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STUDY GROUP FACILITATORS' PERCEIVED ROLE OF APPROPRIATE TECHNOLOGY IN DISTANCE EDUCATION FOR OUT- OF- SCHOOL SECONDARY LEVEL LEARNERS IN ZIMBABWE

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ABSTRACT

Study Group Facilitators' Perceived Role of Appropriate Technology in Distance Education for Out-of School Secondary Level Learners in Zimbabwe

Chrispen Max Gundani

Thirteen study group facilitators, in the Harare Region of Zimbabwe, were surveyed on the instructional role of three audio technologies in study group distance education for secondary level learners. In a focus group, involving applications of communication technologies in distance education, the facilitators were introduced to the study. They then answered a questionnaire about the uses and obstacles to the use of radio, audio tape and teleconferencing in solving specific instructional problems in study centers. They were also asked to indicate whether they would use the three audio technologies if they were available, and to suggest how the use of such technologies could impact on their roles.

Findings indicate a high degree of correspondence between the instructional problems study group facilitators believe are most troublesome and the audio technologies they choose for addressing the problems. Also, the results indicate a relationship between the obstacles that facilitators feel are most serious and the audio technologies they choose for instructional use at centers. The findings indicate that, given the obstacles, radio is the most preferred medium, followed by audio tape and then teleconferencing. In general, the facilitators view the instructional potential of these technologies in study groups quite favorably, but they were particularly critical about the lack of material resources at centers, and the lack of support for audio technologies by distance teaching institutions.

These results suggest that, not withstanding the obstacles to the use of radio, audio tape and teleconferencing in study groups, the facilitators not only consider them appropriate tools for addressing the most difficult instructional problems, but also value their role in dealing with other important, but less troublesome instructional problems.

Dedication

To my loving family,

Helen, Raviro, Tinovonga, Fungayi,

My Mother Tichayeva Veronica, and Late Father

Mr. Max Mushandu across the seas.

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CHAPTER 1

Introduction

Problem Development

Distance education which had its origins in correspondence education, appears to be a major avenue for achieving universal education in the developing countries. It has been in existence for as long as 100 years in some countries (Baath & Willen, 1981). For most years in this period, print has been the sole medium of instruction. It was in the late 1960's and early 1970's that other media such as radio, TV and audio tape, began to be incorporated with correspondence lessons in some programs. In developing countries, the incorporation of these technologies into distance education programs has not been easy because of financial and logistical problems. These countries have limited resources and generally lack qualified educational technologists who can successfully implement multimedia distance education programs. As a result, the cost and appropriateness of some of these technologies are often questioned although their educational value may be acknowledged.

In Zimbabwe distance education started in 1954 as a response by voluntary organizations to the desire by Africans to acquire a formal academic education (Wakatama, 1983). When Zimbabwe became independent in 1980, its formal education system was like a ladder which narrows progressively towards the top so that many had no choice but to fall off at some point on the way (Hendrikz, 1979). This is not to say, however, that education systems should ensure that all reach the top automatically. Rather, it is argued that one criterion of a successful education system is that it should have within it a minimum of artificial barriers, especially geographical, racial, and financial ones, to anyone with educational aspirations. The drop-out rate was very high particularly at the end of primary education. Only 12.5 % of primary school graduates enrolled into

academic secondary schools and another 8% enrolled in junior secondary schools which Africans felt provided an "inferior" type of education (Dorsey, 1989). One of the consequences of this lack of access, has been the seeking of satisfaction by individuals for their academic educational needs through correspondence.

Perraton (1983), argues that there are three different approaches to distance education which all rely on a careful and thorough preparation of learning/ teaching materials at a central institution.To increase the student's chances of success, he notes that the study materials have to be of a high quality. According to him, the first model consists of education that is provided through correspondence courses to individual students who are at home and not enrolled in regular schools. Such students may be in gainful employment or unemployed.

The second approach that Perraton identifies is one in which distance teaching methods are used in the regular school to raise the quality of learning in specific subjects and/ or to change curricula. Radio and television are often used for this purpose. In Mauritius, for example, correspondence courses with broadcast support have been used to introduce new subjects to the school curriculum (Dodds, 1982). In Zimbabwe, radio was successfully used to introduce the teaching of new Mathematics in primary schools in the 1970's. Today it is used as a support in the teaching of various subjects at both primary and secondary levels (Kashambwa, 1990).

The third model Perraton (1983) asserts is the study group and/ or study center system of distance education that was developed in Indonesia, Malawi, Zambia and Zimbabwe in the late 1970's to address some of the difficulties of young correspondence secondary school level learners. According to Kinyanjui (1976), these difficulties include a lack of maturity, life experience and self- directed study experience. Kinyanjui also

points out that studying in isolation requires a high degree of maturity and independence for sustained learning and motivation. Wakatama (1983) found that a high proportion of the adult correspondence students he surveyed liked studying at their own pace which seems to support Kinyanjui's assertion. According to Kinyanjui (1976), the drop out rate from distance education studies is high for young primary school leavers and the failure rate of those who remain is also high. Coming from a developing country with a large number of secondary level distance learners, I tend to agree with Kinyanjui's observations. I also see study groups as providing a compromise between independent study and formal schooling since they help to reduce isolation, increase motivation, and promote cooperative learning.

In Zimbabwe study groups mushroomed throughout the country after the attainment of independence in April 1980. The new government regarded education as a basic human right and expanded its provision at all levels. Realizing that providing secondary education to all primary school graduates in the conventional way was not feasible because of financial, material and, human constraints, it encouraged the setting up of study groups. Appendix A shows the pattern of enrollments and transition rates from grade 7 into form 1 since 1979. It is apparent that many grade 7 graduates could not be absorbed into conventional secondary schools. Study groups were seen as a viable and cost-effective method of providing secondary education to those who wished to continue with their education.

In 1992 there were 345 registered and viable study groups throughout Zimbabwe. These had 25 434 learners and were manned by 643 facilitators also known as mentors. Harare Region had 48 study groups, 8872 students and 180 facilitators which makes it the largest in terms of study group distance education. Appendix B depicts enrollments and staffing in study groups in Zimbabwe.

