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ABSTRACT

The key to preparing today's teachers to carry out their professional responsibilities is not necessarily found in high-priced technologies, but rather in a new level of cooperation between universities and public schools and in new ways to deliver coursework. Indiana University offers inservice teacher education coursework through interactive communications technology at an expense comparable to that of traditional, campus-based instruction. Teacher participants are members of school-based collaborative groups and implement the concepts and practices presented in the courses in practica in their own classrooms. The program continues for an entire school year, and teachers have ongoing access to their instructors through interactive communications technology. The technologies used are basic, low-cost, and reliable, and include speaker phones, facsimile machines, audiographics, Macintosh computers, modems, overhead projectors, and several software packages. The choice of technologies to deliver teacher training through distance education should take into account the following principles: (1) use what is available; (2) choose reliability over sophistication; and (3) let program goals drive technology decisions. Among the general principles for structuring coursework in distance education, three areas are addressed particularly well by this program. These areas are promoting ownership through on-site coordination, promoting application of instruction to on-the-job situations, and encouraging collaboration among teachers. (SV)

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A PARTNERSHIP IN TRAINING: A DISTANCE LEARNING APPROACH TO IN-SERVICE TRAINING IN RURAL COMMUNITIES

Affecting change in special and general education will require new approaches to offering in-service, continuing education coursework to teachers who are already working in public schools. Teachers today are facing an increasing array of changes and challenges in their professional responsibilities that makes it essential for them to have easy and ongoing access to training. Distance education offers a very viable and exciting means of providing this training especially for teachers in rural communities (Knapczyk, 1993; Knapczyk, Brush, Rodes, & Marche' 1993). But discussions of distance education too often focus on rapidly developing high-end technologies, with their astonishing promise for future communication -- and their even more astonishing price tags. In the excitement over new technological achievements, we often lose sight of the more practical issue of how to develop a workable model for distance education in the present times of tight budgets and limited resources. We may forget that the quality of distance education depends less on the sophistication of the technology employed than on the skillful harnessing of available resources -- both technical and human (Keegan, 1990). To be successful, in-service instruction must be based on the practical application of technology to teacher education, and on the partnerships that universities and school corporations can form in offering field-based courses and practicum experiences (Evans & Nation, 1989; Keegan, 1990; Smith & Kelly, 1987; Verduin & Clark, 1991).

Description of Indiana University's Program

For the past five years, Indiana University has been offering in-service coursework through distance education and interactive communication technology at an expense comparable to the cost of traditional campus-based instruction (Knapczyk, Brush, Champion, Hubbard, & Rodes, 1992). The teacher education program at Indiana University arose out of a partnership between the university and several school districts. The teachers take part in the training as members of school-based collaborative groups and they use the concepts and practices presented in the courses directly in their own classroom and school situations.

When we designed the field-based program at Indiana University, we combined traditional college courses and on-site practica into one unified and comprehensive training experience. The teachers implement the theoretical concepts discussed in class immediately in their own professional settings, and use the information to plan teaching lessons and behavioral

interventions. The course instructors design their presentations to encourage collaboration between students during the class sessions, and structure practicum projects that promote continued interactions among the students after the meetings.

The combination of distance education and communication technology allows teachers to obtain the coursework without traveling to the university. However, unlike in-service workshops, the program continues for an entire school year and teachers have ongoing access to their instructors through the interactive communication technology. Thus, the program ensures that teachers do not feel isolated or "cut off" from either their instructors or their colleagues after the individual training sessions are completed. In the next sections, we will discuss some guidelines, drawn from our experiences, for choosing appropriate technology and for structuring field-based training.

A low-cost option for distance education technology

The cost of distance education is a major consideration in selecting an approach to use, because of the limited resources universities and school corporations have for field-based teacher preparation. In our program we use basic, low-cost, reliable technologies to deliver weekly classes to remote sites, typically in local high school libraries or meeting areas. Each hardware and software component fulfills specific roles in course delivery. We will discuss each element in turn:

Speaker phones provide our basic communications link with teachers during the class sessions. Speaker phones are relatively inexpensive and can be used virtually anywhere, and the teachers adapt quite readily to them because they are so familiar. We use the AT&T Quorum telephone system, which supports an excellent omni-directional microphone and a fairly clear speaker, two elements that are crucial for effective communication. While ordinary speaker phones are sufficient for instructing small groups, high-quality microphones and speakers enable us to teach twenty or more teachers in a session. At the originating site, we use operator-style headsets to increase the clarify of the presentations.

