

The CEO Forum on Education & Technology

Teacher Preparation STaR Chart:

A Self-Assessment Tool
for Colleges of Education



Preparing a New Generation of Teachers

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Part I: Setting the Context

In the next decade, the United States will need over 2.2 million new teachers to fill the nation's classrooms—a rate of approximately 200,000 per year. Teachers of the new millennium will need a deep knowledge of their field, a thorough understanding of the learning process, a sincere commitment to nurturing a child's potential, and a love of learning that is shared with their students.

These attributes alone aren't enough for teachers to prepare their students to succeed in the Digital Age. Teachers must be comfortable with technology as a tool to engage students and enhance their learning. If new teachers are ill-equipped to use the instructional tools technology has made available, their professional education will be incomplete.

Preparing a New Generation of Teachers: A National Crisis

In the last decade, reports have sounded the alarm: new teachers are not entering the classroom well prepared to use technology. In a definitive report to Congress in 1995, *Teachers and Technology: Making the Connection*, the Office of Technology Assessment (OTA) stated:

Despite the importance of technology in teacher education, it is not central to the teacher preparation experience in most colleges of education in the United States today. Most new teachers graduate from teacher preparation institutions with limited knowledge of the ways technology can be used in their professional practice. (OTA, 1995, p. 2)

Recent studies suggest that little progress has been made since OTA's clarion call. Today, less than half of the nation's teacher preparation institutions require students to design and deliver instruction using technology. Even fewer require technology use in the student teaching experience. Since less than half of the faculty in teacher preparation programs incorporate effective use of technology in their courses, perhaps this is not surprising.

In our technology-oriented society, new teachers are being placed in classrooms without an understanding of how technology can support their teaching—or their students' learning. As a result, school systems are forced to provide remedial instruction for what should be the most technologically-ready generation of teachers.

State and federal agencies, university governing boards, and the private sector have at last begun to take notice. The American Council on Education (www.acenet.edu) has called on college and university presidents to “move the education of teachers to the center of their professional and institutional agendas.” In addition, the U.S. Department of Education recently announced its first technology grant program aimed at preservice teacher education (“Preparing Tomorrow’s Teachers to Use Technology”). Finally, businesses and foundations have also begun to respond to this challenge with their own special grant programs and initiatives.

States are beginning to add technology-related requirements for program approval or licensure, but only three states (North Carolina, Idaho, and Virginia) require programs to assess technology-related knowledge and skills of teacher candidates. Clearly, the United States has a long way to go. The children of the Digital Age are too often taught by teachers prepared with techniques more appropriate for the Industrial Age.

Current Use of Technology in Teacher Preparation

The growth of technology infrastructure in the K-12 sector has been documented in regular data collection (e.g., NCES, Quality Education Data, and Market Data Retrieval), but the data regarding technology expenditures and deployment in the 1,300 institutions that prepare teachers is more limited. Two recent studies, one in 1996 by the the American Association of Colleges of Teacher Education (AACTE) (www.aacte.org), and the other in 1998 by the International Society for Technology in Education (ISTE) (www.iste.org) for the Milken Exchange on Education Technology (www.milkenexchange.org), offer a window into the status of technology in teacher preparation institutions nationwide. Though limited (only about 1/3 of institutions responded to either study), the findings indicate that the biggest challenge facing institutions today is preparing faculty to model the effective use of technology as a teaching and learning tool.

In 1998, the Campus Computing Project (www.campuscomputing.net) conducted the “National Survey of Information Technology in Higher Education” which targeted chief technology officers (CTOs) at two- and four-year colleges and universities across the country. These results provide another assessment of technology in teacher preparation programs. When asked to compare their information technology components in programs across their campuses, CTOs ranked their education programs high in some areas, but near the bottom in others:

- Use of technology for scholarship and research: 2nd out of 10;
- Use of Internet and Web resources: 6th out of 10;
- Use of technology for instruction: 7th out of 10; and
- Preparing their students with the technology skills needed over the next decade: 7th out of 10.

Why a Teacher Preparation STaR Chart?

