Certification in one California County: A Story of Diffusion, Innovation and Teacher Development

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The push to get computers into our schools has been intense. The standard technology of the 1980s was the VCR, with 90 percent of all schools having at least one (Glenn & Carrier, 1989). In 1988, it was estimated that there were 1.7 million computers in use in schools. By 1995, the number of computers in schools was up to 5.8 million (U.S. Congress, Office of Technology Assessment, 1995 p.1). In 1994, only three percent of schools had access to the Internet. That number ballooned to over 63 percent by 1996, and exploded to 95 percent by 1999, following development of the World Wide Web, and then educational technology funding programs such as the Digital High School program in California. As of 2003 close to 100% of schools had Internet connectivity (NCES 2004). Computers and the Internet have become common fixtures in our public schools. But despite these tremendous leaps in access and hardware, one thing remains constant: many educators have difficulty integrating technology into their classrooms (Smerdon, Cronen, Lanahan, Anderson, Iannotti & Angeles, 2000 p. 14).

Although the National Center for Educational Statistics study "Teachers' Tools for the Twenty First Century" found that close to one-third of teachers in public education felt prepared or very prepared to use computers and the Internet in their classroom, two-thirds did not feel prepared (Smerdon, Cronen, Lanahan, Anderson, Iannotti & Angeles, 2000).

A major barrier to technology integration is a lack of teacher support. Ways to bring teachers up-to-date technology professional development that overcomes this barrier are still needed. (Ertmer, 1999; Glenn, 1989 & 1986; Ham, 1997; McCannon & Crews, 2000; Stevens & Lonberger, 1998; U.S.Congress, Office of Technology Assessment, 1995).

Does technology make teachers more effective? This is an important question when deciding to develop teachers' technology abilities. The U.S. Congress, Office of Technology Assessment (1995) (OTA) found that teachers who used technology in their classrooms were able to improve student learning and motivation. They were also more able to address students with special needs. By using technology, the teachers were able to expose their students to a wider variety of information. The study found that teachers used technology to change teaching and learning, to assist with daily tasks, and to enhance their professional development.

Teachers who had technology skills changed their teaching in variety of ways. Many moved away from traditional ways of teaching into a more constructivist way of teaching (Bozeman, 1999 p. 60). Technology proficient teachers found that they (a) expected more from their students, (b) became more comfortable with students working independently, (c) tailored instruction to individual needs, (d) guided instruction more than led it, and (e) spent less time lecturing (U.S. Government, Office of Technology Assessment, 1995).

In addition, classrooms where the teacher used technology on a regular basis tended to be more student-centered. The teacher was able to plan more group activities and reduce lecture time (Bozeman, 1999).

The OTA found that technology helped teachers in their daily tasks. It made classroom management tasks such as tracking student progress more efficient through the use of databases and spread sheets. Teachers used technology to prepare lessons, keep grades, and contact parents. The area of Professional Development was also enhanced through the use of technology. The OTA study found examples of "just in time training and support", which they described as the opportunity for teachers to gain professional development right at the time they need to do so. They listed examples of teachers learning via satellite in Los Angeles, counselors in Wyoming meeting via video, and math teachers discussing teaching techniques over a computer network (U.S. Government, Office of Technology Assessment, 1995 p. 16).

Based on the research, it is obvious that teaching teachers to use technology increases their effectiveness. It increases their productivity and enhances their instructional program. Technology gives teachers a larger variety of staff development opportunities. For these reasons, it is necessary to develop the teacher's ability to use technology.

How does a school district do this successfully?

Shelton and Jones (1996) found four factors that are important to the success of staff development activities involving the integration of technology into the curriculum: "Time, Training, Technology, and Teacher Type tasks" (p. 99). Additionally, their experience and readings of research found other requirements for success: staff development should be hands-on, staff development should not be "one-shot", staff development should be developmental and geared to identified needs, technology integration strategies should be the main focus of staff development rather than specific applications training, and that for the best results, "teachers should train teachers" (p. 98-99). Peer help can make the difference.

Wang (2000) used a three-phase staff development model to teach teachers in Guam about computers. The three phases were: (a) familiarization, or getting the basics, (b) utilization, or learning the utilitarian aspects of computers, and (c) integration, or the teacher learning how to have students use the computer by incorporating it into the classroom curriculum. Wang found that the most important implication in the study of veteran teachers was that teachers were aware of the fact that technology is here to stay, and had a deep concern of somehow "missing out" (Wang, 2000 p. 8).

