure these populations' roles in the future prosperity of the Central Texas community.

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Also resonant with this group was the suggestion by one educator to “**develop a common vision** [for the Central Texas education system] **with all stakeholders.**” The participants wanted to see not just average industry representatives involved in this effort—the community affairs professionals that work at most major companies—but the “heavy hitters” in the Central Texas business community. They felt that these business leaders should leverage their leadership abilities “to be the mouthpiece for change” in the region’s education system, with a view towards affecting education policy change and the community’s mindset towards education **in tandem** with advocates from the education and legislative sectors.

The consensus was that until leaders in business, education, higher education, and government begin to develop a common vision and work together, the prospect of truly preparing Central Texas youth for success in college and careers after high school remains just that: a prospect.

Addressing Educators’ Concerns for the Future of Central Texas Education

Need for a New Model of Schooling

The perception by Colloquium participants of a lack of connection between high school education and the demands on students in the workplace or in continuing education is at the heart of a profound issue, namely, that, in the view of many educators and others, **our current model of schooling is outmoded and needs radical change.** This issue is best understood by an examination of the historical and economic roots of the current model of schooling. For interested readers, an extended exploration of this topic is presented in Appendix 3. The key points are summarized here.

expanded beyond the mastery of basic reading and mathematics skills to include so-called “soft skills,” such as problem-solving and interpersonal skills, that supplement the more narrow occupational skills sought in the industrial economy. As a result, there is a mismatch between the jobs and careers of the new economy and the high school curricula and pedagogy based on the old model.

Need to Transition to the Information Age

Hence, it is time for **a new model of schooling that will help us make the transition** from the industrial age to the

Industrial Model No Longer Suitable

In essence, the predominant model of schooling in the United States (and other industrialized nations) today was developed during the early part of the 20th century to educate the masses for work in the industrial era. Various terms like the “factory model” and the “industrial model,” the model functions in the same way as an assembly line—moving the product (students) from grade to grade through a preplanned sequence of learning, sorting them by performance, and either certifying or rejecting the final product (graduate or dropout).

“The nations’ old industrial model of schooling is collapsing as economies shift further from their manufacturing base to economies that essentially need thinkers as well as doers.”

J. Abbott, “Education 2000: Creating Modern Learning Communities”

information age. We need to replace the current educational system with a system designed for

the kind of world in which we live today, a world with:

- A global information community;
- An escalating pace of change;
- Rapidly changing technology;
- A growing, more diverse population; and
- An economy in which most low-skill jobs (which used to absorb dropouts) no longer exist.

While this model has been very successful in producing workers suited for work in a manufacturing-based economy, the 21st-century American economy is shifting to a largely service and information-based orientation. As such, the kinds of education and skills required for success in this economy have shifted. Skill requirements have

In the face of these social, technological, and economic changes, the traditional model of schooling cannot serve the expanding needs of the increasingly diverse U.S. population.

“No Child Left Behind” Not Designed to Address These Changes

The need to transition to a model of schooling consistent with the education demands of the information age is at variance with the education reform exemplified by the “No Child Left Behind” (NCLB) Act of 2002. While NCLB is laudable as an instrument for ensuring that the minority and low-income students who, in the past, were often shunted aside by the educational “assembly line,” it is not clear that NCLB prescribes the radical changes necessary to remake education for the 21st century.

Possible Components of a New Model

What a knowledge age, or postindustrial, model should look like is not entirely clear, but there is beginning to be some general agreement around a number of key ideas:

- Student acquisition of a range of skills beyond basic skills;
- Smaller learning communities;
- Continuity in the learning experience;
- Interdisciplinary curriculum;
- Academic and personal success for every individual;
- Assessment as a tool for guiding progress;
- “Real world” learning;
- Lifelong learning; and
- The use of technology.

Each of these ideas is elaborated in Appendix 3. Some other ideas that are worthy of consideration in developing a knowledge-age paradigm, but which seem to be less commonly accepted, are:

- Using current research on how the brain functions to devise new learning environments consistent with our biological and evolutionary predispositions;⁸
- Building electronic learning webs— instructional systems to support the development of independent, self-directed, lifelong learners;⁹ and
- Alternative schooling options, such as home schooling and charter schools.

Each of these ideas moves outside the existing paradigm of pupils/teachers/schools as the only structure in which meaningful learning can occur.¹⁰

High School Redesign Offers Promise

The high school redesign movement, which is occurring in many urban, and even suburban, school districts, embraces most of the more generally accepted ideas and, thus, offers the promise of wide-scale high school reform, if not general education reform. Evaluations of comprehensive high schools converted to smaller schools through funds supplied by the Bill & Melinda Gates Foundation indicate that the kinds of effective schools it wants to see can be created; that more of the student-initiated, real world-based, in-depth learning it wants to promote is evident in the converted high schools than in conventional high schools; and that students in these schools have more positive educational attitudes. Hence, while there are a number of issues that continue to challenge these schools, there is evidence that remaking the comprehensive high school can promote effective reform.

Need for Productive, “Peer-to-Peer” Dialogue Between Education and Industry

Disconnect Between School and Expectations for After Graduation

There is a **disconnect between what schools convey to students to prepare them for success after K-12 education and the expectations of the “real world” after they graduate.**

This disconnect is highlighted by reports of the extent to which high school graduates are unprepared for the rigors of college academic work. According to a 2005 report from ACT, hundreds of thousands of 2005 college-bound high school graduates are not prepared enough academically to succeed in college.¹¹ The ACT report warned that only about half of 2005 high school graduates have the reading skills they need to succeed in college, and even fewer are prepared for college-level science and math courses. The report highlighted other worrisome trends as well, including a continuing decline in the percentage of students planning to major in engineering, computer science, and education.¹²

The disconnect between schools and the “real world” is also evidenced in the historical separation between career and technical education (CTE), formerly known as vocational education, and core academics. This separation is best understood by an examination of the history of vocational education (see sidebar – “History of Vocational Education in the U.S.”), but the essential point is that until the mid-1990’s, there were critical differences in American high schools between “regular” and “voc ed.” These differences were seen in the underlying rationale, the nature and types of the programs being offered, and the students to whom programs were being targeted.

History of Vocational Education in the U.S.

(Abstracted from *High School Career and Technical Education for the First Decade of the 21st Century* by R. L. Lynch, University of Georgia)

Vocational education has a long and rich history in American public secondary schools, largely due to federal legislation and funding.¹³ The beginning of the major federal influences in molding and shaping secondary vocational education began with the Smith-Hughes Act of 1917. This legislation was in response to a complex set of social, economic, and political forces but was enacted especially to prepare youth for jobs resulting from the industrial revolution and to provide them with an alternative to the general curriculum of schools which was “too exclusively literary in spirit, scope, and methods.”¹⁴ The Smith-Hughes Act emphasized separatism from the classical curriculum and called for a new one that would better meet the needs of the children of the working class who, for the first time, were attending high school but were not headed into the professions. Thus, the earliest vocational programs were grounded primarily in the need to prepare more blue-collar-type students with practical skills for the nation’s farms, factories, and homes. *Emphasis in the federal legislation has shifted somewhat over the years, but the general thrust of federal policy and funding at*

A “new” career and technical education is integral to reform of the American high school. ... [CTE] is integral to whole school, comprehensive reform; it is not separate from it.

R. Lynch, “High School Career and Technical Education for the First Decade of the 21st Century,” 2000

*the high school level—throughout the past 80+ years—has remained largely to train boys and girls for jobs in the economy.*¹⁵

Enrollments in high school vocational education increased unabated until the

early 1980s, but declined steeply over the 12 years between 1982 and 1994. There are many reasons for the steep decline, including:

(a) programs were not seen as meeting the needs of students, employers, and the community;

(b) vocational education competed against other curriculum programs—especially college prep programs—for a shrinking student

population;

(c) vocational education suffered from an image of a dumbed-down curriculum;

(d) programs were often targeted primarily to educationally disadvantaged students;

(e) confusion with school-to-work programs, which became unpopular with many critics of education;

(f) an elitist view of any formal context of education for work as inappropriate for students aspiring to a four-year college or university; and

(g) a general perception that vocational education will inhibit rather than enhance students' future career and educational choices.

Whether in response to declining enrollments, a poor image, or increased pressure from such relevant stakeholders as business and policy groups, around 1990 and on into the last decade of the 20th century, some of vocational education in American high schools seemed to change.¹⁶ *Among other changes, one of the most relevant seemed to be to prepare students concentrating in a vocational education curriculum concomitantly for employment and higher education.* Today, U.S. high school vocational education, more recently career and technical education (CTE), seems to be at a crossroads, driven by four forces:

- (1) the new economy,
- (2) public expectations for schools,
- (3) new research on student learning and motivation, and
- (4) high school reform.

Four themes about needed reform in CTE in the 21st century have been consistently discussed by educators, business persons, and policy groups:

- (1) infuse career planning throughout the entire curriculum, from pre-K through lifelong learning;
- (2) ground career and technical programs in high school reform;
- (3) improve and upgrade vocational education into a new and improved career and technical education; and
- (4) prepare high school graduates both for workplaces and continuing education.

Whereas vocational education was intended to prepare students to acquire an education and job skills, enabling them to enter employment immediately upon high school graduation, general education viewed its mission as broader: to help students aspire to a 4-year college or university and thence into a profession. Vocational education was regarded as the track for the less-academically-oriented students for whom a less rigorous curriculum was acceptable, even appropriate.

