

21st Century Technology Support Project
Final Report
by Dr. Shirley Campbell and Dr. Celina Byers

This is a report of the results of the 21st Century Technology Support Project (21CTSP), carried out by Dr. Shirley Campbell and Dr. Celina Byers. Drs. Campbell and Byers requested support for this project and were generously supported in this effort by the Pennsylvania Association for Educational Communications and Technology professional organization (PAECT) through the creation of a task force to carry out this project. In the fall of 2005, before the project began, the researchers contacted the Pennsylvania Department of Education (PDE) to provide information about their intentions, and requested guidance in creating a report that would be most helpful to PDE in this area. The project focus was the need for changes to the Pennsylvania Instructional Technology Specialist Certificate (ITS). This report describes the research effort and provides the resulting recommendations from participants, as well as recommendations for future research. While the information provided here does not offer an immediate remedy for the difficulty with the certificate, it does provide background information that can serve as a starting point for making changes to the certificate and enhancing the use of technology for education in Pennsylvania schools. The 21CTSP task force leaders hope that PDE will accept this respectfully submitted project report as a means of aiding the department in a difficult task. We hope that this report will be found useful to assist in providing direction for the use of technology in education in Pennsylvania in the 21st Century through our collective expertise and enthusiasm. And we thank PAECT for their sponsorship, efforts in carrying out the project, and the valuable contributions of their members.

Current Status of the Instructional Technology Specialist Certificate

The current technology related certificate offered by PDE is called the Instructional Technology Specialist Certificate. The person who holds this certificate is not licensed under the certificate to work with students in the classroom. The intention of the certificate as it is described appears to provide for the holder to be responsible for some level of adult training and instruction in the use of technology along with responsibility for maintenance of technology systems in the district. A copy of the text of the certificate is provided in the Appendix.

There is much confusion about the intended role of the person holding the ITS certificate in schools. In some districts, the person holding this certificate is expected to provide training in the use of technology for teachers and other adults in the district, while in other districts, the person holding this certificate is expected to provide technical support for the district. In still other districts, no one is required to hold this certificate. In some districts, the person holding this certificate answers to the superintendent. In some districts, this person answers to the business manager. In some districts, the person holding this certificate works either in conjunction with or answers to the person responsible for curriculum. In still other districts, this person answers to the Information Technology Director. Other configurations occur as well.

The same confusion occurs in higher education where one university offers ITS training that prepares the holder to teach technology integrated lessons, while another prepares the holder to serve as a district level administrator. Still another prepares the holder to offer training for teachers in the integration of technology, and others variations exist as well.

Project Inception

At the close of the PT3 program (Preparing Tomorrow's Teachers to Use Technology—federally funded program), many Pennsylvania educators were concerned about the need for use of and need to make changes to the ITS certificate. A workshop was arranged at Temple University to discuss technology in Pennsylvania schools. The researchers were in attendance, as were other PAECT members. The researchers requested assistance from PAECT to take the project further, and a task force was formed with the researchers serving as its leaders. They developed a process by which to gather information and report possible recommendations for change. As educators in universities that offer training for the Pennsylvania ITS certificate, the task force leaders of this project were concerned about the alignment of the requirements for the certificate and the needs of the schools we serve. As instructional designers, they saw the need for multiple areas of skill required in schools but not addressed by the certificate.

The research procedures included seeking out literature related to the types of changes that might be applicable in the Pennsylvania system. In addition, a series of meetings across the state were designed and scheduled. Information was gathered at these meetings that involved educators from a variety of roles and institutions for feedback on their experiences and perceived needs in the area of technology support in schools.

The first meeting was a kick off invitational meeting held at the Pennsylvania Educational Technology Expo and Conference, (PETE&C), in February of 2006. Six regional meetings followed in the spring of 2006; one each in the northeast, southeast, northwest, southwest, north central and south central areas of Pennsylvania. Invitations to these meetings were extended via the regional directors of PAECT, through various list serves, through the PETE&C conference, and through schools and universities. Attendance at meetings ranged from 14 to 39 educators. Attendees included K12 teachers, technology support personnel from districts (with and without ITS certification), principals, superintendents, librarians, curriculum coordinators, school board members, university faculty, university students, k12 students and parents. Every type of stakeholder was represented.