Study groups operate under certain conditions. For instance, to qualify for registration and, for a facilitator who is paid a salary grant by government, not only must it have a Responsible Authority but a minimum of 20 learners studying for their Junior Certificate, O and A level Certificates. These learners must also be registered with a recognized distance education institution that is based in Zimbabwe. The institution provides self-instructional materials to the students and other tutorial services. Besides paying a salary grant for the facilitator, the Government pays a capitation grant to the institution which tutors the student on a pro rata basis. This payment reduces the student's fees by about 25%. It also provides personnel to administer and supervise study groups. There is an Education Officer responsible for non-formal education programs in each of the 9 Regions. Also, the government provides money for facilitators' and Responsible Authorities' training workshops. Capitation and salary grants amounted to over Z $ 4 million (US $ 500 000) in 1992.

The Responsible Authority may be a district or a rural council, a municipality, a church organization, a committee, a registered company, or a head of a school or an institution. The Responsible Authority provides studying facilities to the group, registers it with a distance teaching institution and the Ministry of Education, collects and pays students' tuition fees to the institution with which students are registered, and employs the facilitator. The Responsible Authority may charge students an administration fee to defray running costs. This is supposed to be a small amount, not exceeding Z $10.00 (US $1.20) per term. But some charge far in excess of this. Where this happens Ministry officials ask for a justification. If no satisfactory justification is given the Responsible Authority is instructed to reduce the fee to an acceptable level.

Curran and Murphy (1989) argue that in study group contexts, the facilitator plays a critical role in the fostering of learning. This is confirmed by our observations as well.

In Zimbabwe, for instance, the facilitator performs a variety of duties. These duties are: teaching, keeping a daily attendance register, establishing and maintaining a suitable atmosphere for learning, ensuring that students complete and submit assignments and tests by the date set by their distance teaching institutions, advising students in their academic and social life, advising the Responsible Authority including the institution and the Ministry of Education of the needs of the students, and notifying the institution about any general problems related to the course materials (Ministry of Education, 1984: Chief Education Officer's Circular Minute No. 17).

When it is considered that the facilitator is generally an O level graduate without professional training, these responsibilities may be too demanding for them.
To perform these duties satisfactorily and confidently, therefore, facilitators need regular training in how to manage study groups. Such training is not widely available due to limited resources. Not every facilitator can attend the few training workshops that the Ministry of Education organizes from time to time. It is partly for trying to find other ways of making the facilitator's job easier (e.g. by using audio technologies for educational purposes), and, for finding a justification for the use of these technologies in study group distance education that this study has been undertaken. It is for these reasons that the study group facilitator has been the focus of this study.

In considering the use of educational technologies in education systems, it is observed that there are really two quite different users which are the student and the teacher or the facilitator of learning. In the study group system of distance education in Zimbabwe, the researcher observes that there are three users. These include the study group facilitator, the study materials produced and distributed by distance teaching institutions (the teacher), and the student. The value that the parent institution places on the quality of the learning materials may affect the overall quality of its programs. The institution is the

controller of the quality of the material. The study group facilitator is the controller or director of the use of the material or technology within the study group setting. The student is the end user of the material or technology in the study group.

Because of the crucial role of the facilitator in the study group, he/she must be convinced of the value of the technology in facilitating the learning/ teaching process in order to influence the parent institutions to develop appropriate materials and programs which he/she can implement. If not, the technology will most probably not get the opportunity to work on its intended audience, the study group student. In the case of schools, teachers can block the target audience's access to the program by not having it or its delivery system available to the students (O'Bryan, 1981). Within the study group setting, the facilitator is the first audience, while the student is the intended audience and the institution is the developer and distributor of the materials and programs. The facilitator has, therefore, the capacity to block the study group student's access to the programs.

Two other factors which affect the student's use of the material and the programs are the availability of the necessary delivery system and the availability of the people who know how to use the system. Unless study groups have the hardware, and facilitators know how to operate it, the integration of print with audio technologies such as radio, audio tape and teleconferencing, will not serve those study group students. The institution that provides the tuition, the facilitator, the necessary delivery system, and the knowledge of how to operate the delivery system, all determine whether or not the student will ever have the chance to listen to and/ or see the program during meeting times. The bottom line of all this is that the parent institution determines the delivery system and the facilitator influences how it will be implemented. The researcher observes that presently distance teaching institutions in Zimbabwe do not seem to be interested in a multimedia approach to distance education despite the educational and economic benefits that may be

derived from adopting this approach. Over the years the British Open University has demonstrated these benefits. In Zimbabwe, lack of competition in this lucrative business may be contributing to this state of affairs. It may require only one institution to adopt successfully a multimedia approach for the rest to realize its benefits.

Another problem in the adoption of communication technologies in education programs is that, more often than not, the educational benefits that may derive from their use are underplayed by policy makers. This is partly because the appropriateness and educational value of some of these technologies have not been fully discussed and clearly understood.

The above statements point to some problems that are associated with the applications of appropriate technology in distance education. For instance, choosing what is appropriate technology in the context of a developing country also causes problems in decision making. Without 'bottom line' support, distance education programs' access to government and corporate resources will not be on the same basis as formal education or other investment ventures. Providing distance education is big business to the institutions concerned. They want to make huge profits out of it. Resources, therefore, will not be allocated to developing distance education programs (e.g. integrating print with audio technologies) on the basis of educational benefits but rather on the basis of the state of the economic climate.

The integration of print with audio technologies involves using resources of distance teaching institutions as well as the government, and resources have cost implications. And such costs have to be justified economically and otherwise. Without the effort, and/ or the opportunity to show the educational as well as the potential dollar benefits associated with the cost of such an integration, government policy makers and principals

of distance teaching institutions see the integration only as an expense. When realistic information about the value and benefits of integration is not provided to them by the Ministry of Education, decision makers may draw arbitrary and inaccurate conclusions. .

There is also a lack of trained distance educators and educational technologists in Zimbabwe, as a result, it is extremely difficult to successfully work out and implement distance education programs that integrate print with appropriate technology. It is, therefore, no wonder that there is no private distance teaching institution in Zimbabwe that has an educational radio program for its secondary level learners.

Failure to adopt a multimedia approach in study group distance education, which can be attributed to the lack of recognition of the benefits of integrating print with appropriate technology in this type of education, calls for the urgent tackling of this problem in Zimbabwe. One way of addressing the problem is through a survey to find out what facilitators, who are the key personnel in study groups, feel about this problem.

