California State Polytechnic University, Pomona
International Center

Interactive Electronic Distance Education

in Zimbabwe

By

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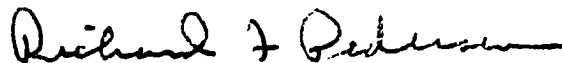Fax (714) 869-3282

Preface

With the dual objectives of providing information on successful experiments in economic growth that might be replicated elsewhere and of providing information to faculty of California State Polytechnic University, Pomona that could help them in working in developing countries, the International Center of Cal Poly Pomona has produced a series of short monographs for distribution to appropriate faculty, AID officials, developing country institutions, and assistance agencies.

Seven such monographs are being issued, principally based on case studies. Their preparation and publication have been made possible by a Matching Support Grant from the Office of Research and University Relations, Bureau for Science and Technology, of the United States Agency for International Development.

This monograph "Interactive Electronic Distance Education in Zimbabwe", is based on findings of Cal Poly Director of Distance Learning, Dr. Robert Threlkeld, in Zimbabwe where lack of adequate telecommunication infrastructure is among major growth bottlenecks. The manual contains practical recommendations that could be used as a sample for other developing nations in similar conditions.

Additional monographs in the series cover EXCEL for Managers (in French), Women Who are Making a Difference in Swaziland, Women Managers in the Banking Industry in India, Student Career-Related Services in Egypt at Cairo and Suez Canal Universities, Strategies to Achieve World Class Manufacture in Mexico (in Spanish), and Foreign Exchange Liberalization in Egypt.

The International Center of Cal Poly, Pomona would welcome observations on these monographs from recipients.

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Interactive Electronic Distance Education
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I. Background

During the Spring of 1992, as part of an on-going relationship between Cal Poly Pomona and Zimbabwe, I was offered the opportunity to travel to that country. My purpose was to examine possible ways in which distance learning could be used to link the Cal Poly with Zimbabwean educationa' institutions.

Cal Poly Pomona is a leading university in distance education. Since 1985 the university has been broadcasting televised courses to 30 high schools in the Los Angeles area. Each year 500 students earn university credit through this system. In addition, the university regularly broadcasts special educational events by satellite to a national audience.

I head the university's distance education program. I have been in field for over a decade and am well versed in a variety of educational technologies. I have an extensive publishing history and speak regularly to groups throughout the U.S. In addition to heading the university's distance education program, I am a professor in Cal Poly's School of Education, coordinating the school's educational technology program.

I was interested in two activities in Zimbabwe: one, to explore how distance education could be used effectively in Zimbabwe, particularly in rural public education; and two, to build on Cal Poly's growing relationship with Zimbabwe and the University of Zimbabwe, and to strengthen it by using distance education technology. In particular, I was interested in seeing how informational and educational resources could be shared among the two locations. Findings from this portion of the visit will be available in future publications. The current monograph concentrates on distance learning within Zimbabwe itself.

Cal Poly has a variety of educational resources which may be valuable to Zimbabwe. The university is well-known for its engineering, business, and science programs, offering both undergraduate and graduate degrees. In addition, the institution has a well-developed arts and humanities area, which provides all students with a broad cultural understanding. In addition to schools of environmental design and of agriculture, the university has a school of hotel and restaurant management, one of only a few in the U.S. Also, Zimbabwe may find Cal Poly's School of Education as a valuable resource for teachers.

In order to work with Zimbabwe in the two areas described above, I proposed the following kinds of activities:

1. Review distance education activities at the university in Harare and provide information about our distance education strategies at Cal Poly.

2. Review academic programs at the University of Zimbabwe which could be involved in a distance education partnership with Cal Poly.

3. Develop an understanding of media resources in Zimbabwe (TV, telephone, computer) that are or could be used in distance education.

4. Visit and become acquainted with teacher education programs for rural schools in the country. Observe rural schools.

II. Brief Facts about Zimbabwe

Zimbabwe is located in southern Africa, bordered by Mozambique, Zambia, Botswana and South Africa. It is a tropical country about the size of Montana (390,000 sq. km.). Much of the country is high plateau. Harare, the capital, is some 5,000 feet in elevation.