Discussions at meetings involved group interaction and responses to leading questions, asking attendees to respond not only to the current situations in schools, but to look toward the future to the needs of schools in upcoming years. Discussion was vigorous and excited. All participants seemed eager to contribute their experiences, ideas they had implemented that worked, and suggestions for additional planning. The discussions were positive and forward thinking.

From the results of the meetings, a database was created and made available online. The database offered participants and others an opportunity to respond to the data gathered. They were welcome to comment on the compiled data and add additional information. A blog was also created, requesting responses to a set of questions outlining a possible scenario for replacing or amending the current ITS certificate requirements and responsibilities. Comments were gathered there as well.

Finally, a last meeting was held at PETE&C in February of 2007. This meeting was poorly attended because of a snowstorm, but the feedback provided on data gathered to date was valuable.

Results and Recommendations

The overall resounding response indicates that the ITS certificate should be replaced. Its replacement should provide for at least 3 areas:

1. It should provide for more people who also have some knowledge about education to do the hardware, wiring and maintenance support.
2. It should provide for people who can do teacher training and support, and that has to be ongoing and continuous, since technology change is not going to stop. Educators cannot be expected to keep up with all of the changes in technology and information while also keeping up with changes to special education requirements, safety issues in schools, global awareness, and the myriad of other important issues about which they must be current. Teachers need specialists they can count on to help.
3. There must be available help for developing curriculum that uses technology, information, and connectivity as a basis for teaching and learning in much the same way that books are currently used. Curriculum development must also involve up-to-date research on learning.

Creation of a single certificate to provide all of this support does not seem possible. To compound the problem, the need for the combination of technology integration, information literacy, connectivity, and practice rooted in learning research to become the base from which education occurs involves changing the job descriptions of everyone involved in education to some degree, from the teacher to the superintendent to the parent and to the state legislator.

The need for the kinds of support that might be offered through revised ITS certificates is evident not only in the data and discussions from the project, but also in the applications for new students in university programs that offer ITS certification. Schools are still looking for trained people to provide support in these areas, and so students are still applying to take coursework that leads to the certificate.

Although interesting and significant data were collected, it is not sufficient as it stands to provide a clear set of descriptions for ITS certification replacements. In order to reach

that point, these researchers recommend completing at least one more round of state wide regional meetings, and a finalizing work session with a small group of educational leaders to complete wording. Statewide meetings offer an opportunity to gather input from the leaders in technology in education. Their participation means that their valuable expertise is available to impact the effort, and they are generally passionate about providing the best possible education for our students. Involving them also increases the buy-in from their districts when the certification requirements are in place. This format has been quite successful in other projects to develop, for example, the ISTE National Technology Standards.

It is very likely that carrying out such a process would also result in recommendations to enhance the technology and information processing components of other Pennsylvania school teaching and educator certificates as well as the teacher preparation programs. These areas are deeply intertwined. It is virtually impossible to discuss appropriate support of technology in schools without addressing the need to critically revamp education to be sure that technology use is supported from other aspects of the educational process as well. Funding and time are required to carry out this process, and although these researchers are passionate about the need and certain that this process would result in an effective set of revisions, it is impossible to continue to move forward on a task this large without appropriate resources.

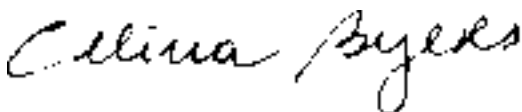
Data collected has been minimally processed and provided in an online database for review that can be found at <http://www.paedutech.com>. The blog is available online at <http://paedutech.blogspot.com/>. Data that has been further processed is available from the researchers upon request.

We hope that the information provided here is useful. We would be happy to discuss any aspects of the project and the findings with members of PDE who would find it helpful. Please do not hesitate to contact us for more information. And we would like to formally thank the board members of PAECT for their support and assistance.