Statement of the Problem

Failure to recognize and appreciate the value of appropriate technology in distance education by distance teaching institutions in Zimbabwe, coupled with a lack of initiative on the part of the Ministry of Education to produce educational justification and potential economic benefits for their use, has been a major factor in the under utilization of appropriate technology in the study group distance education system. This has resulted in the continuation of the correspondence tradition of learning from correspondence text and lessons, writing and submitting assignments which are marked and returned at a future date, rather than learning from a combination of media. This happens despite the intuitive understanding, on the part of officials in the Adult and Distance Education Section, that appropriate technology has value in study group education.

Purpose and Objectives of the Study

The overall purpose of this study is to assess what study group facilitators in Harare Region perceive to be the role of appropriate technology in distance education for the out-of-school secondary level learners in study group settings. The study also examines some of the issues that are associated with the integration of print with these technologies in distance education. This is done in order to determine the educational value of such an integration in study group distance education such that policy makers in the Ministry of Education and, the principals of distance teaching institutions may adopt policies that promote the use of appropriate technology in Zimbabwe.

One main objective of this thesis is to explore some of the issues associated with the applications of appropriate technology in distance education. The issue of what is appropriate technology, its uses, and factors that may hinder its applications in study groups are investigated through a literature review and a survey of facilitators in Harare Region. The survey was conducted to provide information on the needs of facilitators regarding the role of appropriate technology in study group distance education, and obstacles that may prevent its use so that appropriate recommendations could be made.

As a tool of educational technology, a survey provides a holistic, systematic way of determining, not only what facilitators believe to be the needs directly related to their own work in study groups, but also those directly influencing the learning of the students in their environment. According to Tenant (1985), the concept of need has been used in the literature in a variety of ways and is often generalized and imprecise He defines a need as "a 'want' or 'demand' which is deemed to be worthy of satisfying" (p. 9). In addition, he says that needs are value-laden and, require a judgment by someone about the relative merits of satisfying different wants or demands. Clark (1986) and Monette (1979) agree that needs can never be value free. Monette (p. 84, 1979) asserts they "are

not mere empirically determined facts; they are complex value judgments".

We know that in education, learner needs, including those of teachers, have been traditionally prescribed from the value judgments of the educators in curriculum development units. These educators employ a marketing approach to their programming (Moore, 1979). Seldom do learners and facilitators, the receivers and implementers of the program, have input. Yet there is a growing belief that a program built on the needs prescribed by educators alone is not valid. It is argued, therefore, that if we are providers of distance education and want to encourage participation and reduce frustration, we must be sensitive to the needs of individuals and, the barriers that distance learners and facilitators in study groups face.

This research presents the facilitator's needs and those of the study group student on integrating print with audio technologies, in order to enhance the quality of learning and teaching, from a facilitator's perspective. As such, the study relates to some aspects of what Kaufman (1979), Kaufman, Rojas and Mayer (1993) and Rossett (1987) call needs assessment. According to Kaufman et. al. (1993) needs assessment is a process we use to identify gaps between current results and desired ones, place needs in priority order and select the most important ones for addressing. It is, therefore, a process by which a "need" is identified. It may also be seen as a feed-forward process that provides information which may serve as a guide in program and policy development and research. Since this study attempts to determine, from the feelings of the facilitator, what instructional role appropriate technology can play in study group distance education, it is a quasi-needs assessment. As Kaufman, Rojas and Mayer state, quasi-needs assessment is a process for identifying gaps in methods-means, procedures and how-to-do-it in order to efficiently meet performance objectives. That this study is a quasi-needs assessment is also demonstrated by the fact that the needs of the facilitators are "quasi-needs" because

they are not gaps in results but in the process and/or inputs into the study group system of distance education. Appropriate audio technologies are not presently used in study groups which is why this study is being done.

Kaufman (1979), Rossett (1987) and Kaufman, Rojas and Mayer (1993) suggest that the end objective of any needs assessment is to ensure that the organization achieves its objectives efficiently. This study also attempts to ensure that the media that may be selected for instructional use in study centers will help both facilitators and students to teach and learn more effectively and efficiently in order to achieve their objectives.

Arguably, the limitations associated with focusing on facilitator perceptions of the educational role of appropriate technology in study group distance education may not be a severe handicap to an exploratory study of this nature, whose basic goal is to suggest leads for further research. Such further research on perceptions of appropriate technology in study group contexts are necessary in a developing country like Zimbabwe, where print appears to be the only medium that is used in distance education.

Limitations of the Study

Due to the nature of survey research, the result of this study will be limited to the subjects and procedures used herein. The results cannot, therefore, be generalized to other groups. Rather, it is the intention of this researcher to provide distance educators in Zimbabwe, and Ministry of Education policy makers with a case study which attempts to justify the need for, and the benefits of, integrating print with audio technologies in study group distance education. Also, this study may encourage others to use surveys and needs assessment as a means of discovering the needs of distance learners, especially those in study groups, for future program planning; or at the least, it may help to open debate on this subject in developing countries such as Zimbabwe.

CHAPTER 2

Literature Review

Distance Education Defined

Various attempts have been made to define the essential nature of distance education, and to advance models which describe its key characteristics (Baath, 1981; Harris, 1978; Keegan, 1980, 1986; Holmberg, 1985; Perraton, 1983). Distance education is generally regarded as a system of open, flexible part-time education in which the learner and the teacher are separated by time and/or distance. Also, the learner studies independently using self-instructional materials produced at a central institution. In addition, some form of two-way communication employing various forms of media like postal or electronic mail, teleconferencing, two-way radio, computer conferencing, some face-to-face teaching and support, and interactive radio is also involved (Bates, 1982; Perry & Rumble, 1987; Young et. al., 1980).

Although there is now a broad consensus on the key elements of distance education, it is subject to a great variety of interpretation and diversity in practice (Singh, 1992). It occurs in different contexts and countries, and means different things to different people. Singh (1992) also points out that it is known by different names, such as correspondence education, home study, external study, independent study, open learning, off-campus study, and open education. These names point to the complex nature of distance education as a system and why its practice takes different forms throughout the world. In some developing countries such as Zimbabwe, the development of the study group system of distance education has added a new and exciting dimension to this system of education (Young et. al., 1980; Perraton, 1983; Curran & Murphy, 1989). The study group or study center system, as it is known in some countries, will be returned to later.