Zimbabwe is the former British colony, Southern Rhodesia. The country gained independence in 1980, and has been self governing for the past twelve years. Although English is spoken by 80% of the population, the officials languages are the indigenous tongues of Shona and Ndebele. A census was taken during August of this year, and a preliminary count projects the population at about 12 million persons.

The country has two main sources of wealth and subsistence: agriculture and mining. Although only 7% of the land is arable, 74% of the labor force are involved in some aspect of farming. Agricultural products and mining products make up 80% of the country's exports.

For the past several years, and particularly since 1990, Zimbabwe has been facing a severe drought. Prior to that time, the country was one of Africa's few food exporters. Zimbabweans are well-known and respected for their skills in farming.

Zimbabwe's educational system reflects its British roots. Students attend primary school from grades 1-7. Secondary school consists of four years of instruction (grades are called "forms:" forms 1-4). Completion of all four forms provides graduates with what is known as an "0" level certificate. A more advanced and specialized certificate can be obtained after two more years of secondary school. Upon successfully passing exams in at least three subjects, students receive an "A" level diploma.

Until recently, the only university education available in the country was at the University of Zimbabwe (formerly the University of Rhodesia) in Harare. In the past two years two additional universities have been developed: one in Bulowayo (specializing in science and technology) and a second in Mutare. The latter, African University, is sponsored and partially funded by the Methodist Church.

Prior to independence, white students had universal education through secondary school. Black

Africans attended primary school but few entered and completed secondary education. Education was segregated, and there were few secondary schools for Africans. Since 1980, however, universal education has become available for all through secondary school. Although touted as being free (there is no tuition), there are associated fees in secondary school which prove to be costly to many Zimbabweans.

Most teacher education is handled through a series of sixteen teacher training colleges (Chivore, 1990). These colleges are distributed throughout the country, and are attended by secondary school graduates with an "0 level" diploma. This system differs from the U.S. model of university graduate teachers, and is similar to this country's old "normal school" structure. These teacher training colleges are under the supervision of the University of Zimbabwe's Faculty of Education, which oversees curriculum, inspects student teaching and grants diplomas to graduates.

III. Fact-Finding Experiences

I spent the entire month of August, 1992, in Zimbabwe. Although I was housed at the University of Zimbabwe's Guest House, I traveled throughout the country a good deal. My time was spent in two general ways: interviewing faculty and administrators at the University of Zimbabwe, and similar activities with the officials in the Ministry of Information and Culture. The following is a summary of those visits:

My primary contact in the Ministry of Higher Education was Dr. E. J. Chanakira. Chanakira is the Permanent Secretary of the Ministry, a post which is similar to the CEO of a corporation. In 1988, the Government of Zimbabwe split its single Ministry of Education into two. The Ministry of Education and Culture is now responsible for primary and secondary education, and the Ministry of Higher Education is responsible for the university system as well as the teacher training colleges. Chanakira has managed various educational enterprises since Independence in 1980. He received his doctorate from the University of Georgia.

I was impressed with Dr. Chanakira's willingness to spend a significant amount of time with me, explaining the structure of education in Zimbabwe. At the apex of power in the country, he clearly was busy. However, he was keenly interested in how distance learning technology could be used to improve education.

He arranged for me to make several visitations to rural teacher training colleges in Masvingo and Chinoye. These visits provided a context for the activities proposed at the end of this document.

Masvingo is in south-central Zimbabwe, near a national landmark, the Great Zimbabwe ruins. I spent a day touring Bandolfi Teacher Training College and later Morganstar Teacher Training College. Both were located in very remote regions, surrounded by low brush and trees, some fifteen miles from the main roads. Students, both males and females,

live at the facilities and receive three years of training to prepare them to teach primary school students. A key part of their training is student teaching, during which they are distributed among a dozen or more schools in the region.