With the passage of the School-to-Work Opportunities Act of 1994, however, national attention turned to the systems in place in this country for educating and training people for work, and vocational education, which historically made up the lion's share of such efforts,¹⁷ and which had languished after the early 80's,¹⁸ gained new prominence.

Where, in the past, vocational education had the objectives of providing students with general employability skills and preparing them to enter employment in specific occupations, the goals of vocational education expanded in the succeeding years to include preparing students not only for entry into work but also for career advancement and entry into further education and training. The redesignation of vocational education as CTE is a recognition of this enlarged mandate.¹⁹

In this expectation, i.e., preparing students both for employment and for continuing education, general and vocational education have now converged.²⁰ Vocational education, however, finds itself in the advantageous position of already having a working model for doing so, with both a developed curriculum and pedagogical strategy, especially its robust connection with higher education. However, it is now clear that others besides educators must be involved in this effort and must concern themselves with several key issues:

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- Integration of traditional academics and CTE;
- Increasing the access of special populations—including individuals with handicaps, individuals of limited English proficiency, economically disadvantaged students, incarcerated persons, minorities, and women—to quality education programs;²¹ and
- The academic preparation of CTE teachers.²²

Business and industry leaders can be key players in this effort by helping to assure that both general education and CTE are preparing students with the necessary skills to succeed upon high school graduation, whether they enter the workforce immediately or pursue postsecondary education.

Common Goals, Mutual Understanding Needed for Change

In order for business and industry leaders to become key players in education, they must create stronger lines of communication between themselves and their peers in education. Colloquium participants exhibited surprise at the economic forecast information provided by Angelou Economics. This surprise shows that educators feel that they have been “left out of the loop,” not only about economic trends, but also about anticipated short- and long-term changes in employers’ workforce needs in the different industry sectors.

In the community prosperity equation (see sidebar – “The Community Prosperity Equation” in the Introduction), the role of peer-to-peer communication is at the heart of a community’s ability to establish strategies leading to economic and sociocultural growth. Yet all too often, the three key stakeholders in that equation make decisions impacting the community with little, if any, accurate information from other stakeholders.

Education often appears to make decisions based on an ultimate goal of successfully graduating students; employers often perceive their endgame as maximizing profits through, among other things, controlling labor costs; economic development interests cry victory when a new manufacturing facility brings with it the promise of additional tax dollars and land development.

Lying at the core of these interests is a common goal: community prosperity. It is from this common goal that the industry-education peer relationship must begin, informed by the economic development needs and opportunities of the community. Strong partnerships between industry and education cannot survive if the two parties are entrenched within meeting surface-level objectives, because those measures of success can and often do exist independent of one another. Preparing students to succeed on a test does not guarantee success later in life, nor does a skills-training program micromanaged by industry create an employee prepared for future changes in that industry. Instead, by identifying and pursuing the root equation of community prosperity—in which education’s and industry’s surface-level goals become aligned through dialogue with a higher-level objective—these two parties ultimately will produce new economic development assets, and in turn become the beneficiaries of a balanced equation.

Skillpoint Alliance has, over the last decade, supported the creation and management of peer-to-peer partnerships between industry and education. The Central Texas Technology & Education Executive Council (TEEC) is an example of an industry-education partnership that has evolved over time, expanding and enhancing its mission in reaction to the ever-changing high tech industry climate in Central Texas. Originally called the Austin Area Semiconductor Executive Council, the TEEC formed in the late 90’s in reaction to a paralyzing shortage in

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Central Texas of qualified cleanroom fabrication technicians and operators brought on by the rapid expansion of personal computing and the internet boom. At first, the TEEC consisted of community affairs and training representatives from semiconductor manufacturing companies, and instructors from Austin Community College, and their mission was simple: develop a robust associate's degree program for semiconductor fab operators and technicians. Although the group successfully created a scholarship program and paid for technical instructional equipment for this 2-year program, by the late 1990's few students were applying to and graduating from this program. At that time, Skillpoint, then known as Capital Area Training Foundation, was asked to facilitate meetings with area high schools and the Capital Area Tech Prep consortium to explore developing high school curricula that would prepare students for ACC's Semiconductor Manufacturing Technology program. From these conversations the Accelerated Careers in Electronics (ACE) program for high school students was developed.

Over the next few years, the dialogue between industry and education evolved from a focus on creating programs and projects (including a brand for the Council, Destination: Digital) focused on the short-term workforce needs of the semiconductor industry, to a more balanced exchange of ideas between industry and education. As a result, the Council's vision has expanded; no longer concerned with near-term workforce challenges, the Council works toward synchronizing the converging efforts of education, industry, and area nonprofits which have as a root outcome the growth and prosperity of the high tech sector in Central Texas. It has been through years of active communication that the TEEC's industry, ISD, and postsecondary member organizations have arrived at a long-term vision that aligns the near-term goals education has for increasing graduation rates and test scores with the longer-term goals

industry has for creating the workforce that will enable the high tech sector to grow in Central Texas.

Need for All Stakeholders, at All Levels, to Work Together

We Will All Rise Together or Sink Together

The TEEC may be understood as operating within the basic guidelines of the community prosperity equation: ISD superintendents share information with industry executives and vice versa, and together they agree on strategies to address their shared challenges and goals. However, new variables rising to the surface of this equation as evidenced in the comments of Colloquium participants point to some pressing horizon issues for Central Texas.

A key horizon issue for industry-education partnerships involves **developing new ways of thinking about emerging populations within the Central Texas region**. The role that underserved populations will play in our future economy demands that the special considerations attendant to educating these populations be addressed at all levels of industry-education partnership development. Colloquium participants, the majority of whom are educators, indicated that they are already encountering these coming workforce demographic changes in the form of changing student demographics. The issues they are tackling shine a light on the path that postsecondary institutions, and eventually employers, will travel as Central Texas moves further into the 21st century. The Colloquium participants are eager to find avenues to inclusion and empowerment for minorities, English-language learners, and low SES and developmentally challenged learners. Through dialogue with education, postsecondary institutions and industry will gain insight into how best to invest their

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resources to help prepare these young learners—all of whom will be in the workforce eventually—to engage in education as prelude to their contributing to and reaping the rewards of a prosperous community.

Change Needs Involvement of Business, Education, Higher Education, and Legislature

There are numerous gatekeeper variables within the community prosperity equation, including community cultural politics, adversarial relations between business and government, and lackluster economic policy. Yet, one key factor that Central Texas must address is the **perceived lack of alignment of postsecondary education institutions toward engaging in industry-education partnerships on a peer-to-peer basis.**

While large higher education institutions, such as The University of Texas at Austin, may support a wide range of initiatives both statewide and in the local community, higher education is largely absent in an important way: curriculum alignment with the public pre-K-12 system and with business and industry. It is important to clarify the important—often vital—role that 2-year postsecondary institutions such as community colleges have played to this point in laying the groundwork for a stronger alignment between the public education system, postsecondary education, and workforce needs that drive a thriving economy. Nevertheless, 4-year postsecondary institutions are perceived by many Central Texas educators to be disconnected from this continuum.

A quick perusal of the mission statements of some of Texas's largest 4-year universities reveals a range of commendable priorities but nothing indicating a cooperative role for primary and secondary public education or business and industry to address common issues:

- “achieving excellence” (UT-Austin),²³
- “providing the highest quality... programs” (Texas A&M University),²⁴
- providing “the highest standards of excellence” (Texas Tech University),²⁵
- educating “men and women for worldwide leadership and service” (Baylor University),²⁶ and
- “to identify and respond to cultural, social, and economic challenges in communities of Houston” (University of Houston, values within its mission).²⁷

By contrast, Austin Community College names seven specific types of programs, and the populations they intend to serve, that directly address the need for development of a skilled workforce: vocational and technical programs, continuing adult education courses, special programs to address underprepared students, and contracted programs and services for local employers.²⁸

Based on the comments of the educators participating in the Colloquium, there is a perception that much work remains to be accomplished in aligning the roles of postsecondary institutions with the roles of other stakeholders in the public education system in supporting the community and the economy.

Conclusions

What Skillpoint Alliance is Committed to Doing

Facilitating Communication

Key among Skillpoint Alliance's core competencies is the creation and maintenance of relationships between industry and education (cf. Appendix 1). At the root of these relationships is an emphasis on developing lines of communication between traditionally disconnected sectors of the community, be it between industry and education, the various levels of community governmental entities, or the myriad of community organizations and nonprofits.

Skillpoint Alliance will work to establish strong communication lines between the key stakeholders in the initiatives outlined for school redesign, educator professional development, and addressing barriers to student success in preparing for life after the public education system.

Building Partnerships

The result of strong lines of communication among stakeholders is the development of partnerships. Skillpoint Alliance has served for the last 10 years as a convening agent for Central Texas businesses, organizations, and education institutions that are stakeholders in the region's workforce development and education systems. Skillpoint Alliance's mission includes convening these stakeholders as a means of building active, engaged, and dynamic partnerships to effect change in the region.

Skillpoint Alliance will utilize the strong communication lines it establishes among Central Texas stakeholders to build partnerships among those stakeholders.