The CTAP Region 8 Certification Process Has Been In Existence Since 1999

In response to the need for technology integration staff development for teachers, in one four-county region, the California Technology Assistance Project (CTAP) Region 8 developed a long-term, three-tiered technology training program.

In the mid 1990s, there was interest in developing a set of common training objectives for teaching computer basics in California. The interest grew from discussions among TechMentors, expert teacher leaders who served as facilitator-trainers for a cohort of 24 teachers as part of the Telemation Project (1993-1995), funded through the California Technology Project. The pertinent question was "what are those basic skills that all teachers need to acquire for (a) personal computer use and (b) to facilitate student learning with educational technologies?" At about the same time, the International Society for Technology in Education (ISTE), was developing a national set of competencies, the National Educational Technology Standards for Teachers (NETS•T), enriching the discussions on common standards at both levels.

Four counties invited a broad cross-section of stakeholders to participate, with administrators, teachers, and technology leaders from elementary, middle and high schools from large, medium and small districts. Also invited were a professional development consortium, county office leadership, and district leadership. During the school year, they developed a common set of proficiencies that covered basic technologies teachers needed to know and be able to use.

The four counties in Region 8 CTAP – Kern, Santa Barbara, San Luis Obispo and Ventura counties – decided to use the finalized set of proficiencies as the basis for their ongoing trainings. Over time, other CTAP Regional Councils have adopted similar versions.

The first two tiers were based on the California Commission on Teacher Credentialing's (CCTC) technology requirements for teacher credentialing purposes. Standard 9 requires the teacher to have a set of specific computer skills and enables the teacher candidate to apply for a preliminary, five-year, credential. Standard 16 requires the preliminary teacher candidate to be able to develop, design and implement lessons integrating technology into their classrooms.

But how does one keep the technology certification process alive? How does one help it grow and continue? This is where Level III comes in. The Level III certification can be earned in either leadership or mentorship, depending on where the majority of the Level III applicant's work is done. Level IIIs that work primarily in the classroom and do staff development apply for the mentor certificate. Technology leaders, i.e. technology directors, administrators, and technology coordinators who do not have a classroom, generally apply for the leadership certificate. There are also those select few who opt to get certified as both a mentor and a leader.

The Level III certified person is the only one who can sign off a Level I or Level II certificate as completed. The Level IIIs then become the pool of trainers for the CTAP Level I and II certification classes. This is how the program ensures that "teachers train teachers." Level III will be discussed later in more detail.

All levels require a portfolio that shows competence with the technology being taught. Portfolios can be in a hardcopy form (usually a three-ring binder), or digital, either as a burned CD, a website, or an online project within a specific program (LiveText).

The Rationale For The Portfolio

In Level I, teachers learn a variety of basic skills in technology. There are a total of 15 proficiencies. The goal is that through the portfolio, the applicant is able to demonstrate proficiency in the specific skills required by the activity. Applicants demonstrate proficiency by providing several artifacts that represent their ability to do the required skills, as well as a narrative that "clearly describes how the artifact has met the requirements of the proficiency standard." (CTAP Region 8, 1999) Individual narratives placed on or with the artifacts themselves describe the artifacts.

Most applicants complete a 30-hour face-to-face staff development program, where they receive direct instruction in the activities required to complete each proficiency. They work on the portfolio throughout the 30 hours and outside of the staff development. On average, it takes the applicant an additional 10 - 15 hours to complete a portfolio. There are a variety of delivery methods for the portfolio classes. During the school year, some of the classes meet three hours a day, once a week for ten weeks. Others may meet fewer hours each night with more sections. In the summer, classes will meet anywhere from two to four weeks, depending on how the program is set up.

As technology has become more ubiquitous, many teachers have a working knowledge of many of the proficiencies and do not require as much direct instruction in order to complete the portfolio. As a result, several online options have been developed for teachers to complete the certification process. Teachers can now take an online course through several universities, using WebCT and/or LiveText, or their local CTAP office, using Moodle.

