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AUTHOR Farkas, Peter, Comp.; And Others
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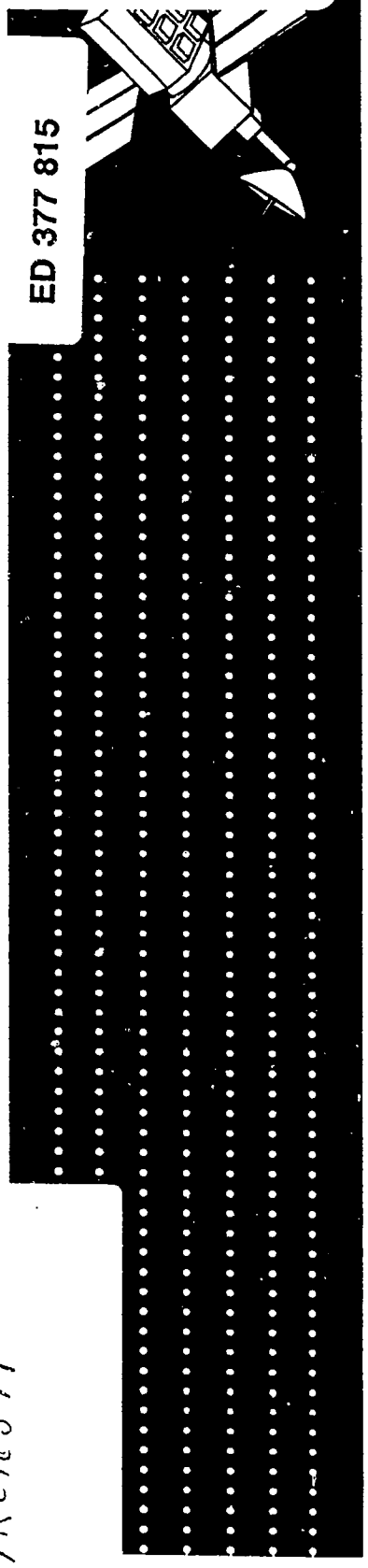
ABSTRACT

The articles contained in this report represent a diverse collection of pedagogical issues involved in teacher training at a distance in countries throughout the world. Distance education offers pre-service and in-service teachers with both skills training and an opportunity to complete teacher training programs or degrees. The proliferation of teacher training programs via distance is limited neither to developed or developing countries, nor is it limited to specific delivery methods. This proliferation is the result of rapidly developing telecommunications technologies coupled with an increasing awareness of the ways to use the technologies for teacher training. This overview of teacher training through distance education includes several issues: (1) the objectives for the use of distance education in teacher training; (2) methods and delivery systems used in various settings; (3) costs involved in the design and delivery of teacher training at a distance; and (4) lessons learned, which may provide the reader with guidelines to follow. Teacher distance education programs in the following countries are examined: Africa, Australia, Canada, Denmark, France, Iceland, Japan, Portugal, Thailand, Turkey, United Kingdom, United States. Contains 80 references. (MAS)



An International Survey Of Distance Education And Teacher Training:

From Smoke Signals To Satellite

A report produced for the Innovation and Development Sub-Committee of the International Council for Educational Media presented to the ICEM General Assembly in Barcelona, Catalonia

Compiled and Edited by

Peter Farkas
Richard Cornell
Charles Saar
Jeff Armstrong

University of Central Florida
Orlando, Florida, U.S.A.

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Introduction

An inventory of the publications on teaching at a distance shows that there have been and are a great number of these. But you cannot find many specifically devoted to the training and the retraining of teachers using such methods. This is quite surprising since several systems or parts of systems of teaching at a distance have been specially created to train teachers as, for example, in France and East Africa. It is all the more surprising that there is an inadequacy between these systems and the training profession.

Nature of the students

The limitations of distance learning are well known, given that students using face-to-face teaching often have a hard time coping with a teaching-at-a-distance system. Most of the time they have to study alone, usually at home, even if there are many ways to compensate for this solitude such as interventions of tutors, regrouping, etc. In teacher training, especially in-service training, students and teachers are better prepared to work by themselves even with books and of course with the various components of such systems.

The potential audience of teachers is very important when numbers are considered: hundreds of thousands in many countries. Training at a distance is an ideal way to reach them, particularly when we consider that they are dispersed over large countries and that we deal with in-service training.

Nature of the actions

In most countries, people who want to become teachers have to earn diplomas like B.A., B.Sc.., M.A., M. Sc.. or equivalents. In order to be awarded these diplomas they have to attend universities or similar institutions. The creation of distance education systems has been of considerable help since many students work at full or part time jobs. Many women who would like to become teachers after they raise their children can also get these diplomas while remaining on the job or staying at home.

This group constitutes a majority of the potential client base for systems of teaching at a distance. When the British Open University began, most applicants were student teachers and teachers. Because of the great demand for its services, decisions had to be taken to limit the proportion of such applicants they could accept. In France, a great proportion of students are aiming at jobs in education or at getting better jobs if they are already teachers, by acquiring higher diplomas.

In-Service training

Providing teachers with in-service training is often a major activity of such systems. Some have even been created to reach this aim. In-service training is a must for all systems of education in order to keep the teachers well informed and always better prepared for their tasks. All teachers are concerned. This means, as mentioned above, that a very large audience must be reached at home or in schools. All the tools of teaching at a distance are put to use at their best: books and printed matter, correspondence, radio-TV (but more often sound cassettes and video-cassettes), software, telematics. Occasional or regular regroupings complete the whole array of the tools and techniques used. If necessary tests and exams can also be undergone at a distance.

For some very urgent actions in retraining involving large number of teachers, systems of teaching at a distance have been specially created or adapted to be the back-bone of such campaigns. When hundreds of thousands of teachers of France had to be retrained in the "new mathematics" following a decision of the Ministry of Education, a new system of teaching at a distance was set up and worked very successfully. Interestingly enough, at roughly the same time, a similar approach was being tried in the State of Georgia and elsewhere across the United States.

The studies described in this publication show that there is no one model or system for initial or in-service training of teachers at a distance. Such systems must be adapted to the different types of educational systems and to the actions which are being planned. But whatever the forms and the modalities, it is obvious that systems of training and in-service training at a distance of teachers are here to stay and will be more and more needed as well in developing countries as in industrial countries.

On behalf of the International Council for Educational Media, I would like to express our thanks to Dr. Karen Murphy for her excellent synthesis chapter; to the lead editor, Peter Farkas, to his associates Chuck Saar and Jeff Armstrong; and finally, to Dr. Richard Cornell, the United States Member to ICEM, who has been doggedly pursuing contributors, continually updating contributions, and generally managing this project for the past four years.

Robert LEFRANC
General Secretary, ICEM

Paris, October, 1993

Preface

Distance Education and Teacher Training's Global Perspective: From Smoke Signals to Satellite.

This report, three years in the making, faced increasingly the possibility of becoming obsolete before it was published. Comparable vagaries accompany the entire broad spectrum of that which we term "distance education" for, as one technology is adopted, a new one suddenly appears on the horizon to replace it. So much for change. . . . so much for telecommunications rivaling the speed of light!

The intent of this report was to assess the state of distance education internationally, with particular emphasis on teacher education, more specifically, how pedagogy is delivered at a distance. Clearly a formidable challenge as little proved forthcoming which so narrowly addressed the topic.

Do we conclude that pedagogy at a distance is not being taught to teachers? No.

Do we conclude that pedagogy can easily be taught at a distance? No again.

What we did find was that there are efforts, scattered about the world, wherein some attempts at transmitting pedagogical principles are being tried.

A number of the articles contained within this report include such efforts while others opted for alternative means through which they teach their teachers, be they around the corner or across an ocean.

It might well be that the paucity of distance education and pedagogy contributions reflects not an unwillingness to address the issue but rather a more urgent priority of simply getting a system up and running! Maslow's hierarchy with technology-based overtones.

No matter the extent to which pedagogy has been cited as a distance education concern, there remains no doubt that training teachers at a distance will increasingly become a major priority.

In our report title, we append the descriptor "Smoke Signals to Satellite" to reflect a continuum along which we have traveled, if not actually, at least in principle.
We must remain cognizant, however, that in some instances, the use of a satellite technology base, even into the year 2000 may still remain a financial logistical, political and philosophical impossibility . . . while the continued use of "smoke signals" may not.

It is, perhaps, this continuing disparity between those nations which have and others less fortunate, sometimes the latter sharing common borders with the former.

While it is not the primary intent to make this report a geo-political treatise, the ongoing issue of equity of access cannot remain ignored. As the reader works through this report, a number of articles provide sufficient contrast in their contents to illustrate that not all nations are ready to address pedagogy at a distance via technology.

It is no accident that we entitled this study *An International Survey of Distance Education and Teacher Training: From Smoke Signals to Satellite.* Even a cursory examination of how teachers have taught through the ages reveals methodologies both diverse and inventive. In the face of odds which often stunned lesser individuals, teachers have continually sought for the impossible.

Imagine, if you will, what teaching was like in yesteryear. We laud those inventive souls of the past who taught despite having no materials, rudimentary communication forms, and a public which frequently chastised them for injecting into their teaching the most outrageous "frills" of the day.

We can envision, for example, the dwellers of Cave # 4, headed by a matriarch whose health was quickly failing. Thanks to the discovery of fire and how it might be used, the clan in Cave 4 sent up distress signals to their cousins in Cave #5, some five miles distant. Within half a day the Cave 5 medicine man arrived and saved the day.

Yes, smoke had been found to have uses far beyond deterring a rampaging tiger - it could be used to cook, to cure, to rid the cave of insects, and now, to communicate. Since that time, warriors have employed smoke for military reasons and, where other information had to be transmitted, smoke signals also saved the day.

Oh yes - it was that very same smoke which, when learned by the young of the tribe, allowed them to understand words, numbers, directions, and events. The oldest taught the youngest and the technological revolution in distance education had begun.

In other early civilizations the sound of drumbeats served to warn, to inform, and to place entire tribes on alert. As with the encoded smoke of an earlier (and later) time, these early audio signals taught the tribe basic communication skills.

It did not take too long to add yet another piece of the technological pie to the mix - light as a communication medium. Bits of glass or other shiny object, reflected from one hill to the next, began the advent of true multi-media for now they had it all, smoke, sound, and light! There seemed no end in sight as to the possibilities for communicating across the miles.

There is within us all, then, this heritage from the past through which each of us, around the globe, has fashioned one or another means through which to communicate from a distance. Our legacy humbles.

Within our contemporary educational environments, there are still those in remote societies who speak to one another across the miles using many of these selfsame tools, despite McLuhan's "global village" affording almost total involvement.

We label these sites as being "third world" or some other descriptor and all too often, rest content within ourselves that we have things much better. There are those, however, who might question what is truly better, but that is fodder for another shot at another time. It is sufficient to acknowledge that such conditions persist.

The intent of this study is to assess the state of how things are in the 1990's with regard to distance education as applied to teacher training. Given the rapidity of technological change, however, the reference to what is "now" must be provided the caveat of recency, rather than immediacy. One but has to scan the paper, read a journal, or watch the evening news to find this or that innovation being employed in the classroom. Clearly, the present is the age of the computer but ... is it the computer we knew, the one we know now, or one that, within comparative milliseconds in time, will afford even more mysterious wonders for our students?

What will be the relationship to the computer and how students learn at a distance? What new information will teachers need in order to keep up with these rapidly changing methodologies? To what extent are these technologies being evaluated? Are we, in fact, having a two-hundred mile an hour romance with a technology base which is, even now, accelerating to mach-1 ? Where are those souls in the educational wilderness who would demand that high touch be an equal partner in the high tech rush toward the future?

We raise the questions because, as you read the situational studies which follow, there are implications which lie well beyond the obvious. Inherent in many of the case studies from around the globe are issues which had to be faced, funds which had to be acquired, attitudes which had to be either dispelled or changed, and amongst it all, learners who had to be taught.

We have focused, for the most part, on the issue of teacher education and how those who teach cannot always be reached by conventional methods. Distance education seemed to be the chosen method of connecting teachers to their content.

In this study, you'll find a wide range of technologies being used, varying cultural emphases, and most certainly, differing settings.

It is not unusual that radio should still be a major means through which distance education is transmitted in some parts of the world. Radio is, after all, both widely available and comparatively cheap.

Increasingly, and especially in the more affluent nations, computers and all that accompany them are the rage. Some tie directly into existing telephone systems, others communicate via modem and satellite while others are tied into a LAN. The future, especially with the emphasis on multi-media systems, offers a tempting vision of what will doubtless become an obsession for many, both teachers as well as their students.

What is to become, however, of the teachers and their students who exist in less-chance areas of our world? Are there, contained within this study, some ideas which could apply easily and near-equally to these populations? If so, who will take the leadership in making such an initiative become reality? Will it be one of you who reads this report? We hope that such is the case.

A few words of thanks, to those who made this report reality. To each of our authors, many of whom were absolutely certain that this report would see the light of day...in the year 2,000! Gotcha! Oh yes, my heartfelt thanks to every one of you wondrous folks!

To Karen Murphy who crafted the all-encompassing synthesis chapter and tied concepts, methodologies, and nations into a single package. She did this skillfully and, incidentally, did so between assignments in Wyoming, London, Turkey, and finally, Texas where she now resides. Much of her chapter was done electronically, complete with all those various gremlins brought on through downloading and differing formats as well. Karen brings to this effort a deep commitment and a scholarly approach, both of which we thank her for.

I cannot complete this preface without acknowledgment of our ICEM General Secretary who kept after me, year upon year, as we both frequently agreed to disagree and then some. Be that as it might be, Robert Lefranc knew that, when all was done, we would have a quality product, one worthy of placing in the hands of our 30 ICEM member nations. I thank him for his grit, for his insight, and yes. for his confidence in me. Add to that, how nice it is to feel both kinship and friendship with one who has given so very much to the promotion of the wise and continued use of media in instruction across the globe.

A special thanks to Jeff Pooley of the University of Central Florida Computer Services Faculty Support Group, and to Laura Kittleson and Brian Ross, for their expertise in navigating the innards of both Microsoft Word and Pagemaker.

Finally, to my omnipresent editorial group, Peter Farkas, the lead editor, Chuck Saar, and Jeff Armstrong, I extend my deepest gratitude.

They have been with me in this effort over the past years, one picking up the editorial torch and passing it deftly to the next. It has been Peter, however, who brought it all together with me and it is to him that I give lead authorship for this report.

I wish for each of you good reading and a shared mystification as soon you will see, how very diverse and exciting is our world when seen at a distance!

Richard A. Cornell
United States Member to ICEM
Orlando, Florida, U.S.A.

October 24, 1993

Pedagogy Through Distance Education

By Karen Murphy

The articles included in this report represent a diverse collection of pedagogical issues involved in teacher training at a distance in countries throughout the world. Distance education offers pre-service and in-service teachers with both skill training and an opportunity to complete teacher training programs or degrees. As will be evident from the articles included in this report, the proliferation of teacher training programs via distance education is limited neither to developing countries nor to more developed countries. Nor are the programs limited to specific delivery methods to reach teachers in their homes or schools. This proliferation is the result of rapidly developing telecommunications technologies coupled with an increasing awareness of the ways to use the technologies for teacher training.

This overview of teacher training through distance education includes several issues: 1) the objectives for using distance education in teacher training, 2) methods and delivery systems used in various settings, 3) costs involved in the design and delivery of teacher training at a distance, and 4) lessons learned, which may provide the reader with guidelines to follow. While the focus is in articles contained in the report, reference will also be made to other articles.

1. Objectives

Teacher training programs have resulted from political factors and social demands to reach the masses of uneducated or illiterate people or to provide education to disadvantaged groups. According to Gary Coldevin (1990), continued high birth rates, coupled with a rise in human expectations toward schooling for children, have created the need to train teachers by distance education in developing countries. Anthony Kaye (1981) suggests that societies should create teacher training programs based on the nature of student populations. These programs should allow for upgrading and certification of teachers in their own environments.

Teachers who receive pre-service or in-service training at a distance from the instructional site generally do so for two possible purposes. They may complete coursework in competence areas or pedagogical techniques through distance education, or they may use distance education technologies to communicate with and receive support from supervisors or other teachers. In response to this first purpose, Coldevin (1990) identifies three types of teacher training programs at a distance.

The first of these teacher training programs that Coldevin describes--teacher certification programs and/or degree programs offered through distance teaching universities--are found worldwide. Brahmawong's article describes the distance education program in Thailand offered through Sukhothai Thammathirat Open University. More than 40,000 teachers in Thailand have upgraded their professional competencies through correspondence and broadcast radio and television Similarly, Carmo reports how teachers in Portugal have been able to obtain in-service teacher training through the Portuguese Open University (Universidade Aberta Portugal) since its inception in 1990 The article by Demiray, McIsaac, and Yangin portrays two in-service programs offered through Anadolu University's Open Education Faculty in Turkey.

The two programs are a Pre-Bachelor Certificate Program, which 130,000 primary school teachers completed, and a University Degree Completion Program offered to 54,000 secondary school teachers. Teachers in the Turkish programs take coursework from their homes through specially designed printed materials supplemented by television and radio broadcasts. (McGreal's article mentions Athabasca University, a distance teaching university in Alberta, Canada, which delivers programs to teachers primarily by correspondence across western Canada.

The second form of teacher training described by Coldevin consists of distance education operations offered through traditional universities. In the U.S., Knapczyk describes how Indiana University uses a variety of technologies to create diversified and flexible in-service staff development programs in rural schools. Similarly, Merkley and Hoy (1989) describe Iowa State University satellite program "Teachers on Television, " which enables large numbers of pre-service teachers to observe real classrooms in diverse settings. The University of the West Indies (UWIDITE), on the other hand, is representative of other island nations, which share characteristics of physical isolation, small populations, and limited economies.

UWIDITE provides in-service training to teachers at seven sites in six countries primarily through audio teleconferencing, though audiographic conferencing is also used on a limited scale (Tietjen, 1987). McGreal's article describes how a consortium of five universities in western Canada delivers a post-graduate certificate program via correspondence, audio conferencing, and computer-mediated communication.

The third form of teacher training is a "sandwich program," which Coldevin (1990) describes as an alteration between campus-based courses with distance education hands-on training while teaching in the field. Johnsen's article is an example of the sandwich program occurs in Iceland, where pre-service teachers first gather in a boarding school during the summer and then have hands-on training in their schools. During their practice teaching experience, the student teachers communicate with each other and with their supervisor by telephone. Another example is a teacher training program for refugee primary schools in Somalia, which involves an initial 'crash course' on basic teaching skills followed by on-the-job training via distance education for primary school leavers (Said,1990). The British Open University offers degree programs to teachers through a combination of correspondence, radio and television broadcasts, and residential programs and tutorials (Kaye, 1982).

In addition to the three forms of teacher training programs at a distance, teachers communicate with and receive support from supervisors or others teachers through distance education. The distance education technologies used for this purpose typically are interactive, enabling teachers to give and receive moral and emotional support. Johnsen found that the Icelandic student teachers found the telephone a critical link with other student teachers, resulting in the emergence of "telephone -mothers." Computer-mediated communication (CMC) is increasingly used to provide a social context and help reduce the isolation that many novice teachers feel. The Beginning Teachers Computer Network, at Harvard's Teacher Education Program, for example, supports teaching and encourages professional growth of first-year teachers across the U.S. (Beals, 1991; Merseth, 1992).

2. Methods and Delivery Systems

Teacher training is offered through distance education by a variety of means, although the basic delivery method worldwide is print materials.

Other distance education delivery techniques include: radio; audio, audiographic, and satellite conferences; broadcast and cable television; interactive television; and computer-mediated communication (including bulletin boards, electronic mail, and computer conferences). A shift is being made toward an integration of technologies, and some more advanced systems include a multi-media mix.

Radio, because it is generally cheap, readily accessible to the masses and motivating if used effectively, has been used since the 1940s to teach teachers. Radio schools, which are generally used in conjunction with print materials, have provided teacher training and upgrading in a variety of Third World settings, e.g., Kenya, Botswana, Swaziland, Tanzania, Papua New Guinea (Young, Perraton, Jenkins, & Dodds, 1980).

Audio teleconferences enable groups of people to interact by voice over standard telephone lines. The personal computer based equivalent of audio teleconferences--, audiographic conferencing-- affords participants the capability of hearing each other and their instructor while sharing text and graphics interactively. Audiographic conferencing requires a microphone with a graphics tablet, modem, and speakerphone to be located at each site. This form of audiographic conferencing enables voice and text to be transmitted over standard telephone lines. Audiographic conferencing is used to train pre-service and in-service teachers in Canada through the Knowledge Network, which is a component of the Open Learning Agency (in British Columbia), and at the University of Calgary; in the U.S. at Louisiana State University, with COM-Net at Utah State University, and through the Delaware-Chenango Board of Cooperative Educational Services (Gilcher and Johnstone, 1988). In Australia Neil Elliot (1989) describes the potential of using audiographic conferencing for professional development of teachers in small schools.

Satellite video teleconferences, which are one-way broadcasts of video, are typically supplemented with a two-way audio return. This form of teleconference enables large numbers of participants over a wide distance to see and hear the instructor and communicate via telephone.

Typical teacher training and staff development programs using satellite conferences in the U.S. are TI-IN Network, Oklahoma State University's Arts and Sciences Teleconferencing Service (ASTS), and Washington State's Satellite Telecommunications Educational Programming (STEP) network (*Linking for learning*, 1989). Iowa State University's "Teachers on Television" uses microwave television to deliver live classroom observations. In Australia, a mixed mode employing satellite conferences along with audio conferences to encourage local participation . An example is one of a series of in-service teleconferences for professional development of members of the School Library Association of Queensland. Participants in this day-long program based on "The Pied Piper of Hamelin" met first in local groups, then met regionally by audio teleconference, and then joined the other participants by video teleconference. Afterward they met again regionally by audio teleconference and concluded the program in their local groups (*Storytelling across the curriculum*, 1984).

Interactive television is currently used on a limited basis for both pre-service and in-service teacher preparation. The delivery systems that enable live, real-time exchange of two-way video and audio are microwave television, fiber optics, and compressed video digital conferencing. Iowa State University's "Teachers on Television" program uses microwave television to deliver live classroom observations (Merkley & Hoy, 1989) Similarly, in 1991, the University of Wyoming College of Education obtained funding for a three-year project of the Video Education Interactive Network to develop a model for using compressed digital video conferencing to provide coursework to student teachers and first and second year teachers in Wyoming (personal communication, Hakes, 1992).

Computer-mediated communication (CMC) is the use of personal computers to communicate via phone lines with a host computer running a computer conferencing program. CMC includes electronic bulletin board systems (BBS), electronic mail (e-mail), and computer conferences. Conferences enable all participants or subscribers to the conference, to read messages from each other and send messages to the conference for others to read.

The asynchronous property of CMC promotes and even encourages collaborative work. CMC can be used to deliver instruction on a stand-alone basis or in an integrated approach as support for other types of instruction.

Hiroo Saga's article contributes to the notion that teachers in Japan are willing to teach themselves to use CMC, using their "spontaneous" energy, in the absence of other forms of a widespread in-service training program. Japanese teachers have access to information on regional education, and can exchange with each other through e-mail and BBS. Other examples of CMC for in-service programs include Harvard's BTCN for first -year teachers across the U.S. (Merseth, 1992), teacher training in computer education in Kansas (McGrath, Thurston, & McLellan, 1990), and on-line communications services and resources for rural teachers through the Big Sky Telegraph (BST) in Montana (*Linking for learning*, 19[illegible] McGreal's article relates to the Ontario Institute for Studies in Education (University o[illegible]to) use of CMC to deliver master's level courses to teachers across the Province of Ontario. The article further describes the first electronic "village" for teachers in Ontario--the Village Electronique Francophone, which French-speaking teachers use to communicate with each other.

Distance education typically integrates various technologies instead of relying on a single delivery system. A number of distance teaching universities--particularly in developing countries--in their attempts to reach the masses, have followed in the wake of the British Open University. Universities, including the Open Education Faculty in Turkey and Sukhothai Thammathirat Open University in Thailand use printed materials supplemented by television and radio broadcasts to deliver their courses Boyd-Barrett's article describes the U.K. Open University's initial teacher training course which will be presented in 1994. The method combines distance learning with practical training in schools and will integrate course units, resource packs, audio and video components, and information technology. Hedberg and Harper's article describes the integrated technologies used at the University of Wollongong. This program has set up an interactive multimedia laboratory that supports in-service and postgraduate studies for teachers through linking them directly to instructors via electronic mail. The laboratory, which is attached to the University's e-mail system, includes workstations equipped with laserdisc and CD-ROM players along with video and audio digitizing and video editing units.

Another innovative integration of technologies is described in McGreal's article about teacher training in music and computers in isolated locations in Northern Ontario, Canada. In that situation, the expert teacher used Contact North's audiographics network in conjunction with a musical instrument digital interface and a keyboard synthesizer. Finally, the article by the French Ministry of National Education and Culture describes the way that the National Distance Teaching Center (CNED) assists candidates as they prepare for teaching recruitment competitions. CNED serves 350,000 students per year via correspondence, satellite, video teleconference, Minitel, fax, telephone, audio cassette, and video disc.

3) Costs

As *Linking for Learning* (1989), describes distance education costs based on initial costs including transmitting and receiving equipment, and continuing costs such as programming and operation.

Costs vary widely and are dependent on a variety of factors. For example, schools sharing teaching resources and using local facilities would have lower programming costs than schools receiving programming from external providers (*Linking for learning,* Appendix B, 1989).

In the articles included in the report, distance education systems based on existing hardware and software were noted to be fairly inexpensive, while those that initiated their own programs tended to be more expensive. CMC at the University of Wollongong, for example, was fairly inexpensive to install, as it included extra costs only for network modems. Students are required to purchase their own modems and usually have their own computers anyway (Hedberg and Harper note that the University of Wollongong was able to minimize costs by avoiding highly designed materials that are "expensive for small numbers and difficult to maintain currency in highly volatile content areas." The Turkish teacher training system was inexpensive compared with the setup costs involved in the original Open Education Faculty distance education system. Teachers in Turkey began to be trained in 1985 using existing distance delivery systems, so additional course costs were related primarily to the production of written and video materials

4. Lessons Learned

Distance education systems take steps to ensure that the system functions well and meets students needs. Many of these steps occur during the planning phase and continue through the final evaluation. Carmo's article in this report describes problems occurring during the first year at the Portuguese Open University that were related to economic, administrative and organizational factors. Said (1990) included several of these same issues in his discussion of distance education in teacher training in Somalia for refugee primary schools. Typical of these issues in developing countries are resource shortages (both human and material resources) and library text books. Additionally, Said remarks that the distance education approach itself is new, thereby creating problems with a general lack of understanding of ways to use distance education technologies.

While teacher training at a distance has been a satisfactory alternative and supplement to on-campus teaching, there is little evidence to support the notion that teachers trained at a distance can teach as effectively as their counterparts trained through conventional modes. Recently, however, a study of the Emergency Science Programme in Guyana (Brophy & Dudley, 1990) revealed that the performance of teachers trained on-campus does not surpass those trained in this distance program. Performance was measured by supervisors' and head teachers' assessments, self-ratings, and students' reports.

Even when a distance education program overcomes teacher shortages in one area, challenges may continue to exist in other areas. An example of this dilemma is found in Zimbabwe, where a pre-service teacher training course (ZINTEC) places large numbers of highly qualified teachers trained at a distance in rural schools. Zimbabwe still has a serious shortage of qualified teachers at all levels, due to a lack of a widespread in-service training program (Gatawa, 1990).

Several articles in this report (e.g., Hedberg & Harper, Marantz & England) note that upgrading of staff through distance education technologies is necessary to familiarize users with new distance delivery systems. Providing them with hands-on experience with technologies at their own workplace can reduce the fears of staff. Hedberg & Harper note that staff training based on traditional teaching and staffing approaches will be difficult to achieve effectively with current funding constraints. Marantz & England remind us that if skills in using CMC are lacking in either teachers or students, the medium becomes a "roadblock between the seeds of knowledge and the learner."

5. Summary

Developing countries in particular often need to reach the masses of untrained or under-trained teachers to provide them with opportunities to upgrade their skills and earn credentials. In this quest for appeal to the masses, a balance needs to be maintained that fosters interaction among pre-service and in-service teachers themselves and with their instructors. Randy Garrison (1989) identifies two-way, interactive communication as "a defining feature of the educational process." Michael Moore (1989) describes three primary types of interaction that can occur in learning: between the instructor and the learners, among the learners themselves, and between the learners and the content. It is not the technologies themselves, however, that induce this interaction. While interactive technologies such as teleconferencing and CMC posses the attributes of real-time, two-way exchanges of information, these technologies require "user skill...to bring about interaction in an instructional context" (Wagner 1992).

Many of the distance education systems described in this report implicitly or explicitly include interactive functions for the learners. While the integration of technologies often times provides for this capability, instructors using distance education must find new ways to structure student-teacher interaction.

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The Author

Karen Murphy, currently an Assistant Professor in the College of Education at the University of West Texas, has studied, researched, lectured, and experienced myriads of educational environments, from Wyoming, to Texas, from Turkey to the United Kingdom and back and forth, all of her studies aimed at acquiring a better understanding of how technology and education relate, more particulrarly, how they do so at a distance. A long time member of the International Division of the Association for Educational Communications and Technology, Dr. Murphy is always there when needed, as she was in providing the editors with this very definitive and insightful piece which leads off the report.

Teacher Education in Uganda

Teacher education is one of the special interests of Chris Yates, IEC's Research and Training officer. Here he describes a current project in Uganda.

In the Mubende district of Uganda, 80 per cent of the teachers working in the primary schools are untrained and unqualified, and this has a serious effect on the quality of education. In an effort to improve the situation, the Ugandan government set up the Mubende Integrated Teacher Education Project (MITEP) early this year. It's a collaborative project, involving the local district administration, the Ugandan Ministry of Education and ActionAid Uganda. External funding for the project has been provided by ActionAid and the UK Overseas Development Administration.

The project is designed to upgrade primary teachers using distance education techniques combined with short residential periods at local colleges and teaching practice supervision.