Skillpoint Alliance will accomplish this challenge by convening events similar to the Educator Colloquium, and through the development of stakeholder awareness of key issues and challenges facing education as it makes progress towards change.

Creating Opportunities for Lifelong Learning

Skillpoint Alliance has a reputation in the Central Texas community for programming that emphasizes the concept of lifelong learning as a means for individual professional growth and viability in a dynamic economic climate. Whereas the industrial model of education prepared youth for linear, static careers in the industrial, pretechnology economy, the concept of lifelong learning is predicated on the fact that because technology drives innovation at ever-increasing rates, workers must continually add to and expand their knowledge and skills in order to be successful.

Skillpoint Alliance will strive to provide opportunities for Central Texans to engage in lifelong learning and to help community stakeholders to foster an environment that encourages lifelong learning among all Central Texans.

What is Needed from Community Leaders and Other Stakeholders

Commitment to Communication

Stakeholders in Central Texas' future economic prosperity must come to the table prepared to listen and learn. Successful dialogue occurs when organizational agendas are left at the door, and participants make the decision to engage in an open fashion. This open dialogue results in the opportunity to

consider all perspectives, empowering stakeholders to communicate with their constituents at all levels.

Executive-level Commitment for Leadership

Executives set the tone for their organizations. Their engagement and commitment to establishing a peer dialogue with education will manifest itself in stronger, more effective teamwork spanning the cultural gulf between the worlds of business and education.

Financial and Resource Commitment for Longevity

Stakeholders in education, industry, and the community at large must have a longer-term vision, and must make an appropriate commitment of financial and nonfinancial resources to encourage “culture change” in a community’s thinking about education outcomes and expectations. This commitment among stakeholders must be long term as well, because the returns will take a while to manifest themselves, but it will potentially bring a sea change in community prosperity.

Appendix 1 – Skillpoint Alliance: Building a Strong Workforce

Background and Mission

Skillpoint Alliance was created in 1994 as the Capital Area Training Foundation with the **Construction Gateway** program as its first initiative. Gateway was developed in response to the construction industry's demand for skilled entry level workers to help build the Austin-Bergstrom International Airport. At the time, unemployment levels were low and the worker shortage was dire. Now more than a decade later, more than 800 people from all walks of life have graduated from this nationally acclaimed program that offers basic construction skills and job placement services.

This collaborative success led Skillpoint to explore other ways to improve Central Texas, expressed in its mission statement:

To build partnerships among industry, education, and the community that lead to college and career success for Central Texans, while meeting employers' needs for a qualified workforce

Working as an intermediary and facilitator, Skillpoint seeks to strengthen Central Texas as a region that attracts and retains good jobs by promoting college attendance, encouraging life-long learning, improving career opportunities, and building economic self-sufficiency for youth and adults.

Adult Workforce Services

One way in which Skillpoint addresses the Central Texas community's need for a strong workforce is through its Adult Workforce Services, which deliver workforce training to the most underserved and challenged populations in the community: **Community Technology Training Centers**, where adults can learn the basic computer skills needed to obtain a good job in today's economy; and

Construction Gateway, where under- and unemployed adults learn basic construction industry skills to help them become productive citizens.

Youth, College, and Career Program

Through its **Youth, College, and Career Services**, Skillpoint connects students, educators, and industry in hundreds of activities designed to improve college and career success. Skillpoint operates three industry clusters that include collaborations amongst industry executives, education leaders, and community organizations committed to education and workforce development in Central Texas. Clusters include:

- Health Industry Steering Committee (HISC);
- Central Texas Technology & Education Executive Council (TEEC); and
- Digital Media Council (DMC).

In addition, Skillpoint hosts an annual **College and Career Fair** which is the organization's signature event, held in the spring of each year for approximately 2,600 high school juniors and seniors. The event provides those students with exposure to colleges and careers that come after high school. Demonstrations by 70 different businesses and 68 colleges and universities are featured. The College and Career Fair is an industry-led, novel approach that promotes student career awareness, education, and exploration by providing a large-scale, convention-type setting that students traditionally do not experience until after finishing school. By placing students in an industry-type convention setting where companies are arranged by industry sector, students gain a unique perspective on the career selection process.

QED Program

In the late 1990s, with initial support from the Texas Education Agency (TEA), Skillpoint applied the industry-led concept behind the success of its College and Career Fair to develop its **Quality Educator Development (QED)** program, an innovative professional development program for teachers. Since 1998, Skillpoint has provided educator professional development for over 400 area teachers with special emphasis on science, technology, engineering, and math curricula. Skillpoint's hallmark educator professional development program is a series of summer institutes in the Semiconductor & Advanced Manufacturing, Nursing, Public Healthcare & Biotechnology, Environmental Sciences, Technology Innovation, and Digital Media/Information Technology arenas. In addition, Skillpoint organizes teacher academies, speaking engagements and industry tours throughout the school year. These programs fill a unique need in the Texas public education community.

TEA enthusiastically embraced the work of the QED program, noting that this kind of professional development for teachers is unlike any other kind of training they can receive. In particular, the teacher institute model offers teachers a greater level of rigor and relevance education than they can receive through state- and district-level training. During the 2004-2005 academic year, TEA provided seed funding to launch the QED program, enabling Skillpoint to expand its institute offerings from four each summer to a total of eight, thereby doubling Skillpoint's outreach to the region's teachers. Thanks to TEA's visionary support of the QED program, Skillpoint provided 86 area middle and high school teachers with unique, exclusive teacher professional development and skills training experiences during the summer 2005 teacher institutes.

Another component of the QED program is the Skillpoint Alliance **Educator Colloquium**. TEA's special grant also enabled Skillpoint to host a first-of-its-kind event for Central Texas educators in summer 2005. Called "Growing Faster Together," Skillpoint's Educator Colloquium, hosted by Advanced Micro Devices (AMD), called together the key leaders and decision-makers for Central Texas school districts to discuss the future direction of the Central Texas economy and the implications for the region's education and workforce systems. Thirty-three Central Texas chief school administrators, state agency education professionals, and others attended this inaugural colloquium on July 26, 2005.

Research and Evaluation

To support its education and workforce development efforts, as well as to help ensure the quality of its programs and services, Skillpoint Alliance is building its research and evaluation capacity. In 2005, two major projects were undertaken. One of these is the **High School Graduate Data Center (HSGDC)**, which aims to provide longitudinal data on the choices Central Texas high school graduates make during the first 4 to 5 years after graduation. Partnering with the Ray Marshall Center (RMC) at The University of Texas at Austin, Skillpoint will endeavor not only to answer the question, "What are they doing?" but also, "Why?"

The second major project in 2005 was the **Labor Market Indicator (LMI) Survey**, whose purpose was to collect accurate local data on high growth occupations and the skills needed to succeed in them. Major findings and recommendations for action are contained in a summary report.²⁹

Additional information about Skillpoint Alliance and its programs and services can be found at www.skillpointalliance.org.

Appendix 2 – Reports Informing Educators’ Discussion

Prior to the 2005 Skillpoint “Growing Faster Together” Educator Colloquium, participants were provided with three reports as advanced reading. The following summaries are based on the reports, which are cited in full in the Bibliography to this paper.

GROW FASTER TOGETHER. OR GROW SLOWLY APART. HOW WILL AMERICA WORK IN THE 21ST CENTURY? (ASPEN INSTITUTE DOMESTIC STRATEGY GROUP)

The Domestic Strategy Group of the Aspen Institute issued this report as a wake-up call to what it termed a “workforce crisis.” The report pointed to three problems that the Institute believes threaten our productivity and growth, our international competitiveness, and, potentially, our cohesiveness as a nation:

- *Problem #1: The Worker Gap.* For the past 20 years, businesses have relied on the dramatic growth of the native-born workforce to find an ever-expanding supply of new workers. That growth is now over.
- *Problem #2: The Skills Gap.* Productivity for 20 years was boosted by technology and better educated workers. Gains in education are now slowing.
- *Problem #3: The Wage Gap.* The gap between workers at the top and the bottom has widened, threatening our economy and cohesion as a society.

To solve these related problems, the Institute recommended:

- *Making work pay*, through maintaining and increasing the Earned Income Tax Credit, expanding government-supported

health care programs for low-income families, and reforming taxes to reduce the marriage penalties and high marginal tax rates for the working poor;

- *Building a more skilled workforce*, through a variety of flexible, industry-informed programs;
- *Restoring worker security while enhancing workforce flexibility*, by increasing pension and health benefit portability, making Unemployment Insurance work for lower paid and nontraditional jobs, and establishing clear definitions of temporary and permanent employment, among other initiatives;
- *Providing a more supportive workplace for working families*, through expanding incentives to employers to aid families, making the child care tax credit refundable, creating wraparound child care programs that meet both parent and child needs, and encouraging employers to have more family-friendly work schedules, among other ideas; and
- *Rethinking immigration policy*, by separating employment-based from family-based immigration, considering our labor force needs and their impact on domestic workers, and increasing the proportion of permanent to temporary immigrants.