The Rise of Distance Education in African Countries

In developing countries there is an increasing demand for educational opportunities offered outside the established institutional situations. The development of distance education in these countries, from the 1960s to the present, is attributed to the need to satisfy this demand. This demand is also most felt at the secondary school level where it is far in excess of the formal facilities available (Coombs, 1968, Harris 1978; Wakatama, 1983; Perraton, 1983; Curran & Murphy, 1989).

Coombs (1968, p. 24) states "all the developing countries face a severe problem, which lies at the heart of their educational crisis". Abernethy (1969) calls this 'the political dilemma of popular education'. Harris (1978, p. 33) asserts "Correspondence education, or its alliance with other media in distance education offers a substantial contribution towards meeting the educational dilemma with unique flexibility and sensitivity, and possible economy of resources". The World Bank (1988), in its *Policy Study on Education in Sub-Saharan Africa,* supports this view when it encourages governments seeking to substantially reduce unit-costs, increase access, and quality at the secondary level to adopt distance education. These statements emphasize the need for developing countries to consider seriously distance education as a viable and sustainable method of providing secondary education to those who cannot be absorbed into the regular schools, as well as those who may want to continue learning to improve their qualifications.

According to Perry (1974), distance education programs had been established in some ninety countries, providing courses for more than two million students. Twenty-one years later the numbers of institutions offering this form of education including that of students must be far in excess of these figures. Various countries in Africa south of the Sahara, (e.g. Ghana, Nigeria, Kenya, Ethiopia, Malawi, Botswana, Swaziland, Lesotho, Zambia and Zimbabwe), have distance education at the secondary level (Kabwasa &

Kaunda, 1973; Young et. al., 1980; Perraton, 1983; Curran & Murphy, 1989). These writers suggest that some of the major objectives of distance education in these countries are: to provide an alternative cost-effective non-formal channel for secondary education; to provide second-chance secondary education to those who drop out of the formal system, or who cannot join the regular schools owing to financial and other circumstances; and, to supplement and to relieve pressure on the conventional system. The researcher, coming from a developing country, observes that it may be a misconception to think that distance education is cost-effective. Kinyanjui (1993) asserts that it is not necessarily cheap unless its properly planned and implemented, and the numbers are large enough to allow for economies of scale. Also, the initial costs of setting up a distance education system are high.

Although these reasons appear to be powerful enough to influence developing countries to adopt distance education as a method of providing universal secondary education, the stark reality is that distance education is not flourishing in many of these countries. This is partly perhaps because it is not well funded by governments. In Zimbabwe out of the 1.3 billion Zimbabwe dollars allocated to the Ministry of Education and Culture in 1992, only about 4 million dollars were spent on distance education. This exemplifies the marginalization of distance education that is widespread in Africa. At the same time, it is observed international donor organizations that may want to support distance education are frustrated by bureaucracy. Negotiations are slow and decisions come after a long time when the focus is on other priorities on the part of the donor agencies. As a result, the potential of distance education has not been realized in most parts of Africa south of the Sahara.

Distance Education Practice

Characteristics of African distance education that writers (e.g. Perraton,1983; Wakatama,1983; Curran & Murphy,1989) cite are that most distance teaching institutes offer courses in arts and humanities, that the courses use mainly print, that student support services are poor and the quality of marking is suspect, that courses which are offered are equivalent to those offered in regular schools, and that students take similar public examinations and receive similar certificates upon graduating. The researcher agrees with these observations. It may, however, be necessary to point out that some science subjects are also taught, and that having a similar curriculum and same examinations with formal schools, has tended to raise the status of distance education which is otherwise generally regarded as a second rate system of education in most parts of the world. In Zimbabwe, unlike in some countries like Botswana, Malawi, Zambia and Lesotho, students at the Junior Certificate level are provided with personal science kits to enable them to carry-out experiments. Science subjects, especially those that do not require practical work in a laboratory (e.g. Human and Social Biology), are offered at the General School Certificate level.

A review of literature on the practice of distance education in African developing countries also shows that the much broader concept of distance education which offers a variety of courses through a multimedia strategy, supplemented by vigorous student support services, is lacking. Few countries are successfully integrating print with audio technologies in their distance education programs. Curran and Murphy (1989), after discussions with distance education practitioners and students in six African countries, concluded that radio is not achieving its educational potential. They point out that radio programs in some countries are not listened to for a variety of reasons. Some of the reasons that students cite are that they are irrelevant to the syllabus, no receiver available, no power source available, and programs broadcast at the wrong time. These

problems highlight the need for more careful planning and scheduling of radio programs for distance learners in developing countries. It is then not surprising that in most of these countries, distance education is practiced in its early form of correspondence lessons which is characterized by limited interaction between the teacher and the taught.

I now turn to the study center/group system of distance education which was developed in Malawi, Zambia and Zimbabwe in the late 1970s. Perraton (1983) and Currant and Murphy (1989) suggest that it was established to cater for the learning needs of young primary school graduates who want to continue with their secondary education outside the formal system. These writers suggest that study groups cater well for young learners who lack motivation and experience of independent study. According to Radikun (1992) Indonesia, also a developing country, has a similar distance education system called the Open Junior High Schools which started in the late 1970s. Students learn at study centers 4 or 5 days a week for 4 or more hours a day during the morning or in the afternoon, or even in the evening as is the case in Zimbabwe. The learning center is located near their homes and is housed in a community or public building, such as a hall, a school, or a church. Students study under the supervision and help of a facilitator or a teacher and the curriculum is similar to that of regular schools. Students get self-instructional materials from a distance teaching institution, which in many cases are national institutes, while in Zimbabwe these are private institutions.

In Malawi and Zambia print is the main medium of instruction and radio is used as support. In Zimbabwe print is the only medium used. In Indonesia print materials are enriched and supplemented with audio visual materials, such as sound slide programs, audio cassettes, and radio programs (Radian, 1992). Several thousands of students are enrolled in such study groups. It is argued that study group methods are a foundation stone of good non-formal education (Young, et.al.1980). Their use provides

the human element lacking in much distance teaching in the past. However, it is observed that, where studying at a center is optional to students, not all may want to use them. Young et. al. (1980) report that half the students of the British Open University make no use of study centers.

