A New High School Graduation Experience Requires Increased Staff Computer Literacy

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More than ever before, teachers are being required to gain more refined technical knowledge in computer-based literacy. New academic and technology standards are being initiated as exemplified by their introduction into Pennsylvania's high school curriculum.

In addition, this state has instituted a culminating project for graduating seniors as a basis for awarding student merit diplomas rather than merely certificates of school attendance. Since many high school students either take computer literacy courses or are self-taught through their own exploration and creativity, they have gained a broad range of technical skills beyond that of most of their regular classroom teachers. Although there has been an increase in the number of computer-literate teachers in Pennsylvania, their population is still inadequate to effectively guide student technology-based graduation projects. While students enjoy exploring the latest technology, many veteran teachers avoid experimenting beyond basic word processing and e-mail. Students who do need assistance must either fend for themselves or learn from their peers in utilizing PowerPoint and other applications to create acceptable senior projects. Therefore, professional development focused on increasing teacher competency to guide students as they develop creative, well-designed, and aesthetically acceptable projects needs to become a local school district priority.

Computer literacy training involves numerous unresolved issues between school district administrators and teachers. One primary issue resides in school district financial capability to offer updated training in technology skills; this is juxtaposed against the lack of teacher desire to gain essential expertise through professional development programs. Many school boards across the country generally allot a little over 1% of a school district's budget for professional development. Decisions regarding time and money allocation are often determined for specific school district curricular goals mandated by state and/or federal guidelines that diminishes the focus on providing professional development for faculty, staff, and administrators.

Although issues of "funding" and "faculty participation" in technical training will be resolved over time, there is a widespread movement toward improving the technology preparation of teachers. The National Board for Professional Teaching Standards strongly encourages states to include technology as a requirement for teacher licensing. During the Clinton administration, the U.S. Department of Education created the office of Preparing Tomorrow's Teachers to Use Technology with the responsibility of developing a national training initiative. Dr. Thomas Carroll, the first appointed program director, stated that

> the power of technology for student learning doesn't come from the presence

> of classroom computers. The real power of technology in education will come when teachers have been trained well and have captured the potential of technology themselves. Teachers should model the behavior students are expected to learn. (Seeger, 1999)

Many teachers currently entering the field are more technically competent; it is hoped that their enthusiasm will motivate and assist veteran colleagues in becoming computer literate.

In Pennsylvania, newly appointed teachers are mandated to complete certification requirements by acquiring an additional 24 graduate school credits; most novices do so in conjunction with work for the master's degree. Although there are no state requirements for technology courses as part of teacher licensing, the availability of university technology course electives for teacher permanent certification becomes one commendable pathway to enhance teacher technical skill.

Pennsylvania's technology standards for student instruction and assessment were reviewed by the Department of Education for approval and implementation during the year 2000. The endorsement of technology standards by the state represented another mechanism necessitating school districts to hire more computer technology coordinators and provide more training for K–12 staff.

The following section provides a glimpse of the type of program requirements for Pennsylvania's student graduation project, thereby offering a perspective on the rationale for more widespread teacher computer literacy training.

Graduation Project Program Descriptors: A Perspective

The philosophical background of the "project" approach is one advocated by Sizer (1992) in his theoretical premise of the nine principles of learning fostered in "The Coalition of Essential Schools" program. Sizer believed firmly in offering students alternative assessment formats such as exhibitions and projects where student knowledge can be displayed and assessed better than using traditional means. His thesis is supported by Gardener's (1993) work, which offers students opportunities to learn according to their dominant intelligence and to demonstrate that knowledge using relevant assessment formats.

In requiring a culminating project for graduation, Pennsylvania Department of Education curriculum personnel and state lawmakers apparently believe that student demonstration of an area of knowledge, utilizing projects and exhibitions, represents a valid form of alternative assessment. In addition, a by-product of this mandate perhaps will increase and maintain student interest in senior high course offerings and constitute one facet of a preventative dropout program. In keeping with a gradual national trend toward terminal school year demonstrations of student knowledge, using the exhibition style as a "gatekeeper" for obtaining a high school diploma of merit serves as an acceptable accountability factor in satisfying future employers and a critical taxpaying public.

Graduation Project Components

The Pennsylvania state guidelines for graduation require "course completion and grades, completion of a culminating project, and results of (successful) local (and state) assessments aligned with the academic standards" for a diploma with a state seal of Proficiency or Distinction (Pennsylvania Code, Title 22). Pennsylvania Department of Education guidelines assert that Graduation Project procedures are to be a part of each school district's strategic plan (a document submitted periodically to the Pennsylvania Department of Education) by 2003. Although guidelines are vague, they provide individual districts with some degree of latitude for interpretation as exemplified in the statement mandating this initiative:

> The purpose of the culminating project is to assure that students are able to apply, analyze, synthesize and evaluate information and communicate significant knowledge and understanding. (Pennsylvania Code 4.24, Title 22, State Board of Education)

Many senior high school teachers view this mandate as an opportunity to facilitate student enrollment retention through graduation, motivate student completion of course requirements in anticipation of a diploma of proficiency or distinction, and encourage student responsibility in being better prepared for either postsecondary education or the workplace. Aligned with this procedure is a small but developing plan among Chamber of Commerce groups to require diplomas of merit for entry-level positions in local labor markets, thus granting more value to graduating senior achievement. Culminating projects would demonstrate skills representative of student achievement throughout a 12-year educational experience. For purposes of definition, graduation projects represent culminating reports consisting of research topics or work-related experiences conducted over an agreed upon period of time, in a student-selected field of interest, to be completed within school procedures and guidelines for reporting and presentation.