CRISIS OR POSSIBILITY? CONVERSATIONS ABOUT THE AMERICAN HIGH SCHOOL (NATIONAL HIGH SCHOOL ALLIANCE)

In this document, the National High School Alliance (HS Alliance), made up of over 40 partner organizations, provides an overview and analysis of how a series of national conferences (e.g., High School Leadership

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Summit) held in the fall of 2003 framed conversations about high school and high school-aged youth. From this analysis, it concluded that:

It is apparent from...these meetings that powerful voices are backing the proposition that the time has come to re-think and reinvent the American high school. (p. 1)

Two different conceptions of how to proceed emerged from the meetings, one reflecting “a discourse of crisis” and the other “a discourse of possibilities.” The crisis discourse, favored by analysts and policymakers, assumes that policymakers have all the answers required to proceed with curriculum alignment. The possibilities discourse, which focuses more on students than systems, gives voice to concerns about whether leaders are asking the right questions.

Both viewpoints tended to coalesce around seven key change factors in effecting institutional reform:

- ◆ *K-16 education* – thinking about K-12 and postsecondary education as parts of an integrated system;
- ◆ *College preparation as the “default” high school curriculum* – preparing students to access postsecondary education;
- ◆ *Teacher competence* – improving teacher preparation and professional development at the secondary level;
- ◆ *Literacy and language* – ensuring that students read at grade level and requiring immediate intervention if students cannot read by the third or fourth grade;
- ◆ *Dropouts and the educational pipeline* – keeping more students in the “pipeline”;

- ◆ *Scale and size* – focusing on the promise of smaller, more learning for student success;
- ◆ *Revisiting standards* – making sure the standards are right in light of a perceived convergence of requirements for postsecondary education and employment.

Although some initiatives can be launched immediately to address these issues (e.g., responding to the challenge of dropouts), others (e.g., developing a K-16 continuum) will likely take much longer. Whatever the timeline, *the message from the meetings was that high school reform is not likely to be a byproduct of general school reform.* In developing an agenda for education reform, the HS Alliance identifies four significant factors:

- ◆ Aligned standards and assessment,
- ◆ Preparation and development of educators,
- ◆ Active, powerful, and knowledgeable communities, and
- ◆ Innovations for transforming high schools.

The HS Alliance concludes by stating that the challenges facing the high school reform movement are substantial and that difficult implementation challenges lie ahead.

STANDARDS FOR WHAT? THE ECONOMIC ROOTS OF K-16 REFORM (EDUCATIONAL TESTING SERVICE)

This report, which is part of the Educational Testing Service Leadership 2003 Series, offers an in-depth analysis of the economic context for K-16 reform in its development from the original standards-based reform that came out of the 1980s.

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Inspired by the landmark report *A Nation at Risk*, standards-based reform swept the country as states instituted the use of specific standards to encourage real improvement in the educational achievement of students. Twenty years later, schools continue to struggle to align standards with assessments, curricula, and professional development, with the ultimate goal of an integrated pre-K-16 education system that serves to align educational preparation with work and citizenship.

The authors argue that while standards-based reform may have seemed like a fad in the 1980s, current economic and demographic forces necessitate these standards:

The inescapable reality is that ours is a society based on individual economic autonomy. Those who are not equipped with the knowledge and skills necessary to get, and keep, good jobs are denied full social inclusion and tend to drop out of the mainstream culture, polity, and economy. Hence, if the standards reform movement cannot fulfill its economic mission to help youth and adults become successful workers, it also will fail in its cultural and political missions to create good neighbors and good citizens.

The shift to a postindustrial knowledge economy has increased demand for postsecondary training. With the fading away of traditional industrial economies, top-down hierarchical organizational structures gave way to flexible networks accountable to common performance standards. Additionally, demand for technology-related knowledge jobs surged as demand for factory workers waned.

Trends show that the demand for college educated workers has grown faster than the supply for over two decades, and earnings have come to depend increasingly on educational attainment. Also, new job growth has and will continue to favor those at the higher end of the educational pipeline.

The necessity for a college education in the U.S. economy is more important today than ever before. Unequal access to postsecondary training, in addition to a shift in the skillset needed by employers, intensifies the need for the alignment of standards with curricula and for the integration of higher education with K-12.

As the U.S. economy has shifted, the skills and abilities employers require has also shifted. Broader and more general skills are required to add value in the knowledge economy:

- *Basic Skills*: Reading, Writing, and Mathematics;
- *Foundation Skills*: Knowing How to Learn;
- *Communication Skills*: Listening and oral Communication;
- *Adaptability*: Creative Thinking and Problem Solving;
- *Group Effectiveness*: Interpersonal Skills, Negotiation, and Teamwork
- *Influence*: Organizational Effectiveness and Leadership
- *Personal Management*: Self-esteem and Motivation/Goal Setting
- *Attitude*: Positive Cognitive Style; and
- *Applied Skills*: Occupational and Professional Competencies.

Demographic trends only make it more difficult for the labor force to fulfill these needs. The retiring baby boomer generation leaves a void in the labor force that younger generations cannot fill. This effect, combined with projected flat educational attainment rates, could result in a labor shortage of as much as 20 million workers by the year 2020.

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The authors warn that the cost of not succeeding in reforming our education system to fulfill economic needs will likely be great, with consequences not only economic, but also social.

If our schools do not help their graduates by increasing choices and opportunities, not only will our economy suffer from an unprepared labor force, but also our citizens will not be equipped to live economically autonomous, resulting in social exclusion from mainstream culture and polity.

Appendix 3 – The Need for a New Model of Schooling

Industrial Model Outdated

As many different educators and commentators have noted, **the predominant model of schooling in the United States** today, variously termed the “factory model” and the “industrial model,” **is outmoded and needs to be replaced.**³⁰ As the economy shifts further from a manufacturing base to a largely service orientation, our model of education likewise needs to shift, just as the industrial model was developed for the industrial era, replacing the earlier, agrarian model.

The public school system that we have today was created during the first two decades of the 20th century. As the country moved toward industrialization and away from agriculture, our model of education had to adjust. During our earlier history, public school students needed to be home early enough in the afternoon to milk the cows and feed the chickens. They needed to be released during the spring to help their families sow the fields.³¹ In the summer, they needed to be free for 3 to 4 months to work in the fields—to pick cotton in the South, to pick peaches in California, and to harvest corn in the Midwest.³²

When the country changed to the industrial economy, the public schools were shaped to fit the new, cutting-edge technology of the time: the assembly line. In schools, as in industrial settings, efficient production was the goal. In his book *The Work of Nations*,

Robert Reich, Secretary of Labor in the first Clinton administration, captures this concept with disturbing clarity:

Children [move] from grade to grade through a preplanned sequence of standard subjects, as if on factory conveyor belts. At each stage, certain facts [are] poured into their heads. Children with the greatest capacity to absorb the facts, and with the

“The industrial model for schooling, which emerged back in the Progressive Era and is still with us, is completely obsolete and should be done away with. But what would replace it is not clear.”

D. B. Light (blogger)
Posted February 27, 2005

most submissive demeanor, [are] placed on a rapid track through the sequence; those with the least capacity for fact retention and self-discipline,

on the slowest. Most children [end] up on a conveyor belt of medium speed. Standardized tests [are] routinely administered at certain checkpoints in order to measure how many of the facts [have] stuck in the small heads, and product defects [are] taken off the line and returned for retooling. As in the mass-production system, discipline and order [are] emphasized above all else.³³

Since industrial efficiency was the exemplar, it is not surprising that the school should look and function like a factory. The following description of the modern school by Yusuf Proglar, Assistant Professor of Education, Brooklyn College, strikes a familiar, if dissonant, chord:

A visitor to a school in most any place in recent years will find the same type of facility, a box-

“Public education was not in fact designed to serve all. It aptly served an industrial economy that could sort for those most able to be served by it.”

S. Scott, *Diversity and the Structure of Public Education*, 2002

shaped concrete building resembling a factory (or prison or hospital), divided into smaller boxes called classrooms, in which there are a

number of desks and chairs facing forward towards a larger teacher’s desk, behind which is a blackboard and above that a clock.

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Students move among these boxes according to strict timings, often announced by bells or alarms, and the school day is divided into several periods approximately 50 minutes apiece, beginning at around 8 a.m. and ending around 3 p.m., with a lunch break in the middle of the day. School meets five days a week for ten months of the year, and this usually lasts for 12 years. Students are classified and graded in many ways, most often ordered according to age-based classes and categorized according to academic grades. This grading and classifying gets ever more precise as students approach their graduation, when each is then given a sheet of paper that certifies his or her experience and performance.³⁴

This idea of school as factory is not a fanciful metaphor. Ellwood P. Cubberley, who was dean of Stanford's School of Education, wrote the following in the 1922 edition of his book *Public School Administration*:

Our schools are...factories in which the raw products (children) are to be shaped and fashioned.... And it is the business of the school to build its pupils according to the specifications laid down.³⁵

What were those "specifications"? No less a personage than Woodrow Wilson laid down the template. In 1909, Wilson, then president of Princeton University, said the following to the New York City School Teachers Association:

We want one class of persons to have a liberal education, and we want another class of persons, a very much larger class, of necessity, in every society, to forgo the privileges of a liberal education and fit themselves to perform specific difficult manual tasks.³⁶

In other words, Wilson was advocating for a model of schooling intended to divide citizens by class and educate them only as far as was suitable to their social role, with an elite at the top and a much larger underclass. The key function for schools

was to sort children according to their abilities and to encourage many to drop out and go to work as unskilled laborers. In short, the industrial model of schooling was developed to prepare the masses for work in the industrial era.