Both Bandolfi and Morganstar are former missionary schools. Each has a church on the campus and a chaplain, whose salary is provided by outside religious sources. Although the religious organizations maintain ownership of the buildings and grounds, all teachers in the two schools are government employees. Most seemed quite well trained, some with advanced degrees from the U.S. and U.K. Two major limitations were books and equipment. The lack of textbooks is endemic in Zimbabwe, with many students sharing a very limited number of texts. The shortage is due to the costs of paper and related supplies.

Dr. Chanakira also sent me to visit the newest teacher training school, Chinoyi Technical Teacher Training College. Established in 1990, the school prepares students to teach technical subjects, such as computers and home economics, in secondary schools. In contrast to the two other teacher training schools, this was a new, attractive brick facility, somewhat like a large suburban high school in the United State. The school principal was extremely energetic and knowledgeable, and was anxious to use new technologies in instruction. His computer training program appeared to equal programs in U.S. community colleges.

Findings related to this portion of my visit were:

• **There is a high need to provide teacher training institutions with specialized staff.** Although the rural teacher training institutions had some excellent staff, they appeared to be distributed erratical among the various schools. I was told that there was a limited number of specialists in any single field, and not enough to have at each of the sixteen teacher training institutions.

• **Equipment, especially computer or telecommunications equipment is rare and often dated.** Except at the Chinoyi facility, I saw no computers. These are an expensive import item and difficult for institutions to obtain. Computer faculty are equally difficult to find as many technically trained persons seek work in the more lucrative private sector. The most rural facilities lacked good telephone service. Although difficulty with telephones is a consistent problem in Zimbabwe, the rural schools are served by a single copper wire strung on poles along the roadway. The erratic nature of the telephone network in Zimbabwe would make it difficult for any high-speed telecommunications.

As noted above, I spent another large period of my time speaking with faculty and administrators from the University of Zimbabwe. I interviewed several persons from the technical elements of the University: Robert Sheppard, head of the computer center; Rob Borland, chair of the computer science faculty; and Mike Collier, professor in electrical engineering. As with most other aspects of the University of Zimbabwe, I was surprised and impressed with the level of technical skills and enthusiasm of these people. They are doing great work with limited resources, particularly books and computing hardware.

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Collectively, their major concern was their lack of international networking capability through the global network known as "Internet." We spoke at length about the problems of the local telephone service. If a major U.S. university could arrange to assist the University in obtaining international connections, it would lead to a very fruitful exchange mechanism for research and distance education.

I also spent substantial time with professors and administrators from the Faculty of Education. My major contact was Dr. J. P. Rwambiwa. Rwambiwa was educated in the U.K. and received his doctorate in educational technology from Columbia University. He developed my itinerary and acted as a guide to the structure of the university.

Including the technical persons mentioned above, I interviewed over twenty faculty and administrators, including the Vice Chancellor of the University (equivalent to a U.S. university president), the Dean and various department heads. To summarize my findings at the University:

> • **Distance learning is an important topic at the University of Zimbabwe.** The University, in conjunction with the Ministry of Information and Culture, has an on-going task force on distance learning. The Faculty of Education has a plan to offer a degree in educational administration by distance learning within a year. Most persons I spoke with were substantially more conversant with distance education than faculty in the U.S.

> • **Distance learning in Zimbabwe means print.** As noted earlier, my experience with distance learning has been exclusively related to electronic media. Although print correspondence instruction has a long history in the U.S., most attention now is on live, interactive distance teaching using media. Zimbabwe, like other developing countries, is more focused on the "industrial" model of distance education. In this model a large numbers of course packets are reproduced to reach large numbers of students. Zimbabwe is a country in a hurry; anxious to provide advanced education to a growing population. Once the government expends the cost of developing course materials, the print correspondence model is very inexpensive to reproduce.