ActionAid invited IEC to advise on the implementation of the project and to help with initial training of key personnel. IEC recruited Jason Pennells to act as long-term advisor on the project. Recently both Jo Bradley and myself have been out to Uganda to help with the initial training of writers, editors and tutors and to assist with planning.

The initial course will be run over nine terms (1991 to 1993) for 900 teachers. If it is successful, it is hoped that a national scheme to train all unqualified primary teachers in Uganda will be set up.

Publication

IEC: International Extension College
Office D, Dales Brewery,
Gwydir Street,
Cambridge CBI 2LJ, England

Tel: 0223-353321
Fax: 0223-464734

Supporting And Developing Teachers Through Telecommunications

John G Hedberg & Barry Harper
Faculty of Education
University of Wollongong

Background

While it is always difficult to predict a scenario of what teaching and learning strategies might be employed with developing technologies, it already appears that the information age challenges us to rethink the strategies that we use for learning. Information technology provides a substrate on which many activities and information exchanges are based. Current technologies allow for a knowledge base to be accessed as required by the user or as directed by a tutor. This trend is evident in the use and application of information technology in business and industry, and is increasingly evident in education. The trend that may be the most significant for education however, is the facility to access information through telecommunication networks, both for the student and the instructor.

In constructing a model for the development of technology in higher education, it is important to examine some assumptions about technology's role in learning and teaching in the immediate future.

The use of technologies in instruction tends to have an inbuilt assumption that the pedagogy used is sound. A definition of "educational technology" is understood to encompass its widely recognized meaning of teaching/learning via *media,* including the traditional audio-visual media and now including instructional computing and various forms of telecommunications as well as interactive media such as videodisc and compact disc.

However, the term "educational technology" also includes a *process* aspect, which has been defined as:

> "A systematic way of designing, carrying out, and evaluating the total process of teaching and learning in terms of specific objectives, based on research in human learning and communication, and employing a combination of human and non-human resources to bring about more effective instruction."

An important aspect of technology in the 1990s and its impact on higher education is the extent to which digital encoding is causing the different modes of storing, transmitting and manipulating information to converge. This has significant implications on the equipment, facilities and functions of institutions involved with supporting and developing teachers into the next decade.

The development and delivery of educational materials is rapidly evolving towards the situation represented in the following diagram.

Assumptions About Alternative Delivery for Teacher Development

If alternative systems of delivery are to be developed in institutions involved with developing teachers, these should be viewed in terms of changing structures and definitions. For example, some basic infrastructure now includes:

• *A hardware network::* a campus-wide, high-capacity communication network linking all teaching/learning, research and administrative areas, enabling the sharing of information in various forms including data, video and audio.

• *A resource sharing network:* a campus-wide network of links between people to share skills, expertise and resources such as hardware, software, courseware.

• *A symbiotic relationship between Information Storage (Library) and Information Services (such Computing Service Departments—Network management and courseware development).* It is essential that the activities of these academic service areas be closely coordinated.

These basic elements of infrastructure provide a skeleton on which professional development of teachers can occur. The existence of this technological "platform" is the changing nature of the relationship between institution and student. In fact it achieves a blurred distinction between an "internal" and a "distant" student and most students will be involved to some extent in off-campus learning. Consider the following scenarios:

• A course on the writings of Emily Bronte could consist of a series of readings which might be borrowed from the library, a twice weekly discussion over a campus radio station with telephone talkback for interaction. The students might only need to attend a few tutorials at the University and many might hold a part-time job during the week.

• Lectures in C programming might be issued on video cassettes through the Library for the student to watch on their home VCR. The exercises could be attempted on their home computer and the final solutions could be transferred via modem and telephone line to the University's network run by the University Computing Services to the Lecturer's Electronic Mailbox. These assignments with written materials and computer programs, which might be test run by the lecturer, are available when and wherever the lecturer decides to mark them.

• Students on practice teaching might continue a subject they are repeating by submitting assignments through electronic mail from the school in which they are teaching. By these means they do not miss out on completing their full course materials because they are over 100 kms from the main campus.

• A physically disabled student might only be able to drive to a satellite campus located in a local school because the time taken to drive to main campus would be physically difficult. A course in Sociology of the Classroom might only be offered on the main campus but by slow scan television transmitted over the ISDN phone network, the student might watch the lecture and even ask questions over a return audio link.

• With the installation of new library computer systems remote access to the library catalogues, and materials reservation facilities, each student is able to identify sources of materials for research and study from their desk whether they are on the campus or at a remote location.

This changing technological relationship enables the reconsideration of the type of institution in which learning occurs. Development of teacher education programs can occur in a 'virtual campus' which will allow a greater range of educational offerings and easier access to courses for teachers a remote locations with little or no degradation in the quality of the course. It also enables the provision of development programs at convenient times throughout the working day reducing travel and improving the productivity of the teachers' time.

Different Cases of Telecommunications Support

Throughout Australia there are a variety of innovative projects being undertaken to apply and evaluate telecommunications to the concepts of distance education and open learning strategies for teachers at the pre-service and post training level. Some of the programs have been designed to maintain currency for teachers, some to offer teachers paths to postgraduate studies and others are becoming integral parts of preservice offerings. As the trend leading to telecommunication facilities becoming available in many schools continues so teachers as participants in E-Mail based inservice programs will rise rapidly.

The brief case studies outline here exemplify the work being done by various educational sectors.

POST GRADUATE STUDIES IN SPECIALIZED AREAS USING TELECOMMUNICATIONS

The University of Wollongong is currently supporting a major initiative in the development of information technology expertise and interactive multimedia specialization as part of the movement toward open learning approaches to professional development. The Faculty of Education has set-up a state of the art interactive multimedia laboratory for research and development in this area and is dedicated to the use of innovative technology in instruction. This facility is being used as a basis for the development of interactive multimedia materials and to support, through telecommunication systems, in-service and postgraduate studies for teachers.

The laboratory is well equipped with facilities to develop software and audio visual resources to test and evaluate prototype laserdisc materials. The facility includes 10 workstations with large storage capacity, equipped with laserdisc and CD-ROM players as well as video and audio digitizing and video editing units. The laboratory is attached to a University wide E-mail system which can be accessed through external electronic mail networks available to teachers in schools.

Development of the system at Wollongong is based on supporting teachers and postgraduate students through linking them directly to lecturers via a simple and inexpensive existing E-Mail system.

The University of Wollongong, through its Information Technology Services unit, has established a campus wide network that takes full advantage of the interconnectivity now being developed for desktop personal computers. The desktop machines of staff members are interconnected through either Ethernet or Appletalk networks that are linked through routers to the campus wide fiber optic system. Access to the library system (PALS), administrative student data and international E-Mail through the Australia wide University network, AARNett, are at the fingertips of academic staff.

The Faculty of Education has three Appletalk file servers all with excess storage capacity.

This excess capacity has been put to use to support a pilot study in course support through student access to the networks via network modems. Postgraduate students are assigned a folder to download assignments and submissions or questions for their lecturers. As well as this a folder for distribution of information to students has been set up so that relevant information or instructional materials in the form of text or in hypertext type applications, such as HyperCard stacks, can be downloaded when students sign on. This system has proved to be reliable and inexpensive for the Faculty to set up, considering the only extra cost has been for network modems. Experience has shown that most of our students purchase a computer to use in their work and the added cost of a modem seems to be an attractive alternative to campus visits, phone calls and submitting assignments by mail. This program was developed as a prototype for providing specialized postgraduate Courses at greater distances without the cost of highly designed materials which are expensive for small numbers and difficult to maintain currency in highly volatile content areas

CHRISTOPHER COLUMBUS LINKS BETWEEN SCHOOLS AND UNIVERSITY

Apple Computer Australia and the University of Wollongong have embarked on a joint project called the *Christopher Columbus Program—Down Under.* Just as Columbus discovered new worlds, this program aims to discover new ways of learning.

The project aims to research effective applications of interactive multimedia in education and training, and to develop educational courseware for both learners and teachers/trainers for Australian and overseas markets. It is also investigating the use of international telecommunication systems in learning environments, through electronic mail links between Australian and the world wide network of centers participating in the program. This network is part of the Apple Global Educational Network.

The University of Wollongong site is the first Australian representative in the Christopher Columbus program, which is based in the U.S.A. and incorporates twenty-two similar collaborating centers throughout the world. The projects that are developed from the program will be based in the interactive multimedia laboratory, established by the Education Policy Program on behalf of the Faculty of Education.

The chief researchers in the project are Dr. Barry Harper, Associate Professor John Hedberg, Professor Carla Fasano and Professor Russell Linke, members of the Education Policy Program, a funded research program of the University of Wollongong located in the Faculty of Education.

The project focuses on working with selected local schools to develop cost-effective uses of interacti e multimedia in the K-12 curriculum and to investigate the use of electronic mail systems in support of teachers and students in these developments.

Apple Computer Australia is supporting the program through links to international telecommunications systems, supply of experimental software and technology to the University and collaborating schools, and funding production costs for an initial Interactive Multimedia package on ecology, which is being designed for use in the Years 11-12 Biology curricula throughout Australia.

THE PEGASUS NETWORK

The development of the concept of 'virtual institutions' through telecommunication is now being employed in a number of settings (Davies and Jennings, 1991). The concept of a 'virtual university' that will promote a global perception of the wisdom and experience of all the world's cultures has considerable attraction to consumers, distant from the source of instruction. Gert Gast (1991) has reported on an experiment which makes use of the Pegasus networks for distance education. . The experiment involved facilitating telemetric access to a campus in California for an isolated student in Australia. The student had access to a 'virtual campus' through which she was able to electronically attend lectures and seminars from her own computer, write assignments and essays, and communicate with her lecturers and tutors on-line. This was achieved through use of a modem and computer with a student with limited experience in computer use. Pegasus Networks Communications Pty Ltd. is a wholly Australian owned company established to make the latest developments in electronic information and communications readily available and affordable to as many people as possible in the Australian community. The network has a variety of gateway facilities that allow the user to access a large number to networks -- world wide. Thousands of academics at major Universities as well as millions of commercial network users are accessible. Pegasus' international connections also offer shared conference material, electronic mail services and a variety of other resources.

FUTURE DEVELOPMENTS

As pilot studies of the use of telecommunication for in-service of teachers are completed the lessons learned will be applied to some large scale programs. The upskilling and retraining of teachers of Languages Other Than English (LOTE), using a distance education model employing innovative technology, which provides curriculum materials for classroom and individual student use is one area which lends itself well to this type of approach.

DESCRIPTION OF ACTIVITIES PLANNED FOR THE LOTE PROJECT

For the National Policy on Languages (NPL) to be effective there needs to be an upgrading of the language teaching staff through reskilling programs and the preservice education of new staff. The development of this type of expertise in the short term, with the current funding constraints of educational bodies will be difficult to achieve if it is based on traditional teaching and staffing approaches. Alternative processes need to be found to implement the policy.

The purpose of this application is to construct, trial and evaluate a model to provide all LOTE teachers with readily accessible upskilling programs designed to improve skills and knowledge in the teaching of languages, targeted as priority languages.

Implementation of the model will ensure accessibility of all teachers, including those in isolated schools, through delivery of the program using innovative technology, at the school level at relatively low cost.

The networking concept is a key feature of this proposal where the technology itself can be used to facilitate the process, achieving a significant reduction in the human resources required by traditional programs through this distance education mode. Schools will be networked through a "Post Office" center with instruction in use of the equipment and curriculum materials disseminated through a telemetric network with the facility for each school site to share ideas and developments with every other center involved in the project. This project straddles two of the second language learning national projects: Distance Education and Innovative Technology.

This project will develop modern language teaching techniques and resources to support particular language groups with a lack of fully trained teachers. Scenarios that are congruent with LOTE syllabuses throughout Australia will be used in the project. The programs will be delivered through telemetric mode. This will be achieved through the development of a comprehensive second language interactive multimedia package that will be designed to introduce and develop teacher competency in using innovative technology in language teaching as well as model the type of instructional techniques and curriculum resource materials available through these technologies. The resource will have two functions. It will firstly be an instructional package for teachers involved in up-skilling and re-training programs in the schools, reducing the need for travel and release time, and secondly it will contain language teaching resources that can be used in schools with language classes incorporating this innovative technology. This will facilitate teacher access in isolated areas, reducing the cost for retraining and upskilling. These complementary projects straddle two areas of the Australian Government's Department of Employment, Education and Training (DEET) guide-lines -- innovative technology and distance education. The laserdisc materials will be multifunction—one set of software packages used for teacher development and another set, using the same video materials, for student development.

THE DLITE PROJECT

The DLITE (Distance Learning for Inservice Teacher Education) Project's principal aim is to develop a cooperative National Policy for the continuing professional development and inservice training of teachers through distance learning (Lundin et. al., 1991). There are two main outcomes expected of this project:

1. A proposed policy framework, and

2. Suggested strategies for policy implementation.

A distinction is made, however, between these policy and strategy suggestions and the actual procedures employed for policy adoption an implementation that are the responsibility of decision makers. The project team have proposed policy directions for future development based on the following assumptions

- to make optimal use of existing distance learning resources.
- to acknowledge restructuring of educational systems.
- to acknowledge past and present developments in the areas of telecommunications and new technology.
- to promote educationally effective and economical provision of services to teachers particularly in rural areas.

Conclusion

The new technologies offer significant opportunities for the professional development of teachers in the schools where they work. The development of new relationships between institution and student enables a wider range of course offerings for both professional development and postgraduate degree studies.

Apart from the convenience, the potential increase in effective time management can reduce the personal costs of professional development for many teachers. The obvious gains are continued immediacy, responsiveness of the provider and personalization.

More importantly, access and equality of opportunity is enhanced at possibly less cost than attended programs, and less cost than the professionally-designed distance education courses which have been considered necessary as part of the distance education program. This latter issue might be contested by those arguing for quality learning materials, but the economics of providing specialised courses or courses with highly volatile content through the means of telecommunications support must be considered in an age of reduced resources.

As these case studies have illustrated, Australian Institutions are beginning to expand their approaches to open learning through telecommunications. The current experiments range from simple, cheap solutions to quite novel and more expensive solutions. With the development of national policy such as the DLITE Project, there is likely a major change in the way institutions view their role and their teaching functions. It places increased pressure on institutions which do not see themselves as holding a national mission and view their relationship with their clientele as being one of personal face-to-face contact. The alternative view of the virtual institution should appeal to both political and individual as a method of addressing needs specific to current national and personal development priorities.

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About the Authors

John G Hedberg

John Hedberg is Associate Professor in Information Technology in Education at the University of Wollongong. He has written and edited numerous books and articles in the area of instructional design and educational technology, including a recently published guide to using information technology in teaching called *The Desktop Teacher*.
Dr. Hedberg is President of the Sydney Chapter of National Society for Performance and Instruction, President-elect of the International Division of the Association for Educational Communications and Technology, and Editor of the *Australian Journal of Educational Technology.*

He has been involved as an instructional designer on many media and computer based teaching materials, including *Ask the Workers...* the first interactive videodisc designed to teach career education in Australian schools. Dr. Hedberg consults in the area of information design for learning and has under taken major contracts locally, with government departments and firms such as Digital Equipment Corporation, as well as several projects in Southeast Asia, including major contracts for the Governments of Malaysia and Brunei.

Barry Harper

Barry Harper is a Senior Lecturer in the Faculty of Education at the University of Wollongong. He lectures in the areas of Science Education, Computers in Education and Information Technology in Education. He has written numerous articles in the area of educational technology specifically related to authoring systems and interactive multimedia. He is currently researching in the areas of technology literacy, the application of technology to science education and navigation systems in interactive learning environments.

Dr. Harper is the director of the Faculty of Education Interactive Multimedia Lab.

Distance Education of Teachers in Canada

by Rory McGreal
Executive Director
New Brunswick Distance Education Network

Canadian teacher education programs delivered at a distance can be divided into two distinct program areas: Special certificates, and Master's degrees. Presently, there are no programs that would lead towards a teacher's license available at a distance. A minimum eight month residency requirement exists in all jurisdictions. Professional licensing is the responsibility of the different provinces. Teachers licensed in one province are not necessarily accepted when they apply in other jurisdictions. They must submit their qualifications, employment history and university transcripts for evaluation. In some jurisdictions, these must be accompanied by a letter from a Roman Catholic priest.

Basic teacher training remains very insular and closed, and is used to regulate and control the numbers of new entrants into the profession in each province. Under these conditions, then it is not surprising that no teacher licensing programs are available at a distance. The eight month residency requirement is one of the control mechanisms used to limit entry. Neither the provincial governments nor the school boards nor the teachers' unions have any desire to change this.

Residents in isolated regions of the country, particularly in First Nations reserves, have often expressed a desire to have these basic courses delivered at a distance to their communities. Up to now, however, there have been few policy changes implemented in any jurisdiction to encourage this. (In British Columbia, both the Open Learning Agency and the University of Victoria do teach some certification courses at a distance.) The success of the teacher certificate and Master's programs delivered at a distance demonstrate the feasibility of introducing a basic teaching license program for delivery to remote communities.

This seems ironic, because the demand for professional upgrading courses by teachers in outlying regions has been one of principal stimuli for setting up distance education programs. Some of the very first distance education programs in the country were set up in response to new government regulations requiring teachers to upgrade their qualifications in order to maintain their licenses.

CERTIFICATE PROGRAMS for TEACHER UPGRADING

McGill University set up one of the first video courses in the 1970s to provide teachers in isolated communities the opportunity to upgrade their qualifications. These courses were based on videotapes of lectures which were shipped to each community with teachers enrolled in the program. One of the teachers in each community would act as animator and coordinate the communications between the students and the professor. Course credits could be credited towards a bachelor's degree or towards a special certificate in Second Language Teaching.

Presently, there are distance education post-graduate certificate programs for teacher upgrading in most provinces. Memorial University in Newfoundland has been delivering a certificate program in Distance Education since 1991. This program has been delivered across the province to teachers in over 100 different centers through audiographic teleconferencing. Using an electronic tablet and audio telephone connection, the professor can interact with students using prepared visuals, or by using the tablet like a blackboard.

The Teleuniversite du Quebec also offers educational upgrading to teachers. They supply principally modular correspondence based courses that include some audio tapes and some videos. The instructors visit different sites at various times during the year to meet with students. They deliver a special post-graduate certificate program in distance education. Presently, they are experimenting with video teleconferencing.

In Western Canada, a consortium of 5 universities delivers a post-graduate certificate program in Adult and Continuing Education. The participating institutions have all agreed to accept each other's credits for granting certificates to students enrolled in the program. These courses are delivered through various media including correspondence, audio conferencing and CMC. The University of British Columbia, delivers its own Adult Education program to communities in the interior of the province.

Athabaska University is a distance education institution that delivers programs principally by correspondence across western Canada. The Ontario-based University of Waterloo also delivers correspondence courses. Both institutions often supplement their print materials with video and audio tapes. Many teachers access their courses for upgrading, often applying these credits towards certificates in other programs.

MASTER of EDUCATION PROGRAMS

The Ontario Institute for Studies in Education (OISE) is the graduate school of Education for the University of Toronto. Since 1982, it has been successfully delivering province-wide distance education courses at the Master's level through audio conferencing. They have set up their own sites in southern Ontario and relied on the Contact North distance education network for delivery to the more remote regions. Contact North provides a network of more than 140 sites equipped for audiographic teleconferencing in communities across Northern Ontario. OISE uses audio conferencing without the graphics, because they must also deliver to southern communities which do not have the audiographic equipment.

OISE has also been delivering masters level courses through computer-mediated-communications (CMC) since 1985. CMC is a means of communicating through electronic mail messages, bulletin boards and conferences among different computers linked to a central host mainframe. OISE has been using a special program called PARTICIPATE to deliver their courses to teachers across the province.

CERTIFICATE PROGRAMS for UNLICENSED TEACHERS

The growth in demand for quality day care has also created a demand for distance education early childhood education programs. Teachers in day care centers must now be licensed in most provinces. There is a demand for licensed early childhood professionals. Confederation College in Thunder Bay, Ontario offers a full program through Contact North, using audiographic teleconferencing. Other Community Colleges in Western Canada offer similar programs.

Teachers in the Canadian Community Colleges often need upgrading in pedagogy. In addition, many volunteers are teaching adults in special literacy programs in their home communities or in the workplace. Sault College in Northern Ontario, using the Contact North audiographic network delivers adult education courses to teachers in remote communities.

RECENT DEVELOPMENTS

The province of New Brunswick has just entered into a cooperative agreement with the federal government to set up a distance education network. Special distance education sites will be set up within many schools;accessible to teachers and to institutions wishing to deliver programs.
In Ontario, the government in cooperation with the Teachers' Federation, has established a province-wide computer conferencing network for teachers. All teachers in the province will be able to participate on line. The computer conference called Village Electronique Francophone has been used for three years now by French speaking teachers in Ontario. Now other electronic "villages" will be created for other teachers.

SOME INTERESTING PROGRAMS

Contact North is a distance education network in Northern Ontario with sites in more than 90 high schools and over 50 communities. Each site contains an audiographic teleconferencing system.

Using an electronic tablet and audio telephone connection, the professor can interact with students using prepared visuals, or by using the tablet like a blackboard. The network has been used for a number of activities in teacher training:

Electronic Site Tours:

Using the audiographic system, the Ontario Art Gallery gave a series of sessions describing their collections and explaining to teachers how to access gallery materials for use in their classrooms. Other institutions like the Museum of Civilization have used the network to give information sessions to teachers. The Royal Ontario Museum has organized a series of special tours of the Egyptian, Maya, Greek and other collections. These tours were specially designed to integrate with the Ontario curriculum, and to show teachers different ways of presenting their material.

Music & Computers

An expert teacher in Thunder Bay teleconferences on the Contact North network to train teachers in Music and Computers using the Macintosh Musical Instrument Digital Interface (MIDI) and Roland D-5 keyboard synthesizer for teaching music. The program was designed by the teacher to train the teachers while teaching students at remote locations across the north. The course covered the operation of the synthesizer, understanding the MIDI, operation the sequencer and audio techniques.

Music teachers in four isolated locations including Moosonee on James Bay and one correctional institution were trained in effective techniques for teaching music and computers. They were also taught how to lobby their school boards and other government organizations to access funds to buy the necessary equipment.

Audiographics Training

The Contact North staff implemented a series of distance training workshops for distance education. At regular intervals throughout the school year, teachers participated in special workshops on the use of audiographics in teleteaching. One series of eight sessions was delivered by a teacher trainer from New York state. These sessions included classes on the profile of the adult learner, screen design principles, personalizing the class and instructional design.

Native instructors from the Wahsa distance education school participated in these sessions. They deliver courses by radio to more than 23 First Nations communities spread across the most isolated regions of Northern Ontario.

CONCLUSION

Canada can report many different activities in the distance education of teachers. However, the efforts are fragmented along provincial lines with no national coordination. It is significant that Canada is the only country in the world that does not have a national department or center for education. It is too often more difficult for Canadian institutions to deliver courses to other provinces than to other countries. Recently, the Open Learning Agency received permission to deliver its programs outside of British Columbia, so the provincial attitudes are changing. Politicians are continually expressing the need for more technological in-service training for teachers. Distance education is becoming a necessity.

Rory McGreal is the Executive Director of the New Brunswick Distance Education Network and may be reached electronically as follows: *rmcgreal@jupiter.sun.csd.unb.ca*

Training Distance Teachers in Denmark

by Lars Ingesman
Danish Computing Centre for Research and Education

1.0 The Problem

For the last 5-6 years, focus in the field of distance teaching/learning has been on what has been termed 3rd generation distance teaching, i.e. distance teaching with the use of computer conferencing systems for communications purposes. After some experiments with focus on technology followed by experiments that focused on pedagogy, we have come to see the distance teaching situation as a new situation that needs to be analyzed and understood as a system.

Focus has been placed on three basic elements: pedagogy, organization, and technology. As is the case with all systems, the components 'interact' - i.e. changes in one subsystem affect and in most cases require changes in the other subsystems: the organizational change from traditional classroom teaching to distance teaching creates a new communicative situation which influences the pedagogical possibilities and needs. Technological advance creates new pedagogical and organizational possibilities etc.

The fact that the learning environment changes and the fact that we create a completely new communicative situation, something that influences almost all aspects of teaching/learning, makes it necessary for the teacher to think in terms of basic pedagogic assumptions and strategies. The following course was developed that particular point in mind.

In the following short presentation I shall outline the structure of the course and some of the teaching strategies and learning points of each module. Following that I shall describe the organizational and technical setup of the course.

2.0 Course structure

The learning goal of the course is to enable distance teachers to develop and run courses at a distance with the use computer conferencing systems or electronic communication in general. As the course is itself using computer-mediated communication, there is an extra dimension to the learning process.

The basic frame is the following:

1. CMC from a user's standpoint, i.e. using the tool for communication.
2. General pedagogics
3. CMC from a theoretical standpoint, i.e. understanding the tool as a communications medium in its own right.
4. The pedagogics of CMC-based teaching/learning.

Module 1 starts with a face-to-face seminar with a lot of practical exercises. People need to be fairly confident users of CMC before they return home to continue basic CMC exercises. As the emphasis in the present paper is on pedagogics, I shall not go into detail with the structure or contents of this particular module.

As I mentioned above, the introduction of computer-mediated communication into the teaching/learning situation necessitates a more or less fundamental redesign of any course. For that region module 2 focuses on fairly basic pedagogic knowledge and assumptions.

2.1 Types of learning

In order to develop pedagogic strategies relevant to a particular course (learning environment), the teacher must be able to isolate different types of learning and, of course, understand that different types require different strategies:

* motor learning
* discrimination
* defined concepts
* abstract concepts
* rule learning and rule use
* problem-solving etc.

Point to understand:

The basic point for the participant to understand (and to understand from personal experience as a learner and teacher) is that different types of learning have different assumptions and thus require different strategies on the part of both learner and teacher.

2.2 Overall pedagogic assumptions and strategies

After having understood that learning is not one single thing, and that you cannot approach it from only one angle, we move on to focusing on fairly general pedagogic assumption and strategies.

One fundamental point to discuss (and to understand) is to what extent learning is an individual process, and to what extent is it a social process. For this particular discussion you need to keep aspects such a types of learning in the back of your mind, too.

Another just as fundamental distinction to discuss is the one between inductive and deductive learning. Again the understanding of types of learning (and types of learners) will influence the mix of methods.

A third fundamental aspect of the learning situation relates to the activity (or lack of activity) on the part of the learner: you need as a teacher to think in terms of active and passive processing of information. Typically, you can say that reading is a fairly 'passive' way of processing information (unless of course the learner gets very involved). So is lecturing (and any other kind of one-way communication). Writing, on the other hand, it typically an 'active' processing of data, at least if you require the learner to comment on or analyze something. Along the same lines question-answer or multiple-choice sessions can be characterized as basically 'reactive' processing.

The whole question of whether the learner is basically active, reactive or passive is, of course, closely related role of communication and meaning in the learning/teaching situation. We are used to thinking of words as symbols with a referent (an object or a 'meaning'), but meanings are not something static that we have learned by heart and recall whenever we hear the right words. Meaning is something we construct on the basis of past experiences. The whole aspect of communication and meaning is of particular interest in this connection as we are introducing a new communications technology into the learning situation to make up for the inherent lack of communication of most traditional distance learning environments.

Point to understand:

It is imperative that participants should understand how different kinds of teacher behavior and assignments influence the situation and behavior of the learner, and that the choices made with regards to (style of) communication may actually enforce a specific learner behavio.

2.3 Learning and remembering

Learning is a very basic function of the human brain, and for the sake of developing teaching/learning strategies It. Ls well worth one's while to spend some time to develop a basic understanding of the way the brain works.

Storing and retrieving information

One fundamental aspect of learning is the storing of information. Brain scientist have for some time worked with at least three different stages in the storing process: a very short-term storage where information is represented as electronic signals; a short-term storage with a span of 15-20 minutes, and finally a long-term storage that will last for ever. To use information that you have stored, you need to be able to retrieve that information.

There are a number of things that will help the brain store and retrieve information in long-term memory:

* using multiple channels/senses
* careful planning of repetitions to facilitate the conversion of data stored in short-term memory to data stored in long-term memory.
* minimizing the workload of the brain by structuring information

Learning is not just storing and retrieving information: that is only one aspect of learning. Being able to store and retrieve information doesn't really mean that you have learned anything if you define learning as some sort of change of behavior. One important aspect is to integrate new knowledge with existing. So the teacher needs to:

* create associations and relations to previous knowledge

Point to understand:

The course participant should understand how the brain functions when it comes to learning and remembering; and (s)he should understand what the teacher can do to facilitate the learning process.

2.4 The learning product and our tools

Most teachers are probably used to thinking of learning in some fairly diffuse way. It is, however, a good strategy to think of learning as a product, i.e. as something we produce. If you think of learning in those terms, the next step is to think in terms of the tools that you can use to produce a certain type of learning. If, e.g., the learning that you want to produce is some sort of understanding, you typically use one or more of the following tools to achieve your goal:

* examples illustrating the point you want to make
* visualization, e.g. graphic presentations of relations
* dialogue/discussion
* hands-on exercises
* analogy/comparison

Point to understand:

Learning is a product, and as such it is produced by means of certain tools. The teacher needs to know the various tools and needs to know which tool to choose for the various types of learning.

2.5 The learning environment

There is more to good teaching than mere craftsmanship, so in order to develop a new learning environment the teacher must be able to see the teaching/learning situation in its complexity of interdependencies. It is a question of defining learner roles and needs, of defining teacher roles, of choosing communications media and learning tools that will work well with the pedagogical intentions and ideals of the teacher and with the roles defined, while at the same time being economically feasible.

Point to understand:

The important point to understand is that the organization of the learning environment affects learner roles and needs, teacher roles, the tools and media available etc. Systems are characterized by interdependencies, and changes in the organization of a learning/teaching situation will affect all other aspects of that situation.

2.6 Computer-mediated communication

Communication being so central to the teaching and learning process, it is necessary for the distance teacher to be understand CMC from a theoretical standpoint, i.e. understanding it as a communications medium in its own right with its own 'rules.'