The above passages serve to highlight the hallmarks of American education today:

- Age-based classes;
- Homogeneous, mandatory curricula and testing;
- Sorting and selecting (grading) of students according to ability;
- Students viewed as products (with remediation to correct defects);
- Emphasis on discipline and order (desks placed in rows);
- Factory-like building and learning environment (students moving from class to class, cued by a bell system);
- Time-driven learning and uniform stages of progression—class periods, semesters, and grade levels;

"Schools were structured in this way for a reason. ... The routines of factory work required that young people be taught the necessary skills and values—including uniformity, punctuality, and efficiency—as well as gain the ability to withstand long hours of repetitive labor."

Y. Proglor, "The Failures and Limitations of Modern Schooling," 2005

- Fragmented curriculum with knowledge divided into discrete parts (suitable for measurement by standardized tests);
- Transmission model of learning (teacher transmitting knowledge to passive students); and
- Credentials awarded on the basis of experience and performance over time (grades accumulated as credits).

Some critics of our education system would add the following characteristics:

- Suppression of original thought and critical judgment;
- Inculcation of conformity and obedience to authority;
- Creation of a servile labor force and a herd of mindless consumers,³⁷ and
- Nurturance of nationalism.³⁸

Even critics who would not attribute so cynical a set of motives to schools still find ample faults with the American education system. Since the 1960's, a host of education critics has commented on the problems of public schooling. Neill (1960), Holt (1964, 1967, 1972), Kozol (1967, 1991), Illich (1971), Kohl (1976), Postman (1973), and Goodlad (1983) are among the more prominent, but they are just a few of the critics of modern-day schooling. As a body, they have argued that the traditional

schooling model is an ineffective, and possibly detrimental, way of educating our youth. More recently, some critics (Kozol, 1991; Berliner, 2005) have decried the unequal funding of schools, which they see as symptomatic of an underlying—even deliberate—class and racial division in American society.³⁹

Need to Transition to the Information Age

Why is this? After decades of school reform (see sidebar – “The Education Reform Movement in the U.S.”), why do we still not have a system that serves our youth well? Some educators, pointing to what is arguably already high performance overall,⁴⁰ suggest that what is called for now is a reexamination of approaches, not radical reform.⁴¹ They contend that progress is being made, e.g., gains in student achievement and a narrowing of the gap

The Education Reform Movement in the U.S.

Calls for reform of our schools have not gone unheeded. The publication by the United States Department of Education in 1983 of *A Nation at Risk* set off a massive, nationwide reform movement that, in some ways, has continued up through the present. The report, subtitled *The Imperative for Educational Reform*, said that American education was experiencing “a rising tide of mediocrity,” and that if we did not address the issues facing American education, the system would be totally overwhelmed. Recommendations in the report aimed at the improvement of content, standards and expectations, time, teaching, and leadership and fiscal support have resulted in a great deal of change but not, some have argued, in very much improvement.⁴²

Concerns about U.S education center, as they have for at least the last 15 years,⁴³ around the relatively poor performance of American students on *international assessments*, *high dropout rates* (or, more recently, low graduation rates), and the *achievement gap*, i.e., disparities between poor and minority students and wealthier, nonminority students.

International assessments are frequently cited by national business and political leaders who are concerned that too many American students are ill equipped educationally to compete successfully in an ever-more competitive global environment. In particular, they fear that students' weaknesses in math and science will allow other countries to surpass the United States in the fields of engineering and technology, thereby threatening U.S. competitiveness in a global economy.⁴⁴ By contrast, some educators have taken strong exception to the equating of student performance with national economic competitiveness or with workers' future economic security.^{45 46 47 48}

International comparisons aside, there remain ample grounds for concern about the state of American education based on dropout rates and tested achievement, where disparities between White and minority students persist, despite decades of education reform. Except among Asians (79%), less than three quarters of high school students graduate within 4 years. Just over half of African American (51%) and Latino (52%) students graduate in 4 years. A persistent gap in student achievement by race/ethnicity has been documented for years. For example, at the end of their high school careers, African American and Latino 17-year-olds read and do mathematics as well as White 13-year-olds.⁴⁹ Particularly disturbing is that this achievement gap appears in the early grades and worsens over time.

In the last few years, education reform has taken a new direction. Where earlier reform efforts had been targeted largely on elementary schools, there is a growing national movement focused on redesigning the high school, basically by “scaling down” school size by creating new small schools or by converting large schools into smaller learning communities. A growing body of research indicates that small schools have benefits for all students but are particularly effective with poor and minority students.⁵⁰ Early research findings about the conversion of comprehensive high schools are encouraging, but a number of issues continue to challenge these schools.

between minority and majority students. In October 2005, President Bush expressed satisfaction with the results of the spring 2005 National Assessment of Educational Progress. He said, “It shows there’s an achievement gap in America that is closing.”⁵¹ However, many in the education community questioned that conclusion.⁵²

In the last decade we have spent great amounts of energy and resources redesigning, reengineering, revising, reforming, recycling, and reordering a system that no longer works.⁵⁴

O’Banion concludes: “The reform movement has just been pruning the branches of a dead tree.”⁵⁵

Others commentators assert that, for all its achievements, the industrial model of schooling is limited by its own characteristics and, ironically, by its great success.⁵³ It is still producing a worker more suited to work in a factory than in a modern workplace. The very attributes that the industrial model stresses—compliance, conformity, and uniformity—are the antithesis of the characteristics needed for success in our 21st-century economy: creativity, problem-solving ability, and flexibility. For these commentators, **reform has failed not because schools have failed but because they persist in pursuing a failing model.** As one community college educator (O’Banion, 1995) put it:

In short, **it is time for a new model of schooling**, one that will help us make the

“Reformers at home and abroad have insisted that young people can be successfully prepared for the challenges and opportunities of the Knowledge Age by getting outdated systems of education designed for the Industrial Age to work more efficiently and toward a higher standard.”

J. Abbott, “Turning Learning Inside Out and Upside Down,” 1998

transition from the industrial age to the information age. The industrial model of schooling, developed in the early 20th century to educate the masses for work in the industrial era, cannot carry us forward in the 21st. We

need to replace the current educational system with a system designed for the kind of world in which we live today, a world with:

- A global information community;
- An escalating pace of change;
- Rapidly changing technology;
- A growing, more diverse population; and

- An economy in which most low-skill jobs (which used to absorb dropouts) no longer exist.⁵⁶

In the face of these social, technological, and economic changes, the old model of schooling is no longer viable (see sidebar – “Traditional vs. New Models”).

Ironically, in the 1980’s, while the schools were pursuing reform by tightening standards and introducing more tests, industry and business were forced into reconsidering their own structures. Many companies and large corporations discovered that, for their economic survival, they had to develop the learning potential of their staff.⁵⁷ IBM exhorted its employees to “think,” and “the learning organization” became the catchphrase among companies. The total quality management theories of Deming, with their emphasis on employee empowerment, customer focus, and continuous improvement, were embraced by business, and, subsequently, government and education, as the means to transform their older, industrial practices.⁵⁸

It is also notable, with the need for a new model of schooling and industry having already embraced postmodern forms, that the education reform mandated by the federal 2002 No Child Left Behind (NCLB) Act remains grounded in the industrial model.^{59 60} While NCLB attempts to address the needs of all students for skills in traditional academic areas, there is clear evidence that much more should be done.

Postindustrial Age Requires Higher-Level Skills

What, then, should a viable model of schooling for the postindustrial, or knowledge, age look like? The answer to this question is not entirely clear, but there is beginning to be some general agreement around several key ideas. One of these ideas is that, **in addition to basic skills, young people should learn a range of skills that go beyond traditional academics.**

Education researcher and intelligence theorist Howard Gardner (2005) proposes, as a starting point, that we consider “the kind of minds we want to cultivate in our education system.” He suggests that, in the future, if we want to be successful as a nation and, more important, as a world, we need to cultivate five kinds of minds:

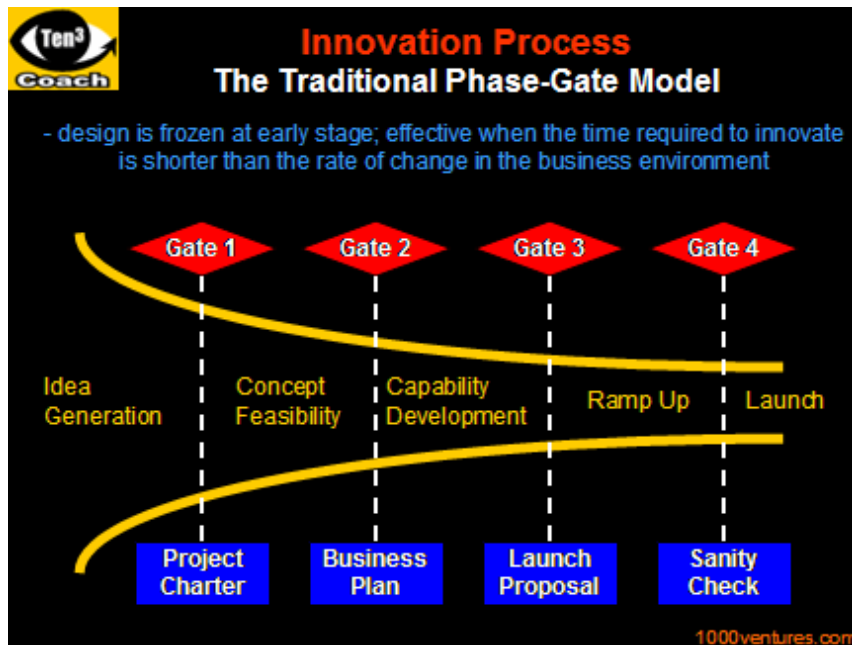
“We have been busy trying to make a coal-burning locomotive our major mode of transportation when across the tarmac there are options such as the Concorde and the space shuttle.”
T. O’Banion, “School is Out— Learning is In,” 1995

