

# NWCET Best Practices

**Title:** Information Technology Gateway Project

## **Challenge**

The challenge of the Information Technology (IT) Gateway Project was to:

- Provide students with an interdisciplinary high school curricula based on industry-identified IT skills standards
- Prepare and equip teachers with a working knowledge in the application of the IT curricula and with the use of technology based teaching tools.

## **Solution**

The project was divided into three phases. Phase One accomplished the development of the core components of the high school curricula. The completion of the interdisciplinary IT curricula lesson plans and teaching materials was accomplished during Phase Two. Phase Three provided for the professional development of IT Master Teachers and for the implementation, beta testing, evaluation, and revision of the curriculum lesson plans.

For Phase One teachers from twenty-eight schools in ten districts were chosen to extract high school-appropriate IT skill standards from the NWCET-published edition of ***Building A Foundation for Tomorrow: Skill Standards for Information Technology.*** The teachers first identified the IT components or major topic areas of skills with which high school students should graduate. Then they developed the learner outcomes, key competencies, and performance indicators for the proficiency and expert levels in each of the areas. The curricula included fourteen major Technical Components – Internet, E-Mail, Word Processing, Graphics Software, Presentation Software, Programming, Network Technologies, Hardware Installation/Configuration, Software Installation/Configuration, Database, Spreadsheet, Computer Trends in Business and Society, Windows, and PC Principles and Operations – and thirteen major Foundation Components – Analysis, Design/Development, Documentation and Business Communication, Facilitation/Customer Service, Organization/Delivery of Presentations, Problem Solving/Troubleshooting/ Project Management, Research, Self Learning, Task Management, Team Work, Testing/Validation, and Workplace Skills.

Phase Two responded to the need by teachers for a set of modules with practical lesson plans and materials that incorporated the IT core components developed in the previous phase. Twenty-two modules were prepared by a group of teachers from Phase One along with additional participants for a two-year course of 360 instructional hours with fifteen modules comprising Year 1 and with seven comprising Year 2. The first half of each year's curriculum covered basic computer skills, word processing, spreadsheet, and database applications. The second halves of the curricula addressed graphics, presentation software, programming, networking, and more technical computer information. The design of the modules provided flexibility for utilization in three different ways: 1) sequentially over two years, 2) the first half of Year 1 and the first half of Year 2 followed by the second half of Year 1 and the second half of Year 2, or 3) individual modules infused into a current IT or academic curriculum. Finally, the

format of the individual lesson plans and materials simulated real-life work experiences using technology, encouraged practice of higher order thinking skills, and provided industry appropriate examples for assessment.

Sixty-six teachers from twenty-six different schools in thirteen school districts were recruited to be IT Master Teachers and trained to implement the new high school curriculum during Phase Three. Some of the many disciplines represented by the group were Anatomy, Art, Business Education, CAD, Career Planning, English Fashion Design, Math, Marketing, Networking, Philosophy, Radio, Science Social Studies, Special Education and Video Production. The IT Master Teachers were required to attend one of four workshops conducted by two Technology Trainers throughout the year. The agenda for the workshop included: 1) a project description and explanation of the IT skill standards-based curriculum, 2) a demonstration of the WebIT site for communication and dissemination of resources, and 3) hands-on computer activities using specific modules and instruction in PowerPoint for materials to be developed by the teachers. For participating in this program, teachers were compensated with \$250 and a copy of the book, *Teachers Discovering Computers*, from the Shelly Cashman Series by Course Technology. (Course Technology also provided free of charge a CD with PowerPoint presentations to each of the schools represented by the teachers.) Three site visits were made during the Spring semester to each of the teachers' classrooms by the Technology Trainers who were responsible for helping teachers with technical problems encountered during the implementation of the curriculum or during development of PowerPoint presentations. The trainers also reviewed student work generated by the curriculum lessons and documented the learning activities with digital photos and movies that were posted for sharing with the other teachers on the WebIT site.

### **Outcomes and Benefits**

The publication of *Building a Foundation for Tomorrow: Tech Prep Information Technology Skill Standards-Based Curriculum* was the result of the first phase of the project. This text has been widely utilized by IT curriculum developers for many high schools and community colleges throughout the nation in the preparation of core technology course. It also includes a chart that cross references the Washington State Essential Academic Learning Requirements with the Technical and Foundation Learning Components. This chart has become a model for many states as they address the task of articulation across grade levels/courses/institutions.

At the end of the Phase Two, a draft version of *Building a Foundation for Tomorrow: Tech Prep Information Technology Skill Standards-Based Curriculum Modules, Volumes 1 and 2* was published. The final version of this document (published at the end of Phase Three) has provided a flexible and innovative approach to the teaching of IT skill standards across disciplines. The scope of the material allows for the lessons to be a foundation course within the general curriculum for all high school students, regardless of career plans. It has also become the preparatory course for students wishing to pursue specific IT career pathways. For these reasons the IT curriculum has often been adopted by districts and states as a basis for complete courses and for the development of additional types of technology based curriculum.