> • **The University of Zimbabwe has strong ties to United Kingdom and Canadian distance learning organizations.** Several faculty members had visited the British Open University to examine course production and distribution. Dr. Rwambiwa himself had plans this year to visit the Commonwealth of learning in British Columbia. The Commonwealth of Learning is an international organization designed to assist member countries in using distance education. The University of Zimbabwe plans to use Commonwealth of Learning course materials in Zimbabwe until the country is able to produce its own.

> • **While somewhat curious about technology-based distance education, the University has made a major commitment to print-based instruction.** Although I

was warmly welcomed at the university, I felt that the sort of technology that is being used in the U.S. for distance learning (satellites, microwave, compressed video) was not compatible with the university's current directions. Senior staff had clearly identified with the mainstream of developing countries and were in the process of expanding the use of print-based distance learning. Given the technical infrastructure of the country and the need to educate large numbers of students, this is probably a wise decision.

During my stay in Harare, I also interviewed officials from the public radio and television media. Zimbabwe uses both media as vehicles in distance education. The Zimbabwe Broadcasting network (ZBC) operates two television channels several hours each day. The viewing areas consists of Harare, Bulowayo and Mutare. One channel is used primarily for education, and programming is largely older telecourse materials from the U.S. and Europe. Little educational television is produced locally.

ZBC also has an educational radio system. It is used several hours each day, and provides formal education for grades 1-7 for 19 hours each week. The broadcasts are used to supplement in-class elementary instruction. The station also broadcasts non-formal instruction for homes in subjects such as cooperatives, health care and agriculture.

• **Zimbabwe uses mass media to provide instruction to students and adult learners.** As with the print media described earlier, Zimbabwe sees its greatest need as providing basic instruction to its growing population. The country is following the model of other developing countries, and has yet to employ some of the more sophisticated and individualized media models used in the U.S. and other more developed countries.

IV. Distance Learning Options for Zimbabwe

The above findings suggest that Zimbabwe has developed a sophisticated distance learning model for the needs of its mass audiences. The methods used are called "First-Generation" distance learning models. The intent is to provide a large audience with a general, non-specific curriculum such as basic language or mathematics instruction.

However, Zimbabwe has made little use of the interactive media such as two-way television. These media allow targeted instruction in highly specialized areas to be shared among a number of geographic locations. Zimbabwe has not used these technologies largely because of limitations in the communication infrastructure (an aging telephone system, limited television capability) and the lack of sophisticated hardware. However, there are significant needs for interactive distance learning which uses electronic technology to deliver education from one location to several others. The remainder of this monograph will examine some of the options available in interactive distance learning,

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research results that suggest that distance learning using these media is effective, and a concrete proposal for the introduction of such technologies in Zimbabwe.

V. Interactive Distance learning Technologies

As noted earlier, distance education is the term used for learning experiences where teacher and student may be separated by time or geographical distance. The most common form of distance education is correspondence education in which the medium for instruction is print in the form of texts and materials and written student assignments. Traditional correspondence courses use the mail system as the delivery system. While it is relatively inexpensive, correspondence education is limited by its dependence on printed text and also by the speed at which interactions take place between teacher and learner.

When the broadcast media of radio and television became widely available, these were used to deliver educational programming. Because the signal can reach large numbers of listeners/viewers, broadcast media are also inexpensive on a per pupil basis. The limitation of this type of instruction is the inability for timely interaction between learner and teacher.

In the United States and other regions, many educational institutions have made use of a variety of communication mediums to create distance education experiences which are more like traditional classrooms. Because of the difficulty of attracting teachers to rural areas, the U.S. has created several national networks which broadcast secondary school courses to students in the 11th and 12th grades. Small groups of students in their school libraries watch classes in math, English and foreign languages. They are linked to the on-air instructor by telephone and computer, and are able to communicate instantly with him. Currently, German is taught to some 2,000 students in small high schools throughout the U.S.