Concerned by the lack of technology preparedness in today’s teacher education programs, the CEO Forum developed an assessment tool that would help teacher preparation programs chart a new course. Encouraged by members of Congress, the U.S. Secretary of Education, and experts in the teacher education community, the CEO Forum developed a School Technology and Readiness (STaR) Chart for

schools, colleges, and departments of education (SCDEs). Building on the success of the STaR Charts developed in 1998 and 1999 for the K-12 community (see page 4), the Teacher Preparation STaR Chart:

- Provides teacher preparation programs with a set of benchmarks they can use to measure their progress in integrating technology into their programs;
- Offers explicit goals that SCDEs are encouraged to strive towards as they move from “Early Tech” to “Advanced Tech;” and
- Draws national attention to the need for programs, policies, and funding to ensure that all teachers entering the classroom are competent and confident in their ability to use technology effectively to support student learning.

The Teacher Preparation STaR Chart was developed with the assistance of a wide group of stakeholders, including education deans, faculty members, students, superintendents, educators, and members of the business community. Their input and guidance provided perspective and a sense of urgency for this project.

Key Considerations in Creating the Teacher Preparation STaR Chart

The ISTE, AACTE, and Campus Computing Project studies highlight the dilemma of teacher education institutions: they benefit from being part of the higher education community, but have their own special challenges. For example, many teacher education programs:

- Receive less attention than the higher status professional programs in the university such as law, engineering, business, and medicine;
- Have a less affluent alumni base, meaning that large gifts from donors (as well as industry) are harder to obtain; and
- Are not accredited (only 38 percent of the nation’s 1,300 teacher preparation programs are accredited by the National Council for Accreditation of Teacher Education (NCATE), the voluntary accrediting association for schools, colleges, and departments of education).

Given these challenges, leadership is particularly critical to providing vision and support for change. Large and continuing expenditures in technology are needed for providing and maintaining up-to-date hardware, software, and connections. Training and technical support for faculty are also needed.

The Good News: Investing in Technology Provides the Opportunity to Jumpstart Teacher Preparation Reform

Technology holds the potential for new and better ways of educating tomorrow’s teachers. It has already facilitated the following innovations:

- Learning tools, built on research of the learning process, that can help build greater understanding;
- Richer models of effective teaching;
- Alternative opportunities for teaching observations;
- New means of reaching potential teacher candidates located at a distance from campus;

- Better ways of supporting candidates in student teaching and the first years of teaching; and
- New models of working with alumni.

To facilitate teacher education enhancements such as these, schools, colleges, and departments of education must be equipped with the infrastructure, both technical and human, that will support these improvements. How well are they meeting this challenge? The Teacher Preparation STaR Chart was developed to help answer this question.

The CEO Forum on Education & Technology: Leadership for Change

Over the past two years, the CEO Forum on Education & Technology has made significant contributions in helping K-12 educators understand, plan for, and assess their progress in integrating technology into their schools. The 1999 Year 2 report, *Professional Development: A Link to Better Learning*, included a series of recommendations to help ensure that teachers are well prepared to guide today's students to future success. While several recommendations focused on continuing professional development of teachers, the very first recommendation highlighted the importance of building a strong foundation of technology expertise in the initial preparation of all new teachers:

"Schools of education must prepare new teachers to integrate technology effectively into the curriculum."

This recommendation included the following target goals:

- National accreditation standards for schools of education should require that schools of education prepare new teachers and administrators to integrate technology into the classroom by 2000;
- Schools of education should provide faculty with the tools, incentives, and on-going professional development they need to integrate technology into the teacher training curriculum by 2001;
- New teacher and administrator licensure and certification programs should require proficiency integrating technology into the curriculum by 2003; and
- Technology funding for schools of education should be increased.

The Teacher Preparation STaR Chart is an outgrowth of the 1999 report's recommendation.

Part II: Understanding the STaR Chart

Part II of this document is intended to provide a more in-depth explanation for each column of the Teacher Preparation STaR Chart. This section should be used as a reference in working through the STaR Chart. Each paragraph corresponds to the numbered column on the chart.