Facsimile machines permit continuous access and rapid feedback between university instructors and teachers. The teachers complete ongoing practicum work each week, and fax their worksheets to the university before the next class. They also send notes if they need clarification or have special difficulties. The instructors return feedback to the teachers' work sites by fax, enabling the teachers to put any advice or direction into practice immediately. The fax machines are also used at class time to transmit supplemental course materials, instructions for in-class activities, attendance lists and other documents to and from the class site.

Audiographics supplies a visual component during the class. Audiographics is an interactive computer-based technology that

allows users to share text and graphic images, and annotate images displayed on monitors or projection devices (Knapczyk, 1990). The system we use consists of the following:

* MacIntosh LCII computers at the university and remote sites,
* 9600 bds modems operating over standard telephone lines,
* An n-View LCD overhead projector at each remote site.

We use the computers as a two-way overhead projector or chalkboard to illustrate our presentations, to emphasize important points in a discussion, and to develop an interactive exchange with the teachers at the remote site. To accomplish this, the system employs the following software:

* AppleTalk Remote Access, to establish the communication link between computers through the modems,
* MacIntosh Multipoint Interactive Conferencing Application (MacMICA), to create a shared "electronic chalkboard" between the sites,
* Timbuktu, to control the remote computer and to access and configure software applications,
* SuperPaint, to create PCX or PICT images of course material, such as overheads, that are pre-shipped to the remote sites before class time.

This combination of technologies and software allows us to complete any needed class preparation at the origination and remote sites. The instructors and students can simultaneously speak with one another, and see and annotate graphic images of course materials. This entire system can be purchased for about $2500 per site, but most universities and many school corporations already have some of the major components. The only additional costs for operating the system are monthly telephone charges. Comparable software configurations can also be purchased for MS-DOS users.

Tips for technology selection

We have found that the choice of technologies to develop and deliver training through distance education should take into account the following principles:

Use what is available. In the rush to embrace new technologies, educators can easily overlook the usefulness of more commonplace inventions. We discovered, for example, that the speaker phones and fax machines are the most powerful and versatile equipment we have. They can be set up almost anywhere and be used at any time, and they allow a greater and more free-flowing exchange of information, ideas and advice than is typical even in a normal campus class. The fax allows us to send backup copies of class materials and overheads to our sites in case the computer link breaks down during class. Before investing in high-end technologies, then, it is important to explore existing or readily available equipment such as fax machines and telephones.

Choose reliability over sophistication. We also discovered that reliability and consistency are far more crucial than impressive effects when delivering distance instruction. Typically, the most elaborate and sophisticated technologies we have used are the ones most prone to bugs and breakdowns that can quickly erode the confidence and morale of the teachers on site. For example, MacMica is an invaluable communications tool because it is simple to operate and seldom "crashes", even over the primitive telephone lines and switching devices that often exist in rural settings. These features make it far more valuable than other more powerful products that tend to be more finicky.

Have the goals of the program drive decisions about technology. Before investing in any equipment, it is important to have a very clear idea of what the instruction is to accomplish, what materials will be used, where class sessions will be delivered, what resources are available in the field, and who will be included in the training. Considering these issues carefully before deciding about technology will save a great deal of time and money. In fact, program development is by far the most important part of creating a distance education course, even when working under a generous budget. Establishing clear goals for the program, and treating technological questions as a subordinate issue, ensures that the equipment used and the way in which it is employed will be well suited to the instructors' and teachers' needs.

General principles of program development

Distance education technologies provide the tools for instruction that can be used in many ways and be adapted to suit a wide variety of demands, constraints and circumstances. Instructors and program developers should, however, first decide what outcomes, goals, and objectives they wish to accomplish in the program and coursework. The following principles, can be used as general guidelines for structuring coursework using distance education (Helge, 1984; Keegan,1990; Knapczyk, 1991; Treadway, 1984). The coursework should:

* Offer training that is practical, useful, and oriented to job responsibilities,
* Be flexible and address a wide range of individual needs
* Assist trainees in the shared development of their own skills and promote ownership in the program,
* Offer opportunities to practice and apply skills in realistic circumstances,
* Utilize local resources and expertise in program planning and delivery, and
* Employ technology effectively and encourage various modes of participation.