- A *disciplined mind*, that can think well and appropriately in the major disciplines;
- A *synthesizing mind*, that can sift through a large amount of information, decide what is important, and put it together in ways that make sense for oneself and for others;
- A *creative mind*, that can raise new questions, come up with novel solutions, think outside the box;
- A *respectful mind*, that honors the differences among individuals and groups, and tries to understand them and work productively with them; and
- An *ethical mind*, that thinks beyond selfish interests about the kind of worker one aspires to be, and the kind of citizen that one should be.⁶¹

Traditional vs. New Models

“Factory Model” Approach to Innovation

Born in heavy manufacturing, the phase-gate approach is the oldest and by far the most common innovation paradigm in the world. It breaks innovation into a series of sequential phases, with gates that must be cleared before you can proceed to the next phase. Ideally, the criteria for passing through each gate and the person (“gatekeeper”) who decides whether the criteria have been met are clearly defined beforehand. The project progressively gains maturity, which is tested at each gate until completion. The gates provide a clear and distinct mechanism to ask and answer the question, should we continue? Driven by the need to reduce the risk of change when ordering expensive tools with long lead times, the phase-gate model’s hallmark is an early “design freeze” that creates a stable target for the remainder of the innovation process.⁶²



Source: http://www.1000ventures.com/business_guide/im_process_main.html
 Accessed: 21 Oct 2005.

If we apply this model to schools, grade levels are represented by the “gates” and our educators are the “gatekeepers.” The students are then a “product” of the schools, and the process is set up to incur the lowest risk possible, attempting to ensure the highest number of usable products, i.e., graduates.

WEAKNESSES OF THE MODEL

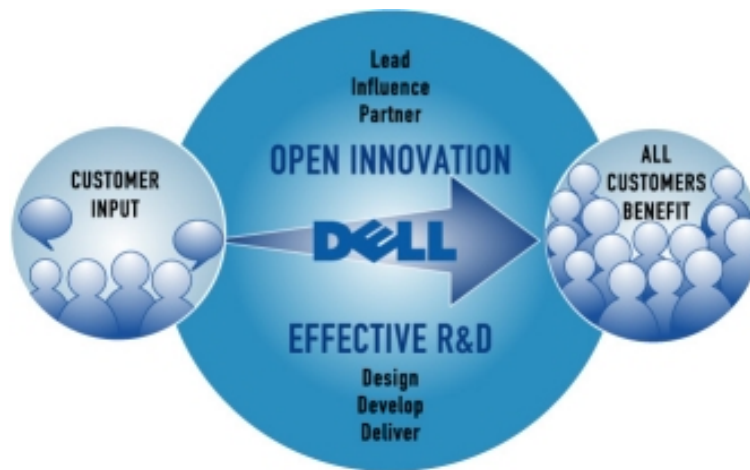
- Low gatekeeper knowledge leads to poor judgments
- Slow and serial
- Concept frozen too early
- Focused on gates, not the customer
- Long review preparation time
- Narrow criteria
- Maturity focus versus learning focus⁶³

Dell Model for Innovation

Companies have changed their approach as strict standards and inflexible designs limit their ability to compete in today's fast-paced economy. While the phased process, inflexible standards, and the early "design freeze" of the phase-gate model may continue to serve factories well, much of the economic climate has completely changed through the 20th century, so that we no longer live in a manufacturing economy. The inflexibility of the original system is not just irrelevant, but ineffective.

Consider a new model for innovation, presented by personal computer manufacturer Dell. This model stresses openness and flexibility, and focuses on input from customers. What does Dell say is wrong with traditional approaches to innovation? "The traditional approach to innovation tends to produce proprietary technologies and products that are often hard to migrate from as a customer."⁶⁴

If the customers are our public school students and the product is knowledge, then in this case the "proprietary...products that are often hard to migrate from" would be irrelevant or inapplicable knowledge, implying a *lack of connection between what is learned in the classroom and what is needed outside of the classroom.*



Source: http://www1.us.dell.com/content/topics/global.aspx/innovation/en/cto_open_innovation?c=us&l=en&s=corp. Accessed: 21 Oct 2005.

STRENGTHS OF THE MODEL

- Openness and flexibility
- Focused on the customer
- Learning focus
- Easy migration to new product

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John Abbott, president of the 21st Century Learning Initiative, offers this prescription:

The needs of the emerging knowledge economy go far further than the industrial economy that preceded it by requiring that young people possess, **in addition to a range of basic skills (numeracy, literacy and an ability to communicate), personal competencies such as the abilities to be self-starting, quick-thinking, problem-solving, risk-taking individuals who can operate in collaborative situations.**

Young workers need the transferable skills of the “quizzical craftsman”—the ability to go beyond their own expertise and thoughtfully evaluate new domains and problems (emphasis added).⁶⁵

In the information age, successful workers now have to have more than just basic skills and an amenable attitude, which is largely what was required of their parents and grandparents (during the industrial age).

Abbott (1998) goes on to suggest that such skills and attitudes “are more naturally developed in the rich, collaborative problem-solving and uncertain world of apprentice-type learning (not to be confused with 20th-century industrial apprenticeship)” than in the industrial-age classroom with its emphasis on tasks, schedules, measurable results, and disconnected activities.⁶⁶

In a similar vein, Marshak (2003) recalls the Secretary’s Commission on Achieving Necessary Skills (SCANS) and two federal studies published around 1990 that defined as significant additional skills beyond the traditional academic skills:

- speaking and listening skills,
- problem-solving skills,
- creative thinking skills,
- knowing-how-to-learn skills, and
- collaboration and organizational-effectiveness skills.⁶⁷

SCANS also identified as important for students the “personal qualities” of responsibility, self-esteem, sociability, self-management, and integrity/honesty.⁶⁸

Building on SCANS and other work, the Partnership for 21st Century Skills advocates that, in addition to core subjects, students need higher-level thinking skills, or what it terms “learning skills,” which are grouped into three broad categories:

- *information and communication skills*, which include information and media literacy skills;
- *thinking and problem solving skills*, which include critical thinking and systems thinking, problem identification, formulation, and solution, and creativity and intellectual curiosity; and
- *interpersonal and self-directional skills*, which include interpersonal and collaborative skills, self-direction, accountability and adaptability, and social responsibility.⁶⁹

The Partnership refers to these higher-level or learning-how-to-learn skills, collectively, as “21st century skills” and sees both basic skills and 21st-century skills as essential.⁷⁰

Robert Reich sets down four key human skills that drive high-value enterprises (presumably including education):

- *Abstraction*—the capacity to order and make meaning of the massive flow of information, to shape raw data into workable patterns;
- *System thinking*—the capacity to see the parts in relation to the whole, to see why problems arise;
- *Experimental inquiry*—the capacity to set up procedures to test and evaluate alternative ideas; and

- *Collaboration*—the capacity to engage in active dialogue to get a variety of perspectives and to create consensus when that is necessary.⁷¹

Clearly, what these different formulations have in common is an emphasis on skills that go well beyond the traditional three R's (reading, 'riting, and 'rithmetic);⁷² i.e., that, besides acquiring the basic skills, young people should develop a range of skills such as problem solving and creative thinking.

Other Possible Components of a New Model

In addition to the idea that students should acquire a range of skills beyond basic skills, there are some **other key ideas that are beginning to form the backbone of a postindustrial model of schooling**:

- *Smaller learning communities*, defined by Abbott (1998) as “what people feel to be the place where they belong and for which they feel a sense of identity and hopefully responsibility”⁷³;
- *Continuity in the learning experience*, e.g.; through keeping students with the same teachers for multiple years (called “looping” in education literature);
- *Interdisciplinary curriculum*, which acknowledges that learning is interconnected and that the best instruction is that which integrates content across subject areas;
- *Academic and personal success at a high level for every individual*, not only those for whom the factory model was designed;⁷⁴
- *Assessment as a tool for guiding progress*, not as a method of sorting students and schools into successes and failures;

- “*Real world*” *teaching and learning*, i.e., linking the curriculum to real-world issues by connecting what is learned in the classroom with what is needed outside of the classroom;
- *Lifelong learning*, which, as a habit of mind, continues after the individual has exited formal schooling; and
- *The use of technology* (Internet, e-mail, etc.) to facilitate instruction, communication, and assessment.^{75 76}

All of these ideas strongly imply that, to accomplish the goal of teaching our diverse population higher-level thinking skills, there must be dramatic changes in the schools, not only in what should be taught but also *how*.

It should also be noted that these concepts are the opposite of those embodied in the industrial model:

- Teaching of *higher-order skills* instead of rote skills;
- *Personalization* rather than depersonalization;
- *Integration of curriculum* versus fragmentation of curriculum;
- *Preparing all students for knowledge work*, not just a few; and
- *Assessment for the sake of improvement* rather than for sorting and certifying.