This will be partly based on a linguistic analysis of the medium and the communication situation produced by that medium, and partly of course on the experiences of the course participant themselves with the medium.

Point to understand

Some of the most fundamental aspects of distance teaching relates to the communicative situation. Thus the teacher needs to understand the situation and the problems related to the situation. But first and foremost the teacher should be aware of roles in computer-mediated communication, and (s)he should know the three golden rules:

* electronic discussions need moderating
* electronic discussions need pacing
* electronic learners need tutoring

2.7 The pedagogics of CMC-based teaching/learning.

The proof of the pudding is in the eating as the saying goes, so the final part of the course consists of the development a distance learning course

3.0 Course structure and setup

3.1 The Electronic Classroom

The computer conferencing systems allows us to set up a learning situation that simulates the well-known classroom situation:

* the learner is part of a group - a class
* the conferences on the system are used a bit like classrooms

This solves (or alleviates) two of the basic problems of distance learning: the learner is no longer socially isolated, and (s)he is no longer isolated as far as his/her learning process is concerned.

Due to the communicative possibilities of the conferencing system we can have:

* individualized learning and tutoring
* classroom discussions of problems, questions answers and solutions so that all
* participants may benefit from each others experiences and problems
* continuous adjustment of the material and the learning process

3.2 Course structure

To make up for some of the problems of using computer-mediated communication we start all courses with a face-to-face. The function of this seminar is to make course participants and teachers acquainted with each other and thus facilitate the electronic interaction. Another important reason for having a face-to-face seminar in the beginning is that participants can become acquainted with the technology that they are going to use.

After this introduction the participants are ready to start working with the course material on their own (or in groups depending on the pedagogical structure of the course).

The course ends with another face-to-face meting, which concludes the course while at the same time allowing for discussion of unsolved problems and the perspectives of the course material.

3.3 The technical concept

Distance learning environments that want to make use of modern technology, be it communications technologies such as CMC, satellite-based teleconferencing, or multimedia applications, or just standard CBT, will have think carefully about hardware and software costs, and thus availability to learners and teachers, technical problems, interfaces, specifications etc.

The problem can be viewed from many different angles. The institutions offering distance learning courses need to think in terms of initial investments and running costs; they need to think about development costs (particularly if they plan to use multimedia or CBT applications, or if they want to tailor interfaces); they need to think about update procedures and costs (which again may be quite considerable if you plan to use multimedia or CBT applications in your courses). Any decision the institution makes then needs to be seen in the light of the subsequent learner and teacher situation.

So when planning the technical aspects of a course, the institution needs to think carefully about the costs of the learner (and the teacher): in some cases technical decision will - for economic reasons - entail specific organizational and pedagogical decisions (e.g. the use of study centres).

Due to both economic and pedagogical considerations we have chosen a concept that is fairly simple from a technical point of view (it could be called the lowest common denominator for doing what we would like to be able to do): on the host side we have a computer conferencing system (PortaCOM), which runs on a VAX 6320, and a number of modems that allow people to dial up-our system. Seen from the point of view of the participants, we are also aiming at the lowest common denominator: all they need to take a course is some kind of computer equipment (a terminal, a PC or a Mac), a modem and a telephone line.

However, going for the lowest common denominator is not without problems or costs. In connection with the description of some of our experiences below I shall go into more detail about about economic considerations and technical decisions.

We have so far chosen not to introduce multimedia, CD-ROM (XA) etc. not because we don't see how we could utilize those technologies to improve the learning process, but rather because multimedia hardware is still too expensive compared to what students will be able to afford (a standard CD-ROM drive costs at present about as much as a low-end computer). So going for e.g. CD-ROM XA applications would take us back to a study centre philosophy, which again would mean lack of flexibility on the part of the learner (and flexibility seems to be what people are choosing when they choose distance learning).

3.4 The pedagogical concept

The basic pedagogical idea behind our distance teaching/learning concepts can be summed up the following words: Communication is central to learning, thus we should use technology to bringing communication back into the (distance) learning situation.

Bringing communications back into the learning situation also allows us to bring teaching back into the distance learning environment, and with the use of computer conferencing systems we can give distance teachers their most important tool back and allow them to do the same sort of things that they do in normal classroom environments: structuring, presenting, commenting, summing up, drawing analogies, adding experiences and perspectives etc.

While we bring communication back into the learning situation, we also try to retain one of the strong points of the distance learning situation, viz. the individualizing of the teaching/learning process, without giving up another basic pedagogical assumption that learning is both a social and an individual process.

The last pedagogical assumption that I shall mention relates to meaning and learning: basically, meaning is something which we construct, and learning is therefore the result of active processing and an active construction of meaning.

4.0 Experiences

This is the first distance teacher training course that we have developed as distance learning course. So I cannot give all that many facts and figures about course participants. We have, however, used the same technical, organizational, and pedagogical setup for a wide variety of other courses with considerable-success.

At present we have taught AutoCAD to some 450 people over the last four years. We have run courses on other computer software such as Smart, WordPerfect, PlanPerfect, DBase IV, and SAS with some 120 course participants. We have helped various other institutions start up courses according to the same principles. One of the most successful courses is a business language diploma offered by Handelsh / jskole Syd, a business college in the southern part of Denmark. They have at present some 120 people doing the diploma course.

4.1 The business language diploma

This particular course in some ways offers the best illustration of the costs and technical considerations of the concept because HHS, the business college, started almost from scratch as far as the technical and pedagogical aspects were concerned.

The business language diploma consists of a number of individual modules covering topics such as translation theory, technical language, economics and legal language. Before introducing CMC into the course, HHS offered a fairly standard distance learning course consisting of 4 - 5 Saturday seminars per semester. In the time between the seminars students were working on their own, sending in assignments etc. By introducing CMC into the course they hoped to revive a stagnant course and get a wider student base. Up till then their student base had been almost exclusively local, i.e. within driving distance (50-70 kilometers) of the college.

The college already had a VAX and a network linking the various departments. They had, however, no experience with conferencing systems or modems and little experience with PCs.

The technical investment on the part of the college included roughly the following things:

Investments:

The conferencing system (approximate costs):	
system:	55,200. - Dkr.
installation and systems adm. course:	10,500. - Dkr.
upgrading:	47,000. - Dkr.
Modems+lines (estimated costs):	71,000. - Dkr.
Modems for teachers	5,000. - Dkr.
Interfaces/terminal emulation:	29,000. - Dkr.
Other software:	10,500. - Dkr.
Teacher training/courses:	31,200. - Dkr.

Running costs:

Hotline support (approx. per year):	30,000. - Dkr.
Systems maintenance per year:	9,000. - Dkr.
Systems resources:	?? - Dkr.
Introduction of new teachers to the system:	?? - Dkr.

These are some of the costs related to the technical setup on the part of the institution. In some cases I haven't ventured a guess as to the costs, but they cost something nevertheless. To the figures that I have given, you should add 25% value added tax, so they are actually a lot higher (and if you divide by 6, you will get the approximate costs in US dollars).

HHS needed not only technical expertise, they also needed somebody to help them use the conferencing system in a sensible way, so they also spent some time and money on actually developing the materials and the course structure. How much money they invested in teacher time I can't say, but it was quite a lot.

So much for the institutional costs. The students, of course, also have to be taken into consideration. To communicate by means of the conferencing system they only need to have access to a low-end computer or a terminal, a modem, and a telephone line. They borrow the communications software (for IBM-compatibles) from the college. However, due to other course requirements (the students are required as part of the course to create a database of specialist terms), they need to buy database software. To minimize support problems the college decided to require the students to use Microsoft Works (if they wanted support and if they wanted to be able to work with their database of terms and word processor at the exams).

Due to these things, the equipment was more or less restricted to IBM- compatibles. This was a fairly acceptable restriction as most course participants were working in industry (and industry is still PC country). As we foresaw that a number of students would have problems affording the equipment, we tried to get leasing bargains with various computer companies.

The prices, however, were such that over a three-year period people would pay more if they leased their computer than if they bought one. It turned out that most of the people who did not have access to a computer at their workplace would rather buy one (and in fact a lot of course participants have access to a computer both at home and from their workplace).

4.2 Teachers and teacher training

What sort of bearing do these experiences have on teacher training? Quite a lot I would say. Teacher training as a subject is not in essence different from translation theory and practice: in both cases we have a certain amount of theory that you need to understand in order to develop practice, and in both causes we can set up exercises that will exemplify or illustrate the theory that the students have read. We can discuss the extent to which theory and practice explain reality as we see it (because we are all perpetual learners). In both cases this discussion of the relationship between theory and practice is of extreme importance in the development of each individual learners understanding and way of practicing theory.

One thing we cannot see of course is how people behave in front of a class, but we can see quite a lot from the way they behave in the electronic classroom as most of the things that make a good teacher are of ultimate importance in that situation.

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About the Author

Lars Ingesman
M.A. in English and German from the University of Aurhus. Mr. Ingesman studied at the University of Edinburgh, Centenary College in Shreveport, Louisiana, and at the Technical University of Berlin. He is a senior consultant at UNI-C The Danish Computing Centre for Research and Education

Ministere de l'education nationale
et de la culture
[ministry of national education and culture]

DISTANCE EDUCATION
AND
ONGOING TEACHER TRAINING
DLC/CNED/MAFPEN System
May 1992

English version edited by Peter Farkas

Distance education related to teacher training is administered by two separate networks:

I. In 24 universities

The Services d'Enseignement a distance [distance education units] (SEADs) prepare students for most teaching DEUGs (Diplome d'etudes universitaires generales) [general university studies diploma] - two years), licenses (BA - three years) and master's degrees (MA - four years) in the principal teaching disciplines: French, history, geography, philosophy, modern languages, mathematics, physics, chemistry, natural sciences and so forth.

The objectives of these university distance education courses are sometimes very specific, and sometimes very diverse. They sometimes lead to a diploma or are sometimes designed as upgrading or refresher courses in certain occupational categories where the student already holds a university degree. They can also be designed to provide education, in the broadest sense of the term, or to increase general knowledge levels.

A. University diplomas

A number of systems have been cstablished to enable certain types of students or all students to obtain diplomas. Sometimes, distance education affords students an opportunity to complete a portion of their studies leading to an examination for which a diploma is awarded. Other times, distance education is a complete program, and leads to a diploma. Finally, a number of organizations offer a complete range of diplomas.

B. Post-university upgrading and refresher courses

Some distance education programs include some very specific and limited activities, such as ongoing teacher-training courses.

C. General post-university education

In addition to specific and limited activities, the distance education systems attempt to provide a high-level general education to broad groups of the general public. These programs, which are aimed at large numbers of students, use most of the components of this type of teaching: printed documents, audio-visual materials, radio programs, audio cassettes, video cassettes, software, electronic communications and periodic meetings of students.

The missions of university and post-university distance education systems therefore vary widely, from specific individual activities leading to examinations, courses which are stand alone or part of a broad program, to large-scale upgrading and refresher courses that carry with them no obligations or credits, and courses of a purely cultural nature.

II. Centre national d'enseignement a distance (CNED) [national distance teaching center]

The CNED was established on December 31, 1979 by decree No. 79-1228, later amended on February 25, 1986 by decree No. 86-254. It is a public administrative institution governed by a board of directors and headed up by an academic president. Basically, it is responsible for providing all types of distance education courses at all levels (primary and secondary) and national ministry of education post-graduate courses.

Its operations include university-level programs, notably courses that prepare candidates for the diplome d'etudes universitaires generales (DEUG), post-graduate accounting degrees, and so forth.

It also provides courses geared specifically to assisting candidates as they prepare for the various teaching staff and administrative staff recruitment competitions held by the National Education Ministry and, under agreement with other departments, for recruitment competitions held to staff administrative positions.

CNED also gives courses in social advancement and ongoing occupational training courses required by law and regulations, notably the July 16, 1971 law. The CNED has its head office in France, along with eight training and teaching centres, one satellite video transmission and video production centre at the Futuroscope site (Poitiers), with antenna sites in Draguignan, Corsica, French Guyana, New Caledonia and a presence in 150 countries.

For many years, CNED has been disseminating knowledge in all academic, professional, and technical fields, and to the senior citizens' university network, at all levels. The publications of the CNED - printed course materials, training exercises, assignments to be submitted for marking and answer lists, allow students to obtain government diplomas, with the help of personalized assistance.

> 6,000 National Education teachers and EAD specialists bring all their knowledge and skills in the great tradition of French teaching.

The CNED:

- claims it is number 1 in the world in distance learning
- serves 350,000 students per year
- maintains a presence in 150 countries
- has developed more than 2,500 training modules
- offers courses from elementary to post-graduate levels
- groups students for exercises
- via its satellite video transmissions, enable students to converse with lecturers throughout the world, from a classroom, from a high school, from a university, from home or workplace, in France or outside France.
- maintains its video production facility at the Futuroscope site (Poitiers)
- provides interactive contact by: Minitel, fax, telephone, audio cassette, and video disk.

With the same methods and tools used by the SEADs in the universities, except for radio, the CNED provides the initial training to a large number of DEUGs and teaching licenses and master's degrees.

The efforts of the CNED are directed primarily, more so than those of the universities, to ongoing distance education for teachers. This education is provided by the various branches of the CNED, in co-operation with the Direction des Lycees et Colleges [high school and colleges branch] and the MAFPENs (professional training mission centres).

III. WHY SUCH A SYSTEM?

Background

Since 1989, the CNED has held preparations for internal technical teaching competitions as part of an original system that combines distance education courses given by the Vanves Centre with classroom courses given by the MAFPENs.

At the urging of the Ministry (DLC21), a working group was set up, consisting of representatives from the CNED, l'Inspection generale de l'education nationale des sciences et techniques industrielles, management-economics, la Direction des enseignements superieurs, la Direction des personnels enseignants and the MAFPENs. Its mandate was to define, on the basis of results from field surveys, those disciplines which required the development, on a priority basis, of specific distance education courses that would prepare students for internal competitions, for courses leading to the CAPET and the PLP2, for the CAPET.PLP2 and the agregations.

The national group was also given responsibility for following up the implementation of the system and evaluating its effectiveness. Activities during the past four years included:

1989-1990

Thirteen internal competitions were held under this system.

1990-1991

Preparations for 27 competitions were held; the new preparations dealt primarily with the technology CAPET and preparations for the preparatory levels.

1991-1992

The internal aggregation competitions, the technology CAPET preparatory level and the tourism CAPET were added; this brought to 34 the number of internal competitions for which preparation was available.

1992-1993

Preparation for 41 competitions with preparations for the CAPET in the following areas: computers and management, science and medicosocial techniques, biological engineering, PLP2 science and medico-social technique, biotechnology (health-environment option), hotel and restaurant (culinary production and organization and service and marketing options).

IV. SYSTEM DETAILS

Establishing the Network

Since 1989, the MAFPENs have been part of the network that was established by the CNED and organized around three elements.

A. Steering Group Element

The steering group sets priorities and draws up each year the list of competitions to be supported by the system.

B. CNED Element

The CNED assembles, in cooperation with the chairmen of the selection boards, a team of teachers whose responsibility is to design and write the courses and to mark the assignments.

The offer of distance education (course materials, assignments) is sent to the candidates (their registration fees can be absorbed by the MAFPENs), the trainers mandated by the MAFPENs to organize training sessions and selection board chairmen who request it.

The CNED organizes working meetings between the MAFPEN trainers and the people who write the courses; they are chaired by the selection board chairmen and/or vice-chairmen.

C. MAFPEN (Professional Training Mission Centers) Element

The MAFPEN organizes academic and inter-academic group sessions for MAFPEN candidates and trainers, which are in addition to the CNED courses. These day-long sessions are designed to clarify certain areas of scientific and technical knowledge contained in the distance education courses, and to prepare candidates for the competition tests, especially the practical or maintenance exercises.

D. The Preparatory Element

Competition candidates therefore benefit from:

1. distance education: uses course materials and assignments: this training offer is also sent to their MAFPEN trainers;
2. classroom sessions, held in the MAFPENs, during the year (approximately ten days)

V. Projects for 1992-1993

During the first university term, the CNED will develop a video which covers preparation for the technical maintenance test; it will be designed for candidates preparing for the CAPET and the electrical engineering aggregation.

Methodological advice will be given, based on examples:

A. Selection of an industrial "support theme" that can be used in specific teaching situations:

1. pedagogical development based on:

   (a). command of the technical content developed as part of the project;
   (b). knowledge of the appropriate reference works;
   (c). pedagogical practice;

2. presentation:

   (a). quality of documents produced;
   (b). board interview: time management and use of appropriate communications tools.

VI. WHAT CONCLUSIONS CAN BE DRAWN?

The experiment that has been ongoing since 1989 to prepare candidates for internal technical-teaching competitions is indicative of the concern that the partners of Education nationale have for improving the level of teacher recruitment and training.

This training is all the more essential because technical teaching must constantly adapt to changing technological and employment conditions.
The training database put together by the CNED is a database that can serve as a basis for the provision of modular, customized updating of teacher knowledge.

The expertise gained in putting together a national Ministry of Education/CNED/MAFPEN network is transferable to other types of training courses, such as:

- the training of general education teachers;
- the training of economics-management teachers as part of the program to reform the tertiary technology/science bachelor's degree;

The results obtained from this exercise reveal the need for interaction between classroom teaching and distance education in the training of teachers.

VII. SUGGESTED MEDIA

To increase the effectiveness of distance education, the CNED will increasingly favor a combination of complementary media:

- traditional media: printed materials, audio cassettes and video cassettes:

- new technologies: satellite video programming

Traditional Media

A. Printed materials

Because of their undisputed effectiveness, printed materials remain the most suitable media for reference works.

Preparation for the competitions is based essentially on printed materials;

- general bibliographical and methodological information;
  - work instructions:
  . summarizing the essential points to be covered
  . expanding on certain points that seem more important, difficult or current
  . suggesting topics for study, self-correcting exercises;

- work schedules: assignments submitted for marking

Pedagogical follow-up is provided by a team of teachers that frequently includes the course designers.

B. Audio cassettes

Some assignments must be submitted to the CNED on cassette; these are primarily those which involve training for the oral admission tests.

C. Video cassettes

The use of videocassettes is currently optional with the CNED; these include vacuum-pack cooking for the PLP2 hotel-restaurant course, and marketing for the CAPET and economics-management PLP2.

Acronyms:

DLC: Direction des Lycees et Colleges
CNED: Centre National d'enseignement a distance
MAFPEN: Mission academique a la formation des personnels de l'education nationale
CAPTE: Certificat d'aptitude professionnelle a l'enseignement technique
PLP2: Professeurs de Lycee professionnel 2e grade
PAF: Plan action de formation

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Theory And Practice Hand In Hand In Distance Education

Berit Johnsen, cand. polit.

Abstract

Professional skills contracts as part of decentralized B.A. education in teaching pupils with special needs on behalf of The Iceland Institute of Education, ICELAND.

In this article I will focus at the role of practicing in a decentralized part time study for teachers. At first there is a short discussion of the concepts distance education, decentralized education and flexible education. Then I will give a short description of the educational project as a whole, continuing by describing and discussing training of professional skills at distance by using a curriculum model as frame of a contract between students and educational institution. Four objects of professional skills training are briefly examined.

Many students in distance learning projects share their time between studies and working in the same field. One of the classical questions of distance education is therefore: How can we make use of the connection between study and work, theory and practice. Several educationalists have stated their point of view regarding this connection. Thus Ilyin from USSR says:

- There will be better training of specialists by the combination of studies and work.

- The work and study combination prevents students from switching professions after training.

- Conventional graduates need two-three years of work before mastering their skills (Daniel '88).

Knowles from USA has developed a system of learning contracts which enables educational institutions and students amongst others to use practicing as an effective part of the study (Knowles '86).

In Norway practicing teaching is seen as a necessary condition for taking part in decentralized teacher training (Brastad-Jensen '87).

DISTANCE EDUCATION AND OTHER CONCEPTS

In the introduction to this work distance education (DE) is defined by Mr. Richard A. Cornell, Ed.D. as constituting any situation in which the student and the instructor (or instruction) are not within the same room.

The International council for distance education defines ED in this way:

"Distance education is a model of education in which the student and teacher are separated in time and/or space and where two way communication takes place through non traditional means for the most part" (ICDE pamphlet '88)

As I see it the very root of DE is the need of educated staff and the right of having the opportunity to educate oneself. Both needs and rights are independent of living near to an educational centre or not. The educational institution has to move to where the students live. In order to do this teaching methods have been developed which do not depend on the teacher and student being in the same room at the same time, as we can read in both definitions above. In the Nordic countries other ways have also been used in order to meet educational needs and rights. Especially in teacher education so called decentralized educational organization have been used with success. By **decentralized education** is meant that the education takes place partly in the home surroundings of the student, who lives far from the educational residence. The education is organized by using all kinds of DE methods and by student gatherings either in the main school buildings or at a subordinate institution in some distance from it. The stay at campus can be of some days or some weeks at a time and students have the opportunity to stay overnight. Boarding schools are often used where they are available. The principle point is that students are not forced to move off their home areas in order to get their education.

Another concept related to DE is **flexible education.** This concept is very wide and can cover both DE, decentralized education and other sorts of part time studying, as f ex. discussed by Knowles in his works upon Andragogy and Learning Contracts (Knowles '84, '85, '86).

DE and so called traditional education is seen by some as two principally different educational systems. During the last years there has been a trend towards mixing pure DE methods and student meetings. On the other hand there have been put a lot of energy trying to loosen traditional educational organization. My guess is that after a while the gap between the two will cease to exist; both systems have taken up successful traits from each other. The result will be - I hope - a greater focus on educational needs of individual students, professions and regions.

The scene of this article is Iceland; one of the Nordic countries, an island in the north west of the Atlantic Ocean. Compared to European standards of population pro. square km. one can say that we are few people in a large area. About two third of the population of about 250000 lives in a densely populated area near the capital city: Reykjavik. The remaining one third is spread near or at the seaside all around the country, either on their farms or in villages with from 50 to lO.ooo inhabitants.

All teacher training institutions are in or near Reykjavik. Several schools in the countryside are boarding schools. Therefore decentralized education is a way of organizing that fits to the circumstances of our country and can fulfill the needs and rights of teacher education as other types of education.

B.A. EDUCATION IN TEACINNG PUPILS WITH SPECIAL NEEDS. DECENTRALIZED EDUCATION IN THE EAST REGION OF ICELAND.

Iceland Institute of Education in Reykjavik is the main educational institution for Icelandic teachers. The institute offered education for teachers in teaching pupils with special needs for some years. This proved to have good effect in the schools near by, but few if any teachers of pupils with special needs came into the schools in areas far from the capital.

The eastern region is large of area but rarely populated. Each eastern school needed such teachers as much as the schools of Reykjavik. At the initiative of and in cooperation with the School Office of the Eastern Area the Iceland Institute of Education arranged the first decentralized education of teachers of this kind at a boarding school in one of our country's few forests (Johnsen '85, '87).

This first part of B.A.education in teaching pupils with special needs was traditionally a one year full time study. Now it was arranged as part time study over two years. The experiment took place over the years 1987 - 89. It proved to reach its aims and was repeated in another area over the next years. The intention is to hold on to other areas.

The education was organized as concentrated gatherings in the boarding school during summertime and independent study during wintertime. The aims were to create a holistic education. All theoretical themes, the special knowledge and experience of each student should be brought together, tried out in reality and evaluated. This was possible because our students practiced teaching during their study. In their teaching the students were separated in an area of about 600 km.. So it was necessary to find a DE method. A contract was made between the students and their educational institution. The schools were they worked and the parents of the children who they worked with, were informed and given the opportunity to have their say. The students were to plan, carry out and evaluate parts of their teaching according to a common curriculum model. This part of the study was called Professional Skills. It was to become one of the most important parts of the education.

TRAINING PROFESSIONAL SKILLS AT DISTANCE

The curriculum model chosen was a well known one to many Icelandic teachers. It contained of 6 key concepts, namely: **basic assumptions, background information, assessment, justification, objectives and teaching situation.** Working with different parts of the model was scheduled throughout the two years of practicing. As mentioned the students used the model as part of their own teaching. They had to work with it alone and individually. But they found their way to cooperating. Students working in the same school or in near by areas met regularly. The telephone was used and some students found themselves to be some kind of "telephone-mothers" for the group. Then as a rule I, being in charge of the education, visited each student in his school at least twice a year. The students were free to call me or write whenever they needed. The use of telefax and communication through computers was not actual then as it would have been to day. It has to be said that students who did not have any possibility of regular meetings with fellow students found themselves to be isolated, but that never caused drop out.

When working with the curriculum model, first the students got a theoretical grasp of it. Then they wrote a paper, where they showed how the model could be used in planning teaching of a fictive pupil. After feed back and group debate, the students went home and tried out the curriculum model in respect to two pupils with special learning needs in their home school during one school year. They designed long time curriculum, from which they derived weekly curriculum. They taught according to it and used dairies in their daily work. They evaluated both the learning process of their pupils, their own teaching and planning and, not to forget: they evaluated the utility of the curriculum model.

After profound personal feed back and group debate, the students tried out long term curriculum planning one more time, during the winter 1988/89.

Now we asked them to change the model in accordance with their own personal teaching style and give arguments for their way of doing it. In their last study week we opened up for a final discussion of the utility of curriculum planning.

So how did it function to train professional skills by using contracts as a DE method?
In order to answer I would like to reflect upon four of the goals which were stated. The goals were:

l) to link theory with practice; 2) to meet the personal educational needs of each student; 3) to give the students the opportunity to practice under some supervision, one of the main tools of the pedagogical handicraft, which is curriculum making; 4) to create and strengthen a professional identity as teacher of special needs.

Before giving evaluative comments, I would like to make it clear, that my observations were rather grounded on informal impressions than systematic observations. I built them on the students' progression as I saw it, being in charge of this education. Then I built it on the students' own evaluation of their practice, written in their reports. I also had my information from my work as special educational adviser, cooperating with school masters, the students as teachers in their home schools, from their fellow teachers, from interviews with parents and from observing the progression of the pupils.

l) **To link theory with practice.**

Working with the curriculum model, the students tried out theory and collected new knowledge on several domains.

Studying **basic assumptions,** the students got very well acquainted with laws and official regulations which set the frames for working in school. They got a realistic view of which are the official rights of their pupils. They also got a clear understanding of their duty as teachers.

By seeking **background information,** the students had to use new knowledge about how other professions, so as doctors and psychologists, work. They had to interpret information into concepts relevant to teaching. Cooperation with the pupils themselves and with their parents was a brilliant opportunity to exercise further counseling skills. During their professional skills training the students built up solid connection with both pupils and parents, not only to discuss difficulties. On the contrary,the students cooperated with pupils and parents all the way through the school year, giving information about progress and asking for opinion before taking decisions.

By working with **assessment, objectives and teaching situation,** the students had the opportunity to try out all they had learned from the study themes. It became clear to them, that this first part of the B.A. study only gives an overview of the field of special teaching. Perhaps the most important understanding they came to, was that teaching and assessment go together in everyday school life.

2) To meet the personal educational needs of each student.

The professional skills part of this education was one of the important factors in trying to meet personal educational needs of each student. There are mainly two factors that influence different educational needs:

- the students had their teacher training from different schools, they had specialized in different themes and their practice varied from 2 to 20 years.

- the pupils who were taught by our students, were from 5 to 19 years, they went to 10 different schools and their special
learning needs differed from learning to put two words together in speech therapy till special assistance with learning foreign
languages.
Only the students' way of practicing their professional skills could tell us to what extent we had succeeded in fulfilling this aim. From their reports it was clear that they had used the curriculum model as a general frame for their planning . Within this frame the model proved itself to be functional for all sorts of learning needs, which our students had discovered. Likewise it allowed for the students to decide how deep and wide and in what direction they preferred to go in their curriculum planning. In this way some students delivered curriculum plans for one strictly limited subject, while others planned a holistic curriculum, where the pupil's whole school life was taken to consideration. From the examples that my students showed me, I conclude that the curriculum model is a flexible one. But it does not allow the students entirely to choose their own studying object as is the case in learning contracts based on Knowles' theory of andragogy; the curriculum model is a frame imposed upon the students by the educational institution.

3) The tool of curriculum making.

As teachers we need some basic skills of how to make all pupils cope with school and school to cope with them. One of the main tools of the pedagogical handicraft is curriculum making. I will now comment on the efficiency of using a curriculum model.

It is my opinion that working with a curriculum model widened the specter of considerations which the students made in their teaching. Not only traditional school subjects were observed and planned, but developmental tasks, working habits and communication, to mention some aspects. But is an effective curriculum model all that is needed to create good teaching? I tend to agree with those who think not. However, from my observations of my students, I have to say that working with this particular curriculum model hand in hand with theory over a two years' period, produced a more enjoyable situation for the pupils, their learning progression as a rule became faster and their parents enjoyed being more involved in their children's school life. My conclusion is therefore that although curriculum planning is not a guarantee for good teaching, it is a necessary component of good teaching.

While practicing alone in their own home schools the curriculum model proved to be "like a trusted friend to hold your hand". Time schedules were wide, but they were there, helping you to go on using what you had learned from theory in your own teaching. Concepts were familiar to all students, making it easy to talk about problems and progression in telephone. The common curriculum scheme made possible collective evaluation at student meetings.

4) To create and strengthen a professional identity as teachers of special needs.

Teachers of special needs are amongst the main defenders of a Good School for Everybody in a Good Society for Everybody. In order to be so, they need a realistic and strong professional identity. The intention was to create that by linking theory with training professional skills in the way we did.

After the two years it is my clear impression that the students have a strengthened professional identity as teachers of special learning needs. While practicing in their home schools, they tried out various teaching methods and new material. They phoned each other, discussed and gave advises. They arranged working sessions, with or without supervisor. The curriculum model was a very important part of their training. The students say that they feel much more responsible and secure in their role now. They have also located domains where they want to learn more.

In conclusion, the answer to the question how did it function, will be: It went well. It was hard but the results were beyond expectations. Best of all: the pupils in the schools and their parents profited. That does not mean that The way is found to link together theory and practice through distance education. But perhaps it means that one of many possible platforms is found, from which it could be possible to go on trying out a variation of distance educational methods.