The Level II portfolio builds from the Level I and requires teachers to begin the actual integration of technologies into their daily classroom curriculum. Several of the proficiencies require the teacher/educator to teach the same skill to students that he or she had previously mastered in Level I. As with Level I, a portfolio is constructed containing artifacts that serve as the evidence that the teacher has reached proficiency in the required technology standard. Level II candidates can take a 30-hour course, an online course, or complete the portfolio independently. The actual portfolio takes an additional 10 – 15 hours outside of coursework to complete.

The proficiencies in Level II are divided into three major subsections: (a) Communication and Collaboration; (b) Planning, Design and Implementation Learning Experiences; and (c) Assessment and Evaluation. The major difference between Level I and Level II is that Level II requires student samples that demonstrate that the teacher/educator has actually taught lessons that require technology integration. Additionally, the participant must include samples of collaboration with parents and other teachers.

Once a teacher/educator has completed Levels I and II, his or her basic instruction in technology skills and integration is considered complete. All participants are encouraged to pursue other learning opportunities in their districts, as well as through local universities and the CTAP offices.

The next CTAP Level is for those who want to take or already have taken a leadership role at the school, district, or county level. The Level III portfolio can be completed in two different areas. The applicant can choose to complete a portfolio in either Technology Mentorship or in Technology Leadership.

The Mentor set of proficiencies requires the candidate to demonstrate that they are "… a role model in the use of educational technology, and those skills pursuant to site and district level staff development workshops and local peer-to-peer mentoring" (CTAP, 1999). A total of six proficiencies cover the expectations. They require the applicant to demonstrate proficiency through artifacts, and also to gather letters of recommendation that clearly show that the candidate is seen as a technology mentor by his/her peers.

The Level III candidate submits a portfolio similar to the previous levels. The difference is that instead of another Level III signing off the portfolio, the Level III portfolio is reviewed by the CTAP Advisory Committee, consisting of not less than three previously certified Level III mentors and/or leaders. This ensures a consistency in the acceptance process.

The Level III Leadership certificate was developed so that those technology leaders who were no longer in the classroom could also support the certification process. The

Leadership applicants tend to be district level technology coordinators and directors, county level personnel, and administrators, as well as school site administrators. CTAP's goal for the Leadership portfolio is to enable educators who advocate "the application of education technology to enhance teaching and learning on an institution-wide basis" (CTAP, 1999) to become part of the certification process. Applicants submit a portfolio similar to the mentor portfolio and are also evaluated by the Advisory Committee. Upon completion of their portfolio, they too can sign off Level I and IIs.

In addition, each Level III certificate holder is required to update his or her portfolio every five years with current artifacts and letters of recommendations. Initially the requirement was every two years, but this was soon discovered to be too demanding on those who were serving in mentor and leadership roles in their districts. The Level III mentors and leaders do meet yearly to recalibrate themselves to the portfolio requirements.

The Boost Effect

Several events have had a positive effect on the number of teachers receiving CTAP certifications. Over the past nine years of the program, the CTAP certification process has become acculturated in the local educational system as a result of these boosts.

The DHS boost

In 1996, the California legislature approved AB 64, which authorized the "Digital High School Education Technology Grant Program of 1997." This grant consisted of one-time installation grants and ongoing technology support and staff training grants, to provide all high school pupils with basic computer skills, to improve pupil achievement in all academic subjects, and to increase collaboration among high schools, private industry, postsecondary education institutions, and community organizations. (AB 64, 2006) The bill also provided follow-up funds for High Schools to provide ongoing technology training and staff development.

The CTAP Region 8 Proficiencies met the staff development requirements for the grant, and a majority of the High Schools in the county wrote the CTAP Certification process into their grants. This created a need to provide training, as well as to develop trainers for the high schools themselves. A large number of CTAP Level III mentors came from the high school districts initially. Having a program in place that a high school could adopt allowed the high schools to write CTAP into their plans and have the staff development piece covered.

The University Boost

All but one university in the Kern County area adopted the CTAP Level I and II portfolio as the way for teachers to meet their preliminary and clear credential requirements. Instructors at the universities became Level III certified in order to sign off their students' portfolios. As a result of their participation in the certification process, the university instructors became greatly invested and involved in the design of instructional materials for portfolio trainings.