Encouragingly, many of the ideas presented above are represented in the high school redesign movement.

High School Redesign Offers Promise

In the light of long-standing critiques of the large, factory-model high school, growing national attention is being paid to redesigning the comprehensive high school.

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A central strategy in this redesign is “scaling down” school size by creating new small schools or converting large schools into smaller learning communities. A body of research indicates that, other things being equal, small schools appear to produce higher student achievement, lower dropout rates, lower rates of violence and vandalism, more positive feelings about self and school, and more participation in school activities than large schools.^{77 78 79} These outcomes are of particular interest because they seem to be more pronounced for students who are traditionally lower achieving.⁸⁰ As a consequence, school districts all over the country are engaged in or exploring small school options.

However, as education researcher Linda Darling-Hammond (1997, p. iii) cautions, “Small is not synonymous with successful,” and school districts engaged in high school restructuring are more likely to be successful if they attend to the lessons learned from the reform efforts of the past several decades. Darling-Hammond lists 10 key design features observed in successful small schools:

1. *Personalization*—through meaningful, sustained relationships between students and teachers, creating an environment students characterize as like a family rather than a factory;
2. *Continuous relationships*—keeping students and teachers together for multiple years (“looping”);
3. *High standards and performance-based assessment*, i.e., through a focus on student work;
4. *Authentic curriculum*, i.e., one that engages students and challenges them to understand concepts deeply, calling for higher-order thinking and extended

writing on material linked to students’ own lives and experiences;

5. *Adaptive pedagogy*—instruction focused on active learning calling for higher-order thinking, using multiple instructional strategies;
6. *Multicultural and antiracist teaching* to promote respect for diversity and to create a context in which all students’ experiences can be appreciated and connected to the curriculum;
7. *Knowledgeable and skilled teachers* who do more than transmit information to students by making content accessible to diverse learners;
8. *Collaborative planning and professional development* on an ongoing basis to support thoughtful and effective teaching and coherence across courses;
9. *Family and community connections* to promote mutually supportive practices at home and at school and to place education in a community context; and
10. *Democratic decision-making* involving participation by teachers, and often parents and students—in school governance.⁸¹

Darling-Hammond (1997) also specifies as important to school success certain essential external conditions:

- *Adequate resources* to fund structural features of having smaller schools; and
- *Redesigned school districts*, giving schools the flexibility to meet performance-based goals.

The Coalition Campus Schools Project, launched in New York in the early 1990’s incorporated a number of features that

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research suggests foster increased achievement and commitment to school:

- Small learning communities organized around a common core of principles intended to prepare students to “use their minds well”;
- Common academic standards supported by performance-based assessment;
- An interdisciplinary, “less is more” curriculum focused on inquiry and intellectual skills;
- Small size and small pupil loads to enhance personalization;
- Family involvement;
- Student and teacher choice of school; and
- Shared decision-making.⁸²

The Small Schools Project, which is part of the College of Education at the University of Washington and which began in 2000, lists these attributes of high achievement schools:

- Common focus,
- Time to collaborate,
- High expectations,
- Performance based,
- Technology as a tool,
- Personalized, and
- Respect and responsibility.⁸³

The New Technology Foundation, which assists school districts in redesigning their high schools using the New Technology High School model, organizes all curricula and assessment around eight learning outcomes:

- Technology literacy,

- Collaboration,
- Critical thinking,
- Oral communication,
- Written communication,
- Career preparation,
- Citizenship and ethics, and
- Curricular literacy (content standards), i.e., the standards required by the particular state in which the high school operates.

Through its National School District and Network Grants Program, the Bill & Melinda Gates Foundation has awarded numerous grants for the creation of small secondary schools premised on the idea that organizations external to the public school system can catalyze the creation of small high schools that will produce better and more equitable outcomes for students. All of the grantee organizations subscribe to a set of attributes of effective, high-performing schools set forth by the Foundation (the same attributes listed for the Small Schools Project above).⁸⁴

The Foundation has also funded a longitudinal evaluation of the small high schools created under the Program. Evaluation findings to date have been largely positive. Key second-year findings include:

- ◆ Intermediary organizations are able to foster the creation of small secondary schools with the characteristics that the Foundation considers hallmarks of high-performing schools;
- ◆ More reform-like instruction occurs in those small schools that have the effective-schools attributes most firmly in place; and

- ◆ Students who attend schools with stronger implementation of the effective-schools attributes have more positive educational attitudes.⁸⁵

The third-year evaluation of the Gates Foundation's national high school initiative found that schools started or redesigned with the philanthropy's support are achieving mixed early results in student performance, school climate, and academic expectations. Researchers stressed, however, that achievement data are too limited to draw definitive conclusions.⁸⁶

In a 2001 overview of smaller learning communities in high schools, the Department of Education found that the conditions created by smaller learning communities offer large high schools an opportunity to improve student achievement. However, smaller learning communities deliver on their promise only to the extent that they have independent control over school budget and staffing, space, schedule, curriculum, and culture. When those conditions are met, students in smaller learning communities may derive the same kinds of benefits as students in smaller schools in terms of academic achievement, attendance, college-going rates, social behavior, attitudes, and student-teacher relations.⁸⁷

Thus, while the redesign movement is beginning to change the educational landscape of school districts in Central Texas and across the country, there are still a number of issues that continue to challenge these schools. Nonetheless, the redesign movement offers the promise of wide-scale high school reform consistent with the needs of a new era. Whether the promise of this approach delivers the anticipated changes remains to be seen.

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End Notes

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² Texas Education Agency. (n.d.). *2004-05 Academic Excellence Indicator System, district reports*. Retrieved on January 25, 2006, from <http://www.tea.state.tx.us/perfreport/aeis/2005/district.srch.html>

³ Ibid.

⁴ City of Austin, Department of Planning. (n.d.) *Austin area population histories and forecasts*. Retrieved on January 12, 2006, from http://www.ci.austin.tx.us/Austin_forecast05_annual_pub.xls. The five-county Austin MSA wholly includes Bastrop, Caldwell, Hays, Travis, and Williamson counties.

⁵ See Miller, Kazis, Trippe, Eagleson, & Porter, 2000.

⁶ Richard Florida, professor of regional economic development at Carnegie Mellon University, examines one sociocultural factor, creativity, and its effects on economic development in his 2002 best-seller, *The Rise of the Creative Class*. In this book, he asserts that the key to economic growth lies not just in the ability to attract the creative class, but also to translate that underlying advantage into creative economic outcomes in the form of new ideas, new high-tech businesses, and regional growth.

⁷ “High-stakes testing” refers here to current Texas law that requires students to pass a state-designed, exit-level test (currently the Texas Assessment of Knowledge and Skills, or TAKS) to graduate from high school. Having to pass a test to graduate high school, irrespective of other educational attainments, is a high-stakes situation for a student.

⁸ See Abbott & Ryan, 1999.

⁹ Described in Buck, 1995.

¹⁰ More than 30 years ago, social theorist Ivan Illich questioned this basic assumption and proposed that schools be replaced with learning webs and other decentralized structures. See Illich, 1971. See also the response from Postman, 1973.

¹¹ Marklein, M. B. (2005, August 16). Many incoming freshmen aren't prepared for college. *USA Today*, p. D6.

¹² Lewin, T. (2005 August 17). Many going to college aren't ready, report finds. *New York Times*. Retrieved August 17, 2005, from <http://www.nytimes.com/2005/08/17/education/17scores.html>

¹³ “Vocational education” is a collective term in high schools to identify curriculum programs designed to prepare students to acquire an education and job

skills, enabling them to enter employment immediately upon high school graduation (Lynch, 2000).

¹⁴ See p. 16 in Swanson, J. C. (Compiler). (1951). *Development of federal legislation for vocational education*. Chicago, IL: American Technical Society. Cited in Lynch, 2000.

¹⁵ Lynch, 2000.

¹⁶ Vocational education was also directly influenced by the passage of the federal 1990 Perkins Act and the 1994 School-to-Work Opportunities Act.

¹⁷ Levesque, K., et al., 1995, p. 1.

¹⁸ Lynch, 2000.

¹⁹ Lynch, 2000, Abstract section ¶ 10, associates the change to CTE with the name change of the American Vocational Association (AVA) whose members voted in December 1998 to change the name of their professional association to the Association for Career and Technical Education (ACTE).

²⁰ See Wirth (1994) and Lynch (2000) for prescient forecasts about the integration of academic and vocational education. Herschbach (2001), however, notes: “We may think that academic integration is a new concept being applied today, but it found its fullest expression in career education 30 years ago” (¶ 6).

²¹ The Carl D. Perkins Vocational and Applied Technology Education Act Amendments of 1990 (1990 Perkins Act) included “incarcerated youths and adults” among the special populations targeted by the Act. See Levesque, et al., 1995, p. 1.

²² See the discussion in Levesque, et al., 1995 (pp. 20-22) about the qualifications and preparation of vocational teachers.