Sincerely,
Coordinators of the PAECT Task Force
21st Century Technology Support Project

A handwritten signature in cursive script that reads "Shirley Campbell". The signature is written in black ink on a light blue rectangular background.

Shirley Campbell, Seton Hill University

A handwritten signature in cursive script that reads "Celina Byers". The signature is written in black ink.

Celina Byers, Bloomsburg University

Appendix A

Instructional Technology Specialist

I. Knowing the Content

The professional education program provides evidence that Instructional Technology Specialist certification candidates complete a program at a bachelor's or post-baccalaureate degree level that requires them to demonstrate their knowledge of and competence in the application of instructional technology in public school settings. The program requires candidates to demonstrate an understanding of the fundamental and advanced concepts of instructional technology planning and applications at elementary, middle, and secondary levels (K-12) including:

I.A. Identification, selection, installation and maintenance of technology infrastructure, and hardware and software applications for school administration and instruction including:

- assessment of educational and administrative technological needs,
- design and production of media including projected and non-projected visual aids, audio and video production in both analog and digital forms, and photography using film-based and digital formats,
- implementation and maintenance of interactive information systems, the Internet, distance learning technologies, and networks,
- assistive technology resources for students with special needs,
- evaluation of the performance of hardware and software components of computer systems,
- application of basic troubleshooting strategies

I.B. Integrating technology into curricular planning and instructional design including:

- research on and evaluation of existing and emerging technologies,
- use of instructional theories and teaching models,
- learner characteristics, developmental levels, and individual differences as related to instructional technology resources and modifications,
- access and use telecommunications for information sharing, remote information access and retrieval, and multi-media/hypermedia publishing,
- electronic mail and Internet resources for communications and instructional support

I.C. Management and administration of technology programs at the building, district and regional levels including:

- planning and utilization of facilities including, budgeting, accounting, and program reporting, grantsmanship, personnel administration, and staff development,
- preparing presentations for parents, administrators, school boards, and the public,
- monitoring and evaluating technology plans

I.D. Research, problem solving and product development of technological applications including:

- basic principles of instructional design associated with the development of instructional technology materials,

- emerging programming, authoring, and problem solving environments including team and collaborative projects such as on-line workgroups,
- designing and publishing on-line documents that present information and include links to critical resources

II. Performances

The professional education program provides evidence that competencies and exit criteria for Instructional Technology Specialist certification candidates are assessed in coursework, field experiences, portfolios from previous employment and an internship. The program also provides evidence that the candidates demonstrate their knowledge of and competence in the delivery of instructional technology services that enhance administrative and teaching capabilities and improve student learning during a minimum of 75 hours of participation in sequential field experiences, practica, and an internship at diverse educational levels including:

II.A. Managing instructional technology services including:

- creating an environment that fosters interest and growth in all aspects of technology,
- establishing and maintaining rapport with all staff and students,
- communicating high learning expectations,
- creating a safe physical environment that is conducive to learning

II.B. Planning, preparation and delivery of technology related in-service programs and instruction in collaboration with other professionals at a variety of instructional levels that utilizes technology in problem solving based upon:

- Pennsylvania Academic Standards,
- strengths and needs of learners at all levels of technological proficiency,
- established technology implementation plans

II.C. Selecting, implementing and adapting technology to teaching methodologies, curriculum resources and administrative functions in collaboration with other educators and integrating a variety of software, applications, and learning tools

II.D. Selecting, developing and administering assessments that utilize technological applications and involve multiple indicators of student progress and using technology to maintain records on student achievement

II.E. Developing leadership techniques for working with all levels of the educational community and to manage and administer instructional technology programs at the building and district levels including:

- developing plans to assess the technological needs and resources, and to evaluate technology implementation and outcomes,
- developing plans to configure computer/technology systems and related peripherals in laboratory, classroom clusters, and other instructional and administrative arrangements,
- developing systems for the secure maintenance of student records

III. Professionalism

The professional education program provides evidence that Instructional Technology Specialist certification candidates demonstrate knowledge and competencies that foster professionalism in school and community settings including:

III.A. Professional organizations, publications and resources

III.B. Integrity and ethical behavior, professional conduct as stated in Pennsylvania's Code of Professional Practice and Conduct for Educators; and local, state, and federal laws and regulations

III.C. Collaborating with school colleagues to enhance student, teacher and administrative capabilities and improve student learning.