Similarly, a consortium of 24 major universities created the National Technological University in 1987. These universities deliver master's degrees in engineering and business by satellite to major corporations throughout the country. Other organizations, depending on their needs, have used different technologies. For 30 years the U.S. state of Wisconsin has been teaching courses by telephone to teachers in small cities. A number of universities make extensive use of computers to provide courses to distant learners.

It is possible to describe the technical choices for distance learning by their transmission system (i.e. radio, copper wires) or the final media output (i.e. pictures, data, voice). The latter approach is preferred because it focuses on what the learner experiences. A somewhat similar description is available in Far West Laboratory's publication "The Promise of Distance Learning." A more extensive description of equipment and costs is given in "Linking for Learning, available from the U.S. Government Printing Office.

The media types are:

Interactive Audio Interactive audio is like a telephone conference call. Students and

teachers at multiple locations have a loud speaking telephone device and can hear and talk to each other in real time. This form of distance learning has been around for decades and is widely used in rural U.S. areas such as Wisconsin, Wyoming and Montana. Many people initially assume that students and teachers must be able to see each other for learning to occur, but that is not the case. The University of Wisconsin has been teaching music courses such as "violin bowing techniques" for years over interactive audio networks. If instruction is carefully designed and supplementary materials — outlines, pictures, video tapes — are sent to students in advance, students learn. Most commonly, interactive audio instruction is over telephone lines, but remote regions occasionally use two-way radio for teaching. This would be a difficult technology for Zimbabwe to use because of the aging and unreliable telephone network. However, as the phone system improves, this might become a very useful and cost-effective technology.

Interactive Audio with Audiographics Even though many subjects can be taught with only interactive audio, many people want to "see" something. However, transmission of live television over regular telephone lines is difficult because the amount of data required for a picture is more than can "fit" over copper wires. Audiographics is the trade-off between the desire for visual information and the constraints of the telephone network. With audiographic instruction, students and teacher hear each other and share a common visual field (like an electronic blackboard). Through the use of computers and monitors, a teacher can illustrate a lesson from one location and transmit a series of still motion pictures (outlines, charts, equations) to distant learners. In addition, students at remote locations can also transmit audiographic images themselves. Audiographic technology is quite cost effective and is used frequently in rural locations. Audiographics technology will be suggested for use in Zimbabwe at the end of this monograph. However, its application will require specialized telephone lines for operation.

One-Way video with Two-way Audio This is what most people in the U.S. currently think of when they hear the term "distance learning." It is the transmission of live pictures (usually of a teacher) to an audience of distant learners at multiple locations. Students view the teacher on a television monitor and can talk with the instructor on-air over a telephone or radio system. The teacher cannot see the students, but can hear their questions or comments. This form of distance learning has been the most publicized in the United States, partially because of the Federally-funded Star Schools program, a $60 million effort to support national distance learning networks. Oklahoma State's Arts and Sciences Teleconferencing System (ASTS) and the Texas-based TI-IN network are examples of large one-way video/two-way audio networks. Although extremely costly to initially establish, these networks can serve large numbers of students and are viewed as efficient. Receiving schools need a satellite receiving unit, telephone line, plus monitor and VCR. This technology would be difficult in Zimbabwe because of the lack of a broad television structure in the country.

Interactive television Not to be confused with programmable video disk technology, interactive television is live two-way audio and video. Each person at every location can see and hear people at other locations. Each site is like a rudimentary television studio. This is the most "media rich" learning environment and the one most desired by educators. The

most routine transmission medium to date has been microwave, in which 2-5 locations are connected to each other in a star-like configuration. Now, as technological alternatives become more available, fiber optic networks are becoming common. Interactive television is the most expensive form of distance learning on a per pupil basis. The establishing of interactive television networks requires a close working relationship with local telephone companies, or in the case of microwave-based systems, licenses from the Federal Communication Commission in the U.S. I am unaware of licensing requirements in Zimbabwe. This highly technical form of distance learning would not be appropriate for Zimbabwe with its current state of communications infrastructure.