²³ “About UT,” The University of Texas at Austin web site. Retrieved on January 26, 2006 from <http://www.utexas.edu/welcome/>

²⁴ “About Texas A&M University,” Texas A&M University web site. Retrieved on January 26, 2006, from <http://www.tamu.edu/00/data/about.html>

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²⁹ Wilkinson, L. D. (2005, October). *Greater Austin area labor market survey (LMI), 2005, summary report*. Austin, TX: Skillpoint Alliance. This report is available for free download from Skillpoint's website www.skillpointalliance.org.

³⁰ See, for example, Progler, 2005.

³¹ Pond, 2001.

³² O'Banion, 1995.

³³ Cited in Pond, 2001, p. 5. Original source: Kushner, K. H., McClelland, A., & Safford, P. (2000). *Human diversity in education: An integrative approach*. Monterey, CA: McGraw-Hill.

³⁴ Progler, 2005, Labeled and Categorized section, ¶ 1.

³⁵ Quoted in Gatto, 2003, p. 5.

³⁶ *Ibid.*, pp.4-5.

³⁷ *Ibid.*, p. 4.

³⁸ Progler, 2005.

³⁹ Such a division, were it deliberate, would not be inconsistent with the traditional role of school to sort students along class—and perforce—racial lines. See, for example, Gatto, 2003.

⁴⁰ Bracey, G. W. (1994, September). The media's myth of school failure. *Educational Leadership*, 80-83. Gerald Bracey is a research psychologist and education writer whose work challenges methods of evaluating U.S. student test scores. Cited in Cardella, 1996.

⁴¹ Dean, 2005.

⁴² *Ibid.*

⁴³ The journal *Education Leadership* devoted an entire issue in 1990 to education restructuring. "Visible signs of public education's ills—low student achievement on international assessments, dropout rates that reach 50 percent in some of the nation's cities, teacher dissatisfaction, bureaucratization—are even more worrisome, given demographic and economic trends mandating that public schools educate to a higher level of success students who have traditionally presented the most challenges" (O'Neil, 1990, p. 5).

⁴⁴ Honowar, September 2005.

⁴⁵ Professor David Berliner of Arizona State University is one critic of the education performance/economic competitiveness syllogism. In his 1995 book, *The Manufactured Crisis: Myths, Fraud, and the Attack on America's Public Schools*, co-written with Bruce J. Biddle, he argues that politicians distort reality when they draw conclusions about U.S. education on the basis of international comparisons of student performance. Further, he asserts that there is no correlation between student achievement and economic might in industrialized countries. Cited in Honowar, September 2005.

⁴⁶ Howard Gardner, Harvard education professor, points to the tenuous relation between performance

on such measures and the success of the society (Gardner, 2005). He cites the example of Japan, whose economic success in the 1980's prompted American doubts about our schools. In the 1990's, however, Japan's economic rise stalled while the United States enjoyed economic prosperity. Gardner questions the value of a system whose goal is to improve or maintain a country's standing in international comparisons. In his view, by pursuing a higher rank, educational leaders are ignoring deeper and more important purposes of education, e.g., cultivating the kinds of minds that we want.

⁴⁷ See Cardella, 1996. An inner-city high school teacher, Cardella argued almost 10 years ago that the School to Work (STW) movement "does not guarantee students work or economic security, but instead serves to instill in students a corporate dictated work ethic that equates civility with individual and social docility. STW threatens the corporate privatization of the content of what is taught in schools and extends the corporate raid on the marketplace of free ideas" (p. 2).

⁴⁸ See Honavar, December 2005. A new Duke University study suggests that comparisons of the number of engineers produced by India and China with those produced by the U.S. may overstate the case. As cited in the article, the researcher points out that, even though the total numbers of engineers produced by India and China are larger than those produced by the U.S., the U.S. actually produces more engineers *per capita* than both those countries. He suggests that U.S. business leaders and politicians could be scaring away high school students from pursuing mathematics and science by focusing on the gross numerical difference and the loss of U.S. jobs to outsourcing.

⁴⁹ Greene, J. P., & Forster, G. (2003, September). *Public high school graduation and college readiness rates in the United States*. New York: Manhattan Institute for Policy Research. Cited in Hancock, K. (2005). *Closing the gap: Do we have the will?* Presentation made to the Texas Higher Education Coordinating Board Commissioner's Summit, Austin, TX. Data are for 2002.

⁵⁰ McRobbie, 2001.

⁵¹ See Dillon, 2005. Contrary to the President's rosy pronouncement, even supporters of the law expressed disappointment with the results, which showed that, in many categories, the gap remains as wide as it was in the early 1990's. Indeed, by some measures, students were making greater gains before the law was put into effect.

⁵² See Olson, 2005. Reading achievement remained relatively flat and progress in mathematics has slowed over the past 2 years.

⁵³ In *The Six-Lesson Schoolteacher*, former teacher and author John Taylor Gatto observes: “It is the great triumph of schooling that among even the best of my fellow teachers, and among even the best parents, there is only a small number who can imagine a different way to do things” (Gatto, 2003, Lesson Six section, ¶ 4).

⁵⁴ O’Banion, 1995, ¶ 5.

⁵⁵ *Ibid.*, ¶ 4.

⁵⁶ Robert Reich, Secretary of Labor during the first Clinton administration, lists the “new realities of post-industrialism” as: “(a) the electronics communications revolution; (b) the emergence of a competitive global market; (c) serious ecological damage; (d) ethnic, racial, and sexual diversity; and, above all, (e) turbulent change, rapid and unpredictable.” Cited in Wirth, 2001.

⁵⁷ Abbott, 1992.

⁵⁸ TKD Tutor.com. (n.d.) *Total quality management*. Retrieved October 28, 2005, from <http://tkdtutor.com/05Instructors/TQM.htm>

⁵⁹ In the view of education professor David Marshak of Seattle University, NCLB seeks to meet the goal embodied in its title not by looking toward the future but by retreating to the paradigm of the past. He faults this approach because: “It doesn’t address the key issue in moving from an industrial model of schooling to a postindustrial model that integrates personalization, academic and personal success for every child, and both common academic standards for all students and individualized standards for each student” (Marshak, 2003, p. 229).

⁶⁰ Berliner (2005) seconds Marshak’s view of the irrelevance of NCLB to school improvement. Based on three studies of the effects of high-stakes testing on curriculum, instruction, school personnel, and student achievement, he dismisses NCLB as “a near perfect case of political spectacle, much more theater than substance” (p. 1). Moreover, he believes that NCLB is merely delaying the day when our country acknowledges what he regards as the common denominator of our failing schools, namely, poverty.

⁶¹ Gardner, 2005.

⁶² Kotelnikov, V. (n.d.). *Innovation process: Traditional and new approaches*. Retrieved October 20, 2005, from http://www.1000ventures.com/business_guide/im_process_main.html

⁶³ *Ibid.*

⁶⁴ Dell, Inc. (n.d.). *Open innovation and effective R&D*. Retrieved October 21, 2005, from http://www1.us.dell.com/content/topics/global.aspx/innovation/en/cto_open_innovation?c=us&l=en&s=corp

⁶⁵ Abbott, 1998, Constructing New Systems section, ¶ 2.

⁶⁶ *Ibid.*, Constructing New Systems section, ¶ 3.

⁶⁷ A 1998 study published as *Workplace Basics: The Essential Skills Employers Want* and a 1991 report published by the Department of Labor, *What Work Requires of Schools*, based on a study by the Secretary’s Commission on Achieving Necessary Skills (SCANS), acknowledged the importance of traditional basic skills but included additional categories of competence and knowledge as being equal in significance to traditional academics. See Whetzel, 1992.

⁶⁸ Cited in *Learning in the 21st Century*, p. 10.

⁶⁹ *Ibid.*, p. 9.

⁷⁰ *Ibid.*, p. 2.

⁷¹ Cited in Wirth, 2001.

⁷² The Austin Independent School District has organized its high school redesign efforts around what it terms the “4 R’s”: rigor (high academic standards), relationships (an adult professional paired with each student), relevance (of classwork to the outside world), and results (preparation for college and future success). See AISD, 2005.

⁷³ Abbott, 1998, Components of a Community section, ¶ 4.

⁷⁴ Scott (2002, pp. 25-26) sketches out “the inadequacy of services to marginal populations” under the industrial model, defining marginal populations as “all students who were not well suited for the standardized system, students who were not typical,” e.g., special education students, but also including students from different racial, cultural, and economic backgrounds.

⁷⁵ SCANS listed technology, which it defined as selecting equipment and tools, applying technology to specific tasks, and maintaining and troubleshooting equipment, as one of its five basic competencies. See Whetzel, 1992.

⁷⁶ In describing a hypothetical program of community-based education reform, Abbott (1992, p. 15) set down the following as one of four basic assumptions: “Information technologies have infinite possibilities.”

⁷⁷ Darling-Hammond, 1997.

⁷⁸ U.S. Department of Education, 2001.

⁷⁹ McRobbie, 2001.

⁸⁰ Darling-Hammond, L., Ancess, J., & Ort, S. W., 2002.

⁸¹ Darling-Hammond, 1997.

⁸² Darling-Hammond, L., Ancess, J., & Ort, S. W., 2002, p. 642.

⁸³ Wallach & Lear, 2003.

⁸⁴ AIR/SRI, 2004, pp. 7, 8.

⁸⁵ *Ibid.*, p. 2.

⁸⁶ Reported in Robelen, 2005.

⁸⁷ U.S. Department of Education, 2001.