MODELS FOR PRE-SERVICE AND IN-SERVICE INSTRUCTIONAL TECHNOLOGY (IT) TRAINING AT THE UNIVERSITY OF PITTSBURGH AT JOHNSTOWN (UPJ)

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From the early 1980s, with the help of the Pennsylvania Department of Education (PDE), the Education Division at the University of Pittsburgh at Johnstown (UPJ) has had an evolving program in Instructional Technology (IT) for both pre-service and in-service teachers. Two programs in particular have made this possible. From 1985 to 1995, UPJ was one of fourteen IT Education for the Commonwealth (ITEC) centers. Complementing the ITEC centers, and now the only state-funded source of IT education for in-service teachers, a series of Eisenhower Higher Education Professional Development Grants have meant that K-12 teachers in West Central PA have been able to register for University of Pittsburgh credit-bearing courses in IT. These state-funded programs, the ITEC program in particular, have been of significant benefit to our undergraduate program at UPJ which has evolved to the point where IT is now a well-integrated component of the preparation of our candidates for the teaching profession.

EVOLUTION OF THE IT PROGRAM AT UPJ

Until 1985, very little was done to provide pre-service training in educational computing. Campus computing was mostly mainframe-based, with our CS programming courses still using keypunch machines and punch cards. Then, in 1985, under the Education Division leadership of Dr. David Dunlop*, UPJ was selected as one of fourteen IT Education for the Commonwealth (ITEC) centers. The ITEC program provided money to establish and maintain state-of-the-art computing facilities for the purpose of in-service IT training for area teachers. Graduate level ITEC courses were offered every semester. Registration was free. The program presented a major opportunity for our pre-service students to use the ITEC facilities provided by the State grant. The ITEC program was funded for ten years, and over that period of time the ITEC computer labs were repeatedly updated with the latest technology. This meant that our pre-service Education majors were kept current with state-of-the-art advances as they occurred.

But the technology courses were on the whole ill-conceived, tacked onto the Elementary and Secondary Education programs without a clear concept of their value to the program of preparation for the teaching profession. Other than teaching computer programming (BASIC and LOGO), they tended to focus on preparing Education majors for non-computer aspects of technology use in schools, such as the use of spirit masters and so forth. A second major weakness in the program was that the students were allowed to take the Ed Comm courses as early as their Freshman year. Whatever they learned then was likely to be obsolete by the time they graduated and applied for jobs in schools.

In 1996, the Education Division at UPJ was finally given the go ahead to advertise for a full time instructor in IT. Negotiations for the position resulted in

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three significant changes in the structure of the instructional technology program: 1) the name of the department was changed—from Ed Comm to IT; 2) the number of required IT credit hours for all Education majors was increased from 3 credits to 4; and 3) all IT courses are now Upper Level offerings. Thus the technology and related academic skills acquired in the IT courses are relatively current when the students go off to student teach.

EISENHOWER HIGHER ED PROFESSIONAL DEVELOPMENT GRANTS

Professional development of in-service teachers is important in educational reform. The continual expansion of the Internet offers enormous potential for improving education; more on-line resources allow students and teachers to have information readily available. However, it is only since 1995 that Internet connections for schools were available in West Central PA, and teachers still need training in the effective use of technology. Educators from the region served by UPJ became convinced that teachers were willing to meet challenges of educational reform. But needs assessments indicated that local teachers face several problems: 1) many do not receive any graduate level pedagogical training in mathematics, science and/or technology education, 2) most work in small, rural, and economically disadvantaged school districts, 3) small budgets make purchasing new equipment/classroom materials difficult, and 4) teachers often work in isolation, rarely exchanging ideas with colleagues. These educators reasoned that these problems could best be addressed through the creation of a regional center which would offer in-service training, an equipment loan program, and foster partnerships with local schools. It was thought that a regional center, although not a panacea, could help teachers solve some of the problems they faced. Therefore, the UPJ Center for Mathematics and Science Education (funded by the Dwight D. Eisenhower Higher Education Professional Development grant administered by PDE) was created in 1991 in cooperation with thirty school districts. The Center has since nurtured a group of in-service educators through the process of reform by providing them with professional development and the equipment/resources needed to successfully implement instructional change. The Center has been funded for approximately $200,000 per school; thus, the UPJ Center has garnered nearly $2 million over the past ten years for use by in-service and pre-service teachers, ultimately benefiting schools and students.

The primary objective of the Center is to provide sustained, high quality professional development for K-12 educators from public/private schools, with regard to the development, implementation, and evaluation of instructional strategies that reflect best practice, stress strong pedagogical components, allow teachers and students to effectively make the connection between hands-on and on-line activities, and is of sufficient intensity/duration to have a positive and lasting impact on teachers' performance in the classroom. The secondary objective is to provide services and a pool of equipment/resources which support implementation of effective instructional strategies. The Center's objectives are met through several professional development activities. These include graduate courses in IT and a series of IT workshops. The Center also provides services such as observations by staff, an extensive equipment and materials/resources loan program, and an "ask a technologist" email service. One graduate course offered

yearly to 25 teachers is *Multimedia Applications & Instructional Technology in Math & Science Education*. Teachers meet for three credits hours a week for fifteen weeks of graduate level instruction and devote time to out-of-class assignments/projects. Participants develop plans for improving the quality of IT use in their schools. To date, nearly 250 teachers have taken this or a similar course. The methods used for teaching graduate courses are pedagogically sound --some lecture is necessary, but the courses "practice what we preach" and give time for hands-on discovery in state-of-the-art computing labs at UPJ. The educators learn how to appropriately use Internet resources and multimedia applications and implement teaching improvement unit plans in their classrooms. In addition, special interest workshops (three hours in length) are offered during the school year. Workshop topics range from the use of PowerPoint and Excel, to the development of web pages. Educators learn how specific applications can be used appropriately to improve teaching and learning. Ninety-five percent of those attending rated the workshops as "excellent" or "above average".

The UPJ Center has gained national recognition as an exemplary Eisenhower program for developing a vision of excellence for education. Improved teacher learning and proficiency in content has occurred with application into classrooms. Students of these teachers access the Internet and use technology frequently and appropriately. Schools benefit by teachers transferring content knowledge and skills into the classroom. Cooperating schools receive computers, peripherals and classroom materials to support their changes. Benefits to UPJ Education majors include observations of lead teachers and attendance at professional development workshops, which complement what is provided in the I.T. undergraduate program. This also provides a witnessing of local teacher implementation and interest in IT. The students are able to use materials from the equipment/loan program during field experiences and student teaching. Likewise, UPJ faculty use the materials in courses and benefit from contact with local teachers by gaining a better understanding of their needs and an awareness of the backgrounds of students entering UPJ and developing closer ties with school districts.

OUR VISION FOR EDUCATION IN AN INFORMATION AGE

Certain currently reticent understandings about teaching and learning will become the rigorous norm:
- Individualized education, including IEPs, will be the rule for all, not, as now, the exception for the privileged or disabled few.
- The teacher's influence on student learning will extend beyond the physical classroom into cyberspace, where a 24-7 learning dialog will pertain.
- Students, whether or not guided by their teachers, guardians, or parents, will roam the virtual universe in search of knowledge. They will do so most effectively if well-prepared teachers take them by the hand.
- Students will need teachers more than ever.

Based on our recent interaction with teachers worldwide, both directly and through membership of various on-line listservs, we believe that this vision is already a seminal reality that will explode into general view in the fullness of time.