Computer Based Distance Learning Although audiographic systems also involve computers, the computer is used to create visual images. Most computer-based distance learning systems use computer conferencing and bulletin board software to store and transmit *text*. Some consider it to be a logical technical outgrowth of correspondence instruction, the original distance learning whose history reaches back nearly a century. Usually computer-based distance learning is not live, and students "check in" for mail and messages whenever it is convenient. Although it is clearly the most inexpensive form of distance learning, it lacks live interaction and is often considered a supplement to other mediums. Such a system would be quite feasible in Zimbabwe if reliable telephone lines were available.

VI. Research on Effectiveness of Distance Learning

Officials in any country want to know about the effectiveness of distance learning prior to making a large investment in equipment and course development. While there is a large literature which demonstrates the effectiveness of correspondence education, developing countries could benefit from some understanding of research on mediated distance learning. The following material, drawn largely from a chapter I have written for a book on distance learning, provides readers with a good understanding of the effectiveness of media. The research was performed almost exclusively in the U.S.

General media comparison studies

The most common theme in distance education research is that which compares two or more media in relation to their effectiveness: "does it teacher better than..." Typically these studies are comparisons of traditional instruction with instruction by media such as computers, television and radio. Although they often show some slight advantage for one medium or another, the most common outcome is "no significant difference" between mediated and face-to-face instruction. Literally hundreds of media comparison studies have been performed over the past forty years, and the results have been uniform: the instructional medium doesn't appear to make any difference in student achievement, attitudes and retention.

There have been so many media comparison studies that researchers are writing reports that are reviews of the entire field of media comparison. For example, in 1967, Reid and MacLennon performed a broad review of 350 instructional media comparisons. They found a trend of no significant difference in comparisons of mediated instruction vs. face-to-face, regardless of whether the instruction was live or videotaped. In another review of media comparison literature, Dubin and Taveggia did a longitudinal study of various approaches used in college teaching. They found the following:

> In the foregoing paragraphs we have reported the results of a reanalysis of the data from 91 comparable studies of college teaching technologies between 1921 and 1965. These data demonstrate clearly and unequivocally that there is no measurable difference among truly distinctive methods of college instruction when evaluated by student performance on final exams. (Dubin and Taveggia, 1968, p. 35)

Visual-based instruction

The above summaries look at results from studies of a wide array of media. What about studies which focus on distance education which uses some form of visual-based instruction, such as television or audiographics (televised computer graphics), the technology suggested for use in Zimbabwe?

Cohen, Eberling and Kulik (1981) performed a meta-analysis of 74 studies which compared visual-based instruction with conventional instruction. They found that students learned slightly more from visual-based instruction than from traditional teaching, but there was typically no difference between the two groups in regards to course completion, student attitudes, or the correlation between attitudes and achievement.

Whittington (1987) performed the most widely quoted review of research on instructional television. Under contract to assess the instructional effectiveness of television for the Coordinating Board of the Texas College and University System, he reviewed studies done during the 1970's and 1980's and concluded the following:

1. Comparative studies indicate that students taking courses via television achieve, in most cases, as well as students taking courses via traditional methods.

2. Findings of equivalent student achievement hold even when rigorous methodological standards are applied.

3. Television is a technological device for transmitting communication and has no intrinsic effect, for good or ill, on student achievement.

4. Effective instructional design and techniques are the crucial elements in student achievement whether instruction is delivered by television or by traditional means.

Looking at one specific audience, high school students, we find similar results. Recent evaluation reports suggest that students who enroll in distance learning classes seem to do as well as students in traditional classroom settings. One group of high school students (SERC, 1990) taking a Japanese course learned slightly more than their traditional counterparts. Speth, Poggio and Glasnapp (1991,) found that satellite students received lower grades than students in conventional classes, although the researcher attributed this to differing student characteristics among the two groups. Satellite students tended to be better students, who had heretofore competed only with peers in a single (often small) school setting.