Roles for the College or University as a Whole

Schools, colleges and departments of education (SCDEs) do not exist in a vacuum—they are part of the larger university context where institutional support for teacher preparation from the president, the provost, the chief information officer, and other college deans, is critical.

UNIVERSITY CHANCELLORS, COLLEGE PRESIDENTS, PROVOSTS, AND ALL DEANS

Campus-wide Leadership

1 **Strategic planning incorporating technology**

College or university leaders committed to integrating technology in all aspects of teaching and learning on campus will be far better positioned to ensure that technology is a part of the learning environment for their students. But university leadership must go further. As the American Council of Education report said in their 1999 *Action Agenda for College and University Presidents*, the “first and most important action for college and university presidents is to move the education of teachers to the center of their professional and institutional agenda. They must clarify and articulate the strategic connection of teacher education to the mission of the institution.”

- 2 **Funding for technology in SCDE** Institutional leadership must translate into financial support for the teacher preparation program. Most SCDEs receive over half (54 percent on average) of their funding from the institution as a whole. Thus, support translates into the dollars needed for building the human and technological infrastructure of the teacher education program. It also means giving the SCDE the green light to seek financial support from those donors (foundations and businesses) whose support has typically been targeted for business, engineering, computer science, and other high visibility colleges and departments on campus.
- 3 **Technology appropriately integrated in courses in all departments** Most teacher candidates take many of their courses in other academic departments on campus (up to 75 percent of coursework in some programs). If teacher candidates are to appreciate how technology supports understanding in all academic areas, it is important that faculty across the campus provide role models for the appropriate integration of technology in teaching.
- Campus-wide Infrastructure
- 4 **Access to advanced technologies in campus facilities** The availability of up-to-date hardware, software, and telecommunications access throughout the campus—in dorms and study areas, in classrooms and faculty offices, in libraries and laboratories—is critical to the education of teacher candidates. This also means that access is available to students both on and off campus.
- 5 **Campus-wide faculty development and technical support** Training and support to use campus facilities is often provided by the larger institution. The campus-wide support network should be a system that makes learning about and using technology a seamless process throughout the institution.

Roles for the Schools, Colleges, and Departments of Education (SCDEs)

Just as the principal provides the vision for a K-12 school, the dean sets the tone for what will occur in the SCDE. If technology is to be an integral part of the school's vision for the future, the dean, along with the department chairs and directors of teacher education who lead key units in the program, must be committed to using technology as a catalyst for reform.

EDUCATION DEANS AND DIRECTORS OF TEACHER EDUCATION

- SCDE Leadership
- 6 **Strategic planning incorporating technology** Technology should be a catalyst that sparks the vision for change within a strategic plan for the SCDE. The plan should take into account how technology can support the overall goals of the teacher preparation program. One of the goals of the strategic plan should be to meet Target Tech goals of the STaR Chart within a reasonably defined time period, with clear indicators for measuring success.
- 7 **Funding for technology internally and via fundraising** This plan must be supported by a line item budget for technology, something that is often missing in the budgets of SCDEs. Data suggests that the teacher preparation institution typically provides only \$9 out of every \$100 spent on technology. The deans and department chairs that make technology a priority commit more of their budgets to technology and are more aggressive in seeking additional funding from private sources and grants.