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About The Author

BERIT JOHNSEN, cand. polit. from The University of Oslo, Norway. I have worked as planner and adviser of pupils with special needs for 10 years; planned and ran the first decentralized education of teachers of pupils with special needs on behalf of The School District of East Iceland and The Iceland Institute of Education; planned decentralized pre-service teacher education and arranged courses for teachers of distance education on all school levels. I am now working at planning decentralized pre-service education for preschool teachers. Myself I am a wife and mother of four, living in a decentralized part of Iceland. My address is:

Berit Johnsen
707 HALLORMSSTAo
Iceland

Teachers' Self Training Activities on Computer Networks in Japan

Hiroo Saga, National Institute of Multimedia Education, Japan

Abstract:

In-service teacher training programs in Japan are conducted by various organizations including local education boards, the Education Ministry, and public foundations. Pre-service teacher training is extensively offered at national, public, and private colleges and universities. These formal programs fulfill the basic needs of teachers, and they have little link to distance education systems. Teachers' spontaneous energy to teach themselves is now directed toward using personal computer networks. These telecomputing activities are reviewed and future directions are suggested.

Overview of distance education and teacher training in Japan

The beginning of distance education in modern Japan can be attributed to Tokyo Special Training School (later Waseda University) having started in 1886 its correspondence course for working youth by mailing transcribed texts of lectures. At present, distance education systems in Japan can be categorized into five subgroups; 1) correspondence education at upper secondary schools, 2) correspondence education at universities and junior colleges, 3) social correspondence education, 4) the University of the Air, and 5) school broadcasting.

Correspondence education at upper secondary schools. Upper secondary schools can offer full-time or part-time as well as correspondence courses. In 1953, the Law for Promoting Part-time and Correspondence Education of Upper Secondary School was enacted, and in 1961, when the School Education Law was partially amended, a number of improvements for correspondence courses were made such as the independence of correspondence courses from regular courses and the possible establishment of wide-area based correspondence schools. In correspondence courses, students are provided with textbooks, and continue studying through answering regular assignments and attending tutorial sessions usually held on Sundays. NHK Gakuen School, one of the wide-area based correspondence schools, has been using television and radio for instruction.

Correspondence education at universities and junior colleges. Higher education institutes can also offer correspondence courses. Most departments for correspondence higher education were established in around 1950, and since 1980 twelve university and nine junior colleges have been offering correspondence courses. The size of enrollment has been steady since then at around 90,000. Among these institutes, Tamagawa University in Tokyo is the only institute which offer pre-service teacher training for primary and secondary education. Some junior colleges offer programs for nursery education. Students study with printed textbooks and send assignments regularly to receive marks and guidance. They attend intensive tutoring sessions held during the summer time. In order to promote correspondence courses in higher education, the Education Ministry gives the Association of Private Universities for Correspondence Education a financial support for developing instructional materials which are used in common among the member universities. The National Institute of Multimedia Education is cooperating with the Association to develop and broadcast a series of radio programs to support students' learning.

Social correspondence education. Non-formal education organizations are also offering quite a number of correspondence courses. Based on the Social Education Law, the Education Ministry can give official recognition to those courses which are of good quality and worthy of being encouraged. These courses range from flower-arrangement to information processing. At present, there are nearly 200 Ministry-recognized courses offered by about forty organizations. In addition to these courses, many people are using television and radio programs for their own study. NHK (Japan Broadcasting Corporation) has a separate educational TV channel and broadcast a variety of educational programs for general audience.

The University of the Air. Established in 1983, the University of the Air aims at making higher education available to everyone through its distance education system. It is a formal higher education institute, and therefore should comply with the standards for universities regulated by the Education Ministry. The University of the Air uses its own broadcast facilities for broadcasting radio and television lectures and provide a full program of education through the use of textbooks, guidance by mail, and classroom instruction at study centers. The broadcast materials are produced through the assistance and cooperation of the National Institute of Multimedia Education. In order to meet the diversified needs of the adult students, the University has established a Faculty of Liberal Arts which offers courses in three areas of study, each of which has two majors. Human Development and Education major belongs to the area-of Science in Everyday Life. As of the Spring semester in 1992, a total of 41,468 students of all ages, sexes, and occupations are enrolled, of which 2.4% are school teachers.

School broadcasting. School broadcasts started quite early in Japan. Radio programs for schools on a nation-wide scale were inaugurated by NHK in 1935. NHK started school television in 1953, and extended it with the introduction of educational TV channel in 1959. Today, NHK transmits a wide variety of radio and television programs intended for use in classes at kindergartens, primary schools, and lower and upper secondary schools. A series of radio programs for teachers is also transmitted on current educational issues. In addition to NHK's nation-wide school programs, five prefectural boards of education operates TV broadcasts through the local UHF stations. They are relatively more focusing on teacher training programs than NHK.

Outline of teacher training in Japan. As seen above, teacher training through distance education is very limited in Japan. Mainly because of Japan's geological and institutional infrastructure, most teacher training programs are arranged on campus or in the form of face-to-face meetings. Pre-service teacher training for primary and secondary teachers is widely conducted in the national, public, and private universities and junior colleges approved by the Education Ministry. Regarding the in-service training of elementary and secondary teachers, a statutory system of one-year induction training for beginning teachers was created in 1988. In the school year 1990 the one-year compulsory training began to be administered for all beginning teachers at all public elementary and lower secondary schools. Other in-service training of teachers is conducted in various forms at the national, prefectural, municipal and school levels. Non-profit educational organizations and foundations also offer training courses in specialized fields such as audiovisual education, curriculum development, and educational evaluation. These formal programs fulfill the basic needs of teachers, and they have very little link to distance education systems.

Spontaneous training among teachers through telecomputing

Although formal teacher training is very limited in terms of distance education, considerable number of teachers are now very active on personal computer networks and are in effect training themselves mutually and spontaneously. As a background of this trend, communication networks for personal computers have been rapidly growing in Japan during the last decade. At present, there are about twenty major nation-wide computer networks which are being used by over 300,000 people. In addition, it is reported that over two thousand local networks are operated by different groups and individuals. Another background is a series of reports concerning educational information networks recently published by government councils (for more detailed review, see Inoue, Saga, and White, 1987).

Information network proposals. The National Council for Educational Reform, established in 1984 as an ad hoc council responsible directly to the Prime Minister, published its Third Report on Educational Reform in April 1987, and then it Final Report that same August. Among the various points emphasized by the Council, it was emphatically pointed out that Japanese education needs to adapt to the ever-progressing information society. These reports emphasized harmony between high technology and sensitivity to human environment, and have influenced many sectors of education to design new schools and community education facilities. A more concrete proposal for the development of educational networks was presented, in April 1988, by the Committee on Educational Media of the Social Education Council of the Education Ministry in a report on "Life-long T,earning and the New Media." This report stated that a wide range of media should be used in support of life-long learning activities including school education and recommended the establishment of such systems in various localities. The primary aim of this report was to develop models which could be applied to realistic situations where educational networks are to be established (Committee on Educational Media, Social Education Council, 1988). One of the nine models outlined in the report is named "Regional School Information System." This model is designed for use by both schools and individual teachers. It provides schools and teachers with a variety of information on the region's education, and enables participants to freely exchange each other through its bulletin board and electronic mail. Another model, named "Nation-wide Audiovisual Material Information System," would provide local audiovisual centers and libraries with information on various types of audiovisual materials for use in school and community education. This model was applied to develop the AV-PUB system which is summarized below.

AV-PUB: A computer network for audiovisual education materials. The development of a nation-wide audiovisual educational materials information network by the Japan Audiovisual Education Association (JAVEA) was made possible with financial assistance received from the Education Ministry during 1987. This system consists of two parts, an "Audiovisual Materials Database" and an "Audiovisual Education Bulletin Board," and is designed so that anyone in Japan, using a personal computer connected to the telephone, will be able to search for required audiovisual materials, seek information on research activities and conferences, read reports on educational media, and exchange information between participan . Called AV-PUB (Audiovisual Public Board), its experimental utilization was started early in 1988, and at present about 250 institutes and/or individuals are enrolled in the system. Teachers' and staffs of local audiovisual centers use the database which contains information over 5,000 films, sides sets, and videotape materials, and exchange each other in the bulletin board section. Participants' on-line discussion is occasionally summarized on JAVEA's monthly journal.

Teachers' activities in general networks. PC-VAN and NIFTY-Serve are two major computer networks in Japan, each of which holds over 250,000 members as of January 1992. PC-VAN has a wide range of bulletin boards conferences, and special interest groups (SIGs) in which several sections related to education are included. Active among these are "Education and Software" (STS, the SIG name) and "Computer-Assisted Instruction Group" (CAI). The STS SIG is managed by a group of voluntary teachers and CAI is maintained by a group of software engineers at a public organization. In STS, teachers exchange daily in its twelve sections including "Lounge," "Planning Room," "Conference Room," "Students' Room," "Library," and so on. Participant-developed public domain software for instructional purpose is stored and distributed in its "Software Laboratory" (Okada, 1989). Teachers in STS are also exchanging electronic mails with foreign teachers and schools through international networks such as INTERNET and BITNET. NIFTY-Serve, another big nation-wide network which is directly connected to Compu-Serve in the United States, also has some educational sections (Mizouchi, 1989). Among its large number of computer conferencing, teachers participate in such educational forums as "CAI Forum," "Future School," "Foreign Languages Forum," "Special Education Forum," and the "Mainichi Newspaper Education Forum." A number of other commercial networks like "Nikkei MIX" and "ASCII Net" also have educational sections. "TWICS-BeeLine" is a commercial English language service which has an ongoing computer conference called "Talk Education" participated by many foreign teachers living in Japan.

Grassroots networks for education. Among a growing number of local computer networks, some are managed for educational purposes. Since many of these are supported by voluntary efforts of particular people and groups, they are often called "grassroots networks." In the Sapporo metropolitan region, Hokkaido, for example, there is a network called "ANT" (Active Network of Teachers) designed for those involved in education (Shioda, 1988). While in Sendai City, Miyagi Prefecture, the municipal "Sendai KomiNetto" (Communication Net) has a section operated by a teachers' research group. In Tsuchiura City, Ibaraki Prefecture, an "Inter-school Network" has been opened by the municipal board of education. In the region around Asahi City, Chiba Prefecture, "Asahi Municipal Region Educational Information System" has been in operation for more than ten years. This system provides on-line graphical, statistical data for use as school instructional materials as well as photographs and pictures (Asahi Education Information Center, 1986). The network serving the area surrounding Fukui City, Fukui Prefecture, has its host computer located in the Fukui Municipal Audiovisual Center and provides information on instructional materials and in-service courses at the Center (Masunaga, 1988). COARA, a network in Oita City, Oita Prefecture, and nearby communities is one of the most active of all such networks in Japan, and has conference on raising infants and school education. Hasumi (1989), one of the leader teachers in PC-VAN's STS SIG, add to the above list the following grassroots networks; AYUMI-NET in Sendai City, Miyagi Prefecture, run by a local computer store and participated by teachers; Hamanasu-NET in Takahagi City, Ibaraki Prefecture, managed by a private evening school; UDAIF~UCHU BBS in Utsunoniya City, Tochigi Prefecture, operated by teacher at the Junior High School of Utsunoniya University; LETS TALK BBS in Tatebayashi City, Gumma Prefecture, run by a teachers' group; Miotsukushi BBS in Choshi City, Chiba Prefecture, managed by a high school teacher; Saitama Prefectural Education Center BBS in Fukaya City, Saitama Prefecture, established by a public institute for teachers; LOGO-Net in Tokyo focusing on the use of LOGO in education; ASIJ BBS in Tokyo operated by students of the American School in Japan; Niigata NET in Niigata City, Niigata Prefecture, jointly operated by Niigata University and Niigata City Education Center for school teachers; Computer Education BBS in Anjo City, Aich Prefecture, focusing on computers and education; Newton Network in Kyoto City run by the Kyoto Teachers' Association for Educational Technology; Ishikawa NET in Kanazawa City, Ishikawa Prefecture, managed by the Ishikawa Teachers' Association for Educational Technology; Ujo-Net in Okayama City, Okayama Prefecture, participated by the Okayama Teachers'

association for Educational Technology; ND-Network in Kurashiki city, Okayama Prefecture, operated by two teachers of a Girls High School; and Ehime Science Teachers NET in Ehime Prefecture run and participated by high school science teacher. One should not that this is not a complete list and it is almost impossible to make such a list without a nation-wide survey.

Prefectural networks for education. In a number of prefectures, Boards of Education and Prefectural Education Centers have been developing their own communication networks for schools and community education facilities. One such example is "Cosmos NET" operated by Iwate Prefectural Education Center. Having a main frame as the host computer at the Education Center, this network connects personal computers at all the primary and secondary schools in Iwate Prefecture, and divisions of the Prefectural Board of Education and the Education Center. This system consists of the following seven sections; l) Invitation for the Beginners, 2) Members Directory, 3) Bulletin Boards, 4) Conferences, 5) Electronic Mail, 6) Online Talk, and 7) Educational Information Database. The Bulletin Boards are divided into 19 areas including the Center's News, Events Information, Research Summaries, Educational Statistics, List of Newly Arrived Books, Authoring Software and Programming, New Subject Matter Material, Software Library, Lesson Plan Library, and so on. More interactive section is the Conferences in which teachers and the staffs of the Education Center exchange on a variety of educational topics (Iwate Prefectural Education Center, 1991). Another example is the Gumma Prefecture's Learning Information Network which was designed to support life-long educational activities. Located in the Prefectural Life-long Learning Center, the host computer already has nearly 20,000 items on guidance personnel, study groups and organizations, use of municipal facilities, exhibits and events, and other learning resources for the citizen. Regional adult learning centers have been established in various areas within the prefecture and are connected to the host computer by telephone circuits. Similar networks have been developed in several other prefectures with financial assistance of the Education Ministry.

Concluding remarks

As outlined above, educational use of computer communication networks is rapidly growing in Japan. And as far as the distance education system is concerned, computer communication is actually the only field in which teachers train themselves mutually and spontaneously. Formal teacher training programs in Japan are widely conducted, but basically in the form of on-campus or face-to-face meetings except a few programs of correspondence education and the use of educational television sponsored by some Prefectural Boards of Education. Because of Japan's geographical features, people can easily move from one place to another using public transportation or their own cars. Moreover, institutional structure of Japanese educational system helps teachers receive various chances of formal training. In such a situation, it is natural that teachers' voluntary energy to teach themselves and exchange with other teachers goes to the use of computer communication which is supported existing and fully developed telephone networks. Teachers' use of computer networks is expected to grow continuously. Their on-line activity and the provision of formal training programs are helping each other. The next step would be to encourage research, both practical and theoretical, on effective on-line communication and learning through it, and the negative effects, if any, of computer communication on teachers and learners.

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About The Author:

Hiroo Saga is Associate Professor of National Institute of Multimedia Education. His main research interests are cognitive and affective processes of learning with media and development and evaluation of multimedia learning materials. Address for correspondence is 2-12, Wakaba, Mihama-ku, Chiba-shi, Chiba, Japan 261; Phone +81-43-1111; Fax +81-43-5117 (Work), +81-45-3427 (Home).

Distance In Service Training Programme

Distance Training of Teachers: The Experience of Universidade Aberta - Portugal

Hermano Carmo
(Universidade Aberta's Teaching Coordinator)
Lisbon, November 1991

ABSTRACT

The in-service-training programme for teachers, presented in this case study, allows us to reflect about several questions concerning conception, planning, organization and control of professional distance training programmes.

The context in which this distance training programme occurs and also the needs it intends to overcome are pointed out. Also, the way some of the Universidade Aberta's resources were articulated with the defined objectives are described. Following, some aspects of the production process of educational materials (written, audio and video supported) are presented.

Next, the author focuses on the three basic support sub-systems for students: post, phone and face-to-face contact with teachers - analyzing some specific aspects of the target group and its learning results.

Finally, the presentation highlights some stronger and weaker aspects of the programme. It defines corrective strategies and reflects on how the present case could be useful for the training of trainers working in distance education systems.

1. THE CONTEXT

The Universidade Aberta - Portugal, as similar foreign universities, has been conceived with two main purposes:

- On one hand, certain groups, geographically and socially isolated from the traditional education centres, had to be reached.

- On the other hand, the gradually accelerated changing process in which we are immersed, urgently requires the creation of learning systems allowing the student to acquire autonomy competencies. So the student becomes the subject of his own History instead of a mere object of it.

After several years of political and institutional negotiations comparable to the ones other Open Universities had to deal with when started up, the Universidade Aberta could finally begin it's activities in December 1988.

Four conjunctural factors led to its creation and made it indispensable:

- First of all, there was a reform conjuncture with a widespread debate on the Education System Law.

- In the second place, the Education Ministry showed a strong political interest in the creation of the Universidade Aberta, arguing that it could be a powerful instrument to supply more educational programmes, improving their quality, adequating them to the needs of the Portuguese society, and reaching geographically or functionally peripheral populations.

- In the third place, the Portuguese University Council of Rectors approved the initiative since Universidade Aberta was not intended to reach the target groups of other (conventional) universities.

- Finally, there was an obvious need to professionalize(1) a great number of experienced teachers, in order to endow the reform in course with the necessary human resources. As a matter of fact, the stabilization of scholar teaching teams would not have been possible without professional teachers. Such a situation showed three strangling consequences:

1. A deep professional instability: the temporary teachers were compelled to apply for a job year after year, without knowing whether they would get it or not.

2. A pluriannual pedagogic strategy was impossible to implement due to a systematic alteration of the schools teaching staff.

3. A higher probability of educational unsuccessfulness, for it was impossible to establish durable relationships between teachers and students.

These four factors had as a result, not only the creation of Universidade Aberta, but also the fact that the main program for the first year should be the "in service training teachers", urgently stimulated to initiate from that moment on.

The Universidade Aberta and especially the teachers' training program were thus created in a emergency conjuncture, which constrained the production and teaching teams to accomplish in one year what at other universities had been realized in two or three years.

Deciding for this very strategy, we were conscious of the high risks we were running, that is, the danger of delivering lower quality products. Nevertheless, the benefits were considered higher than the costs because at the end of the first year the programme would permit 3500 teachers to be professional. To prevent the risk mentioned above, a quality control
system was established and based upon the following criteria:

1. A very cautious selection of authors, to reduce the risk of minor quality contents.

2. The establishment of communication channels between the author and the University and within the written and audiovisual production teams.

3. The establishment of feed-back mechanisms which would permit to correct the educational materials and the services provided by the program.

Thus, after this presentation of the context in which the in-service-training program (PFS) was created for preparatory and secondary school teachers, let's have a look on the program curriculum and consider some of its key-areas:

2. STRUCTURE OF THE IN-SERVICE-TRAINING PROGRAM

To satisfy the requirements of the program each learner has to follow the 3 general subject matters, completed by one or more didactic subject matters corresponding to his own scientific area:

GENERAL SUBJECT MATTERS:
- Educational Communication
- Educational Methods and Techniques
- Educational Psychology

SPECIFIC SUBJECT MATTERS:
- Philosophy Didactics
- History Didactics
- Portuguese Language Didactics
- Portuguese Language and Literature Didactics
- French Language Didactics
- English Language Didactics
- German Language Didactics
- Physics Didactics
- Chemistry Didactics
- Physics and Chemistry Didactics
- Geology Didactics
- Biology Didactics
- Geology and Biology Didactics
- Geography Didactics
- Mathematics' Didactics
- Nature Sciences Didactics
- Didactics of Economy and Social Sciences
- Accountancy and Management Didactics
- Technological Project Methodology

For each subject, the learner disposes of a handbook, sometimes completed by an anthology and a set of video and audio modules, broadcast directly or by means of cassettes.

Beyond the basic material, the learner receives a whole of formative tests (3 tests for the general subjects and 2 for the Didactics) which he has to solve in order to be able to propose himself to the final examination. Afterwards the assistant responsible for the subject matters receives all the formative tests, corrects a representative sample and produces a feed-back report which is sent to each student.

3. ORGANIZATION OF RESOURCES

To execute the program, resources had been organized according to the University's general criteria.

3.1 Scientific coordination

The tasks, which integrate the conceptualization, planning and production of materials, are regulated by a scientific coordinator specialized in the field of Educational Sciences(2).

He is entitled to negotiate contracts with the authors, according to the scientific and pedagogic criteria defined by the Universidade Aberta Scientific Council. He also supervises the authors and the University's coordination to ensure its scientific and pedagogic efficacy.

3.2 Teaching coordination

The learning phase is supervised by the teaching coordinator, who superintends the support system to the students. This system contains three subsystems:

- The central teaching team: 18 assistants supporting the learning process by phone and post.
- The primary Support Centers network: 20 adequately equipped support centres localized in higher education institutions(3), situated nearly all over the districts of the country.

- A secondary Support Centers network, still in preparation, but very comparable to the former, except in what concerns the orientation team (it doesn't exist) and its localization, in institutions more close to the target-groups.

3.3 Coordination of the evaluation process

The evaluation is not a phase: it is a process which accompanies the whole life cycle of any programme. The evaluation process in face-to-face teaching is essential to the perfection of a both effective and efficient(4) learning system. As far as distance teaching is concerned, the evaluation process plays a key-role, for this educational model does not provide a feed-back in presence. At Universidade Aberta, this important function is controlled by a pedagogic coordinator.

In the present case, the Pedagogic Coordinator's task was to command all the evaluation processes, which can be specified through the following functions:

- Consultancy on evaluation methods and techniques to the authors.

- Orientation and training of the central teaching team in this matter.

- Accompaniment and technical orientation to the elaboration of formative tests and their respective corrective reports, as well as the final tests.

- Organization of systematic inquiries concerning the student's opinion on educational materials (scrip to, audio and video), on tests and services provided by the central teaching team.

3.4 The central teaching team

As we have said above, we created a central teaching team intended as a support to the students' learning process. It is composed by assistants, normally with a Master's Degree in the respective scientific fields and with the appropriate pedagogic qualifications. The work consists of the following tasks:

- To participate in the elaboration of didactic materials, written or on a video/audio/computer base, under the care of the scientific coordinator.

- To orient the student in his self-learning process via phone or post.

- To be the Support Center's interlocutor for scientific and pedagogic information.

- To correct the formative tests, the final exams and other assessment papers.

- To collaborate in research projects and other activities in which Universidade Aberta is involved.

In order to carry out these tasks in an efficient way, the assistant to Universidade Aberta is responsible for his self-training in Educational Sciences, namely in the field of Adult's Education and Educational Communication (Mediatization and Reception).

Finally, these lecturers, as well as either of their partners at the others universities, are responsible for presenting research for Master and Doctor degrees. This team, initially consisting of eight assistants, was recruited from July 1989 on and started functioning in October of the same year.

The period between that moment and February 1990 was used to organize the support system by means of the following actions:

- To allocate the subjects to each members of the team,

- To create rules for post and phone communication between learners and assistants and assistants and coordinators,

- To establish performance circuits and patterns concerning formative and summative evaluation process,

- To elaborate time-tables within the following distribution:

    - Total hours/week: 35 h

    - Attending to students and other teaching tasks: 9 h

    - Meetings: 3 h

    - University projects and tasks : 7 h

    - Self-training in distance teaching: 4 h

    - Personal research: 12 h

Since February 1990, when the program for in-service- training was started, the central teaching team has been growing in accordance with the greater program offer. Actually, it consists of 18 members. This number is not expected to increase in the next years.

3.5 Support Centres Network

The Support Centres of U. Aberta are situated, as we referred, all over the country, mostly installed in higher education institutions (universities and polytechnics). With this implementation strategy U. Aberta wanted to reach two types of purposes:

- First of all, to create working conditions for the students and trainees, facilitating them the access to local graduate institutions.

- Not less important and also urgent, to establish collaboration links with other educational and pedagogic institutions, thus contributing to the creation of a critical group of graduates being able to accelerate the country's development.

It's main function is to provide for both students and trainees (in a self-learning regime) the following services:

- insight in mediatizing materials.

- consulting of written materials.

- face-to-face support provided by orientation-lecturers for scientific and pedagogic advice.

- meetings with other UA students in order to create informal study groups.

- rapid communication with U.Aberta via fax or phone

To detail the characterization of the present case study, a short reflection on the production and support subsystems and a characterization of the target-group of this programme will be presented in the following pages.

4. PRODUCTION OF WRITTEN MATERIAL

4.1 Production planning

Conceming the production of written material, we immediately face two challenges:

- Firstly , it was necessary to select credible authors(5), and negotiate with them contracts which would permit the contents adjusted to distance learning. It hasn't always been easy to attain this objective as some authors couldn't set used to team-work nor stick to a schedule.

- Secondly, it was necessary to train the authors in the designing of handbooks appropriate to distance learning.

Once the contract was signed, the author received a monograph with general recommendations concerning the mediatization. Despite this caution, some specifications as easy as: to explicit the objectives of each didactic unit or, to insert self-evaluation exercises all over the text, were sometimes, considered as serious obstacles for whom never worked in distance education.

The training was organized in an informal way, and based upon conversations concerning the first versions of the manuscript. In those talks, the assistant or even the scientific coordinator proposed some insertions and partial changes in the text.

The whole process needed a certain capacity to negotiate, that means, the capacity to reach the Universidade Aberta aims without harming the authors' status.

4.2 Products worked out for this program

From the beginning on, this program led to the production of 23 volumes with an average dimension of 400 pages. Until the end of 1991/92 we expect to produce another five volumes of the same dimension.
The average production time for each handbook had been eleven months: 8 months to work out the manuscript, two to compose it (realized by the university's services) and 1 to print it (carried out by exterior enterprises).

Beyond manuals and anthologies, the following written material was produced:

- 52 formative tests (81 till July '92)
- 52 feed-back reports (81 till July '92)
- 24 final exam tests (42 till July '92)

5. PRODUCTION OF VIDEO AND AUDIO MATERIAL

The programs broadcast by television or radio are double-aimed:

- On one hand they intend to be a reference on the conduction the learning pace.

- On the other hand, by means of a mediatization other than the written one, the programs have to underline and question certain aspects concerning the contents. Thus, they are not considered as lessons but as another way of challenging the learner to deepen certain topics.

The programs tape recorded don't regulate the learning rhythm, nevertheless, they enable the learners to use them as many times as they like, fixing them own rhythm and pace.

Within this frame our option was to video and audio broadcast, providing at the same time tapes recorded editions.

5.1 Production planning

As in the production of written material, we faced serious difficulties on account of the short time available. Moreover, we needed to reengage a staff for mediated production, while the production process was running. Besides the planning of the modules which integrated each discipline, this phase included the following tasks :

- the planning of the program credits.

- the negotiation of broadcast agreements with the broadcast centres/stations.

- the elaboration of standard - maps of television and radio broadcasting.

- the planning of publicity spots.

- the planning of patterns for broadcasting continuity information news.

- the planning of an evaluation model for the modules.

Beyond the difficulties mentioned above, we were confronted with other, unexpected ones, as for example:

- television broadcast errors due to natural accidents (e.g. a storm) or unannounced program changes.

- radio broadcast failures.

- lack of collaboration by some schools which organized teachers time-schedules with lessons on Saturday, during the radio and television programs.

- difficulties in access to the Portuguese Television and "Cinematic" video files.

These problems made us take the following decisions:

- an inquiry on the difficulties concerning the reception of broadcast programs.

- an inquiry to the schools to know which ones had video recorder.

- production of 100 copies to be sent to schools whose learners didn't pick up the second channel or had superposed time-schedules.

- efforts to renegotiate with broadcast stations.

- re negotiations with the institutions: Portuguese Television and Cinematic.

5.2 Products elaborated for this Program.

Concerning the in service training program, the following products were conceived and diffused during the first two years:

- 114 videograms (more 30 till July 92)
- 66 audiograms (more 30 till July 92)
- 3 introducing video programs
- 3 introducing audio programs

6. POSTAL SUPPORT SYSTEM

For a programme of this dimension and with these characteristics, we had to be careful in organizing the communication circuits between the teaching and the learning system.

One of the instruments we initially preferred was the post system, which seemed us to have the following advantages:

- it was relatively cheap.
- the distribution network already existed.
- users were acquainted with it.

Nevertheless, this initial opinion had to be corrected due to the following reasons:

1. Due to the large volume of documentation to be sent by mail (thousands of kilos of paper), this system , even if it was relatively cheap, turned out quite expensive in absolute terms. This understanding led us to a rationalization of the mailings and compelled us to concentrate the documentation in fewer sending operations.

2. Despite the previous existence of the distribution network, we observed several initial strangulation's due to the volume of the correspondence. This fact obliged us to send the volumes right to the Central Post Office, avoiding intermediate stations.

At an internal level, it has been established a management circuit for the written information, defining the mail circulation inside the university between the entrance and the exit moments. Also, appropriate distribution of tasks and responsibilities has been defined: who receives? which information? who answers? how is the answer provided and how quickly? Our purpose was to reach an internal circulation time of less than 24 hours between the postal interface system and the receiver or sender. This purpose has been partially accomplished.

3. Our hypotheses that postal service was a communication medium with which users were well acquainted, was not completely right. We observed as problems:

- The impossibility to answer to certain letters on which the learner hadn't mentioned his address.

- Difficulties to answer to others because of the lack of clearness and rigor the question was put with. This obliged us frequently to phone to the learner so as to understand what his problem was.

During the first year, teachers' syndicates and the Education Ministry passed through a period of considerable tensions due to the educational reform conjuncture that characterized this period. The consequence of this reality was that Universidade Aberta had been a frequent target of this "cross-fire" between the two referred organizations. Hence, much energy was lost in negotiation processes. This situation clearly reflected upon the augmentation of postal communication traffic, through collective documents (petitions, requests, complaints and anonymous letters) as well as individual documents (demands for information, complaints and current school post).

From the second year on (1990/91), the post system was normalized after the following measures had been taken:

1. The phone has gradually been preferred when answering to questions put by learners, even if sent by post.

2. A system of standard-answers for standard-questions has been developed.

3. Large distributions by post (mainly formatives tests and feed-back reports) became a routine, and were planned at least six months before.