Another problem with study groups that we have observed in Zimbabwe is that it is difficult to run a study center which does not soon turn into a glorified high school. There is a tendency for centers to call themselves institutes or academies. In addition, students expect to be taught all the time, and not to be helped; facilitators expect to teach and not to guide learning. The problems that distance teaching institutions and administrators face as a result of these expectations are enormous. Students do not purchase complete sets of study materials as they tend to rely more on facilitators and textbooks. They also do not write and/or submit tests for marking by tutors. They feel that what their facilitators and/or teachers do for them is adequate. This has tended to reduce the role of a distance teaching institution in study center contexts, especially in Zimbabwe.

According to Young et.al. (1980) despite these problems, it appears that study groups may provide an important clue to the future of distance education in developing countries, especially for young students, who may lack motivation and the knowledge and skills of studying on their own. It seems as if the key to success for study groups may lie in the link between the facilitator's role and that of the print or broadcast, particularly interactive radio, and audio cassettes produced centrally or by the parent distance teaching institution.

The other type of secondary level distance education that is prevalent in sub-Saharan Africa consists of education that is provided through correspondence courses to individual students who are at home and not enrolled in a regular school. Such students may be in gainful employment or unemployed. Print is the primary medium of instruction and radio is used as support, for example, in Botswana, Nigeria, Kenya, Ethiopia, and Lesotho. Considering that these students study under conditions that are not conducive to learning, for example, family and work commitment, poor lighting, inadequate shelter and furniture, isolation, and no access to a library, it is no wonder why many drop out and/or take a long time to complete their studies. According to Perraton (1992) few independent students working at home, and without support from a study center, succeed in studying at a distance. Curran and Murphy (1992), who considered distance education at the secondary level in six developing African countries, confirm this view.

Studies on the effectiveness of distance education at the secondary level are scant. The only study in study group settings that the researcher found is that carried out by Murphy (1992) in Malawi, Zambia and Zimbabwe. Murphy looked at several factors (e.g. organization and management, quality of instructional materials and physical facilities, internal efficiency of central institution, nature of face-to-face support, student characteristics and perceptions, access to the system, pass rates, acceptability of graduates, and the social and economic benefits to the country) to evaluate the effectiveness of the study centers. Murphy concluded that study centers are perceived as performing a useful function but offer low-quality education, and the pass rates confirm this. Generally study center results in national examinations are lower than those of established secondary schools, although a few centers in Zambia and Zimbabwe have produced results which are just as good if not even better.

Another conclusion that Murphy made is that study centers provide access to secondary level education for many students who would not otherwise get one. He also observes that study centers have limited choice of subjects and do not provide laboratory facilities which is partly why they have a low status. After a careful consideration of the disadvantages and benefits of study centers, it is found that their benefits outweigh their disadvantages.

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Educational Technology and its Applications to Distance Education

From the review of literature the prognosis is that educational technology will play an increasingly significant and legitimate role in distance education in the developing countries. The writer believes that its extensive use would require radical change in the approach to education in Africa since it is regarded as an added cost by policy makers. It is also observed that different writers have different perceptions of educational technology. Rowntree (1982, p. 10) states " educational technology is what education technologists do to improve learning". This is further expounded by Gagne' (1968, p. 15) who argues "Educational technology can be understood as meaning the development of a set of systematic techniques and accompanying practical knowledge for designing, testing and operating schools as educational systems". And in its defense, King and Brownell (1966, p.211) state "without educational equipment, material and specialized spaces all pretense of inducting the learner into the disciplines of knowledge begins to fade". This view is refuted by the Coleman Report (Coleman, et. al. 1966) which argues that despite the wide diversity among student bodies in different schools, over 70 percent of the variation in the achievement of each group is variation within the same student body.

Educational technology appears, therefore, to be a field that is concerned with the facilitation of human learning through the systematic identification, development,

organization, and utilization of a full range of learning resources. The researcher believes that at the heart of educational technology is the facilitation of human learning which is achieved when various communication technologies are employed in education. Further, that it is concerned with improving the process of human learning, and also with problem solving in education.

From experience with working with distance learners in Zimbabwe, it appears that understanding of content and concepts tends to be a problem to many young distance learners. This may be because study materials are not well researched and poorly written. They are generally written in English which is a second language and a problem to many students. Distance learners are also generally less capable than those in the regular schools, and learn under more difficult conditions. Furthermore, educationists (Reiser & Gagne', 1982; Imhoof & Chritensen, 1986; Laurillard, 1987; Garrison, 1990; Bates, 1991, 1992), generally agree that integrating print with appropriate technology may make what is learnt more interesting and more understandable, and thus enable distance learners to achieve identified goals so that they get to their objectives.

The World Bank (1988) believes that the challenges of the next century for Sub-Saharan Africa, will call for the increased use of distance education through appropriate communication technologies to support, extend and in some cases even replace, the conventional system of education. The UNESCO sponsored, *Priority Africa: Regional Seminar on Distance Education, Arusha, Tanzania, September, 1990,* in its Report acknowledges the educational benefits of integrating print with appropriate communication technologies in distance education. It also identifies lack of applications of appropriate technology to distance education as a major problem facing distance education in Sub-Saharan Africa. Financial and personnel constraints, as well as negative attitudes toward distance education, are also cited as obstacles to the integration of print

with appropriate communication technologies. These statements point to the urgent need to revitalize, and even to restructure distance education so that its potential may be realized. In addition, they also call for a change of attitude toward this form of education on the part of senior policy makers, both in the public and private sectors.

Bates (1990) argues that appropriate technology has great potential in developing countries' distance education programs. He also suggests that it can reduce administration, course production and delivery costs, especially for those courses with less than 200 students per year. In addition, the trend towards study group distance education; using it in work-based training and developing suitable courses; the preference for more on-line and easily updated course design and delivery which reduce front-end costs and development time, would tend to favor the adoption of appropriate communication technologies in distance education for developing countries, such as Zimbabwe. To effect such changes it is necessary for institutions to reorganize their departments and to change job specifications. Retraining of staff is also required so that it can use the new technology.

From a developing country's perspective, adopting appropriate technology in distance education, calls for superhuman effort on the part of decision makers since courageous and, at times, unpopular decisions must be made. This, according to Bates (1990), is the price to be paid in order to obtain the savings. A major problem that the researcher observes here is that many decision makers in the public sector in developing African countries appear to be afraid of making decisions that will result in major innovation. This may be partly because they over-rely on their experience and intuition in decisioning when such bases may not be adequate for making decisions in today's complex world. They, therefore, avoid making crucial decisions, such as those affecting the practice of distance education, in order to prevent criticism which may arise when

programs fail. This may indicate the need for training of people in decision making positions to strengthen their capacity.