- 8 **Hiring, tenure, and promotion of faculty with technology research and teaching expertise**
- SCDE leaders must set policies that provide incentives for faculty to learn about, experiment with, design and deliver technologically supported instruction. These policies must, in turn, be supported by resources that send a message that technology use is valued as a component of professional practice, and provides tools they need to use technology for research and training. Unless hiring, promotion, and tenure decisions recognize innovative teaching and development activities with technology, faculty will find it difficult to take time away from the pressure to “publish or perish” in order to advance their professional careers.
- 9 **Program guided by NCATE or equivalent technology integration standards**
- Many states do not require accreditation of the institutions that prepare educators. Today, approximately 500 of the nation's 1,300 teacher preparation programs are accredited by NCATE, the National Council for the Accreditation of Teacher Education (www.ncate.org). NCATE has taken a lead in adopting requirements that emphasize the importance of technology in content, pedagogical and professional standards. They also set high standards for faculty qualifications and institutional resources for teaching and scholarship with technology.
- 10 **Partnerships with K-12 schools around technology**
- The employers of new teachers have had little to say about teachers' preparation for the classroom. Teacher preparation programs that are moving forward with technology integration find that having partnerships with the K-12 community provides the needed two-way flow of expertise between the faculty in teacher education and K-12 teachers. By working closely with K-12 schools, teacher educators gain a better understanding of the ways that technology impacts student learning and the tools that today's teachers employ as a part of their instructional repertoire. In addition, some schools of education have gone as far as offering a “warranty” on their graduates to certify that they are well-equipped to enter classrooms. Taking this concept one step further, a “technology warranty” could be another way that school systems could focus their hiring on technologically prepared educators.
- 11 **Access to advanced technologies in SCDE facilities**
- SCDE Infrastructure**
The SCDE should provide equitable and ubiquitous access for all faculty and students, including those participating from off-campus sites. One or two wired classrooms or labs will not meet the teaching, research, and communication needs of the teacher education community. Innovative solutions should be considered (e.g., mobile computers with wireless telecommunications access available for on-call teaching needs, centralized research facilities for faculty and student use, etc.). The AACTE study found that in most SCDEs, the ratio of students to computers is approximately 10 to 1, higher than the 7 to 1 ratio in higher education overall and the 6 to 1 ratio now found in K-12 schools. Faculty have better access to a computer but still not every full-time faculty member in SCDEs has access. Furthermore, while close to 11 percent of higher education institutions require or strongly recommend microcomputer ownership for students in specific disciplines or programs, less than 2 percent of those SCDEs responding to the AACTE survey require that their teacher education students purchase a computer.

- 12 Faculty development** Educated in an earlier era, most faculty in colleges of education were not trained to teach with technology. SCDEs face a huge challenge in helping teacher education faculty become more familiar with technology. Many have found it necessary to develop a faculty development program that offers multiple professional development opportunities, going beyond formal workshops to include one-on-one coaching, mentoring from peers, informal “show-and-tell” content applications and “hand-holding” support from more accomplished colleagues. Some institutions have recruited students to serve as “technology teaching assistants” to faculty. Furthermore, new incentives (e.g., summer stipends, mini-grants, and sabbaticals in a K-12 environment) may be necessary to encourage faculty to take the time to learn about technology and change their teaching approaches in order to use it most effectively.
- 13 Technical support** Whether support comes from the central administration, a team based in the SCDE, graduate assistants or undergraduates serving as technical mentors to faculty and students, it is critical that, should problems arise, friendly and skillful technical support is available, 24 hours a day, seven days a week.
- 14 Coursework that integrates technology to enhance learning** SCDE Curriculum
Research confirms that stand-alone technology classes may not provide the best way to ensure that basic skills are integrated in one’s teaching repertoire. Today, most teacher education institutions have specific information technology course requirements (85 percent in the Milken/ISTE study), but the majority of these are introductory technology classes. They may not be the best vehicle for understanding how technology supports learning in a field. Teacher candidates should be learning to create and apply technology as a means of supporting student learning in all methods and content courses. The AACTE study found that only 40 percent of institutions require their teacher candidates to incorporate technology when they design and deliver instruction on campus.
- 15 Use of online resources to support learning opportunities** Electronic communication tools can extend the research, communication, and reflection components in traditional courses and provide opportunities to reach learners at a distance. By using these resources in teacher preparation programs, teacher candidates are also exposed to innovative teaching approaches and models for communication.
- 16 Technology in field experiences and student teaching** Many new teachers consider classroom observations, student teaching, and field experiences the most important learning experiences in their teacher preparation program. Student classroom observations should provide opportunities to observe the integration of technology in teaching and learning in K-12 classrooms. Some observations can be enhanced by technology, such as video links that bring the K-12 classroom into the SCDE classrooms, a setting in which a wider range of classroom observations can be offered to students. Wherever possible, student teaching and practicum experiences should be chosen for opportunities that will expose teacher candidates to: best practices in technology integration, a range of technology resources, and the design and delivery of instruction that incorporates technology as a learning and problem-solving tool. The AACTE study found that less than one-third (28 percent) of teacher preparation institutions require this during student teaching. Technology links can also help support ongoing supervision and mentoring.