These principles can create many unique challenges for course instructors who work with in-service teachers. They also represent unique opportunities, if properly planned for. In the next section, we will discuss three areas in which distance education offers distinct advantages over traditional instruction

for addressing the principles described above: (a) promoting ownership through on-site coordination, (b) promoting application of training to on-the-job situations, (c) encouraging collaboration.

Promoting ownership through on-site coordination

One challenge of distance education is handling the logistical and instructional tasks that arise in any normal class session. We have found that these tasks are best carried out by the teachers themselves. Adult learners bring a wealth of professional skill and experience with them to their classes. Properly structured, distance education can capitalize on these experiences in a manner that facilitates the mechanics of course delivery, enriches the content and teaching interactions of the class sessions, and more closely involves teachers in their professional development.

To accomplish these aims, we have two different teachers serve as coordinators for each session. One person coordinates the technical set-up of the class by assembling the equipment for class and establishing the voice and computer link-up. As the year progresses, each teacher learns about the technology and becomes comfortable with its operation, thus removing the initial apprehension teachers often have about participating in a distance education activity.

The other coordinator oversees the instructional aspects of the class sessions. This includes passing out papers and working out seating arrangements for small group activities, as well as assisting with the actual course instruction. We prepare the coordinators for these responsibilities by talking with them before the class sessions to explain the topics that will be covered, outline the roles they will serve, and suggest methods for carrying out the duties. This preparation enables coordinators to oversee class discussions, re-direct questions back to the group, present examples of course concepts, and explain how procedures and techniques can be used in situations that all the teachers are familiar with. The on-site coordinators personalize the class activities and allow for a fuller consideration of the concepts and techniques covered in the course, thus shifting the responsibility and ownership of the instruction onto the teachers themselves.

Promoting application of instruction to on-the-job situations

In many in-service programs, teachers have very few opportunities to apply the concepts they learn to actual teaching situations until much later in a practicum or student teaching experience. However, learning under "artificial" circumstances is often not very effective because teachers typically have considerable difficulty transferring abstract concepts to real-life job situations.

We offer training for one to two years, and we show the teachers how to fully integrate theoretical concepts into teaching practices that suit their job situations. A prime benefit of providing instruction over a long period is that it allows us to create opportunities for the teachers to practice new methods, to use them in combination with other methods, and to adapt them to fit a variety of teaching contexts and situations. Thus, as teachers learn new teaching skills, they also learn how to put them together with the skills they already have so as to form increasingly complex and unified teaching behavior. The extended training approach allows us to tie the concepts covered in the program directly to the teachers' existing knowledge and skill base. At the same time, the instructors learn increasingly more about the teachers' particular circumstances, and can access technology that permits easy and frequent communication with each teacher.

Encouraging collaboration among teachers

Research has repeatedly shown the value of within-school professional team building and collaboration among teachers (e.g., Thousand & Villa, 1989). However, in traditional models of teacher preparation, strategies for collaboration are usually not built into the instruction. In fact, the design of many teacher education courses discourages, rather then encourages, collaboration among students (Resnick, 1987).

Because our program is field-based, we can attract groups of teachers from the same school or school district, and can incorporate collaborative team building techniques into the very structure of the coursework. The coursework encourages teachers to share their ideas and build closer professional relationships with one another. Thus, they work with expert mentors that include both the university instructors and other teachers in their school building. We use a variety of in-class activities in which teachers share their experiences and help one another apply and adapt the course concepts to their teaching circumstances.

Out-of-class projects are assigned on a collaborative basis so as to continue this professional dialogue about course topics. The students meet in school-based groups to discuss the concepts presented in the class sessions. Then, they work togetner to prepare lessons and interventions for the children in their classrooms. By working together, the teachers can access a wealth of expertise, resources, and information that would otherwise remain untapped. Furthermore, after the year-long training is completed, the collaborative teams often remain intact, thus providing the teachers with a ongoing peer support structure.

Summary

The key to preparing the teachers of today to carry out their professional responsibilities is not necessarily found in high-priced technologies, but rather in developing a new level of

cooperation between universities and public schools and exploring new ways to offer coursework. Even at a low cost, distance education and communication technology can help to give teachers access to current information on teaching practices and provide a catalyst for improving the quality of teacher preparation and educational programs for children.

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