The BTSA Boost

In 1998, the state implemented the "Beginning Teacher Support and Assessment" program, or BTSA. California has a unique way of credentialing teachers. The majority of teachers complete a fifth year of study after completing a bachelor's degree in order to get a preliminary teaching credential. They then need to clear their credential within five years and receive their professional clear credential. In 2004, AB 2210 stipulated that all teachers with a preliminary credential be required to go through an induction program in order to get their California Clear Credential. The BTSA program was designated by the California Commission on Teaching Credentials (CCTC) as the main program to do this. Because the CTAP Portfolios had already been aligned to the CCTCs's teaching standards (9 and 16), they were selected by the local BTSA program as the way for BTSA teachers and induction teachers to meet the state's technology requirements.

The result of these boosts was to create a network of cooperation between several entities in the educational world of Kern County. The high school district, the elementary schools, the universities, the BTSA induction program, and the CTAP Region 8 office collaborated in the certification process. Each year, meetings are held for the Level III certificated people to recalibrate to the proficiencies and the portfolio expectations.

The Effects of CTAP Training on Teachers in Kern County

Since the implementation of the CTAP proficiency system, records have been kept on the number of teachers certified at all three levels. Figure 1.1 shows how the number of Level I and Level II certifications has grown during the years 1999 to 2005. The chart also shows the influence the Digital High school boost and the BTSA boost had on the total number of certifications. The number of Level I certifications per year grew from an initial number of 94 in 1999 to a total of 1168 in 2005. Level II certifications went from 37 in 1999 to 524 by 2005. Interestingly, the number of Level III certifications has fallen between 34 in 1999 to 16 in 2005. The numbers associated with each year in the graph represent only those applying for a certificate that year.

Figure 1.1

Does The Program Have An Effect?

Beginning in 1999, all participants in a county CTAP class were required to evaluate their technology abilities through an online assessment program. The program originally was named CTAP^{2,} which stood for California Technology Assistance Project's California Technology Assessment Profile (CTAP " squared"), and later renamed EdTechProfile. The data collected is not only from those taking CTAP certification classes, but also is a mix of assessment data from a variety of technology projects. In the beginning, CTAP proficiency students were the majority of those taking the assessment, but over time, others were added. In 2002, both the AB 75 Principal's training and the Enhancing Teaching Through Technology Completive grant (EETT-C) required participants to do the CTAP^2 online assessment. AB 75 participating principals had to have 80% of their site's teachers complete the assessment and EETT-C recipient schools had to have a 60% completion rate. There is no clear data addressing how many of the AB 75 schools' teachers had a CTAP Level, nor how many of the EETT-C teachers did. Both programs, however, relied on CTAP staff to train administrators and teachers on how to take the assessment. CTAP staff trained 100% of the county's AB 75 participants. Two districts received EETT-C grants, and both wrote CTAP Region 8 training into their grants. An assumption can be made, then, that the majority of CTAP^2 / EdTechProfile participants had one or more of the CTAP certifications.

A simple review of the number of assessments administered shows a steady growth up until the year 2005. The graph below shows the number of assessments for each of the years 2000-2005 in the county.

Figure 1.2

When the assessment data is looked at by the number of participants evaluating themselves as beginning, intermediate, or proficient, there is a steady decline in those that are labeling themselves "beginning" over the five-year period. (Figure 1.3) The years 2000 and 2001 had only 33 and 321 respondents respectively to the CTAP^2 assessment. The lower numbers of beginners can be explained by the fact that for the first two years, nearly all CTAP class participants were already at a certain proficiency level and took the classes to validate knowledge rather than to learn more. They were the early adopters (Rogers 1995) of the CTAP process.

Figure 1.3

The most striking data, however, is the percentage of the teacher population in Kern County that has obtained a CTAP Region 8 Level I certification. (Figure 1. 4) By the end of 2006, 65% of the teachers in the county had been awarded one. An additional 48 % of these teachers had gone on to earn their CTAP Level II. As a result of this large number of participants in the program, the CTAP Level I and Level II certificates have great name recognition. Several districts require a Level II certificate in order for teachers to have access to new technologies in their classrooms, or to participate in grants. A majority of the districts make reference to the number of certificated teachers at their school site in their state-approved technology plans.

Figure 1.4

Conclusions And Areas For Future Research

The story of the CTAP Region 8 certification process is one of success. It has been self- sustaining for the past nine years. The program has been diffused through the districts in the county. Initial looks at the data support the following conclusions:

1. The program has had steady growth and now has trained over 65% of the teachers in the area.
2. Some of the technology gains that teachers have made in the past 8-9 years can be attributed to the CTAP Region 8 certification process.
3. The certification process is self – sustaining and has replicated itself throughout the county.
4. The program has become an important part of the teacher technology training in Kern County.