Media Selection

Another problem that Bates (1990) highlights is the lack of agreed theories or procedures for media selection, and the lack of trainers in this area. It seems this problem arises partly because of the rapid technological changes that are taking place in distance education. These changes entail that training will be continuous, over a long period of time, and will need to be revised continuously. Since training has cost implications, it will require a cost benefit analysis which many managers in developing countries are ill prepared to handle partly because of inadequate training in this area, and the large sums of money that may be involved. As a result, it may not be easy in these countries to adopt a wide range of communication technologies in distance education. Bates (1990), nonetheless, suggests that each institution should have some criteria for media selection, and to be aware of the potential and limitations of the different types of media. The criteria will help decision makers when selecting media and ensure that they do not make decisions that are detrimental to the future of their institutions.

Bates (1989) suggests that decision makers in distance education should make intuitive decisions based on experience when selecting media. A careful analysis of questions such as the following may help: Will the technology be accessible to students, depending on where they will learn? What are the specific teaching functions of the media? Does it promote interactivity, and is it user-friendly? How novel is it, and will it attract outside funding? Can the new technology be used to produce new materials, and/or to up-date materials quickly? The particular situation of the distance education institution has also to be considered before a final selection is made. Also, it has been argued that training decision makers and administrators may go some way to enable them to make informed

and better decisions in a particular distance education environment (Bates, 1992). But since training requires money funding becomes a problem although international organizations, such as The World Bank, may help if the need is justified.

There is a wide range of technologies that can be used in distance education. Bates (1990) suggests the following technologies are now increasingly available to distance educators: electronic publishing; telephone teaching and audio conferencing; video cassettes; computer assisted learning; audio graphics; satellite and cable TV; video conferencing; and, video-discs and CD-ROM. Each of these technologies is already being used in some institutions although the more traditional technologies, such as radio and audio cassettes, are not fully exploited, or have often been badly used in distance education. The researcher, coming from a developing country, attributes this to the commercialization of technology in the developed nations which has led to an unprecedented technological explosion in distance education. As a result, some of these technologies may be totally inappropriate, given the local conditions of developing countries, such as Zimbabwe. With inadequate infrastructure, financial, human and material resources, coupled by lack of determination on the part of policy makers and administrators, the future of educational technology may be doomed in some developing countries

The issue of what is appropriate technology is one which is not directly addressed in the literature that was reviewed. From what Bates (1990, 1992) says, it seems that the appropriateness of any technology is determined by the circumstances of each institution, its resources, and those of its target groups. As a result, while a computer may be appropriate technology in a developed country, it may be inappropriate in a developing country. In addition, what is appropriate also differs even within one country, as well as within institutions in one country. To the researcher, appropriate technology for distance

education in Zimbabwe is that communication technology which aids learning and that is readily available, affordable, efficient and easy to use for the target learners. Since most distance learners in developing countries belong to the disadvantaged groups, any technology that is selected must be as cheap as possible.

In the context of a developing country, such as Zimbabwe, the traditional technologies of print, radio and audio cassettes, may be considered appropriate technology. Radio is one of the more accessible technologies. Receivers are relatively cheap and widespread. Solar-charged batteries are available. Also, radio does not need a high level of literacy skills. In Zimbabwe many households in urban areas have a radio receiver, and some have one with a tape deck. A few households in rural areas have radios as well. Most districts have information centers at Growth Points that are equipped with a radio and a telephone. Electricity is also available at most of these Growth Points. And according to the *Census Preliminary Report* (1992) about thirty percent of Zimbabwe's 10.5 million people live in areas that are considered urban. These facts point to the appropriateness of the traditional technologies in distance education in Zimbabwe.

Kashambwa (1990) states that Zimbabwe has 4 radio stations,and that all formal education programs are transmitted on Radio 4 which operates from Monday to Friday. He also says that air time is not a problem if one is prepared to pay transmission fees to the Zimbabwe Broadcasting Corporation. He, however, does not spell out the level of these fees. This information may be important since high fees are likely to deter distance teaching institutions, faced with limited financial resources, from using radio as an educational tool. In addition, the Audio Visual Services (AVS), a program under the Ministry of Education, has modern studios and personnel that can assist with scripting for radio and educational broadcasting. The AVS provides radio receivers with cassette decks to schools on a first come first served basis. Study groups also qualify to be issued

with these radios. It seems, therefore, that there is potential for using radio and audio cassettes in distance education in Zimbabwe.

The case for using traditional technologies such as radio, integrated with print, as educational tools in distance education is advocated by several writers (Grundin, 1984; Durbridge, 1984; Bates, 1984, 1990, 1992; Koumi, 1992; Robinson, 1983). For instance, Bates (1984) and Koumi (1992), suggest that audio-visual media give students greater control over their learning as well as greater interaction. *The Learning Technologies for Basic Education Studies in Interactive Radio Instruction (IRI)* (1990) in Kenya, Nicaragua, Lesotho and Honduras, show that IRI can improve student performance in Mathematics and English at the primary school level. Interactive radio increases the amount and level of interaction between the learner and the study materials, and in some cases gives more opportunity for human interaction. As a result it is considered a more effective method than the traditional radio broadcasting that is prevalent in African distance education programs.

Formats of Audio Technologies

Grundin (1984) suggests that radio can mean either radio broadcasting for direct consumption, or recordings of radio broadcasts to be stored on audio cassettes which can then be used later at a more convenient time. He also reports a reduction in radio broadcasts at the Open University which resulted in a significant increase in the use of audio cassettes, which were mailed to the students together with the printed course materials. Bates et.al. (1981) found that most students who listen to Open University radio broadcasts rate them favorably, and that the more the program is explicitly linked to printed course material, the more highly students rate it.