During Phase Three it was estimated that more than 5,000 students participated in the lesson activities based on the IT curriculum implementation. Many of the academic teachers using the curriculum experienced an increased student interest in their classes once technology tools were incorporated. For example, one Anatomy teacher used the newsletter, graphics and presentation modules in his class for the delivery of student research projects. Displays of students' works around the school resulted not only in a better understanding of technology careers but also in a heightened awareness of health issues. All of the IT Master Teachers indicated that the students especially liked the real life situations included throughout the modules. It was also reported that the timeframes for the learning activities were adequate for students in grades 9 – 12, regardless of prior computer experience or learning abilities.

Observations from the site visits confirmed that, the more teachers were familiar with a technology, the more accessible that technology became for the students. All of the IT Master Teachers prepared PowerPoint presentations for classroom use and many teachers then allowed students to use PowerPoint presentation in a variety of projects. The confidence level of the teachers improved by their positive experiences using technology to enhance student learning. Teachers reported that being trained in the workshops with other teachers created a more supportive environment and described the just-in-time type of training during the workshops as most valuable because they could see immediately real results and real time use.

Finally, the special web site developed by the Technology Trainers called WebIT provided a collaborative on-line network for the teachers in the project and proved to be an effective tool that 1) allowed direct access to curricula and other multimedia resources for use or easy modification by teachers for their classes, 2) provided e-mail, chat, and bulletin board functions for the quick dissemination of information, timely feedback, and the sharing of projects produced by teachers and students, and 3) introduced teachers to the potential of on-line learning and to the experience of new technologies.

### **Next Steps**

With completion of all three phases of the project, the next steps for this IT curriculum and its continued implementation fall into three areas: 1) the tracking and documentation of additional applications of the curriculum as it is purchased and disseminated to districts and states, 2) the updating and maintenance of the existing curriculum to insure adherence to current standards or industry changes, and 3) the development of additional digital methods by which the curriculum may be distributed to more audiences, such as publication on CD Rom or on a Website.

### **Key Issue**

The key issue for the Information Technology Gateway Project was the successful development of an interdisciplinary IT skills based curriculum for grades 9-12 and its widespread implementation of the in a variety of educational settings.

**Side Bar**

Effective teacher recruitment and training were the most critical factors in the success of this project.

The difficulty in recruiting teachers from a broad base of disciplines stemmed mostly from a lack of easy dissemination channels to the teachers themselves. Recruitment flyers were created and distributed to Vocational Directors and high school administrators; however, the flow of information from the administration to the teachers proved very slow. The most successful strategy proved to be teacher-to-teacher recruiting. Once recruited, the goal was to prevent the problem of teachers dropping out of the process before completing their commitment. To encourage full participation in the project, teachers involved in Phase Three agreed to sign a contract committing them to invest the necessary time for training, piloting of lessons, and documenting of the results. As mentioned earlier, every teacher was compensated for their time on this phase of the project at a rate of \$200 per lesson piloted and \$50 per evaluation of the results.

Training in Phase Three was provided to all of the IT Master Teachers in one of four workshops which they were required to attend. Although selection criteria for teacher participation had been familiarity with Microsoft Office applications, the range of technical skills among the teachers varied widely. To give all of the teachers a consistent set of the necessary skills to incorporate some basic level of computer technology in their classroom, training during the workshops focused on the uses of presentation software and of the Internet. During each workshop the teachers were given a mini-demonstration on how to develop a PowerPoint presentation based on the lesson they had selected which could be used as a teaching aid in the classroom. Teachers were then shown how to use the WebCT site and the Internet as a resource for lesson plan development and acquisition of resources. To accommodate the diverse technical skill levels, the teacher-to-facilitator ratio in the workshops was less than 1:9. To introduce teachers to the technical content and tools in a short period of time, more experienced teachers were encouraged to tutor other teachers during and after the workshop. Finally, to deal with technical incompatibilities, which the teachers experienced -mainly in transferring files from the PC platform to the Mac platform -, the workshop facilitators were experts in both platforms.

**Partners:**

Northeast Tech Prep Consortium (16 Teachers)

- Redmond High School
- Juanita High School
- Bellevue High School
- Woodinville High School
- Tiger Mountain Community School
- Mercer Island High School
- Skyline High School
- Shorewood High School
- Shorecrest High School

Puget Sound Career Consortium (15 Teachers)

Sea-Tac Occupational Service Center  
Renton Sartori Alternative School  
Lindbergh High School  
Tyee High School  
Evergreen High School  
Mt. Rainier High School  
Highline Community College

South King County Tech Prep Consortium (15 Teachers)

Kent-Meridian High School  
Kentlake High School  
Auburn Riverside High School  
Sumner High School  
Federal Way High School

Seattle Public Schools (20 Teachers)

Ingraham High School  
Ballard High School  
Roosevelt High School  
West Seattle High School