One audiographics report (Murray and Heil, 1987) stated that "...the pattern of scores across seven courses justifies the conclusion that receiving (distant) students do as least as well and perhaps better than their sending site counterparts and non-teleteaching control students." (p. 14)

As noted above, these findings which indicate that the medium doesn't have much effect are extremely common. Russell (1991, a) reviewed media studies and abstracted sentences from studies which include terms such as "no significant difference." In nine single-spaced pages of research results snippets ("...students can learn about as well from television as from classroom instruction. . .media comparison studies, regardless of media employed, tend to result in no significant differences. . .over 24 years there was no significant difference in academic performance of the two groups..."), he documents the dulling consistency of the findings.

VII. Implementing Audiographics in Zimbabwe

The technology most likely to be useful in Zimbabwe is audiographics, described previously. The technology would allow the country to share scarce educational resources among several locations at once. The following is a concrete proposal for a pilot study of the use of this technology in support of the teacher training colleges in Zimbabwe.

The goal of the project would be to demonstrate the use of cost-effective audio and video teleconferencing technology for teacher education in Zimbabwe. The initial phase of the project would link the teacher training facilities in Chinoyi and Belevedere in Harare. The second phase would build on the experience of the first, and would expand the electronic network between most or all of the Colleges. The demonstration would have the following elements:

1. Installation of Audiographic telecommunication links first between Chinoyi and Belvedere Technical Teacher Colleges, and later among other colleges

The technology to be employed is known as "audiographics" in the U.S. It allows the instructor and students to interact over telephone lines, hearing each other's voices and viewing computer graphical images. While it does not provide regular television quality video per se, it is quite suitable for most forms of instruction. The proposed equipment is

currently in use in rural regions of the United States and operation doesn't require advanced technical training. Its major virtue for Zimbabwe is that it is relatively inexpensive, uses existing telephone lines for transmission, and is readily repairable by computer technicians. The PTC would need to provide leased lines for the demonstration project.

2. Provide training to demonstration faculty in Teacher Training Colleges

The project will provide assistance to lecturer(s) who have been selected to provide the demonstration lessons between Chinoyi and Belvedere. This involves helping faculty to think in graphic terms, techniques for teaching students at a distance, and ways to design telecommunicated distance learning lessons. In addition, training would be provided to lecturers from other Teacher Training Colleges, so that they would be ready to participate in a second phase of the project.

3. Monitor and evaluate the effectiveness of the project

The project's instructional duration should be no less than two terms, so that lecturer's and students gain some measure of comfort with this new form of instruction. A major element of the project will be to gather formative and later summative evaluation data on the project. A major portion of the evaluation will concern costs of the project, so that the Ministry can assess the viability of expanded the project. The initial Chinoyi-Belvedere phase of the project would be given a formative evaluation, to assist in designing the second more expansive phase of the project.

4. Disseminate the project to educators and administrators

One major value of a demonstration project is its ability to make an abstract idea, such as teaching students by computers and telephone lines, concrete and visible. It will be important to expose educational decision makers to the project, so that they can assess its value in other educational settings. Some form of mass media coverage, press and television, would be worthwhile, as would be a series of workshops throughout the country.

5. Train and support permanent technical and instructional staff

The single most important aspect of a project such is this is the creation of a staff of persons who can continue and expand the project at the end of the demonstration period. Without this, the project will fade away once the initial funding is exhausted. The project will identify one or more educational organizations which will act as both the technical and instructional support to telecommunicated distance education. Project staff will then provide training on maintenance and repair of equipment, as well as instruction on how to use it effectively.

In summary, Zimbabwe is making good progress in using traditional print-based distance learning to provide education to a large audience. However, the country could make use

of some of the newer technology-based distance learning models, in particular models which use audiographic technology. The above project suggests a realistic pilot test of newer forms of distance education The project's strength is that it meets a current educational need using existing, inexpensive equipment which doesn't require sophisticated engineering support. Once this form of instruction is shown to be successful, it can be expanded to other teacher's colleges as well as Zimbabwe's university system, providing a low cost educational network to move educational resources to places they are needed throughout the country.

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