According to Bates and others (1981) and Grenadine (1984) radio can take various formats. For example, it can be used to transmit information to learners by an expert without accompanying source materials or visuals. It can take the form of an interview or discussion of an important topic with an external expert or course tutor. It can also take the form of radio drama, and of samples of spoken language to be analyzed by students. Another format is that of radio-vision which is a talk illustrated by some kind of visuals such as pictures and diagrams or slides. This format is what Koumi (1992) refers to as audio-vision. He suggests that it ensures active learning better than most other learning strategies. These formats provide a useful basis for a taxonomy of radio in a distance education environment, but as Grundin (1984) observes, circumstances specific to each distance teaching institution will determine the format and kind of program that is appropriate. The writer believes that some of these formats, can be used in Zimbabwe to enrich the process of learning in study groups.

According to Bates (1991) audio cassettes play an important role in distance education if they are designed to integrate with textual material; also course developers find it easy to integrate the two. In addition, they are low cost and easy to produce. A simple studio can produce high quality educational audio cassettes. Durbridge (1984) and Bates (1991) cite cheap distribution costs if numbers are not too large, convenience of use, providing a human touch to academic study, and the stop button which facilitates discussion and gives learners the chance to consult their books as they listen, as some of the advantages of audio cassettes. In study groups costs can be reduced significantly if learners pool their resources. Indications are that they will be more than happy to do so. Also, audio cassettes for students to listen at convenient times, prepared by the distance teaching institution, can be sent to study groups cheaply through the Responsible Authority.

Bates (1991) also argues that some forms of video and computer-based media are cheap and can be used in developing countries. The researcher, however, believes that Zimbabwe cannot adopt these media on a wide scale at this stage because the hardware is not accessible to the majority of the centers. But, nevertheless, these media can be tried on a pilot basis in selected urban study groups if donor funding is available. What may be feasible now, and on a pilot basis for that matter, is telephone teaching. The telephone can be used, for example, to motivate learners in study group settings to continue with their studies, to give them quick feedback on problems, and to offer supplementary tutorial for self-instructional materials. According to Robinson (1984), teaching by telephone has been done in a number of distance education contexts such as with individuals, and with small and large groups. In study groups a loud speaking telephone can be added to the regular telephone to enable students in groups to hear and speak to the person at the other end of the line. It has also been observed that students are at the beginning shy to initiate telephone calls to their tutors. Educating them on the value of phoning their tutors, including how to use the telephone, may be necessary at the start of the program.

In addition, it should be acknowledged that organizing a telephone teaching system and developing it into a teleconferencing system may not be easy for a developing country like Zimbabwe. Before such a system is introduced, appropriate equipment has to be acquired, and the sharing of costs between the students and the distance education institutions has to be determined. Also the support and cooperation of the Post and Telecommunication Corporation has to be secured and guaranteed in advance.

Costs of Audio Technologies

The cost factor, in adopting audio technologies in distance education, has received a lot of attention from distance educators (Young et. al.,1980; Snowden & Daniel,1980;

Rumble, 1981; Perraton, 1982; Holmberg, 1985). The point that these writers make is that technology is not cheap, particularly to poor nations. In addition, they suggest that the cost analysis must involve the process and outcomes rather than simply the costs. Bates (1991) and Daniel and Marquis (1979) stress that effectiveness must be balanced with cost. For example, self-instructional materials generally provide great economies while interactive materials do not. Also, it is widely acclaimed that interactive materials enhance the quality of instruction, and add to the support of the student, which in turn lowers drop-out rates, thereby improving the cost effectiveness of the program.

The other point which Bates (1991) makes is that telephone teaching costs rise proportionately to the number of students. This may make it difficult to introduce telephone teaching unless special rates are negotiated with the provider. Bates notes that technologies vary considerably in their fixed and variable costs, but audio cassettes and radio have low fixed and low variable costs, and that radio broadcasting is economical for national distribution when enrollments exceed 1 000 students per course. Since in Zimbabwe, according to the Secretary's Annual Reports (1990- 92), most courses that are offered in study groups have well in excess of 1 000 students, and all together about 30 000 students are enrolled in study groups throughout the country, radio can be cost effective. Audio cassettes are a particularly economical medium; and audio cassettes plus print is usually a cheaper combination than the cheapest form of video or computer-based learning (Bates, 1991). In Zimbabwe, if students in study centers pool their resources together, the cost per student for audio cassettes can be low.

Benefits of Multimedia Approach

The literature in this field shows that proponents of a multimedia approach to distance education (Bates, 1984, 1989, 1990, 1991, 1992; Grundin,1984; Robinson, 1984; The World Bank, 1988; Koumi, 1992) advocate that communication technologies are useful

for effective learning as they accommodate learner control, stimulate interest, and the associative and structural thinking of the learner.

Lewis (1985) investigated faculty perspectives on the role of information technologies in academic instruction. Specifically, the study focused on the instructional role of computer, video and audio technologies at the collegiate level. According to Lewis (1985), "Its purpose was to understand to what extent and in what ways faculty see these electronic technologies contributing to the solution of important instructional problems" (p.-i-). The study consisted of 26 focus group sessions and questionnaires, and involved 254 college faculty at 15 colleges and universities throughout the United States.

First, the study identified instructional problems from the faculty's perspectives. The following problems were identified: 1) conveying abstract concepts; 2) motivating students and encouraging them to be more active learners; 3) dealing with individual learner differences; 4) encouraging the development of generic skills and abilities; and, 5) obtaining support necessary to make faculty more effective teachers. Second, it identified feelings of faculty toward using information technologies to address these and other instructional problems. In addition, it identified obstacles to the instructional use of these technologies and the steps that might be taken by various constituencies to improve the situation.

The results showed a high degree of correspondence between the instructional problems college faculty say are most troublesome and the reasons they give for using the technologies. Also, faculty consider these technologies appropriate tools for addressing instructional problems as well as for dealing with issues like course management, enabling students to experience real-world problems in a safe, manageable or cost-

effective manner, and helping students appreciate times, places, people and events that cannot be experienced in a conventional classroom.

In general, the faculty who took part in this study viewed the instructional potential of computer, video and audio technologies quite favorably, although they were critical of the quality of most currently available instructional software materials, especially computer software. Many faculty, however, made it clear that they value the instructional capacity of video and audio technologies. This study provides some support for integrating print with audio technologies in study group distance education in order to improve the quality of learning.

The potential to increase the quality of learning in study groups of such an integration, has led me to undertake this study in order to find out what facilitators in study groups perceive to be the role of appropriate technology, particularly audio technologies, in study groups. Also, what they consider to be obstacles to its use, and whether they would use it, if it were available, were regarded as important factors in this study. Once identified, their perspectives will be analyzed and recommendations made that decision makers may use as a basis for formulating policy on integrating print with appropriate technologies in study group distance education in Zimbabwe.