Project topic selection may be made from a wide variety of available sources. Many high schools encourage students to become actively involved in a graduation project that may be community service oriented or bear some relationship to a student's future goals; however, the primary requirements are that it is student-selected and represents a high degree of student interest. Representative project topics may consist of computer repair apprenticeships, veterinary medicine experiences, expanded science fair projects, historical meteorology, auto mechanics computerization, or design of an interactive visual basic program for mathematics remediation, etc. Resources for project activities exist both within and outside of schools; for example, library research (both actual and online), interviews with experts in a field, volunteer activities in areas of

interest, community civic service, research/work experiences in health organizations and agencies, local businesses and universities, computer labs, etc.

Since many senior high students are either currently enrolled in computer courses or self-taught, students appear to enjoy creating presentations utilizing different types of technology. Projects may range from sound-videos to more hi-tech productions. In many senior high schools, students having mastered computer courses in Microsoft Office and Hyperstudio are capable of creating presentations utilizing word processing, spreadsheet, multimedia, video, CD-ROM, digital cameras, and pertinent information from Internet sites. What's missing in this picture is the capability of regular subject discipline teachers to provide the guidance essential to the development of an organized, aesthetically viable project.

There is the argument that since many senior high students possess an understanding of a variety of computer applications, why is there the necessity for subject area teachers to understand these technologies? The answer to this query resides primarily in the fact that students may select a graduation project advisor from any subject discipline relevant to their project topic regardless of teacher proficiency in computer technology. Although some senior high schools retain a technology coordinator, normal position responsibilities would not allow sufficient time for adequate student project assistance. Student population size, another constraining factor, would limit faculty access and preclude quality research and presentation formats. Additionally, there is the question of whether faculty who develop rubrics to judge graduation projects and student oral presentations will do so considering the type of medium students may select to utilize in project development.

According to the design offered by Schell and Hornberger (2000) in their Graduation Project Booklet, students are scored on project content, organization, and delivery in addition to submittal of some form of written research work. Therefore, the prospective auto mechanic may create an audio/video presentation but is also expected to submit a written research paper of the length agreed upon with

Table 1. Sample of Topics Normally Covered in Graduation Project Booklets

Topic	Subtopic
Senior High Faculty Roles	Graduation Project Coordinator (entire school) Research Paper Coordinator Technical Assistants (Professional/Paraprofessionals) Graduation Project Advisors
Project Timeline	From Sophomore to Senior Year From May of Junior Year to March of Senior Year
Project Procedures	Project Topic Selection Project Advisor Selection Graduation Project Proposal Form Advisor Approval Form/Course Credit Monthly Progress Reports Research Paper/Oral Presentation Schedule
Graduation Project Requirements	Academic/Honors/Grading Procedures Minimum/Maximum Hour Allotments for Research Paper & Oral Presentation Preparation
Guidelines	Faculty/Student Responsibilities Sample Logs and Formats
Project Topics	Project Resources
Grading Scales	Research Paper (Content/Organization/Conventions) Rubrics for Oral Presentation Presentation Skills/Content/Audience Interaction
Rubric Range	(6 domains) Superior/Above Average/Competent/ Marginally Competent/Not Competent/Seriously Flawed

Note: From Schuylkill Valley School District Graduation Project Information Manual (pp. 5–20) by S. Schell and D. Hornberger, 1998, Schuylkill Valley, PA: Schuylkill Valley School District.

his or her selected graduation project advisor. Sample criteria for honors students mandate reports with a required number of citations from literary sources. Students opting for multimedia presentations likewise are required to follow similar guidelines, but adaptations of these models will vary according to individual school decisions. However, the main point is that teachers need a more substantial knowledge of computer applications to provide the guidance essential for those students who elect to engage in computer-based projects.

A Framework for Pennsylvania Graduation Project Requirements

A brief overview of sample guidelines based on a review of several formats of graduation projects representative of different senior high schools in Pennsylvania reveals similar patterns of project requirements. First, many districts introduce the project in the student's sophomore year to provide sufficient time for student exploration of topics, selection of project advisor, decisions regarding methods of presentation including use of varied technologies, and identification of available resources. Second, a booklet, devised by a faculty committee consisting of instructions, procedures, sample logs, and requirements, is disseminated to teachers, students, and parents. A representative sample of topics normally covered in graduation project booklets is outlined in Table 1.

As demonstrated in this article, there is a need for teachers, especially those serving senior high school students, to acquire appropriate computer literacy skills and knowledge of content-specific curriculum software as well as learning to guide students in utilizing appropriate search engines to obtain worthwhile information from the wealth of knowledge available on the Internet. The rapid pace of technological progress at the onset of the 21st century represents an opportunity to radically transform educational practice. Innovative curriculum and pedagogical changes are required to capitalize on this opportunity. It is hoped that school districts and teacher groups will join forces to achieve competency in technological literacy for this represents essential survival skills in our century.

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References

Gardener, H. (1993). *Multiple intelligences: The theory in practice.* New York: Harper/Collins.

Johnson, A. M. (1999). *A web-based interdisciplinary graduation project.* Penn State University, Great Valley School of Graduate Professional Studies. Retrieved from www.gv.psu.edu/faculty

Pennsylvania Code, State Board of Education. *Title 22, Chapter 4: Academic standards and assessment. Curriculum and Instruction. 4.24. High School Graduation Requirements.*

Schell, S., & Hornberger, D. (1998). *Schuylkill Valley School District graduation project information manual.* Schuylkill Valley, PA: Schuylkill Valley School District.

Seeger, J. (1999, November). ISTE develops unprecedented tech standards for student learning. *International Society for Technology in Education.* Retrieved from www.iste.org/News/NETS

Sizer, T. (1992). *The dilemma of the American high school: Horace's compromise.* Boston: Houghton Mifflin.