Roles for Faculty, Students, and Alumni

Institutional change comes from the bottom up as well as from the top down, as students, faculty, and alumni take responsibility for using technology to advance the teaching and learning goals of the teacher preparation institution.

FACULTY

Competence and Use

- 17 **Understanding and use of technology to enhance teaching and research**
- As faculty increase their confidence and skill in using technology, they move through a series of stages similar to what the Apple Classrooms of Tomorrow (ACoT) identified as levels of teacher expertise in K-12 classrooms. These are defined as:
- Entry:** Educators struggle to learn the basics of using technology;
- Adoption:** Educators move from the initial struggles to successful use of technology on a basic level;
- Adaptation:** Educators move from basic use of technology to discovery of its potential for increased productivity;
- Appropriation:** Having achieved mastery over the technology, educators use it “effortlessly” as a tool to accomplish a variety of instructional and management goals; and
- Invention:** Educators are prepared to develop entirely new learning environments that utilize technology as a flexible teaching and learning tool. They begin to “think with technology,” designing new ways to solve learning problems that their students may have faced in the past.

STUDENTS

Competence and Use

- 18 **Understanding and use of technology to maximize student learning**
- As states are beginning to require that candidates demonstrate technology proficiency that meets content standards, the ultimate measure for the success of a SCDE is the pass rate of their graduates in meeting these standards. In order for students to develop these skills, they should be required to design and deliver instruction incorporating new technologies both on campus and in the student teaching experience. As school districts become increasingly aggressive in competing for candidates with advanced technology expertise, the success of SCDEs graduates in the marketplace will be a critical indicator of the quality of their teacher preparation program.

ALUMNI

Connections

- 19 **Connection with the SCDE for continuous growth**
- As education and technology practices change and grow, today's SCDEs have the opportunity to create a two-way support structure that provides continuing expertise to their graduates. The SCDE should create a learning community that works with alumni throughout their careers, as alumni can be a powerful voice for change—and a resource base that helps fund new initiatives.

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The CEO Forum on Education & Technology

Founded in 1996, the CEO Forum on Education & Technology is a unique four-year partnership between business and education leaders who are committed to assessing and monitoring progress toward integrating technology in America's schools. The CEO Forum hopes to ensure that the nation's students will achieve higher academic standards and will be equipped with the skills they need to be contributing citizens and productive workers in the 21st century.

Organizing Principles

- All students must graduate with technology skills needed in today's world and tomorrow's workplace.
- All educators must be equipped to use technology as a tool to achieve high academic standards.
- All parents and community members must stay informed of key education technology decisions confronting policymakers, administrators, and educators.
- All students must have equitable access to education technology.
- The nation must invest in education technology research and development.

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The CEO Forum Four Year Agenda

Year 1: In *The School Technology and Readiness Report: From Pillars to Progress* (October 1997), the CEO Forum issued the STaR Chart, a self-assessment tool individual schools can use to gauge their progress toward integrating technology to improve education. In its first year, the CEO Forum also issued the first STaR Assessment, a benchmark measure of national progress toward integrating technology in education.

Year 2: Focusing on the issue of professional development, the CEO Forum's *Year 2 School Technology and Readiness Report*, called *Professional Development: A Link to Better Learning* (February 1999), included a status report on educator professional development, an update of the STaR Chart including new criteria for assessing individual school progress on professional development, and an update of the STaR Assessment.

Year 3: The CEO Forum will report on the integration and use of digital learning in K-12 schools as well as update the STaR Chart and STaR Assessment. (Spring 2000)

Year 4: In its final year, the CEO Forum will address the important question of how to measure the impact of technology on student achievement and educational outcomes as well as update the STaR Chart and STaR Assessment. (Spring 2001)



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Additional Resources

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www.ed.gov/technology

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