III.D. Communicating effectively with parents/guardians, other agencies and the community at large to support learning by all students

Appendix B

Compiled Data as collected at the PETE&C meeting in 2007, when data already collected was compiled and reviewed. These are categories and items under each.

Tools needed

time: changes in job expectations
time: continuous professional dev
time: learn about newest tools
complete tool packages, including peripherals
imaging stations
data warehousing
tools available when teachers are
time for revision of curriculum
collaboration opportunities/portals
share workspace
conferences
apprenticeship options
equality of access to tools and resources
communication among ALL stakeholders
all school staff requires training
training must be done using versatile options
reliable and invisible tools

places and tools

video on demand
equality issues
video conferencing
bandwidth, bandwidth, bandwidth
global conferencing
online courses
blended, hybrid classes – virtual - does
equity issues begin here – probably
funding is a better place
home schooling
virtual schooling
course shells like blackboard
constant instantaneous communications
anytime anywhere
learning in social spaces (in “my Space)
enough of the right technology (one to one, mobile peripherals, open source software)

everything compatible and working
transparent

political impact

paradigm shift needed in school boards –
all the way to state and federal reps
involves funding, equity, legislation
involves listening to educators
involves addressing resistance to change
and fear of the unknown

changes for teachers

have to learn new tech and keep up
teacher is coach or facilitator
team teaching
mentoring
finding strength and weaknesses
every teacher has to be a specialist; no
one can know everything
need to know how to teach tech skills
need to know how to teach content using
tech skills
professionalism is faster pace and more
demanding loads
accountability consistently growing
less autonomy
need to become risk takers
need to access to research on learning
have to learn the tools the natives use
integrate the tools, not just use

the content

creating knowledge that uses previous
knowledge
analyze and evaluate info
more and more info available
digitally available info
need the research on how virtual options
impact learning and achievement
need to learn tech skills

need to learn to use tech skills for learning
collaborative sources of info - wikis, weblogs
databases of information
impact of global perspective on learning
difficult to know what is essential info and what is supporting
info literacy skills
new social skills related to online

Teaching and Learning Formats

interactive instruction; hands on
digital natives
controlled chaos
integrated curriculum/cross curriculum
innovative and inventive
creative
problem solving
real life experiences; authentic
global
self directed
learning styles
students empowered
collaboration – small groups and global
cooperative/collaborative
students active in learning processes
learning is more personal
multi-paced and asynchronous
effects of cognitive on mental emotional and social
effects of connectivity on mental, emotional, and social
personal safety issues
identity safety issues
ethics, cyber ethics, technology ethics

Funding

Total cost of ownership (TCO)
Budgets must align with long term plans – purchases too
Schools in diverse areas are affected differently
How to share funding when learning opportunities cross “borders”

Economic issues are widening gaps
There are no one-fits-all ideas
Corporate /business partnerships
Per student funding

Administrators

Decision makers must be tool users
More and faster communication will help data driven assessment
Must expect more from new hires
Must be creative about new options
Principals are key to involving tech in schools
Tech support person needed in every building – admins need to understand
Reps by every level on decision making committees

Technical Support

Need ongoing it prof. development
Need adequate #'s of support people
Eliminate gaps between IT folks and curriculum folks
Latest in security; Best security
On demand, just in time support
Latest in tools
Daily support for troubleshooting tech
Daily support for integration

Assessment

electronic storage and record keeping
instant access
instant feedback from observation
small remote device for data
data driven instruction
data driven decisions
PSSA must reflect tech values – needs restructuring***

Higher Ed

colleges not producing tech savvy teachers
standardize across state for teacher prep
college instructors should have up to date k12 experience