The data also suggests further areas of study. Are teachers who have been through the certification process more likely to utilize and integrate technology into their classroom setting? Does the technology certification process translate into student use of technology in the classroom? Is there a connection between the certification process and student achievement?

Technology is here to stay and will only become more pervasive. The advancements in technology only come more quickly from year to year. Teachers will need help in learning positive ways to integrate these new technologies in ways that support student achievement. The CTAP certification process is one model that works.

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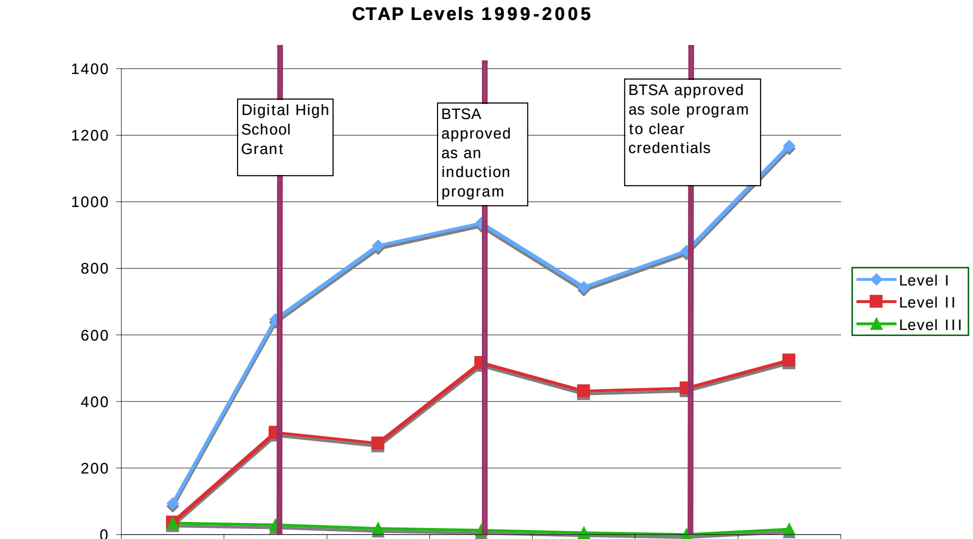
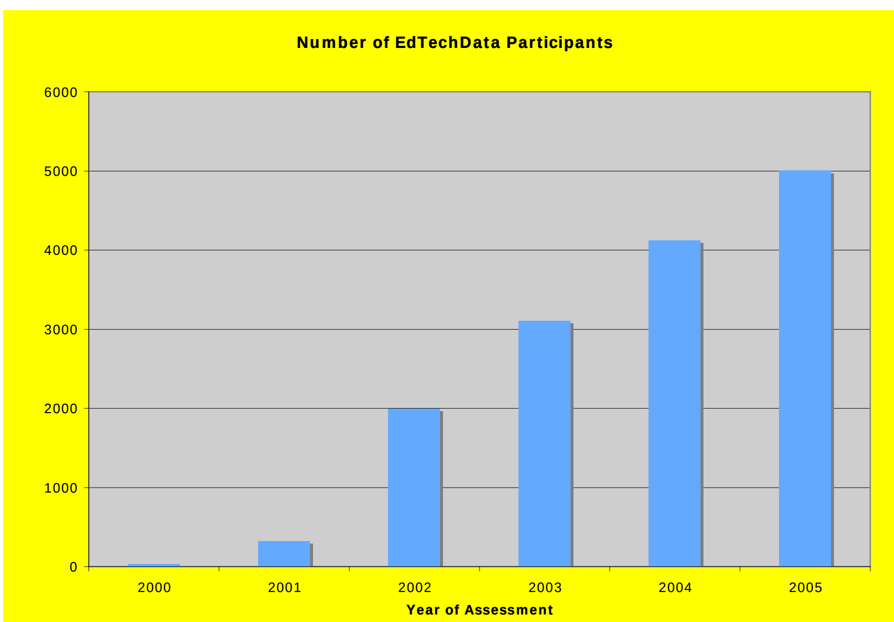
Figures:



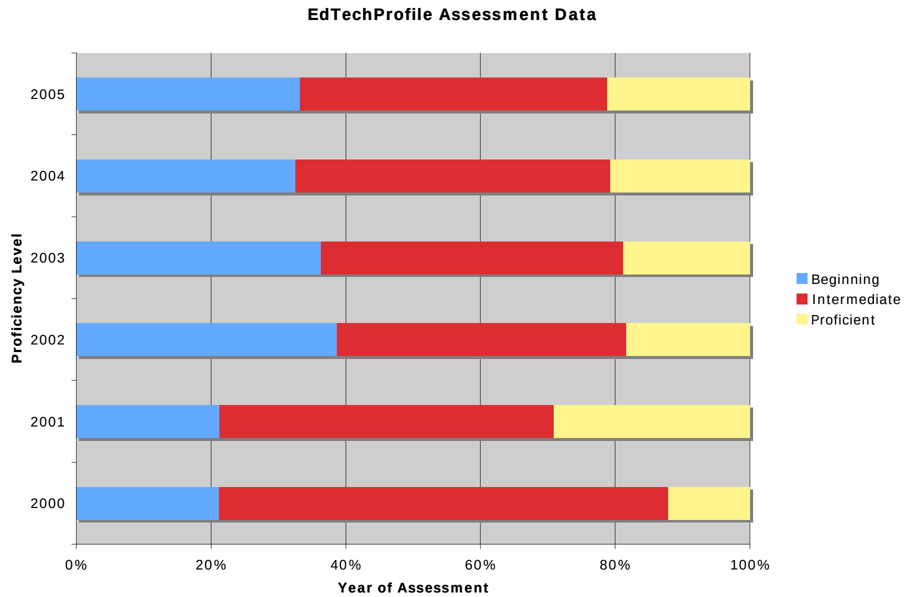
	1999	2000	2001	2002	2003	2004	2005
Level I	94	646	868	935	743	852	1168
Level II	37	306	274	516	431	440	524
Level III	34	29	18	13	5	0	16

Number of Certifications

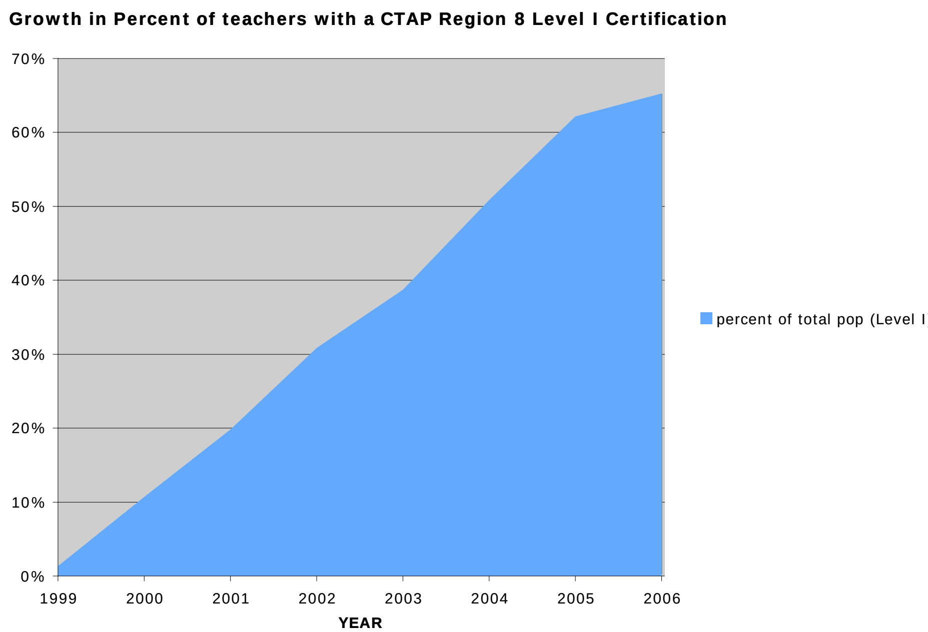
1.1



1.2


EdTechProfile Assessment Data
Proficiency Level
2005
2004
2003
2002
2001
2000
0%
20%
40%
60%
80%
100%
Year of Assessment
Beginning
Intermediate
Proficient

1.3


Growth in Percent of teachers with a CTAP Region 8 Level I Certification
70%
60%
50%
40%
30%
20%
10%
0%
1999
2000
2001
2002
2003
2004
2005
2006
YEAR
percent of total pop (Level I)

1.4