4. Finally, in the beginning of 1991/92, a campaign using written, audio and video information on how to communicate efficiently with the university, was started.

SUPPORT SYSTEM

As in the postal system we faced, from the start on, considerable problems concerning communication exchange. There was, as a matter of fact, an excessive input compared to the means at our disposal: Universidade Aberta is situated in an old quarter of Lisbon, with an out of date telephone network.

The immediate consequence of this fact was that the Telephone Company couldn't provide the necessary phone lines. A first strangling situation was thus created. This situation made us take various measures of which the following are the most important:

- The disposability of the internal Telephone Central Equipment was increased as much as possible.

- The University's direct phone numbers were extended to a maximum and the majority of these direct lines were reserved for an exclusive use by the staff to answer to learners' questions.

- Automatic answering machines were installed and allowed learners to put questions and ask information during the night in order to receive an answer the day after.

- General communication rules were established in order to facilitate the interaction promoting:

1. the identification of the interlocutors,

2. the previous identification of the subject of the communication, so as to hand it over to the appropriate receiver,

3. the creation of a scheme with a de concentrated attending hours to enable the counseling staff to answer the trainees questions. (About 122 hours weekly were used for this purpose).

- The attending staff (information services, academic services and counseling teams) was oriented in order to perform correctly the above mentioned rules.

- Finally, we started the above mentioned campaign towards the learners on how to make better use of the phone.

8. THE FACE-TO-FACE SUPPORT SYSTEM

8.1 General principles

As we said, the face-to-face support system was based upon the organization of a Support Center Network. The chosen strategy was based on the **" trapezist's net principle":** the guard net is only used in the eventual case of a crash, and not systematically. Concretely, the whole training system had been conceived in a self-learning regime with possibilities to appeal directly, by phone or post, to the teaching system. However, as many learners could have problems in using these possibilities, a support system network was created, as described above. The secondary network is not operational yet, but we foresee that it will be extended by the local authorities.

8.2 Working criteria

The collaboration with the Support Centers was organized according to the following criteria:

1. Autonomy of support centers: they are free to organize face-to-face support systems in accordance with local needs and resources.

2. Quickness in answering: the face-to-face support system should provide answers to the learners' questions if possible within real time. Since it was impossible to find local lecturers for either specialty, the support centres were equipped with a fax, which permits a local lecturer to consult the assistant of the discipline if he doesn't know the solution to a question.

3. Minimal bureaucracy: bureaucratic weight of the Support Centers was reduced to a minimum. Each center has a specific contact point at U.Aberta, a member of the central teaching team, acting as an interface between the two subsystems for scientific - pedagogic topics. Logistic and beaurocratic matters are regulated by U.Aberta academic services: the registration of formative activities is guaranteed by two information supports, which are analyzed in order to evaluate the type of question put by learners to the centers, but also to check the quickness and quality of given answers.

8.3 Some aspects concerning the performance of Support Centers.

Two years after the starting of this Support System, we can indicate some data concerning the characterization of the accompanying given by support centres.

- The first aspect we noticed, is the **low affluence to the Support Centers by learners:** the average is less than one learner per day. This is probably due to four factors:

1. The disciplines are based on self-learning so the appealing to the support centres is frequently considered unnecessary.

2. The learners are a group more or less trained in self-study activities, for they are teachers with a professional experience of at least six years.

3. The learners are often spread all over the district territory and do not have time to go to the center.

4. Finally, they prefer to organize informal study groups with other colleagues to moving to the center.

Learners with doubts generally prefer to phone to the central teaching team. When contacting the support center, 88% of the learners do it in a presencial way(6); the phone was only used in 11% of the contacts and the post in 1%.

- A second interesting aspect is that **the amount of phone calls per discipline shows** that there were more uncertainties about the general disciplines than in the didactic ones. This is surely due to the fact that the learner, because of his professional live, is more acquainted with the subjects on Didatics.

- In general terms, **the Support Centers reply was given in a face-to-face situation** in the presence of the learner (in 69% of the contacts). When the lecturer could not give an immediate answer on a question, he gave it by phone, within a very short time (31% of the contacts).

- Generally, the answers to learners' questions were given **very quickly:** indeed, in 87% of the cases, the question was answered immediately, in 2,6% during the same day, in 3,4% within 48 hours, and in 6% within one week.

- The **main problems** support centres faced during the two years of functioning, were:

1. some local lecturers' **lack of information** on U.Aberta's model and strategy, especially during the first year. This situation sporadically originated tensions between the learners and the University.
2. logistic difficulties during the final examination period: centres with the biggest amount of learners had insufficient classrooms and vigilantes regarding the numerous examinees.

These two types of problems have been resolved by the **supplying of information in due time and with a better quality,** within the relationship between Universidade Aberta and the Support Centres. This was achieved by means of:

- **Visits to the Support Centres** by the teaching coordinator, assistants and director of academic services. The purpose of their visits was to divulge the Aberta working model and pedagogic strategies, as well as to contribute to the improving of the system's logistics.

- **Meetings at Universidade Aberta** with the same purposes.

- **Establishment of routines in transferring information by post our phone,** in order to enable the Support Centres to receive the information at the same moment as the learners, or even before, if possible.

- **Use of the Support Centres as a meeting point for the learners' deluges,** which obliges the former to keep themselves informed.

9. THE TARGET-GROUP

9.1 General aspects

During these three years, we have gradually extended the nature of the target-group.

- Initially, it was composed by 3425 teachers with a professional experience of at least six years, whom the **Education Ministry recruited** for the programme. The fact that learners couldn't choose this model but were compelled by the authorities, led to some tension between learners and the University during the year 1989/90. This programme was defined as an **"In Service Training Programme"** (P.F.S.). In the same year was created for the U.Aberta students in Modern Language and Literature the possibility to follow as an option several disciplines of the program.

The year after, U.Aberta enroled all the volunteers, that is, teachers who answered to the same conditions as those of the first year. About 400 of them made use of this possibility, which was later on defined as the **"Education Sciences Qualifying Programme"(QCE).**

- In 1991/92, a third programme was launched: the **Singular Discipline System (RDS)**, aiming at professional or non professional teachers who wanted to follow separate disciplines as a continuous training activity.

Since October 1989, 8413 students were inscribed for the disciplines of this program. Most of them still belonged to the in service training programme (PFS), which was though diminishing quickly, in accordance with the decreasing needs of the Education Ministry.

This decrease of PFS learners was counterbalanced with the creation of other programs, as figure n°1 shows:

Figure 1: **Students inscribed for the educational sciences subjects.**

ABBREVIATE SUBJECT MATTER	NUMBER OF STUDENTS 1989/90	1990/90	1991/92	TOTAL
MT	3447	1892	3074	8413
PE	3422	1852	3061	8335
CE	3425	1818	3060	8303
DH	1372	372	1630	3374
DLP	1615	822	500	2937
DF	388	102	1328	1818
DLI	1031	390	190	1611
DLA	637	241	115	993
DLF	463	288	123	874
DFQ		403	58	461
DGR		215	22	237
DBG		66	19	85
MPT			303	303
DMAT			246	246
DCES			225	225
DCN			196	196
DCG			78	78

9.2 Brief characterization of the trainees

The target-group (86% of the totality) was situated between the ages of 25 and 39, with an average age of 33 years, and it included class teachers from the 5th till 12th forms, of whom 70% were married and 26% single.

As long as the PFS was the only program running, the teachers were geographically distributed all over continental Portugal. However, since the creation of other training programmes, their geographical spreading was extended to the 4 island districts, Macao, UK, Switzerland, Belgium, Italy, Germany, Holland and Luxembourg.

9.3 Some problems put by the learners

During the learning process some problems emerged, of which the most important are:

- Visual and phisical handicapped students who needed specific support.

- The recognition that the material produced for the Didactic disciplines contained examples especially appropriate to secondary school

- Difficulties for learners to translate some texts from French or English.

- Learners who admitted having forgotten their scientific preparation.

We tried to answer to this problems (except for the last one which had to be resolved by the learner himself), by taking more **individualized decisions** (in the case of deficient, for whom we set up specifically supported evaluation tests in order to not discriminate them negatively), or **more standardized decisions** (elaboration of complementary materials).

During the first year, as referred above, we dealt with various political obstacles, raised by several lobbies who pressured us with petitions, anonymous phone calls, demonstrations ard press releases.

Their aims varied according to the different groups. However, the main problems under discussion were: the claiming of less examination matters; the final examination dates; critics on the audiovisual material and, the case presented by a small but noisy group of teachers, the administrative approval, i.e., the students obtained the final certificate without having to perform an examination.

We may found two kinds of reasons for this uneasiness:

1. The program was considerably too large to be accomplished within the provided time. Despite the fact that the first programme book was published in January, the first television broadcast only took place about the middle of February 1990, date which nearly coincided with the one the Ministry approved as the starting date. The University's answer to the claim by some groups to reduce the matters, was negative. Although, the final tests were postponed until three months later, so as to provide more study time for the learners.

2. Fear of academical results, since the number of failures in the other face-to-face models was close to zero. Learners were afraid that U.Aberta, in order to affirm itself as an academically reliable institution, would be too severe. After a strict analysis of the face-to-face teaching criteria, we concluded that the failure rates they used did not take into account the presential trainees who were dissuaded of continuing because they did not guarantee conditions for success, according to that teaching system.

- When correcting the divergence's of these criteria, we observed that the statistic results between the face-to-face model and the distance education model were different indeed, but not in what concerns the modes, averages and medians. The differences regarded the spreading measures, due to the fact that our evaluation system is based upon objective tests (multiple choice, association, short answers and directed, longer answers). In our system the curve occupied all the whole evaluation scale, from 0 to 20, where as, in the presential system, results only fluctuated on a real scale between 8 and 18.

Due to this problem, Universidade Aberta presented the thesis that there **should be made a statistic of the result curves concerning all the various existing training systems** in this area. This "checking" should be carried out by the employer, that is, the Education Ministry. Nevertheless, the idea was never concretized, for the results would be unpopular in two segments of the universe: the worst results of the more concentrated curve would become worse and increase the failures, meanwhile the best results of the less concentrated curve would decrease.

9.4 Academic results

During the first year, the academic results obtained by the Universidade Aberta learners denied the fear of some of them. Indeed, using a strict and transparent evaluation system which guaranteed the anonymity of the evaluation proofs, and maintaining a high exigency standards, as we're training the Portuguese childrens' teachers, the failure rate of learners in 1989/90 was 5,3%, which means that 94,7% of the learners passed with success.

Next year, we observed that the success rate decreased until 90,2%, despite the above mentioned general criteria being maintained. This evolution, visible in nearly all subject matters, was due to the changing of the target-group's profile.

More rev indicative was the fact that the participants of the in service training program are also very motivated to be successful, in spite of the negative reinforcement mechanism(7). On the other hand, the average age of the learner of other groups is higher, due to several factors which enunciation here would extend extremely this presentation.

The geographic factor does not seem to have clearly influenced the results. Indeed, confronting the failure rate with the variable "district", we didn't discover any relationship between the factors "interiority" or "distance from the central system" and the obtained results.

On the contrary, the factor "age" seems to have exerted influence upon final results, as we observe in the next figure:

We can state that the failure rate increases slightly until the age of 50, then growing quickly until 59. It is a curious fact that higher aged learners show a lower failure rate than the age group before. This is probably caused by the pressure they feel when getting closer to the ending of their active carrier. This induces them to over invest in the program.

10. EVALUATION

10.1 Stronger and weaker points of the program

In the present case some stronger and some weaker points emerge, mentioning them may enable a reflection upon the efficacy and efficiency of the program. As strong elements we should point out:

a) The fact that 7200 teachers were professionalized within a very short time.

b) The fact that we guaranteed a highly scientific and pedagogic exigency level without affecting the end results, whatever the point of view might have been.

c) The fact that we succeeded in organizing and evaluating a production system for educational material as well as a support system to the learner, within a very short time and without causing harm to it's quality in respect to the existing face-to-face systems.

On the other hand, the main weak points of the program were, as far as I am concerned, the following:

a) The time available for both written and mediated production phases was too short. It reduced the efficiency of the program and obliged to an over investment in human and material resources within the available time, provoking an augmentation of the costs.

b) The delays in the beginning of the teaching-learning process due, not to the U.Aberta planning, but to the 1989/90 school calendar of the face-to-face systems, created absorbing tensions between learners and U.Aberta, avoidable if the Education Ministry would have managed an earlier start for the University.

c) The fact that this program was started up together with U.Aberta itself, obliged to a larger effort in attempting the compatibility of important problems with urgent ones. Obviously, such a big effort had rather expensive initial costs, because the two types of problems did not always converge.

In short, one could say that the programme has had a great efficacy: it did not only reach the initial aims - to train the group of teachers the Ministry asked for - but passed beyond, opening possibilities of professionalization and continuous training for many others.

Nevertheless, it's efficiency must be clearly improved, especially by a planning which may enable the system to work without overheating situations caused by too short answering terms.

10.2 Strategies

After the exposed considerations, a few corrective strategy lines seem to emerge (some of them are already running):

1. The ending with the acceptance of an emergency conjuncture, not justifiable anymore. This means, for example:

a) the non acceptance of orders of new modules without acceptable terms, taking in account the (internal and external) resources able to be mobilized within a normal time. (already in course).

b) to avoid the starting of the subject matters without having all the AVSI material ready to be used by the learning system.

c) to base all the U.Aberta activities upon a middle and short terms planning system consentually agreed by the partners in presence.(already running).

2. Besides the actual Master in Multimedia Educational Communication, addressed to train specialists in this field, to **prepare short training programs in order to motivate to mediatization:**

- new authors
- new lecturers
- new technologists
- new directors

3. To make clearer and stricter **contracts with the authors** (already running).

4. To reactivate the **pedagogic "visioning" and evaluation team,** yet foreseen in the present legislation.

5. To reevaluate the broadcasting diffusion strategies.

6. To increase the SUPPLY (formal courses, free courses, continuous training) and improve it (guaranteeing a more adequate adjustment of certain materials to the respective target-groups).

7. To increase the DEMAND side of the market to specific groups such as handicapped people, or to new regions: Azores, Madeira, Macau, Portuguese speaking countries and Portuguese communities in Diaspora, implementing there the corresponding Primary Support Centres Network and the Secondary Support Centres Network (already running).

8. To maintain and qualify **postal and phone supporting systems** (already in course).

9. To consolidate the actually existing network of (only partially running) Support Centres promoting:

a) Meetings for balance and problems resolution.
b) Statistic and quality control of the Centers' performance.
c) The creation of new financing criteria for the partners with Support Centers, using the advantage of the experience of the first three years to rationalize the supply in regard to the demand.
d) To implement institutional exchange programmes with the Universidade Aberta partners.

10.3 Proposals concerning training teachers

Nowadays, the role of the trainer in a face-to-face regime has been considerably changed, in agreement with the profound alterations which our society is undergoing, leaving the industrial model for an information one.

Being this a reality, for majority of reasons, in a distance education/training system context, the question of the role of the trainer should be of a special strength:

- In the first place, the training system frequently consists of diversified people with different academic and technical characteristics which are indispensable for the efficacy of end results.

- In the second place, the **learning system** is also endowed with a **large heterogeneity,** for it's composed by very dispersed groups, with different academic and professional backgrounds
- Finally, the **communication system,** existing either between the two systems either between themselves and the global environment, is becoming more and more complex in regard to the channels used (live contact, phone, post, fax, telematic networks).

It is clear that such a **complexification, caused by the diversity of the subsystems in presence, and also caused by its newness** (e.g. new communication technologies and new ways of conceiving the power in an organization) and its transitoriness (informational contents are more and more degradable), **created a more complex profile of the training system.** To conclude, it's enough just to consider one of it's elements, the assistant:

- Along the present case study I think that I succeeded in showing that a distance education/training assistant, beyond an unquestionable scientific and pedagogic competence, needs abilities which are not usually required in other teaching/learning contexts. The assistant must act as a kind of a manager of an educational product which consists of goods (audio, video, written, materials) and services (phone, post or other mediated supports).

This means that his scientific background should need to be completed among the following objectives:

1. To be able to plan, organize and control educational goods and services.

2. To be able to communicate (to listen, to speak, to write and to read in a qualitative way).

3. To be emotionally mature in view of his role as a motivator and learning facilitator. He has to manage uncountable situations of tensions within the training system as well as in the relationship with learners and other agents.

(1) In Portugal, in order to be professional, a teacher is required to have two different types of habilitation: scientific habilitation through a higher education academic degree, and pedagogic habilitation, obtained through a two-year post-graduation that integrates an academic curriculum in Education Sciences and a period of training. In this specific case, the Ministry of Education has exempted the teachers of the training period, thus, the teachers only needed to have the required academic degree.

(2) At Universidade Aberta (Portugal), the teaching subsystem is structured in coordination's of scientific areas and not in faculties or departments. This organizational formula is intended to avoid the very strict compartments which sometimes exist in traditional divisions, and to permit a more flexible management of scientific and pedagogic resources.

(3) With whom Universidade Aberta established cooperation agreements.

(4) We use the terms efficacy and efficiency in their normal acceptation:- we understand "efficacy" as the relation between obtained results and expected results. "Efficiency" defines the relationship between obtained results and the means used to reach them.

(5) In this programme participated 31 authors, 21 were higher education teachers, the others teach in secondary schools and they were selected due to their experience in teachers training programmes.

(6) Dates of an inquiry organized after the first year of functioning.

(7) If the trainee of the in service training programme fails, he has only one more chance to repeat his year. After two following years of failure, he looses administrative link with the Ministry.

Teacher Education Through Distance Education: The Case Of Sukhothai Thammathirat Open University In Thailand

Chaiyong Brahmawong, Ph.D.
Professor of Education
School of Education
Sukhothai Thammathirat Open University

ABSTRACT

In Thailand, Sukhothai Thammathirat Open University's School of Education has been offering teacher education programs as in-service training to regular teachers and educational personnel in various educational institutions and agencies to upgrade their professional competencies. There are both 4-year and 2-year degree programs and one-year teaching certificate program.

Students study mainly at homes from distance learning packages mailed to them and from listening and viewing broadcast programs from radio and television stations. Some of them may attend 10-15 hours of faceto-face tutorial sessions provided at various local study centers throughout the country. After completing all the course work, students must attend a 5-6 day Professional Experience workshop in order to get a certificate or degree.

The results of STOU's teacher education program were outstanding. There are more than 40,000 graduates working in various educational institutions and agencies. Their opinions on STOU's distance education system, media components, and delivery system were highly positive and feel that the certificates and degrees earned contributed to the progress of their work and upgrading the quality of their life.

Introduction

Sukhothai Thammathirat Open University (STOU) is a singlemode distance education higher institution in Thailand located in Nontaburi Province, about 18 kilometers north of Bangkok business center. After 12 years of operation, STOU has emerged to be one of the leading distance education universities and was designated by UNESCO Regional Office for Asia and the Pacific as the lead institution in distance education in that area. So far, STOU has produced nearly 100,000 graduates in various fields especially in the area of teacher education.

From the very beginning, the School of Education, offering in-service degree programs to regular teachers and educational personnel, has been playing a major role in upgrading the quail fication of teachers in Thailand. Presently there are more than 40,000 graduates in the areas of Educational Administration; Early Childhood and Elementary Education; and Secondary Education. From 1990, STOU offers a few more programs in Counseling and Guidance; Non-formal Education; and Educational Technology and Communications.

This paper is aimed to provide a review on STOU's achievement in teacher education programs during the first decade with the emphasis on types of programs, student and graduate profiles, and its over-all achievements.

1. Background

Sukhothai Thammathirat Open University was established as a national institution of higher learning by a Royal Charter on September 5, 1978 under the Ministry of University Affairs. It has the right to award its own degrees from the bachelors to doctorates holding to the principles of life-long education and aims at improving the people's quality of life in response to the increasing demand for higher education. As an open university, STOU admits students without entrance examinations using the full range of distance teaching approaches and integrating multi-media packages to help students learn effectively at their dwellings without attending classes. After they have successfully passed all the requirements, they are awarded degrees or certificates of equal value to those from traditional, closed admission universities.

In pursuing the philosophy of life-long, continuing education, STOU has five major goals:

First, STOU is aimed to "open and expand" multiple opportunities for higher education to working adults and secondary school graduates who are, whatever the reasons, unable to attend conventional colleges and universities;

Second, STOU provides the most suitable self-instructional system based on existing infrastructure both on the part of the university and the students;

Third, STOU utilizes existing human resources and infrastructure outside the university in the production and dissemination of knowledge and experience to the students;

Fourth, STOU provides continuing education and outreach programs to all the public to upgrade their worth and the quality of their life;

Fifth, STOU makes a full use of advanced telecommunication and computer technologies for production and delivery systems.

STOU is governed by the University Council and run by a President and a number of vice-presidents. There are presently ten schools headed by Deans; namely Liberal Arts Education, Management Sciences, Law, Economics, Home Economics, Political Sciences, Health Sciences, Agricultural Extension and Cooperatives and Communication Arts.

Three types of programs are offered: four-year degree programs, two-year degree programs and one-year certificate programs to home-based students. For the six-credit course, each student studies from print media as a core medium augmented by audio-cassettes, radio programs, television programs, and for some courses face-to-face tutorials. Computer assisted instruction and teleconferencing are being developed.

At the end of each semester, students must sit for the final examination at local study centers conducted at various secondary schools, teacher colleges, and provincial universities throughout the country.

The university is offering master's degree programs in Educational Administration, Curriculum and Instruction, and Education Technology and Communications in 1992.

. Teacher Education Programs

2.1 Objective

Teacher Education programs are offered by the School of Education aiming at providing "in-service" teacher education programs to regular teachers and educational personnel to upgrade their teaching and working competencies according to their needs as indicated by a survey conducted by a research team appointed by the Planning Committee in 1976-77. Presently there are two degree programs and one teaching certificate program.

2.2 Types of Teacher Education Programs

STOU offers both degree programs and certificate programs in teacher education.

2.2.1 Degree Programs

The School of Education offers both 4-year and 2-year programs in Early Childhood Education, Elementary Education, and Secondary Education.

A four-year program is provided for regular teachers holding secondary school certificates or Lower Teaching Certificates. A student must take 22 courses (132 credits) for the period of 4-12 years. After completing all the course work, he/she must attend a six day intensive workshop aimed at providing certain experiences, attitudes and skills he/she might not be able to obtain from merely studying by himself such as team work or group process and production, of multi-media instructional packages.

A two-year program is provided for regular teachers holding Higher Teaching Certificates or Associate Degrees in Education or other areas. The student must take 12 courses (72 credits) to complete the program within 2-6 years. Also, after completing all the course work, he/she must attend an intensive training workshop similar to that for the 4-year program students.

Students with non-educational background such as those holding Vocational Certificates or Higher Vocational Certificates or any Associate Degree must take extra 18 credits (three courses) in Instructional Sciences, Educational Foundations, and development Education.

Beginning 1992, STOU's School of Education is offering three Master of Education programs in Educational Administration, Curriculum and Instruction, and Educational Technology and Communications. Limited numbers of graduates students are admitted based on their personal experience related to their work and the future plan as expressed in their project proposals submitted at the time of application. After admission, the graduate student must attend a 2-3 day orientation program to get acquainted with the University and distance learning techniques. Then they have to complete 40 credits(25 credits of course work and 15 credits for Master's thesis) in order to get a Master of Education degree in the area of their specialization. Specially designed distance learning packages employing a variety of teaching media using print as the core media are developed to help the students study effectively by themselves. Also, a special arrangement is designed to help them through their thesis work by letting them come to attend a series of seminars in research methodology and on defending of their thesis. After completing all the course works and requirements, graduate students must also attend an intensive Graduate Professional Experience Workshop before getting the degree.

2.2.2 Teaching Certificate Program

According to the Regulation of the Ministry of Education, a person entering the teaching profession must earn at least 15 credits in teaching from any Teachers Colleges or Schools of Education before getting teaching credentials to teach in public or private schools. STOU has been offering a one-year Teaching Certificate program for teachers of non-educational background since 1980. A student takes six courses (30 credits) and attend a five-day intensive workshop on Professional Teaching Experiences provided for them at STOU's main campus in Nontaburi.

3. Distance Learning System and Learning Facilities

All students participating teacher education programs study at homes from distance learning packages delivered to them via mails and broadcasting stations. For a six credit course there are 15 units of printed texts and workbooks bound into 2-3 volumes; 15 twenty-minute radio programs broadcast via Radio Thailand Educational Network(STOU gets 49 5 hours/week of air time); 3-5 half-hour TV programs broadcast via Channel 9 and 11 (totaling 30 hours of air time weekly); 1-3 audio-cassettes; and 10-15 hours of face-to-face tutorials.

STOU has developed its own distance education system called "STOU Plan" and sub-systems on Curriculum Development, Media Production, and Delivery and Evaluation.

Expenses for implementation of distance education system are mainly from tuition fees (85%) and government budget (15%).

Learning facilities are provided to students at local study centers making use of provincial colleges, universities, secondary schools, and public libraries.

STOU has one of the best production facilities for TV and radio programs equipped with professional broadcasting quality totaling $12 million. It also owns a printing shop, audio-cassette duplicating system (Electro Sound), film production unit, and seminar centers for professional enrichment programs and workshops .

4. Results: Student and Graduate Profiles, Opinions, and Achievement

In 1980, 82,139 students were admitted to STOU. The number of students increased steadily during the next five years and then began to decrease. Presently, there are approximately 450,000 students in both degree and non-degree programs with an average 60,000 new intakes and active enrollment of about 250,000 students per semester. Among these students, some successfully complete their programs within the minimum period of time some continue until the end of the time, and many drop out. STOU allows its students to stay three times the specified number of years- for example, a student in a four-year degree program may take up to 12 years before his time expires.

4.1 The Student Profile

The profiles of teacher education students, as viewed from the new intakes along with students in other programs outside School of Education from Academic Years 1980-87, are as follows:

1) Basic qualifications: Students for four-year degree programs are holders of Matayom Suksa(MS) 3 (10th grade)certificates age 20 years or over with five years working experience); and holders of MS. 5 (12th Grade) certificates.

For two-year, continuing education programs-new students are holders of higher vocation, technical, business, and teaching certificates; holders of associate degrees, or holders of bachelor degree. For teacher education programs, however, most students hold Lower or Higher Education Certificates from Teachers Colleges or Associate Degrees from other universities.

2) The average ratio of numbers of male and female students among 100 students from 1980-1987 is 53:47;

3) The average age of students is 27.8 years. In 1980, it was 29.4 years old and in 1987 it was 26.5;

4) The ratio of students with secondary school certificates (MS 5) to those with higher qualifications are 9:91;

5) Among the three biggest schools in terms of student enrollments within eight years, on average, School of Education ranked the first followed by Management Sciences and Law:

1. Education	40,687 (30.3%);
2. Management Sciences	33,529 (25.0%);
3. Law	25,245 (16.4%).

Since 1985, however, the enroliment in the School of Management Science has been increasing and become the biggest school. For example in 1987, the biggest schools were Management Sciences (40,987 or 29.4%) followed by Law(29,069 or 21.3%), Education (20,771 or 15.3%), and Health Sciences (14,173 or 10.3%).

6) The majority of students live in the provincial areas (90%);

7) There are about 2,000 (1.5%) Buddhist monks, priests, groups of handicapped, and prison inmates for whom special arrangements have to be made in terms of tutorials, professional enrichment programs and examinations;

8) Of the overall students each year, the average success rate is 9.4% decreasing from 11.7% for the 1980 in-takes to 3.2% accounted for the 1986 batch. The drop-out rate is about 30%.

4.2 The Graduate Profile

Of the 82,139 students who enrolled in 1982, STOU awarded degrees and certificates to 9,594 students. During the first ten years, 68,782 students received degrees and 2,893 received certificates. Some characteristics of the graduates are as follow:

1) The average percentages of male and female graduates are 51.12 and 48.88 with that of females rising from 42.2% in 1982 to 48.6% in 1987;

2) The average age of the graduates is 32 years old;

3) The percentages of employed and unemployed graduates are 98.28% and 1.72%;

4) The percentage distributions of graduates by careers and professions are:

Public sectors	84.42
Private sectors	7.28
State enterprises	4.94
House-wives or unemployed	1.78
Self-employed	1.44
International agencies	0.14

Graduates who are government employees decreased from 92.4% in 1982 to 77% in 1986 while those in the private sectors and state enterprises increased from 3.6% and 2.9% in 1982 to 11% and 6.7% in 1986;

S) The average monthly income of the graduates is 4,178 Baht ($167) increasing from the average of 3,704 Baht in 1982 to 4,553 Baht in 1986. In 1986, graduates from the School of Economics earned the highest monthly income of 6,128 Baht followed by graduates from Schools of Law (5,541), Health Sciences (5,074), Political Sciences (4,813), and Management Sciences (4,759). Teacher education graduates, unfortunately, earned the lowest.

4.3 Graduates' Opinions

In a 1985-87 study by Preecha Kampirapakorn and team, funded by IDRC, revealed interesting findings on STOU's graduates' opinion on STOU's distance education system and the media components.

4.3.1 On Media Components

The graduates, who have gone through the process of distance education through multi-media component felt that STOU's media were successful.

In regards to STOU's multi-media components, the graduates found printed materials very useful especially when they closely followed the steps laid down in the self-learning modules. but indicated that only some of them managed to undertake the given activities/assignments, and the provided pretest/posttests.

For audio-visual media and broadcasting programs, most of the graduates listened to audio-cassettes and found them very useful. However, they listened to and viewed only some radio and TV programs relevant to their interests. Although they no longer listened to radio programs after their graduation, most of them still keep on watching television programs.

4.3.2 On Tutorials and Educational Services

Tutorials were found useful and attended by most graduates when- they were students. They reported that tutorials helped them understand their studies especially in the topics they had difficulties understanding from reading the printed materials.

In terms of the educational services provided by STOU, most graduates were of the opinion that the educational services provided at various points, Study Centers and Public Libraries, were good.

4.3.3 On Learning methods and Attitude towards Knowledge and Diplomas Earned

The most effective method of learning, as identified by the graduates was when they studied independently with minimum help from others. Most graduates felt that the knowledge gained from studying with STOU was equal to that from traditional universities.

In general, most graduates voiced confidence in the certificates and degrees earned from the distance education system and felt the certificates and degrees were equivalent to those offered by conventional universities.

4.3.4 On Education and Occupational Benefits

In terms of occupational benefits, most graduates from the School of Education felt that the certificate and degree programs offered by STOU were beneficial to their occupational and professional opportunities.

Concerning the expectations and the actual benefits received after graduation, the opinions varied among certificate graduates and degree holders.

Most graduates felt that they had gained some benefits from their studies, but the actual benefits were below their expectations. However, for the graduates who had more work experience, the expected benefits and the actual benefits were not significantly different. The certificate graduates, on the other hand, were of the opinion that the actual benefits were greater than the expected ones.

While most degree graduates remained in the same positions, most certificate graduates' positions had changed because with the certificates they were better qualified to be promoted.

Conclusion

In reviewing the achievement of STOU's teacher education programs in respects to its philosophy and goals, it may be stated that in general STOU has been successful and might be used as a model for teacher education in developing countries. Its distance education system and sub-systems such as media, delivery, and evaluation were found successful both from the view-points of the students, graduates, and the general public as evident from various research and surveys.

About the Author

Chaiyong Brahmawong, Ph.D (USC)
Planning Committee serving as the founding Director of the Office of Educational Technology (1978- 1987), in charge of designing STOU's distance education system, media production system including printed modules, radio, television, AV, and tutorial systems. His experience includes being media coordinator at the Department of Teacher Education, University of Southern California (1968-72); visiting lecturer at the Institute Dr. Brahmawong was a member of Sukhothai Tharnmathirat Open University's of Educational Technology, British Open University (1976); Associate Professor and Program Director of Department of Audio-Visual Communications, Chulalongkorn University, Thailand (1972-76); UNESCO's consultant on Communication Technology for Education (1976); UNESCO consultant on Production of Distance Learning Materials in Thailand, Pakistan, India (1986);

UNDP/DTCP's Training Advisor at Ministry of Agriculture in Jakarta, Indonesia (1987-88); visiting professor at the National Institute for Multi-Media Education, Chiba, Japan(1988-89); UNDP/UNESCO consultant on Distance Education for Non-Formal Education (1989); UNDP/UNESCO consultant on Educational Technology at the Open University of Sri Lanka (1988-9O).

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Distance Education for Primary and Secondary Teacher Training in Turkey

Dr. Ugur Demiray
Acikogretim Fakultesi
Anadolu Universitesi

Dr. Marina Stock McIsaac
Educational Media and Computers
Arizona State University

Gurbuz Yangin
Research Assistant
Anadolu Universitesi

Abstract

This paper describes two teacher training programs offered through Anadolu University's Open Education Faculty (OEF). The first program, which began in 1985-86, is a pre-bachelor certificate for 130,000 primary school teachers. The second program, begun in 1990, offers a university degree to 54,000 secondary school teachers. Pedagogy, course materials, delivery systems and evaluation are discussed for both programs.

Distance education has proven particularly useful for training people in remote locations who cannot attend classes at universities. Studying at home, using distance education materials, allows individual adults working in various sectors of the economy to update their skills and continue their training. Distance education programs have also become increasingly popular with people in urban areas who want to study at home in their free time or after work without the long evening commute to campus.

Structure of Distance Education in Turkey

Anadolu University in Eskisehir, Turkey, has a dynamic record of producing distance education programs. The Open Education Faculty (OEF) was established in 1982 as a branch of Anadolu University, located in the Anatolian city of Eskisehir. It remains the only higher education institution in Turkey involved in distance education. The OEF began in 1982 with two open education programs, one in Business Administration and the other in Economics (Barrows, 1990). Today their are programs produced not only in those subjects but in Nursing, Foreign language, Math, Sciences, Tourism, Business and training programs for the private sector, and Teacher Training (Demiray, 1990; McIsaac, 1992; Ozer, 1991; Yangin, 1989). There are also new programs being developed in Social Sciences, Home Economics, and other branches of Teacher Training such as Foreign Language Completion, Physical Education and Painting. These programs are planned for the 1992-93 academic year.

Turkish educational programs are sent on videotape to around 3,000 Turks living in many European countries like Germany to provide students with curricula similar to that in the Turkish educational system. There are now about 400,000 students enrolled in all of these distance education programs, a vast undertaking indeed. The Turkish Open Education Faculty, which is coordinated by Anadolu University, provides distance education courses using printed materials, television and radio programs. In addition, contact with students is maintained through academic counseling, video education centers, student information bureaus and a newspaper entitled "Anadolu".

Development of Two Teacher Training Programs

Two of the most recent distance education programs are the primary teacher and secondary teacher training programs. More than 130,000 primary school and around 54,000 secondary school teachers have participated in Anadolu University's Pre-Bachelor Certificate Program (Onlisans) and the University Degree Completion Program (Lisans Tamamlama). The Pre-Bachelor Certificate Program for primary school teachers began in 1985-86 and is now being completed. The University Degree Completion program for secondary school teachers began in 1990.

The Open Education Faculty, in cooperation with the Ministry of Education, offered new distance education opportunities to solve the vast teacher training problems in Turkey. Two main problems were addressed. One problem was that until 1973, teachers who worked in primary schools were graduated of teaching high schools and they had only six years of education after primary school. After the National Education Basic Law of 1973, students waiting to be high school teachers had, at the minimum, an education from Two Year Educational Institutes. After 1982, the task of providing secondary level teacher training was charged to the universities (Yuksel, 1987).

Following their education, primary school teachers were hired to work directly in schools with little opportunity for upgrading their skills. In addition to this, the National Education Basic Law, article 1739, of the Ministry of Education, requires teachers to undertake in-service training at some time during their professional life, thereby giving them the opportunity to pursue higher education during their free time in summer or during official holidays. BY 1985 there were about 130,000 primary school teachers in need of in-service training. As a result, in 1985 the Ministry of Education decided to use distance education programs to begin to solve the problem.

For secondary school teachers, the problems were somewhat different. Those who received a two or three year university education through Educational Institutes wanted to complete their four year university diploma and receive a Bachelor's Degree. So in 1990 the University Degree Completion Program for secondary school teachers was begun.

Pre-Bachelor Teacher Training Program for Primary Teachers

Prior to 1985, in-service training was provided by university education faculties in many universities throughout Turkey using traditional face-to-face methods. These in-service courses usually lasted only 15-20 days and the number of teachers who received training was not high. By 1985 there were some 130,000 teachers still in need of in-service training. At that time the Ministry of Education and OEF signed an agreement to develop in-service teacher training programs at a distance.

In 1985-86 Anadolu University's OEF registered 46,774 of the 130,000 primary teachers for in-service training. In 1986-87 there were 83,852 more teachers registered. Additionally approximately 2,500 retired teachers registered. Within a two year period, OEF had more than 130,000 teachers registered for the in-service teacher training program. The goals of the program were to help teachers become more effective in the classroom, update their subject area knowledge and to provide them with a better standard of living by rewarding them financially for participating in in-service training. The pre-bachelor certificate program is a two year course of study.

Characteristics of the Pre-Bachelor Teacher Training Student

The age of the teachers who enrolled in the program ranged from 27-67 years. They were all primary school teachers. Their professional experience ranged from 6 to 40 years. Forty-five percent of them were female and 55 percent were male (Ozer, 1991). Fifty-eight percent worked in the countryside and 42 percent of them were in city centers. Ninety-four percent of the teachers were married and 6 percent were single or divorced. One hundred sixteen of the teachers who registered for the program were from the North Cyprus Turkish Republic. These teachers were between 23 and 30 years old and their teaching experience ranged from 1 to 7 years (AOF, 1990).

Pedagogical design of instruction

Three main types of instructional materials were used for the Pre-Bachelor Certificate program. These were print materials, TV, and Radio course programs. All the materials were prepared by well known Turkish educational experts and edited by OEF and Anadolu University educational staff. Pedagogically, the materials were designed to allow students to work independently, using printed materials which were designed especially with the distance learner in mind. Because of limited availability of other types of media for the classroom teacher, broadcast television and radio were used primarily to support the print instruction. Print materials were designed with self-study and self-examination sections which provided individuals with feedback about their performance. Students corresponded with designated experts from Anadolu University when questions arose.

In addition to the teachers in Turkey, teachers also participated from Western Europe; Germany, Belgium, Britain and France. Materials which were produced in Turkey were transferred to VHS and Beta formats for distribution to the OEF centers in Europe. Lectures were presented via broadcast television by leading experts in the field. These lectures supplemented the printed text. Feedback was provided by the responsible project units. Because of the large numbers of teachers trained in the short period of time, support services traditionally available to other OEF programs, such as individual counseling and face-to-face tutors, was not provided. It is hoped that in future projects this can be improved.

In the first year of the pre-bachelor program 3,222 pages of printed material covering 9 courses were sent to students. In the second year 2,946 pages for 6 courses were sent. During this two year program a total of 6,168 pages of material was received by the students. TV and radio programs of approximately 15 or 20 minutes were produced for each unit. Each course contained 6 to 15 such units. One hundred ninety five TV program units (a total of 65 hours) and 142 radio programs (a total of 41 hours) were broadcast during the two years that the students were registered in the teacher training program (Demiray, 1990).

Courses

There were 15 courses in the pre-bachelor teacher training program: 9 of them to be completed for the first year and 6 for the second. The names of the courses, unit numbers and times for TV broadcasts are shown in Tables 1 and 2.

Table 1
First Year: 1985-86 Academic Year
Pre-Bachelor Certificate Program

Name of the courses	Number of units	Total T.V. broadcast time in minutes and seconds
1. Social Sciences	15	320' 42"
2. Science	15	293' 48"
3. Mathematics	15	313' 40"
4. Behavioral Science	15	314' 31"
5. Foreign Language I	18	337' 30"
6. Principles of Ataturk	15	342' 14"
7. Turkish	12	262' 23"
8. Teacher Study Guide	6	137' 00"
9. Academic Counseling	-	- -
TOTAL	111	2321' 48" (38 hours,41'48")

(Source: Demiray, 1987, p. 38; Yuksel, 1987, p. 51).

Table 2
Second Year: 1986-87 Academic Year
Pre-Bachelor Certificate Program

Name of the courses	Number of units	Total T.V. broadcast time in minutes and seconds
1. Contemp. Technology	8	146'13"
2. History of Civilization	6	83' 02"
3. Methods of Teaching	18	333' 29"
4. Educational Sciences	19	402' 11"
5. Principles of Ataturk	15	304' 16"
6. Foreign Language 1	18	343' 26"
TOTAL	84	1612' 37" (26 hours 52'37")

(Source: Demiray, 1987, p. 38; Yuksel, 1987, p. 51).

The total time for broadcast of tv programs during the 1985-86 academic year was	38 hours 41' 38"
The total time for broadcast of tv programs during the 1986-87 academic year was	26 hours 52' 37"
TOTAL 1985-87	65 hours 34' 25"
Total number of broadcast program units during the 1985-86 academic year was	111
Total number of broadcast program units during the 1986-87 academic year was	84
TOTAL 1985-87	195

Graduation and Drop-out in the Pre-Bachelor Program

At the end of the 1985-86 academic year 41,718 students passed into the second class. Five thousand and fifty-six of the 46,774 students failed in the 1985-86 academic year, a passing rate of 89%. At the beginning of the 1986-87 academic year there were 88,908 enrolled students including 83,852 newly registered students. At the end of the 1986-87 academic year 36,802 of 46,774 students completed their studies and were graduated from the program. In addition, 780 Turkish student-teachers who were living in Western Europe studied the courses and graduated. The graduation rate was estimated at 79%.

In the 1987-88 academic year 80,355 of the 93,198 students graduated, for 89% graduation rate. Through the end of 1991 there were an additional 13,468 teachers who graduated from the program. A total of 130,625 students for primary school teachers. The overall graduation rate, when the program was completed at the end of the 1987-88 academic year, was 92.3%.

The demographics were as follows. Thirty two percent of graduates were female and 68 percent were male. Twenty percent of the graduates were 41 years old or older. There were 143 students over 60 years old, and 3 of them were 67 years old. One of these was female, two of them were male (Ozer, 1991).

University Degree Completion for Secondary School Teachers

This second teacher training project is a cooperative effort of Anadolu's Open Education Faculty and the Ministry of Education. The program began in 1990 and is in its second year of operation. The aim of the program is to provide one-year of additional education to the secondary school teachers who have previously completed a two or three year university education. The university degree program is designed to help them to update their knowledge of the subject they teach and to promote the opportunity to continue their academic career by obtaining a university degree.

The University Degree Completion Program for secondary teachers began in April, 1990 by enrolling aproximately 54,000 teachers in several subjects. These were, Turkish Language and Literature, History, Geography, Mathematics, Biology, Chemistry and Physics. During the 1992-93 academic year, other branches of the degree completion program like language teaching (German, French and English), Physical Education , and Painting will begin with and estimated enrollment of 16,000 students (Anadolu University, 1992).

Since 1980 when the Open Education Faculty began, the number of students who enrolled in universities, including the Open Education Faculty, increased from 300,000 to 800,000. In spite of the overall increase in numbers of students in university programs, the proportion of students accepted into traditional university programs has declined while the proportion of students accepted into Open Education programs has increased during the past ten years. For example, out of 322,320 students who were enrolled in the university programs in 1983-84, 281,703, or 87.4 percent, were enrolled in traditional universities. During that same year 40,617 students, or 12.6 percent were enrolled in the Open Education Faculty.

In 1990-91, however, 798,500 students were enrolled in both traditional and open university programs. Of those, only 434,752 or 45.6 percent were admitted to traditional universities while 363,752 or 45.6 percent were admitted to the Open Education Faculty (Anadolu University, 1992). These figures reflect the fact that, although nearly twice as many students have been accepted into university programs over the past ten years, the Open Education Faculty is absorbing almost half of that population.

In other words, while the proportion of students in traditional university programs has decreased, the proportion of students in Open Education Faculty programs has increased.

Pedagogical design of intruction

Similar materials are used for the degree completion program as for the pre-bachelor program. The primary medium of instruction is print material supplemented by TV and Radio broadcasts. At the beginning of the program, fifty-five books were prepared and published for the seven branches of study. Each book consists of eight units. All units are written and produced by the content experts who are drawn from diverse academic communities throughout Turkey under contract to the Open Education Faculty Board of Commissioners. Lectures on broadcast television are given by academicians connected with one of the major universities. These lectures, along with bboks which are mailed to students, comprise the major part of the instructional package. Feedback is provided through tests and self-instructional materials placed at the end of reading sections in the units.

The program in each subject consists of eight units of instruction for each of seven fields or branches of study (see Table 3). The television programs which reinforce the print materials run about twenty minutes per broadcast. TV and radio programs are produced by the Open Education Faculty and broadcast by Turkish Radio and Television (TRT) on channel 2 (or TV2) in the morning and channel 4 (or TV4) in the afternoons. Radio programs are broadcast during weekdays on Monday, Wednesday and Friday nights (Yangin, 1989). A total of 296 TV programs were produced and broadcast in 1991-92 for a total of 99 hours. 144 radio programs were produced and broadcast in 48 hours of programming.

Examinations for both of these programs are set under the auspices of the Anadolu Computer Center, twice a year. One of the examinations is mid-term, the other is the final examination. The examinations are weighted 30% for mid-term and 70% for the final examination. Apart from these, there is a make-up examination opportunity for students who have failed. The composition of the make-up examination is similar to that of the final examination and is used in the same manner. Examinations use a multiple choice test system and are taken in 23 centers around the country.

Courses

The secondary teacher training degree completion program consists of seven branches of study. The branches, number of graduates, and media production are shown in Table 3. The seven branches of study reflect the subject specialties of secondary school teachers who participate in the degree completion program. The courses are designed to update teachers' knowledge particularly in the areas of science and math. The curriculum is similar to a traditional undergraduate degree program. Each of the branches includes its own subject related to that area of study. For example, Turkish Language and Literature has 64 units of instruction covering 9 subject areas. Eight of the units is broadcast by television. Fifty-six of them are broadcast by radio. Each broadcast program, whether radio or television, is approximately 20 minutes long. All 64 units of instruction have their own print materials.

Table 3
1990-91 Academic Year
University Degree Completion for Secondary School Teachers
Television and Radio programs

Branches	Number of units	Television		Radio	
		Number of Programs	Broadcast Time	Number of Prgrams	Broadcast Time
1. Turk Lang & Literature	64	8	160'	56	1120'
2. History	64	8	160'	56	1120'
3. Geography	56	24	480'	32	640'
4. Mathematic	56	56	1120'	--	--
5. Biology	56	56	1120'	--	--
6. Chemistry	64	64	1280'	--	--
7. Physics	64	64	1280	--	--
Courses for all	16	16	320'	--	--
Total	440	296	5920'	144	2880'

(Source: The Open Education Faculty Degree Completion Unit, May, 1992)

Graduation and Drop-out in the Degree Completion Program

Since the degree completion program for secondary teachers is still in its beginning stages, full statistics are not yet available. Of the estimated 50,000 teachers who have enrolled, 8,525 graduated in 1991 with a bachelor's degree. Their areas of study can be seen in Table 4.

Table 4
1990-91 Academic Year
University Degree Completion for Secondary School Teachers
Graduates

Branches	Number of Graduates
1. Turkish Language and Literature	4903
2. History	708
3. Geography	2322
4. Mathematics	163
5. Biology	293
6. Chemistry	70
7. Physics	66
Total	8525

(Source: The Open Education Faculty Degree Completion Unit, May, 1992)

Conclusion

Both the Pre-Bachelor Certificate Program (Onlisans) for primary school teachers and the University Degree Completion Program (Lisans Tamamlama) for secondary school teachers have realized their goal of providing additional educational opportunities for almost 200,000 teachers in Turkey for whom in-service education was previously unobtainable. If numbers are a measure of success, then the pre-bachelor program was highly successful. Virtually all of the teachers who enrolled in the program completed it successfully. The opportunity to receive training beyond the six year minimum post elementary education which many had received, was very well received by teachers. At the end of the three year period of the project, aproximately 130,000 teachers were educated by distance methods through Anadolu University Open Education Faculty. This education provided a wide range of advantages to teachers by updating their knowledge, keeping their minds fresh and promoting their professional lives. Their status and their salaries have increased and they have gained promotion within the Ministry of Education structure.

It is still to early to evaluate the success of the degree completion program for secondary teachers. Because many of the teachers are at different educational levels, it is difficult to estimate the length of time all will take to complete the program. However, since there are fewer secondary school teachers in this project, it may be possible to provide more counseling and tutoring support than was previously available in the larger scale primary teacher project. It is hoped that most of the over 50,000 secondary teachers will be successful in earning their bachelor's degree and upgrading their skills. The indicators are promising. Already between 8,000 and 10,000 are preparing to graduate this semester.

The teacher training projects in Turkey have been judged successful by the Ministry of Education, Anadolu University Open Education Faculty and by many teachers. Through the use of distance education media and materials, teachers were offered an opportunity to keep pace with developments in education and work towards improving their teaching situations without having to disrupt their teaching schedules. There is no other way that such a large number of teachers could receive this type of cost effective training.

Teacher Training at the UK Open University

Oliver Boyd-Barrett

Abstract: The history of educational studies in the UK since the founding of the UK Open University (OU) is described, as is the variety and breadth of current courses provided. The planning for the provision of the new Postgraduate Certificate in Education is explained, as well as possible opportunities.

Development of educational studies at the O.U.

The Faculty of Educational Studies was one of the founding faculties of the Open University. During its first decade in the 1970s, its mission was to contribute full credit and half-credit courses (440 and 220 study hours respectively) within the university's undergraduate course programme. In this programme, made up from the course contributions of six faculties, students compiled six credits to achieve a BA (Honours) degree. The regulations required students to take two (later, one) foundation courses and then a range of second- and third-level courses (although third-level courses were obligatory only for students wishing to study for Honours). (The Senate of the Open University has recently voted to reduce the number of credits required for an Honours degree to six, of which two must be at third-level.)

The Faculty of Educational Studies, unlike the other founding faculties, did not have a foundation course. It was thought that because a high proportion of all Open University undergraduate students were teachers, many of whom possessed a Teaching Certificate and who wanted to top up their qualification to degree level, such students were not in need of a foundation course but were likely to be interested in including within their degree profile some courses that were of professional interest to them. But the faculty also produced highly successful courses in areas such as the sociology of education, or the psychology of child development, that were of interest to significant numbers of non-teacher and undergraduates. Then, as now, many of these undergraduate courses attracted significant numbers of associate students (i.e. students who studied courses on a 'one-off' basis, for purposes of professional development, outside the undergraduate programme). Some courses, such as the School's courses in education management, attracted larger numbers of such associate students than they did undergraduate students.

Diversification

There were significant changes during the 1980s. The proportion of undergraduate students who were practising teachers had shown a steady decline from the outset. This was attributable largely to the nationwide transition to an all-graduate teaching profession and, therefore, saturation of the market for a 'top-up' degree qualification. (The Open University did not offer an initial teacher training programme, nor was there any reason to think it would have been encouraged by government to do so.) But it was becoming clear that there was a growing market in the provision of in-service courses and other school- or other classroom-focused courses leading to professionally relevant qualifications.

In 1983 the Faculty of Educational Studies was merged with the INSET Section of the University's Centre for Continuing Education to form the School of Education.

During the course of the 1980s, the School developed a programme of advanced diplomas (made up from combinations of specifically named undergraduate courses at postgraduate level), and an MA in Education (awarded on successful completion of three 400-hour postgraduate modules).

Then in 1991, following extensive market research, the School introduced a new programme consisting of a shorter, 110-hour, in-service course - Certificate of Professional Development in Education, a postgraduate programme - which could feed into the MA in Education. The purpose was to respond to changes in the funding of the in-service market, and in particular to changes in the funding of in-service training (by central government through funds to local education authorities) that were intended to achieve a sharper integration of provision with government-defined need, in the form of classroom-focused courses shorter than the School had previously provided. There have been subsequent marketing difficulties as central government has undermined the role of local education authorities through such means as LMS to establish grant-maintained schools which have "opted out" of local authority control. These have had the effect of devolving decision making for in-service expenditure to individual schools.

The next major venture for the School is the introduction in 1994 of a part-time, initial teacher training course for graduates: the Postgraduate Certificate in Education (PGCE). This venture was approved by the Department of Education and Science (now the Department of Education) who also put up the development funds. The initiative was taken in response to market research which showed that a significant proportion of all Open University students are interested in teaching as a career; many of them were interested in subjects where there has been difficulty in recruiting teachers (e.g. science, mathematics, languages); many of these students would not otherwise be likely to register for a PGCE course at a conventional establishment, because of paid employment or because of distance from a teacher training institution.

Open University students are adults over the age of 18; median age is 34 (undergraduate), or 40 (graduate). They are resident primarily in the UK and there is a small but growing student population in the Republic of Ireland and in other European countries. Most students are in employment, waiting for employment or engaged in child-care, and their mode of study is part-time. The University had 57,000 continuing students registered in 1991, with a new intake of 18,000 that year (4.1 per cent of total curse registrations were for education courses within the undergraduate programme). In addition, there were 17,000 associate students studying professional and postgraduate diplomas.

Education courses within the undergraduate programme do not attract only teachers. The School's full credit course on child development, for example, had approximately 1500 undergraduate students of whom only 11 per cent were teachers. Some other courses within the programme attract much larger teacher proportions. Within the advanced diplomas and the postgraduate programmes the proportions of teachers are considerably higher.

In 1992 there were 3,565 undergraduate students studying School of Education courses; there were a further 3,147 associate students studying courses from the undergraduate programme or advanced or professional diploma courses. In addition, there were 2, 561 students studying for the MA in Education and a further 544 associate students following courses in the short-course programme. Total student numbers for 1992 were 9,273.

The School has approximately 100 academic and academic-related staff. Some of these are staff tutors who operate from the 13 regional offices of the Open University around Great Britain. The others are based on the main campus in Milton Keynes, which is a new city in Buckinghamshire about 60 miles north of London, which began development in the 1960s.

The academic staff belong to any of six academic centres: Human Development and Learning, Sociology and Social Research, Language and Communications, Curriculum and Teaching Studies, youth and Adult Studies, Educational Policy and Management. The centres cluster together staff of similar academic disciplines, and also serve as a focus for research activity. Centre members contribute to courses in four programmes, each of which has its own programme director: undergraduate programme, programme for Masters in Education, Certificate Programme of Development in Education, and the Postgraduate Certificate in Education programme. The School has also produced a large number of study packs for general sale, for which no assessment is offered.

Undergraduate programme

Until 1993, the undergraduate programme was financed solely from government grant, and courses in the undergraduate programme carry course fees at subsidized rates although fees are higher for associate students waiting their turn in the queue to gain admission to the undergraduate programme (whose annual numbers have been subject to a ceiling negotiated between the University and the Department for Education) .

Courses are offered at either second or third level. Currently, they comprise titles in the areas of child development, cognitive development, educational issues, language and communications, special needs, curriculum organization, cognitive development, race and education, computers and learning, learning and teaching mathematics, education management, adult learning. These courses are either half-credit or full-credit; they are assessed by a combination of tutor-marked assignments (typically there are eight of these on a full-credit course), and an end-of-year examination which the student takes at a study centre under supervised examination conditions.

The course materials typically take the form of a number of study texts (16 units for a half-credit course, 32 for a full-credit , and some 15,000 to 20,000 words per unit), audio or video cassette programmes (or radio or television programmes shown on BBC television) together with course readers and set books (which the students buy, in addition to their course fees) and, where appropriate, computer software. Students can attend tutorials which are arranged in their local region (there might be eight of these for a half-credit course). Tutorials are generally taken by part-time staff (many of whom are working for other institutions of higher education).

Tutors' marking and comments on tutor-marked assignments are monitored by members of central staff or by experienced part-time staff to assess for quality and to maintain standards. In addition to tutorials and correspondence, students may contact tutors by telephone or, in the case of the course on learning and computing, by computer conference. The nature of assignments and the proportion of total marks which they carry can vary. Some courses include formative assignments which do not count towards the final assessment. Assignments may take the form of project work, or of the interrogation of data or evidence of some kind that is either generated by the student or provided with the course materials.

Face-to-face tutor briefings take place at the start of each course, and these are often followed up by end-of-year debriefings and by subsequent course-based staff development meetings arranged in the regions.

It is the regional offices which have the responsibility for recruitment and monitoring of part-time tutorial staff. Part-time staff serve a probationary period, during which time they benefit from consultation with mentors chosen from the pool of more seasoned tutors, as well as from visits to tutorials from staff tutors. All part-time tutors receive quantitative feed-back which shows the distribution of their marking scores against previous assignments and the national average. They also receive monitoring reports from their monitors, which comment on the marking and on the appropriateness and tone of marking comments. In the examination season there are also coordination meetings for examination script markers.

Course production is generally spread over a three-year period between proposal and first presentation. A course is presented for anything between six and ten years, depending on how vulnerable it is to dating. There are facilities for limited updating of materials by means of additional supplements, the occasional remake of units or remake of broadcasts. Course materials in production are assessed by an external course assessor, and frequently there will be specialist assessors for different parts of a course; assessors from Scotland, Northern Ireland and Wales may be invited to comment on the suitability of draft materials for the various constituent nations of the United Kingdom. Course teams also appoint panels of developmental testers who study the draft materials as though they were students and who provide comments on the pedagogy, level and clarity of materials. During the first year of a course life, there are institutional surveys of student responses to other course materials.

Advanced diploma and postgraduate programmes

Many of the features of course presentation and production which have been described in relation to the undergraduate programme also pertain to the advanced diploma and postgraduate programmes. Apart from the level of these courses and their more specific focus on issues of professional development, the main difference until now has been their different (and less generous) funding: essentially this meant that while most of these components have been financed from block government grant to university, they have been required to be self-financing in presentation. A full-credit course at postgraduate level provides far less, directly, in the way of learning materials for students, and the role of readers and set books is greater. Except for modules in the Certificate of Professional Development there is no video, but some courses do have audiocassettes.

In 1992, advanced professional diplomas were offered in the areas of special needs, educational management, mathematics education, technology education, and post-compulsory education. Students are required to take the equivalent of a full credit postgraduate level from a specified range of core and optional courses. Advanced Diplomas typically take from two to three years. By 1995 it is expected that all advanced diploma postgraduate elements will also be available in the MA programme.

For the MA in Education, students are required to pass three modules from a choice of (in 1992) 10 full-credit modules: these include titles in educational evaluation; classroom studies; gender and education; educational organizations and professionals, language and literacy, education, training and employment; management in education; curriculum, learning and assessment; child development in social context. There is also a dissertation module which allows a student to undertake an original project under the supervision of a specialist tutor. Many of the other modules require project work. Several have a residential school component of a week or half-week duration, while others have day or weekend schools. An MA in Education generally takes students three years to achieve.

From 1993 it will be possible for students to take a "named route" through the MA for the award of MA in Education (Management). In 1993 the School will be planning the development of a taught doctorate, which will build on the MA, with the inclusion of further training in research methods and a substantial dissertation.

The Certificate of Professional Development in Education, which was first launched in 1991, comprised eight modules in 1992 (rising to twelve in 1993). These are quarter-credit modules. A student who passes any two modules is eligible for award of the Certificate and this can count as half a credit towards the MA in Education.

Current titles include professional development in action, teachers into business and industry, assessment and the primary curriculum, science in the primary curriculum, design and technology in the primary curriculum, mathematics in the primary curriculum, and developing reading and writing in the primary curriculum. There is a pilot module, evaluating INSET, which is delivered in collaboration with local education authorities who undertake the tutoring. Modules to be added in 1993 include topics in management and race, and planning learning.

The PGCE is a 17-month part-time initial teacher training course which the School will present for the first time in 1994. This is a major new departure, with development money provided by the Department for Education (DFE). The programme offers two primary lines (5-8, and 7-11/12) and six secondary (science, technology, mathematics, English, history, and French). It is anticipated that many students (1,000 a year in the first instance), will be currently in work, but wanting to switch to a career in teaching. Successful applicants will qualify for government grants to cover tuition fees, and many will also be eligible for maintenance grants.

Students will nominate placement schools at the time of application. Schools will interview applicants for their suitability, and will sign an agreement with the OU which commits them to maintenance of quality support for the students, including the provision of a mentor and a co-assessor. Each student will also be allocated an OU tutor. The course comprises a mixture of distance-learning and school-placement experience with final assessment against a competence model within a nationally agreed-upon framework. Course materials will include course units, resource packs and audio and video components, together with the provision of appropriate information technology hardware and training.

It is envisaged that in time the OU will establish a close relationship with a large network of training schools, through which it will also deliver training in mentoring. Graduates of the PGCE course will be potential clients for the OU's Certificate Programme in Professional Developments and the MA in Education.

Challenges for the Future

Tasks of establishing the infrastructure for the new PCGE, and finalizing its tuition, mentoring, and assessment elements constitute a major challenge for the immediate future. Development has occurred against a background of substantial change in government policy for initial teacher training, with a move towards less reliance on university departments of education and a much greater role for schools. Nonetheless, there is a clearly a role for an organization such as the Open University that is able to create opportunities for significant sectors of the population which, in practice, have been excluded from teaching as a career for reasons of place of residence, age, and income dependence.

There has also been considerable change in the structure of educational provision at local government level. This has reduced the influence of those agencies (the local education authorities) with which in the past the School has collaborated in the promotion of its teaching materials. Increased devolution of responsibility to schools has greatly fragmented the market, although there are signs that new coordinating in-service education agencies and consortia are emerging with which the school may work in the future. The economic recession has also created difficulties, helping to account for a reduction in the number of associate student registrations for undergraduate courses and in the number of group bookings.

At the same time new opportunities are emerging, such as the provision of courses which fall within the range of government-subsidized ("GEST-designated") training courses, the potential for further expansion of the provision of taught higher degrees and for more generous resource funding for such provision, and access to new client groups in the wake of successful implementation of the PGCE.

Biographical Notes

Dr. Oliver Boyd-Barrett holds a Doctorate based on international news agencies, and, as well as being sub-Dean, Course Resources, is a Member of the Centre for Language and Communication. He has recently completed a study pack, *Media and Education: An Introduction.*

The Comparative Effectiveness of Videotape, Audiotape, and Telelecture in Delivering Continuing Teacher Education

Paul L. Beare

Providing higher education for non-traditional students has become a point of interest for many colleges and universities (McMeen 1984) In urban areas it may be accomplished in a traditional manner through regularly scheduled afternoon, evening, or weekend courses. In rural areas the only choice available may be a specialized program or curriculum at a distant institution. Yet, evening or weekend courses may be impractical because of the travel time involved.

Shortages in certain licensure fields, new certification requirements, and salary incentives have all contributed to a growing need for alternative methods of continuing teacher education. The use of audio and video technology in distance education, continuing education, and teacher training has been advocated since the late 1960s (Fraser 1985), but administrators have been reluctant to use technology in delivering what has traditionally been classroom-based instruction.

This reluctance has been based on concerns over expense, as well as a lack of knowledge concerning the effectiveness of such programs (Chang 1983). Thorman and Amb (1974) demonstrate equal learning by teacher education students receiving audiotape instruction versus live instruction. DeMuth (1979) reported that 94 percent of offcampus. students felt audiotape instruction was a valuable experience. Ainsworth (1986) discussed the advantages of videotape instruction in higher education but did not present data to support its efficacy. Whittington (1987) conducted a review of literature concerning the instructional use of television, and concluded that it may be an effective medium, despite a lack of controlled research concerning its efficacy.

Problem

The purpose of this study was to compare a variety of alternative distance education delivery methods offered through a continuing education program. The instruction was part of a teacher training program involving nontraditional teacher education students in a widely scattered geographic area.

Moorhead State University (MSU), the site of the study, is located on the Minnesota-North Dakota border and serves as the primary special education teacher training site for a large, primarily rural area. The region has experienced a continual shortage of special education teachers in the areas of learning disabilities (LD) and emotional/behavioral disorders (E/BD) since the inception of those public school programs. Because of the shortage, there has been a consistently high number of public school LD and E/BD teachers without formal licensure in special education who are employed on a "variance" or temporary certification. They hold a general education license and must complete approximately forty quarter-credits of special education study—including field experience—in a two-year period in order to keep their positions and be eligible for continued certification.

In order for full-time teachers to complete forty credits in two years they must attend summer school--generally devoted to practicum teaching—and enroll in course work during the regular school year. In the past, because of the prohibitive travel distances involved in the service region, many teachers simply could not complete the course work and lost their jobs. The public schools, in turn, were forced lo replace them with other untrained teachers, employable only by means of a variance.

In response to this situation, the MSU faculty developed alternative methods of delivering instruction through the Continuing Education Program. The major question raised by the implementation of these instructional formats concerned their efficacy compared to more traditional classroom instruction. The present research compared these alternative instructional delivery systems to more traditional instruction control groups and examined methods of instruction for differential effects in student achievement and course evaluation.

Method

The course utilized for this study was Special Education (SpEd) 471g, "Behavioral and Environmental Management," available to graduate or undergraduate students. It was a requirement for teachers seeking licensure in special education, adaptive physical education, and early childhood education. It was offered on campus three times a year, and had an annual enrollment of approximately 150. SpEd 471g was a traditional course in behavior modification, covering application of learning theory to teaching appropriate behavior and altering maladaptive behavior. It focused on atypical learning characteristics that result in academic and behavioral problems. The course followed a traditional lecture format with the inclusion of practice in systematic observation and recording of behavior, planning of interventions through presentation of vignettes and videotapes, and completion of a behavior change project with a human subject.

Course materials included a textbook (Alberto and Troutman 1986) and a manual developed by the course instructor. The manual included a detailed course outline, space for student notes, definitions of terms, lists or reinforcers, and sample exam questions. Course assignments included practice in defining, observing, and recording behavior; writing critiques of journal articles; a test of vocabulary terms; and an applied behavioral analysis project.

Subjects

The 175 subjects included 92 undergraduate and 83 graduate students at MSU over a two-year period from fall 1986 to spring 1988. The majority of graduate students were fully employed on a licensure variance as special education teachers during the regular school year, most holding licensure in elementary education or some field of secondary education. There were twenty-three full time on-campus graduate students. The undergraduate students were traditional education majors in the fields of special, elementary, and early childhood education. Students were assigned to a group on the basis of their class section. No method was available to equate the number of graduate and undergraduate students across groups or to randomly assign students to a particular instructional format group.

Independent Variable

The independent variable was the method of instructional delivery used in teaching the course. Descriptions of the six instructional formats follow:
Lecture. Three fifty-minute sessions per week with the instructor present. This should be considered the control condition for this study, being the usual practice for both this course and general university instruction.

Lecture with videotape backup. A traditional lecture format, with a set of videotapes of classroom sessions available at the library reserve desk for students who missed a class or wished to review a session. According to library records, a total of seventy-four individual viewings of tapes occurred during the quarter.

Telelecture. Students travelled weekly to one of five satellite locations spread across the MSU service region and received 150 minutes of instruction. A two-way phone hookup with a speaker and microphones at all sites allowed students to listen and participate. The course was taught on campus to a class of fifty face-to-face students, and copies of overhead transparencies were provided to off-campus students. Data from two quarters were utilized for this group to ensure adequate sample size.

Audio Assisted Independent Study (AAIS). Students listened to audio cassette recordings of the lecture content, recorded from the electronic equipment used for the telelecture. Students were required to attend three two-hour sessions on Saturdays. At the first session the students registered, purchased the text and manual, received tapes for the first half of the course, and heard an oral overview of the course. At the midterm meeting they sought assignment clarification, received a second set of tapes, and completed a midterm exam. At the last session, students took the final exam and filled out the course evaluation. One additional exam was taken through individual arrangement.

*Video Assisted Independent Study (V*AIS). This was identical to AAIS, except for the use of videocassettes instead of audio tapes. Professionally produced, the tapes included graphics and clerical organizers, and were filmed while the course was taught in the usual lecture format. Each lecture was sixty minutes as opposed to the usual fifty minutes and dead time (while the taped students completed in-class activities, etc.) was edited out. The final product was a set of four six-hour cassettes, which was supplied free of charge to the students.

Video On Campus (VOC). Students attended three weekly class sessions and viewed videotapes instead of receiving live instruction. The student's only face-to-face contacts with the instructor were at an orientation session and after the course, when informal reactions were gathered. The instructor corrected all examinations and assignments, ensuring consistency across experimental conditions. At the first session, students were told they could drop the course without penalty and enroll the following quarter when a traditional lecture format would be utilized; no students chose that option. There was daily contact with a graduate student who showed the tapes and answered questions. The VOC condition was a special case, created expressly for conducting this research.

Dependent Variables

Percentage of Correct on Exams. The six groups were compared on the percentage of correct responses on three exams, two midterms, and a final. Exams for all groups were parallel, with questions drawn from an item pool arranged by topics. Tests were designed to measure a variety of levels of knowledge. Some items involved definitions or term recognition; most, however, involved application of behavioral principles or procedures and were in anecdotal format.
For example, a question might present behavioral data and ask the student to graph and interpret it, or present a vignette and ask what behavioral principal was in effect, or present a behavior problem and ask for an operational definition of the behavior discussed. All items could be described either as objective short answer questions or graphs of data. Typical questions follow:

> "Bonnie frequently talks out in class without permission. To reduce this behavior the teacher penalizes her two minutes of recess for each occurrence. What type of punishment is this?"

"Each week that his children bring home a paper with the grade of A, Larry takes them out for a rare ice cream soda on Saturday evening. What mistake probably accounts for the fact this has been ineffective in increasing the number of A papers?"

Course Evaluations. Students were requested to complete an anonymous, twenty-one item course evaluation during the meeting scheduled for the final examination. Questions on the evaluation were answered on a Likert scale, and included items about content, the instructor's performance, course materials, and an overall rating of the course. Typical items to rate on the five-point scale were: "The subject matter was stimulating," "The instructor's knowledge of the subject was...(poor to excellent)," and "Overall, I would rate this course as...(poor to excellent)."

The students in the two video sections differed in that the VAIS students were taking the course in the only manner available to them. The VOC students were taking it as a regular class: the format did not provide any special advantage or convenience. Therefore, the two groups were asked extra questions on the evaluation to discern if attitudes varied according to the reason for receiving taped instruction.

Results

The mean percentage correct on exams and the percentage of students rating the course good or excellent overall versus mediocre or poor overall for each instructional format group, for graduates and undergraduate students, and for the total sample are listed in Table 1. A two-way analysis of variance from the SPSS computer package revealed no significant difference among the instructional group formats on percentage correct, $F = .59$, df (5, 174) $p = .724$. The graduate students did score significantly higher than the undergraduate students, $F = 13.35$, df (I, 174) $p = .001$.

Table 1. Number of students, mean percentage correct on exams, and percent of students rating course good or excellent versus poor or mediocre for six different instructional formats.

	Number of Students	Mean % Correct Overall	% Rating Good or Excellent	% Rating Mediocre or Poor
Lecture	46	81	93	7
Lecture (tape backup	35	79	97	3
Telelecture	34	80	100	0
AAIS	14	79	92	8
VAIS	20	86	95	5
VOC	26	80	92	8
Undergraduates	92	78	93	7
Graduate Students	83	84	98	2
Total	175	81	95	5

All groups were compared on each course evaluation item through use of a Chi-square procedure. There was no significant difference on any of the twenty-one items by either instructional format groups or academic level. Table 2 presents the mean and modal ratings, for each group, on five selected questions of interest.

One of the extra questions for the video-only groups yielded a significant difference (Chi-square = 12.970 with 40 total observations, p = .011). On the question of willingness to take a video format course again in the future, the VAIS group was more likely to agree with this possibility than the VOC. The data from the video-only questions are presented in Table 3.

Table 2. Mean and mode course evaluations in five areas by instructional format versus undergraduate status.

	Stimulating Subject Matter		Instructor's Knowledge of Subject		Course Inspired Interest/ Excitement		Course Material Relevancy		Time Compared to Other Courses	
Rating of 1 =	Always		Excellent		Agree		Relevant		Much more	
Rating of 5 =	Never		Poor		Disagree		Irrelevant		Much less	
	Mn	Mo	Mn	Mo	Mn	Mo	Mn	Mo	Mn	Mo
Lecture	1.9	2	1.1	1	1.7	2	1.3	1	2.0	2
Lecture w/tape	2.0	2	1.1	1	1.6	1	1.5	1	1.9	2
Telelecture	1.8	2	1.1	1	1.8	2	1.3	1	2.4	2
AAIS	1.8	1	1.3	1	1.7	1	1.5	1	2.0	1
VAIS	1.9	2	1.1	1	1.8	2	1.3	1	1.2	2
VOC	1.8	2	1.0	1	1.8	2	1.2	1	1.8	1
Undergrads	2.0	2	1.1	1	1.8	2	1.4	1	2.1	2
Grad Students	1.8	2	1.1	1	1.7	2	1.3	1	2.1	2
Total	2.0	2	1.1	1	1.8	2	1.3	1	2.1	2

Written comments on the course evaluation revealed some interesting patterns, even though no statistical analysis was possible. Students across groups were positive about the course overall, particularly about the utility of the content. Those who received live instruction repeatedly stated appreciation for the humor infused in the course and jokes told by the instructor. The only mention of humor by the AAIS and VAIS groups was comments to the effect of "You are much funnier in person" and "Some of your jokes were too long."

Despite relatively high course evaluations, there were numerous anecdotal comments concerning a preference for live instruction. "This was a good course, but I wish I could have taken it in person," was repeated frequently. Two telelecture students stated that it "would have been worth the two-hour drive each way" if they could have reached campus in time to take the course in person instead of on the two-way audio link.

The frequent comment of the AAIS and VAIS groups was "I learned a lot but would have learned more if I could have asked questions."

Table 3. Percentage of students in video independent versus VOC group responding in three categories to four questions concerning the use of videobased instruction.

	Agree or Strongly Agree		Undecided		Disagree or Strongly Disagree	
	VAIS	VOC	VAIS	VOC	VAIS	VOC
I learn as well from the video format as from a live instructor.	69	50	19	12	13	38
The advantages of the video format make it preferable to regular instruction.	25	17	25	21	50	63
I would willingly take a regular on-campus class in video format.	81	29	13	33	6	38
Viewing the instructor raised my motivation for learning.	69	46	31	33	0	21

Discussion

It clearly appears from the data that individual instructional formats had little effect on student achievement or course evaluation. Though teacher-student interaction would seem to be an important variable in the learning situation, the lack of individual opportunity to interact on a daily basis with the instructor did not reduce student learning as measured by the course examinations. It should be noted, however, that in the three groups with the instructor unavailable for interaction, the students were hearing or viewing the interaction of other students with the instructor. They had the opportunity to formulate answers to the instructor's questions and to hear other students answers and questions. Apparently, in this situation, the vicarious experience was sufficient to ensure equivalent achievement.

It may be hypothesized that the lack of access to the instructor was offset by the easy opportunity to review lectures or repeat entire lectures. Many students stated that they did this; some reported that they played each lecture repeatedly instead of listening once and taking notes. A frequent comment of the AAIS group was that they listened to the tapes while driving in their cars. The opportunity to view or hear lectures repeatedly was not a significant factor when comparing the two lecture groups, one of which had access to tapes. The number of viewings by the tape backup group was very low compared to the number of students in the class, averaging only slightly over two viewings per student.

More surprising than the lack of differences in course achievement was the lack of differences in course evaluation. Distant learners found the course just as stimulating, were equally interested in the subject matter, and judged the instructor equally as skilled as did those receiving face-to-face instruction.

In the case of the telelecture, VAIS, and AAIS groups, the students had the advantage of being able to take the course, and only had to go to the campus three times. In spite of the fact that the VOC students were denied live instruction, they did not exhibit a negative reaction to the course; the novelty of the situation may account in part for their positive feelings.

The extra questions asked of the two video instruction groups revealed a difference in willingness to enroll in future video classes. The VAIS group—which had sought out the video instruction in the first place— was more willing to enroll in another such course than the VOC group. The VAIS group also reported higher motivation for learning from the video format (69 percent versus 46 percent), though the Chi-square was not significant. Judgment of the format—versus judgment of the course content—would seem to rest in the reason for enrolling in a particular format. The mechanical formats delivered instruction not otherwise available, and as such were valued more highly than a substitute for traditional instruction, such as the VOC group.

A number of Students in the VAIS group reported that they had taken other courses in the AAIS and telelecture formats. They were unanimous in saying they preferred the VAIS tapes and would always choose them over audio-only. "After watching the videos, listening to (audio) cassettes is just too boring!" was written on one course evaluation.

It should be noted that on-campus students in classes being broadcast on telelecture are vocal in their dislike of that medium. They resist speaking into microphones and they do not like the separation of instructor attention between the local and remote sites. One night, when the electronic equipment failed temporarily, the class spontaneously cheered.

The data from this research show that a variety of inexpensive, yet effective alternatives to face-to-face instruction are available to the continuing education programs of colleges and universities. For example: once master tapes were prepared, copies of cassettes for each student in the AAIS and VAIS sections cost less than a textbook. Student achievement was not negatively affected by these instructional formats, and course evaluations were equivalent to those for face-to-face instruction.The less formal questions asked of the video-only groups revealed that students respond favorably to video and audio instruction if it is the way they can take the course or—even more important—keep their jobs. Distance education is not received as favorably by those who have a clear option for face-to-face instruction.

Future research on additional interactive instructional formats, such as those employing fiber optics and satellites, would be informative. Valuable data could be gained from the use of randomly assigned subjects and simultaneous instruction over different media. This would assure that results were the effect of instructional format alone and not due to a selection bias on the part of individuals enrolling in the course. Close examination of the costs involved in the various forms of distanceeducation will also be a deciding factor in their future utilization.

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Managing a Technology Staff Development Project

RICHARD LEE, Coordinator
Technology Staff Development
Sacramento City Unified School District
Sacramento, Calif.

In July of 1989, the Federal Department of Education awarded a three-year technology grant to Sacramento City Unified School District. This allowed us to create the Computer-Based Staff Development Project, which will strengthen and expand the district's computer-based educational program in both its elementary and secondary schools. This project aims to help our teachers and administrators develop their technical skills and provide them with an educational philosophy that will assist in the task of integrating technology into the curriculum.

The first step—after hiring a coordinator, a technology training specialist and a secretary—was to equip a suitable facility. The district had an existing teacher training facility, Tomorrow's Classroom Today (TCT), but its technology needed upgrading. TCT now consists of 20 IBM computers in a network with a file server running Novell and IBM Classroom LAN Administration System. Much of the application software for the facility has been provided through partnerships with companies like IBM Corp., Josten's Learning Corp. and Scholastic Software, Inc.

What to Train

The next step was to assess the needs of principals and teachers. The district's department of research and evaluation conducted a survey to evaluate technology training needs. Without understanding the available technology, however, our principals and teachers were unable to articulate their training needs, so the survey did not really help.

The most successful needs assessments conducted to date have been more practical. One obvious method has been to offer workshops and simply count the number of people who register. If the classes filled up and there were waiting lists, those classes were offered again. Another method has been to visit educational technology centers and talk to teachers, especially those teachers using computers. Hearing about their difficulties—both with the computers themselves and with assisting other teachers in the use of computers— has helped us discover which workshop topics are most needed.

Attendees can earn salary credits. Workshops are generally designed for classroom applications. Specific content has emphasized both a particular application—such as learning how to do word processing, desktop publishing and database management (with Microsoft Works or AppleWorks)—and classroom usage with topics like "Managing the One-Computer Classroom" and electronic recordkeeping .

When to Train

After completing the needs assessment, we planned our training program. A Summer Technology Institute had been conducted for the last two years, so our department first emphasized refining and expanding this existing program. As a result, the Summer Technology Institute offered 70 workshops between August and 17, 1990. Teachers were hired as presenters and computer labs in schools throughout the district were reserved.

Every teacher, administrator, aid and clerical employee in the district received a booklet announcing the workshops and containing an application form.

The biggest problem the Summer Institute faced was a 25 percent drop between registration and actual class attendance. Of course, the reason is quite understandable: It is easy to complete a registration form and drop it in the mail; it is far more difficult to get in the car on a hot August afternoon and actually drive to the workshop.

Although the attrition problem will never be completely solved, it has declined considerably for workshops held during the regular school year. Among the reasons for this improved attendance are: Letters are now sent one week before the workshop, confirming registration, date, time and location; the reputation of the workshop is now more widely known; and people are naturally more interested in attending training workshops during the school year than they are during the summer.

We decided to schedule most school year workshops between 3:30 p.m. and 5:30 p.m., when teachers were finished with school. We announce them every two months with fliers sent to all staff members in the district. Classes offered at this time have proven to be very popular. The presenters are teachers who are paid by our office. Attendees are not paid, but they can earn salary credits. Each attendee is sent two certificates of completion, one of which can be sent to Personnel Services as proof of attendance.

Who to Train

Our grant states that training is to help "teachers and administrators." We are not, however, limiting workshops only to certificated personnel. Many others— such as clericals who use computers or parent volunteers and aids who work in the computer labs—are desperate for more training. Because the grant's wording seemed to limit who we could train, the project coordinator for the Department of Education was consulted. He said that as long as the workshops were planned for teachers and administrators, and that other attendees added no cost, then anyone could attend. Thus no one is turned away from our workshops. Parents, teachers, administrators, substitutes and clerical personnel are all welcome, and many noncertified people have attended. We also discovered that administrators will attend a workshop more readily if it has been planned just for them rather than for teachers and clerical staff as well.

In addition, ours is a large district servicing nearly 50,000 students. Many neighboring, smaller districts have also been adding technology components, but lack the resources for training. Our project is open to these districts. A contact person at each of eight neighboring school districts receives a stack of fliers, announcing workshops, and many teachers, administrators and clerical people from their districts have attended our technology workshops.

The software they use daily on the computers in their offices will not work properly on the machines installed at the training facility. Most teachers and students have access to IBM PS/2 Model 25 or 30 machines. But many of the administrators and clerical staff have more powerful DOS computers capable of running Windows-based applications such as Word for Windows, Excel and PageMaker. We resolved this dilemma by adding nine of the more powerful DOS computers to the training facility.

The district also found a special need for training secretaries. A special class in Microsoft Word (funded from other sources) was offered just for clerical employees. Although its main goal was to enhance these workers' skills, a corollary purpose was needs assessment—to find out how much help was wanted or needed by this group. Some of the people who

helped design this class speculated as to the number of people that would enroll; guesses ranged from seven to 40. In the end, 128 people actually registered. To accommodate them all, the class was divided into four sections. The attrition rate was very low because these classes were presented during the work day and clerical personnel were released from their jobs to attend. Classes also had to be offered on different days so people could attend in shifts, thus ensuring that some staff remained on the job. This demonstrates the importance of considering clerical personnel in any technology staff development project.

Technology Advisors

Providing enough substitute teachers to cover for educators taking workshops during school hours was another factor to consider. Discussions with coordinators of similar projects revealed that it is far better to give intense training to few people than a little training to many. Those who have attended the workshops can then train others.

With this in m ve are implementing a "trainer of trainers" program; those involved are called Techno dvisors. First, we certified people who heId previously led workshops and asked scho cipals for names of potential Technology Advisors. So far, response to this program has been tremendous and it should solve the problem of providing substitutes since fewer teachers will need to attend workshops.

A Technology Advisor will:

- Be a resource person for a school site, aiding other staff members with technology questions and/or problems;
- Help with .staff development both at the site and districtwide; and
- Be a part of a network of Advisors established to distribute applications and solve computer-related problems.

We have specified two ways to become a certified Technology Advisor: Demonstrate proficiency after taking classes in a specific area, or already be proficient and fill out an application. Certification will include such areas as:

- Managing a computer lab;
- Using application software;
- Using a word processor for writing across the curriculum;
- Integrating technology into specific content areas;
- Identifying and utilizing software to address the needs of at-risk and bilingual students;
- Understanding basic computer technology; and
- Using and developing teacher tools.

Technology Advisors can be paid to present on-site workshops; they will also have workshops developed just for them to help them perform their advisory functions. A list of other Technology Advisors will be supplied as a resource, and opportunities will be provided for Technology Advisors to meet with one another throughout the year.

Final Considerations

One challenging aspect to this project has been managing it's budget. Federal budget constraints allowed for no capital-improvement funds, and hardware purchases were restricted to no more than 25 percent of the total budget. Learning to manage and balance a large budget is an on-going task and there are few guidelines.

Confusing budget classifications are a constant battle. For instance, if an item is under $500, it is considered an office supply rather than a hardware furniture purchase.

Ten chairs which each cost $60 exceed the $500 limit and are considered hardware. A desk which costs $XXX is considered an office supply. If a carrying case for a laptop computer is purchased on a separate purchase order, it is considered an office supply. If it is purchased with a computer, it is considered hardware. Managing a technology staff development project is an exciting challenge. The purpose of the federal grant we were awarded i.s to promote research into methods of training and report on those that work. Since some methods work better than others, our program is continually evolving as it grows. A survey will be conducted before the end of this school year (June 1991) to assess the changes for both students and teachers that have resulted from this project. Meanwhile, Sacramento's students benefit from more technologically proficient teachers, and the district gets administrators and staff with enhanced skills.

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About the Author

Richard Lee was a teacher with the Sacramento City Unified School District for 26 years. He taught Computer Science and English in the Academy of Math, Science and Engineering from September 1981 through April 1990, when he accepted the position of coordinator of Technology Staff Development.

Using Schooling and Technology to Learn to Teach in the 21st Century

The University of North Texas/
Dallas ISD Professional
Development Center

RICHARD L. SIMMS
Interim Dean, College of Education

GERALD PONDER
Director, UNT/DISD Professional Development Center

America's schools have outdistanced the capacity of traditional university-based teacher education programs to prepare teachers for them. Powerful forces, including the growing cultural and economic diversity of school populations, school culture norms that have moved toward collaboration, collegiality, empowerment, and continuous self-improvement, and an accelerating array of emerging technologies for teaching have disadvantaged traditional campus-based teacher education programs in terms of their ability to provide novice teachers with the knowledge base and skills needed to practice their craft successfully in their beginning year. This rapidly changing school environment and the necessary redefinitions of "teacher" that have resulted from these changes are among the factors that led both the Holmes Group (1986) and the Carnegie Forum (1986) to recommend Professional Development Schools as primary vehicles for preservice teacher education.

These reports, using the analogy of a teaching hospital, proposed that laboratory schools be developed and run collaboratively between universities and school districts. The Professional Development Schools (PDSs) would have interns work with master teachers as they taught classes of children. University faculty would join in the supervision and participate in research and development projects at the school sites. In all, the Holmes Group summed the characteristics of their recommended PDS into four concepts that were to be the hallmarks of these schools: reciprocity, experimentation, systematic inquiry, and student diversity.

House Bill 2885, passed in 1991 by the 72nd Texas Legislature, put a significant twist on the PDS concept by mandating "Centers for Professional Development and Technology," conceived to be collaborative centers for preservice and staff development education, with a significant, integrated technology core. Done well, the legislation offers the potential for Professional Development Centers to use schooling to learn teaching and technology to become accomplished at using technology-based instructional paradigms.

The UNT/DISD Professional Development Center will be a prototype Center for Professional Development and Technology, as authorized by HB 2885. The center is a collaborative effort among the Dallas Independent School District (DISD), the University of North Texas (UNT), Region 10 Education Service Center (ESC 10), Project Bluebonnet (SchooLINC), Texas Center for Educational Technology (TCET), and private sector technology corporations.

The UNT/DISD Professional Development Center will have two primary, interrelated missions. The highest priority for the PDC will be to effect a school/university collaboration to develop and provide exemplary, results-based educational experiences, including technology accessibility, for an economically and culturally diverse urban student population.

The second major purpose for the PDC will be to develop and renew exceptional teachers and other educators for urban schools through the integration of technology and effective teaching practices in the preservice and staff development training of teachers and administrators.

The PDC project, a "teaching hospital" for preservice and inservice educators, will contain the following key components:

• **Sites.** The PDC cluster will initially include one elementary school (Cowart Elementary) and one middle school (Stockard) located in a predominantly minority, lower-income neighborhood in southwest Dallas. These are regular schools that will be part of DISD's School-Centered Education initiative, featuring site-based management and an integrated social services approach to delivery of education.

• **Highly effective education for urban students.** Preservice and renewal teachers in the PDC will receive instruction in results-driven planning and teaching models. These candidates can then serve as interns to reduce the adult/student ratio in PDC schools. In addition, the technology component of the PDC will help address the equity issue of technology access for urban students served by PDC schools.

• **Preservice Teacher Education.** Cohort groups of candidates committed to teaching in urban schools will be recruited from both traditional (campus based undergraduates) and nontraditional (alternative certification pools, corporate and military outplacement services, and "grow-your-own minority recruiting programs) sources. The curriculum for the PDC preservice program will be developed from research-verified "best practice" models, as well as from assessments of workplace requirements for teaching in urban schools provided both by practicing educators in Dallas ISD and by representatives of the corporate sector. The model for learning in the UNT/DISD PDC is conceived as a "constructivist/reflective model," in which preservice candidates Will be provided opportunities to contribute actively to the ongoing program of the school through curriculum development, instruction, and research. Reflection through case studies and review of experience will follow. Distance learning and other technologies to be found in "classrooms of the future" will be integrated into the preservice program in PDC schools.

• **Inservice Education.** The PDC will serve as the site for a full range of staff development activities and for collaborative projects between school-based and university-based practitioners. An induction year program will be established to help candidates make the transition from the PDC to another school. The PDC also will serve as a distance learning origin site for staff development programs that can be transmitted to other school sites or stored on videotape for dissemination.

• **Research and Development.** The PDC will serve as a research and development center on the effectiveness and effects of technology-based instructional paradigms and for research and development of solutions to problems in urban education and teacher education. Teacher-as-Researcher and other collaborative models of research and development will fuel an ongoing program of systematic inquiry into a series of concerns ranging from school culture and governance through product evaluations of hardware and software in elementary and middle school settings.

• **Collaborative Planning and Governance.** PDC schools will feature site-based decision making, collaborative planning for the PDC, and shared governance in some program elements. University representatives will serve on the school councils of the PDC cluster schools, and school district personnel will be involved in the recruiting and selection of university faculty who serve in the PDC. Teachers and other educators from the district will help to develop the preservice and inservice teacher education programs at the PDC.

• **State-of-the-art technology access and utilization for urban students and their teachers.** The PDC schools will be part of SchooLINC, a Texas distance learning prototype. These schools will be equipped with the technology and software to develop, test, and implement technology based instructional paradigms. These technologies include:

- connection of UNT and other SchooLINC sites by a fiber optic cable system
- computers with rich instructional environments
- two way full motion video conferencing
- access to multiple information sources
- access to major libraries
- access to CD ROM information
- access to image data bases
- access to satellite systems such as the National Weather Service and Cable News Network

At least one classroom at each school site, as well as a similar classroom at UNT, will be equipped as a "classroom of the future." These "classrooms of the future" will contain the following:

- two to three video cameras to focus on students, teacher, and instructional materials
- computers in at least a ratio of one computer:three students. More computers will be required for writing labs, math labs, and science classrooms.
- two big-screen TV monitors
- optical fibers with adequate bandwidth for two-way video communication and data communication
- file server
- teacher control console that allows the teacher to control and direct the technology
- two teacher presentation stations
- echo canceling audio
- telephone and FAX link
- supportive software (examples: authorware packages, *Ulysses,* etc.)

Schools in the Dallas PDC cluster will be linked, via distance learning technology, with sites in small-town schools in north Texas, with other urban areas in central Texas, and with more affluent, technologically oriented suburban districts. There is even the possibility of future links with the Superconducting Supercollider Project in Waxahachie. These linkages promise to provide a window on the world and a bridge to other cultures and future opportunities for students and teachers at all of the linked sites.

The vision of students—and teachers—in inner-city schools joining with students—and teachers—in small, rural schools and larger, more sophisticated suburban schools to accomplish a writing lesson triggered by a science experiment at the SSC project is a driving vision for the UNT/ DISD Professional Development Center. This image captures the idea of joining technology and schooling to produce a new conception of "teacher," a person who works with children, technology, community agencies, and other educators to integrate learning and technology and open doors to the more diverse, technologically demanding workplace of the 21st century.

The PDC offers a way to use schooling and technology to learn to teach and to continue the learning process in the coming years. When institutionalized, the concert of the Professional Development Center promises beneficial effects for both the school district and the UNT teacher education program. For the school district, the PDC can provide a source for developing or renewing teachers for the district's schools. It also offers an opportunity to develop teacher leaders who are experts in mentoring and staff development in technology and innovative teaching practices. And the PDC offers the school district an opportunity for a continually improving vision of the instructional program through its technology, research, and development capacities.

For the university teacher education program, the PDC offers an avenue for field-based and highly credible teacher preparation. It also offers university faculty the opportunity to continually upgrade their knowledge base and to become well grounded in the real world of schools, as well as the realities of emerging instructional technologies. The PDC offers true collaborative potential, with invaluable benefits to each partner.

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A Distance-Learning Approach To Inservice Training

by DR. DENNIS R. KNAPCZYK, Associate Professor
Indiana University
Bloomington, Ind.

Improving the skills of personnel already teaching in elementary and secondary public schools require that universities generate new approaches to their K-12 staff-development activities. Innovative strategies are particularly important in situations where such school personnel cannot easily travel to on campus training sites. Under these circumstances the success of staff-training efforts will depend on the ability of universities and school corporations to establish partnerships for professional-development activities. Some areas in which collaboration is essential include identifying the needs of instruction personnel utilizing local expertise in devising and delivering training activities, and providing on-the-job training experiences suited to the demands of the work environment.

Such collaboration has been key to the At-Risk Program, an inservice program for educators and other professionals working with students who display learning and behavior problems. A cooperative effort of faculty at Indiana University and school personnel from several rural school corporations in southern Indiana, the At-Risk Program focuses on improving the educational services provided to this student population so that they can more successfully participate in classroom and school activities. Specifically the program offers skills in restructuring the classroom and other school environments; it also demonstrates the use of collaborative-planning practices.

Audiographics Is Key

Faculty and trainees participating in this program have found that a distance-learning approach, employing audiographic technology, is a great help. It has proven to be particularly suitable for organizing and offering the wide range of training experiences needed by local school corporations.

Audiographics is a computer-based, hybrid technology that permits simultaneous transmission of voices and graphic images across telephone lines. Audiographics is highly interactive. It allows people at different locations to speak with one another to share text and graphic images and to annotate images displayed on monitors. Several schools can be networked together in a conference-call format with each site having full interactivity.

The audiographic system used in the At-Risk Program was developed from various components manufactured by AT&T. The system combines teleconferencing via speaker phones with computer-based graphic scanning. AT&T Model 6300 DOS-based personal computers equipped with hard disks and 640K of RAM serve as the system platform. With the help of an overview scanner and a modem the system captures and scans graphic images,transmits images from location to location, displays and annotates images, and sequences and stores multiple images in the form of slide presentations. Scanware communication software, also from AT&T, links origination and reception sites in both point-to-point and multi-point networking configurations.

Overview of the At-Risk Program

The At-Risk Programs field- based. Via distance-learning, inservice classes are delievered to off-campus sites in rural communities located as much as 100 miles away from the university. Teams comprising two to six teachers from the schools close to one another form cohort groups for the program.

Coursework is designed to improve the skills if school personnel who work with at-risk students. Particular attention is given to demonstrating effective teaching practices, promoting the application of these practices within a trainee's work environment, and restructuring both classroom and schoolwide settings to offer students a wider array of educational opportunities. The program provides 12 credits of teaching methods and six credits of supervised practicum. Professionals enrolled in the program include grade-level coordinators, special educators and therapists.

Training activities are developed and delivered in partnership with participating school corporations.Local personnel assist in planning and teaching the academic courses, set the focus of field experiences, and take an active part in evaluations. The At-Risk Program also fosters collaboration among teachers. For example courseware assignments and practicum projects are designed so that school-based teams plan and carry out activities tailored to the characteristics of students in their buildings. Each team member is partially responsible for completing the component steps of the projects.

Coursework Delivery

Teachers receiving the inservice training commute to a regional off-campus site and participate in weekly classroom sessions in groups of 10 to 20 trainees. Instruction is presented in a co-teaching arrangement. One co- teacher is a trainee from the cohort group, who serves as an on-site field trainer. This person acts as a group facilitator for the sessions, coordinates class activities, oversees practice exercises and monitors small-group projects. The other co-teacher is a university-based instructor, who administers and supervises the course, organizes the class content, prepares training materials and participates in class presentations by means of the audiographic link.

Before each class session, graphic materials are prepared for the trainees. These instructional materials may include notes, outlines, tables, charts of other visual displays. The materials are then scanned, sequenced and stored as a slide presentation. Both co-teachers --the university -based instructor and the on-site field- trainer--preview materials via the audiographic system. Together, they plan how to incorporate the materials into the lessons.

A link between the university and the regional sites is maintained during the trainees' class meetings. This link permits two-way, voice and graphic interaction during lectures and discussions. Since both instructors can physically control the slide presentation, responsibility for presenting materials and monitoring discussions can be assumed by either one or shared. For example, the university instructor may explain the principle underlying a teaching strategy while the field instructor describes how to apply the strategy with specific students. Trainees can then discuss any adaptations they would need to make to incorporate the strategy into their own instructional routines, receiving guidance and feedback along the way from one or both instructors.

Additionally in-class exercises, small- and large group projects and similar activities have been devised for each class session to promote application and synthesis of concepts The audiographic network allows trainees to scan and transmit samples of their work to the university instructor for review, feedback ,further discussion and evaluation.

When meetings end the university and field instructor review the day's activities and assess the progress of trainees. Preliminary plans for the next class meeting are then made.

Supervising Practicum Projects

Practicum activities provide opportunities for trainees to apply the coursework's concepts and principles. In the practicum, they learn to adapt teaching methods to the context of their own classrooms and school buildings Projects are collaborative in nature and trainees work together on them as school-based teams. Practicum activities are coordinated and supervised by the university-based instructor.

Communication between trainees and their practicum supervisor includes monitoring and evaluating field activities. By using the network to present progress reports of their field work, trainees obtain feedback about their performance with very little delay. For example, every week the university instructor establishes a voice-and-graphics link with the school-based teams to review each group's accomplishments. As reports are presented, documentation of completed work is scanned and transmitted to the university instructor. Documentation can comprise of hand-written notes, students' work samples or any other printed material that a trainee might use to demonstrate progress. While trainees give verbal descriptions of their activities, the instructor reviews the images of written material and indicates areas requiring elaboration for clarification. Approval, suggestions for revisions, editorial comments or other feedback can then be provided by the practicum supervisor.

Benefits of the Approach

Faculty and school personnel participating in Indiana University's At-Risk Program have discovered several important advantages to using distance learning and audiographic technology in staff development activities. A prime benefit is that it opens university level training to school personnel who would not have access otherwise. It enables a university to provide advanced graduate training to rural communities in a manner that ensures quality control.

Such an approach also facilitates the recruitment of groups of personnel working in the same school. This is contrasted to campus-based coursework in which trainees are likely to be from schools and communities having very different characteristics. Providing training to groups of professionals from the same school building creates many opportunities to incorporate techniques that greatly enhance collaborative relationships and mutual support along instruction l staff.

Being able to transmit graphic information is especially important in offering methods coursework and in supervising practicum experiences. In both instances, the transmission of work samples, outlines, progress reports and other written materials to instructors for review, feedback and evaluation are vital to the training experience. In the university's At-Risk Program the two-way link has helped bridge the gap between educational theory and the application of teaching practices within a trainees work environment.

The success of the At-Risk Program has largely depended on the partnership between the university and school corporations in planning coursework and field experiences. University instructors provide technical assistance, feedback and other support activities. Local instructors assume primary responsibility for training.

The At-Risk Program uses local telephone service to offer a wide range of training experiences suited to the needs of rural communities.

It is a prime example of how an innovative strategy (distance learning) combined with state-of-the-art communication technology (audiographics) can provide remote communities with access to university-quality inservice training.

About the Author

Dennis R. Knapczyk is an associate professor in the department of curriculum and teacher education at Indiana University. He coordinates the graduate teacher training programs in the area of special education. His work in developing the At-Risk Program is partially funded through grants from the U.S. Office of Special and Rehabilitation Services and Indiana University's Center for Excellence |AT&T| Alliance Project.

Staff Development In Rural Schools Through Distance Education

Dennis Knapczyk
Thomas Brush
Mary Ann Champion
Lori Hubbard
Paul Rodes

(Indiana University)

Abstract:

Because of their isolated locations, rural schools were in the past somewhat sheltered from the changing demands placed on other public schools, but today this is no longer the case.[1] Students today are bringing into the classroom an increasingly complex array of problems that affects their school performance. Communities and businesses are also placing new and greater demands on schools, further transforming the classroom curriculum. Since school personnel need to constantly upgrade their skills to respond to the changing character of education, staff development has become central to the public schools' mission of educating children and youth. [2] School personnel in rural communities need ready access to information about new teaching practices and innovations to carry out their jobs effectively. Rural school districts must see to it that their staffs obtain this information.[3]

In many instances staff development in rural settings is hampered because the sources of expertise for in-service training are located great distances from the communities. In addition to finding ways of connecting with these outside experts, rural schools must also learn how to look for and develop expertise from within their staff so that they capitalize on the wealth of knowledge that already exists in the schools. Furthermore, rural schools must discover methods for carrying over the expertise both from outside and from within the schools to all the teachers in the school district.

For the last few years Indiana University has been working with several rural school corporations in Indiana to create staff development opportunities for instructional personnel. These activities are field-based, in that the teachers remain at their schools during the training and they address problems and concerns that pertain to their day-to-day teaching responsibilities. The instructors remain at the university and communicate with the teachers via distance education technology.[4] In our work we have discovered that there are some major challenges that rural schools face in providing staff development including bridging distances, promoting ownership of training, improving on-the-job performance, and increasing staff collaboration. This paper will describe these challenges and offer some solutions for meeting them.

CHALLENGE ONE: BRIDGING THE DISTANCE TO OUTSIDE EXPERTS

One major challenge for rural schools is to minimize the travel time and costs that are usually associated with involving outside experts in staff development.[5] The primary consideration in meeting this challenge is to create a two-way communication network that is diversified and flexible enough to support the requirements of in-service training.

We have found that the best solution for bridging the distance to outside experts is to set up a distance education link between the schools and the university through which we can communicate with one another and yet remain in our home communities.

We use the communication link between our sites to augment instruction with print materials, video images, and graphics. This link also allows us to provide ongoing training activities, as we are able to oversee several hour-long meetings from our home location rather than relying on a single on-site marathon session.

Video links through cable or broadcast television are already available to many rural school districts. A far less expensive option is audiographics, a computer-based technology that we have found to be very well-suited for staff development in rural settings. Audiographics allows instructors and students to transmit graphic and text information across local telephone lines. Audiographics is interactive and enables users at the different sites to annotate images on their computer screens with either text or graphics (e.g., underlines, checks, short comments) and the annotations appear simultaneously on the other sites' computer screens. In addition, several graphic images can be stored on the personal computers and used as part of large group presentations, small group conferences, and individual reporting and feedback sessions. Furthermore, several schools can be networked with one another in a conference call format and each site can have full interactive capabilities.

In conjunction with standard teleconferencing equipment, we use the audiographic technology as a two-way long distance overhead projector through which we and the school staff portray graphic images, such as notes, charts, and outlines, on the computer screens. By combining this technology with standard facsimile machines for sending documents and assignments, we have been able to create a versatile and reliable two-way link that offers instructors a wide array of teaching options while allowing them to oversee staff projects and provide detailed feedback.[6]

School systems will find that they can put together a teleconferencing network that links them to outside experts fairly easily. Many districts already have facsimile machines; speaker phones are very inexpensive to buy; and the major computer companies make graphic scanners and communication software, such as electronic mail and bulletin boards, that are compatible with the equipment that is already in the schools. We have also found that audio graphics equipment is very easy to move from location to location and is inexpensive to use because it operates across one or two telephone lines. In addition, audio graphics gives us a way to communicate with several schools simultaneously, and enables all of the schools in a district to link with one another. This networking ability further reduces the need to commute to a central training site.

CHALLENGE TWO: PROMOTING OWNERSHIP OF TRAINING

The second challenge to staff development is to promote ownership of the training so that the staff views the activities as an important and useful part of their professional development. We have discovered that ownership will most likely occur when the topics and activities in the training closely match the staff's needs and interests. However, finding ways to meet this challenge is particularly problematic in a distance education format because of the separation of the trainers and the staff. For example, we found that it was difficult to come up with a realistic and practical training experience on our own because we do not have many opportunities to become familiar with the situations in which the teachers are working.

The solution we have developed to promote ownership is to structure the training as a cooperative arrangement between the university and the local schools so that we both share the responsibilities for planning and delivering the training.

On the one hand, we provide the technical expertise about the training topics, administer and supervise the activities, organize the content of the sessions, prepare the training materials, and participate in the sessions by means of the distance education network. On the other hand, the school personnel assist in structuring the training sessions and in showing the staff how to use the information in their classrooms. To accomplish this aim, one of the school teachers or administrators serves as an on-site coordinator for the sessions, helping us to plan the training activities, oversee the practice exercises, and monitor the group projects.

The schools that we work with have derived several important benefits from sharing responsibilities for staff development. First, the coordinators give valuable input into the planning of the program by clarifying the specific needs of the personnel. They highlight the areas of training that need particular emphasis and indicate how the topics can be tied to the policies and procedures of the schools. Second, during the training sessions the coordinators help make the instruction more personalized by bringing up examples and experiences that are related to the topics and by explaining how a procedure can be used with a particular student or in a situation that all the staff members are familiar with. In addition, the coordinators help direct discussions and small group activities and elaborate on the points that are covered in the training sessions. Third, the coordinators give us detailed feedback about the training sessions so that we can modify the presentations and plan follow-up activities. Finally, the coordinators serve as an on-site resource to help the staff apply the material to their work situations. For example, after the training is completed, coordinators confer with the teachers about how to use procedures or methods in their classrooms and get back in touch with us if the group has further questions. By sharing the responsibilities for the training in these ways, the teachers feel that they are an integral part of the staff development activities.

CHALLENGE THREE: IMPROVING ON-THE-JOB PERFORMANCE

Another challenge rural schools face in staff development is to ensure that the training actually improves the teachers' on-the-job performance. All too often, staff development activities are "one shot" efforts that do little to actually upgrade the teachers' classroom teaching skills. Most teachers, for example, have attended Friday afternoon in-service workshops and discovered that by Monday they either forgot what was said in the workshop or they were unsure how to apply the ideas in their classrooms.

We have discovered that one of the best solutions for improving on-the-job performance is to incorporate activities that encourage the teachers to apply the concepts immediately to real life situations. This "reality check" ensures that the training is both practical and useful for the participants. For example, during a training session on curriculum development or classroom management strategies, the teachers complete case study projects in which they generate actual solutions for modifying their curriculum or upgrading their management approaches. In this way the training has an immediate impact on improving on-the-job performance because the teachers leave the sessions with definite plans for applying the concepts in their classrooms.

Another way we promote carryover of the training is to have follow-up sessions after the staff has tried out the ideas or techniques in their programs. Because our distance education link allows us to provide several training sessions over an extended period, we are able to oversee both the planning and the actual implementation of staff projects.

These follow-up sessions give the staff feedback and clarification about the procedures they are learning to use. The teachers have stated that this approach provides them with valuable input about how to apply the key concepts to their job situations.

CHALLENGE FOUR: INCREASING COLLABORATION AMONG THE STAFF

The fourth challenge to staff development in rural settings is to use the training to encourage stronger collaboration among the staff. One of the major outcomes of in-service activities is that they give personnel a common set of experiences that they can use for classroom-, school-, or district-based planning efforts. Furthermore, they provide opportunities for the staff to share their experiences and expertise and to form task-oriented work groups that address issues pertaining to improving educational services.[7]

One approach that we use to increase collaboration is to have the staff complete projects during the training as school based teams or grade level units. In this way teachers with similar backgrounds or common concerns can devise solutions that are especially useful and functional for them. For example, we have found that a session on improving school-family relationships or on social skills training gives the staff a unique opportunity to gain shared knowledge about a topic and to work together to upgrade these particular aspects of the school's program. Such opportunities also increase communication and cooperation among the staff and help them to realize that providing educational services in rural settings requires a team effort based on collegial support.

Furthermore, as a follow-up to the training, the team members implement their plans and use their team as a support group to refine and further develop the procedures. For example, as part of a project on mainstreaming special education students, the teams discuss the impact of mainstreaming at their particular grade levels and generate solutions for overcoming anticipated problems. In conjunction with the projects, the team members serve as a resource for one another in carrying out the mainstreaming activities. Throughout many of these activities our efforts in staff development have primarily served as a catalyst for the ongoing process of upgrading teaching skills. The collaboration among the staff is an important factor in this process and ensures that the in-service training has a long lasting effect on improving educational programs.

CONCLUSION

Alliances must be formed between schools and outside experts that create new approaches for in-service training of personnel who are already teaching in rural communities. We have concluded that staff development presented through distance education can give teachers in rural communities access to training when more conventional forms of delivery are not available to them. However, rural schools must take a very active part in planning and delivering their in-service training. For example, distance education and communication technology have given Indiana University and participating schools considerable flexibility in organizing and offering a wide array of training experiences that are well suited to the needs of rural communities. But the success of these efforts has largely depended on a partnership in which both the university and the school corporations have shared the responsibilities for the training.

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Can CMC Teach Teachers Teaching?

by Barbara Marantz and Richard J England

Some time back, Pogrow (1988) urged that we move from questions about how to help people learn to use computers to a "second generation concern" -- how people can use computers to learn. We would like to consider some implications of that latter question in relation to teacher education, with specific focus on computer mediated communication (CMC). We will argue that the two questions are neither sequential nor mutually exclusive, but rather, are interdependent: to use computers to learn, teachers must learn to use computers and must learn HOW they learn using CMC. We will argue that only then can they be expected to use computers effectively to teach.

We assert at the start that CMC teaches nothing; teachers do. We say this neither to dismiss nor "trash" computer mediated communication. Quite the reverse, we believe that CMC is an amazing medium and are convinced that educational telecommunication (teacher + PC + Modem + students provides a significant addition to our pedagogical toolbox. If effective teaching and learning call for a way and a place to express and explore interests, to raise and respond to questions, to discover, practice and experiment with ideas and cognitive skills, to identify and examine relevant information and ideas, and to broaden and deepen individual ways of thinking about the world by providing opportunity to consider and evaluate alternative views both privately and through interactive "live" discussions, then certainly CMC more than qualifies.

In a recent CMC experience at Empire State College/SUNY, as "instructor" and "student," we deliberately set out to explore the medium as a teaching tool from the onset. We found: The medium kept us engaged and feeling we were doing a responsible job; we were able to stay in constant contact, uninterrupted by the days of the week or hours of the day; we had the time and space for timely discussion and feedback; we had the opportunity to know the texture and style of both student and teacher; and we had the unique ability to adjust and adapt the study to meet emergent needs and interests within the broad framework of the course. We began by "playing with" the system to see which of its abilities could be beneficial to the study. We wound up, to our surprise, discovering that CMC had become an open conduit from teacher-to-student-to information-to-knowledge providing every imaginable combination of communication capabilities. By the end of the study each of us had been both "teacher" and "learner."

However, lest our enthusiasm override our more critical judgment, we would like to underscore some important concerns particularly relevant to the use of CMC as an instructional medium for teaching teachers and for teachers teaching.

We repeat -- CMC, in and of itself, teaches nothing; teachers do -- a fact often forgotten in the face of the lights, whistles, and costs of new technology in the classroom. Levinson (1992) reminds us that using CMC demands a new body of technical and information retrieval skills. Teachers must acquire those before they can be expected to use the medium effectively or creatively in their work with students. We assume that teachers can read, and know that libraries exist--and how they work--before we expect them to use those skills and resources in their learning and teaching. Similarly, we need to remember that the skills called for by CMC must be developed in teachers before if they are to be applied in their teaching. Where those skills exist, CMC becomes the invisible highway to learning it should be; when they are lacking in either the teacher or the student, the medium becomes a roadblock between the seeds of knowledge and the learner. For this medium to become a general resource rather than a "showcase" display on Parent's Day (or, worse, an unopened carton in the supply closet) institutions that teach teachers, and school administrators who hire them must become proactive in providing time, equipment, effective instruction and sustained support and encouragement so that teachers will develop personal competence and comfort with the technical aspects of CMC.

Only after teachers have been helped to build those skills, and have, themselves, learned through the medium, can they be expected to bring CMC into the classroom and creatively explore its educational potential.

As teachers learn, so do they teach. Thus, whether they use CMC in their own education courses, or teach through CMC, a second level of concern emerges. As in the case of any instruction medium or material, CMC must become secondary to the learning process. Teachers must be kept aware that the ways they facilitate learning -- challenges and presentations leading to active discovery and integration, responsive feedback enhancing assimilation and application, interest and support sustaining motivation -- all are doubly essential in the use of CMC. This medium neither traps students in a classroom nor controls them through face-to-face authoritarian power. Rather, it forces them to take charge of and accept responsibility for their own educational journey. It is important, therefore, that teachers come to appreciate that CMC is not an electronic blackboard or new form of overhead projector, but rather a "place" that will be transformed into a productive, interactive learning environment only to the extent that the teacher, even at ease with the medium, knows how to teach.

An additional caveat: the practicing teacher must recognize that the ease and autonomy of quick, asynchronous (delayed, but interactive e-mail) communication CAN lead to responses by both teacher and student that are less thought through than in traditional formal writing. Further, they need to learn that real-time synchronous communications ("chat," forums, PHONE) tend to transform phrases into acronyms (IMHO="In my humble opinion") nonverbal metamessages into emoticons (:- for a smile, and others) and to produce sentences that could never be diagrammed. (Thompson, 1992) As teachers and learners alike become familiar with the language and culture of the medium and gain access to the wide range of information and human resources it makes available, teaching and learning becomes a MORE, not less engrossing enterprise.

Of the many new realities that CMC brings to the learning environment, five stand out which can help us better visualize the medium's potential for in-service and pre-service teacher education. Each of these is available to any college or K-12 teacher with access to equipment and imagination.

EMAIL: We have used email (electronic mail) to announce upcoming assignments or on-line "appointments," to introduce new or ongoing trains of thought to be explored in writing in discussions, and to forward reference materials. Email can become a formal "documentation" of more informal discussions and examinations taking place during the course. With email, the sender is assured that information was received and that it is available for more detailed review. Email is more than simply a way for the teacher or student to "drop a note." Using this capability to its full potential allows both student and teacher to create mail lists, to route mail from one location to another, to organize communications by creating mail folders for convenient access and review, and to extract bodies of related messages into a file that can be stored "off-line" for review. The possibilities are wide-ranging and should certainly be explored, experienced and experimented with in upper level education courses. In that way teachers are provided opportunity to practice and "play with" creative applications BEFORE they meet their own students.

SYNCHRONOUS LINKS: Most larger systems or LAN's (local area networks) provide some means of real-time, point-to-point communication. In many instances several users can "link up" and converse. At ESC our DEC mainframe has a PHONE utility. The need for real phone contact (and frustrating telephone tag) become less necessary when, prior to, during, and even following course completion, synchronous contact can be made among those on the system. Using the PHONE utility allows instructor and student to converse simultaneously, and also provides opportunity for "real time" joint meetings among up to six users so that plans can be discussed, modified or rejected efficiently. Moreover, these 'sessions' can be transcribed or summarized as notes, or minutes, or assignment updates.

They also provide opportunity for students and instructor to "meet" and "get to know" one another in a less formal interactive mode. And all of this is true despite actual physical distances. In our case, we learned the hard way; not only did "in-service training" not exist, but even the two inch thick systems Manual failed to mention the existence of PHONE capability. It is apparent that if teachers are to learn the potential of synchronous communication via CMC, they should be made aware of its existence and helped to explore its advantages and shortcomings early in their training.

ASYNCHRONOUS LINKS: Group discussion is hardly a new idea in education and is a capability common to many CMC systems through conferencing modes, currently in use for advancing education on a world-wide scale (Rasmussen, 1991). ESC's VAX mainframe provides the conferencing system called "CAUCUS." It allows topics and administrative functions to be posted as discussion "items" that can then be 'responded to' by a group of participant readers. Individual 'Caucuses' can be open to all, or restricted to a specific group -- hence creating an 'electronic classroom.' Caucus items can be used for varying purposes during a course. We found that one item could be used to post assignments and administrative notes, one for "introductions" by participants, another to list resources, yet another to provide a place for informal "hallway chit-chat," and finally, items designed around learning objectives, discussion of substantive readings and emergent ideas, or working projects.

Unlike email, we found asynchronous conferencing valuable for interactive discussion of substantive issues. These discussions may last a few weeks or continue for months. In each instance, anyone can join in, review previous discussion, and participate on a level equal to those who have been involved from the start. Conferencing becomes extremely useful in managing discussions and critical review of readings and other assignments. It can be used effectively to allow the "learning space" to shift its purpose to become at times a seminar-like discussion group, at times a "lecture" with subsequent discussion, at times a tutor review, and at times a place to work out problems and directions. Here, again, the teacher's and student's level of technical know-how is coupled with pedagogical know-how to determine the degree to which discussions are deepened, broadened and moved forward with a minimum of digression.

ON-LINE SOURCES: Whether through NASA, the local library, the county courthouse, or educational networks like BITNET or INTERNET, a wealth of information is available on-line to nourish the electronic learning environment; it's just a matter of discovering them, evaluating them, and learning how to gain access to them. In our own course we have used BITNET databases (COMSERV), discussion lists (EDUCOM) and December 10, 1993newsletters and electric journals (like, DEOSNEWS, NETWEAVER) as up-to-date, accessible, and ready resources. If anything, because there is an overabundance of information available, information overload can become a real problem. It is important the teachers receive introductory training and time to explore these rich resources; it is essential that such introduction occur at a pre-service level, and becomes an intrinsic part of education courses so that felt "need" joined to interest becomes the impetus to real understanding and fosters application of the medium. Unfortunately, such training and demand is seldom a normal or mandatory aspect of education programs or certification requirements; it should be.

MOVING STUFF AROUND-UP AND DOWN LOADING: If there is a central body of technical skills empowering users of this medium, it is ability to move information around in the system -- to "get" information or files from a distance database or list, to bring it up into your own VAX system or PC, to transfer papers, files, and other information from and to whatever source is appropriate. With these uploading and downloading skills in hand, material can be gathered independently, presented to the 'class,' responded to by all, or stored for later use. Discussions and/or assignments can be shared, printed, reviewed, edited, and reviewed again and again. These skill MUST be taught to, assimilated by and used by teachers before they can be expected to apply them in their teaching. What better time to do so than in the course of pre-service study.

Modem-equipped personal computers linked through a mainframe are challenging definitions, expectations and demands for "electronic" education at both the college and k-12 level. As more and more students come to class equipped with notebook computers and more instructors view the modem-equipped computer as a learning tool rather than as a threat, institutions preparing teachers to use them effectively will be at the forefront of a new kind of "close" distance education. But we believe this can happen only as teacher education programs, administrators hiring and supervising teachers, and teachers themselves come to grips with what is different, what is similar, and what is special about CMC. Only if serious and sustained effort is made to help teachers develop and apply the necessary technical skill will the full and rich potential of the medium be realized. While physical classrooms and face-to-face tutorials will remain the preferred mode for many instructors and students, opening electronic pathways between teachers, learners, and the world of knowledge can and must be enhanced by adequate training and pre-service use, initiated and supported purposefully as an essential part of Teacher Education.

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