It is hoped that this study may not only help to give both the Ministry of Education, and the principals of distance teaching institutions in Zimbabwe new insights into how audio technologies and print can be integrated into study group distance education. It may also make them appreciate the economic, social and educational benefits that may be derived from such an integration.

CHAPTER 3

Methodology

My literature review and personal interest led me to hypothesize that, after the focus group discussion, the study group facilitators sampled would identify the educational role and potential obstacles to the use of appropriate communication technologies in study group distance education. In addition, it was hypothesized that they would indicate a preference for using radio, audio tape, and teleconferencing as instructional media in study groups if they were available.

Beginning with my research question, "what are study group facilitators' perceived role of appropriate technology in distance education for the out-of-school secondary level learners in Zimbabwe?", I set out to design a quantitative study, particularly, a survey which would give me some numerical scores denoting a degree of importance, some frequencies of particular issues among respondents, identifying a causal relationship, and some comparison or ranking of responses to specific questions. The researcher's involvement in study group distance education as an administrator and supervisor, prompted a particular concern for the total lack of a multimedia approach in this form of education in Zimbabwe. Realizing that most of my subjects in the study had a vague notion about the applications of appropriate technology within distance education, I included a focus group phase to expose them to a few of its uses in this type of education.

Subjects

Initially twenty-five (25) study group facilitators in Harare Region were randomly selected for the study, however, only thirteen (13), fifty-two percent, participated in the study. The age range for the study sample is from 21 to 44 years. Most are engaged as

full-time, while a small number is part-time and supervise a study group after work. The gender ratio is 1 to 5.5 in favor of males. The range in length of service is from 1 to over 5 years.

Two reasons account for the 52% turn-up. Not only were there heavy rains in Harare on the day scheduled for the study, there was also communication breakdown with some of the sampled facilitators who did not get the invitations on time. Given that this is an exploratory study, the researcher feels that 13 subjects may be adequate for making some tentative conclusions on the research question.

Instrumentation

The two commonly used methods of data collecting for an inquiry are interviews and written questionnaires. Focus group techniques are also an important method of gathering data in both quantitative and qualitative research - hence they are used in this study.

Madge (1967) and Oppenheim (1982) consider questionnaires and interviews to be closely connected, and regarded as the method par excellence of social science. According to Oppenheim (1982) the greatest advantage of the interview is flexibility but on the negative side it can be fraught with possibilities of bias. In addition, interviews cost more money, and take up a lot of time to execute properly than other methods such as questionnaires and focus groups.

With respect to mail questionnaires, Oppenheim argues that their main advantage is cheapness. He asserts that what is required is the cost of planning, and pilot work, duplicating, sampling, addressing, mailing and other costs associated with its return.

Questionnaires , if properly constructed, are usually easy to complete, and simpler and cheaper to process and analyze. Evans (1984), Madge (1967) and Oppenheim (1982) agree that mail questionnaires cannot hope to cover people of low intelligence or limited educational background, and lack the personal introduction of the study by the researcher, although a good covering letter is known to work. It was partly to compensate for the limited educational background in applications of educational technology to distance education that the focus group phase was included in this study. Also the response from mail questionnaires is usually very poor even though the situation can be improved by sending reminders.

According to Lewis (1985) the focus group permits the researcher to raise questions in groups so that the subjects respond in free discussion. Among the common uses of focus groups are stimulating new ideas, obtaining general background information about a topic of interest and diagnosing the potential for problems with a new program (Stewart & Shamdasani, 1990). These writers also argue that focus groups are appropriate in a study, as a prelude to other types of research that provide more quantitative data such as a questionnaire survey, particularly if subjects are presumed not to have sufficient knowledge on the subject of interest. In addition, they enable the researcher to gather data that might not have been uncovered in individual interviews. They also provide data from a group of people much more quickly and at less cost than would be the case if each individual were interviewed separately.

Consideration of the approaches above, particularly in the light of the fact that the researcher is away from home, and that the subjects have little experience, if any, of the uses of technology other than print, in distance education, led to the decision to use both a modified focus group technique and a questionnaire in this study.

The Focus Group Phase

Different communication technologies and media formats were presented by an educational technologist at the University of Zimbabwe and discussed under the guidance of the research assistant. Questions discussed during this phase included the following:

* Is the content presented in an interesting way for a distance learner?
* Is the material presented in such a manner that it interacts with the learner?
* Is the technology used suitable for study groups?
* Before the technologies are used in study groups what would you suggest?

The Questionnaire

Confidentiality and honesty are vital both ethically, and to invoke honest responses (Whitt, 1991). My commitment to confidentiality was reiterated in the introductory part of the questionnaire as well as in the consent form which participants signed at the start of the study. Also in preparing it, the advice of Cohen (1976), Oppenheim (1982) and Evans (1984) was considered. According to Evans (1984) the first step in drawing up a questionnaire is to decide its exact purpose, and to spend some time thinking out the introductory paragraph. Oppenheim (1982) contends that the main function of the questionnaire is measurement, and that it is not just a series of questions or a form to be filled out, but essentially a scientific instrument for measurement and for collecting particular kinds of data. Cohen (1976) points out that a good questionnaire is simple in form, clearly understood, reliable and valid. From what these writers say developing a good questionnaire requires good thinking and careful preparation.

Following this advice, the questionnaire was kept as simple as possible and to a reasonable size. The language used was clear and easily understood, especially after the focus group phase. Through a preliminary review of literature connected with this study,

a report of a study on "Faculty Perspectives on the Role of Information Technologies in Academic Instruction", by Lewis (1985) was found suitable. Since this study is relevant at the tertiary level and in formal face-to-face instructional settings, it was necessary to adapt it to suit distance education at the secondary level. Two key aspects related to the use of appropriate technology in distance education were selected. They are as follows:

* Reasons for using audio technologies; and,
* Obstacles to use of audio technologies.

A third aspect, 'feelings about audio technologies' was included to give subjects a chance to reflect on the focus group phase as well as the questionnaire so that they could express their overall feelings toward using these technologies in study groups.

The instrument was composed mainly of multiple-choice questions which are less subject to variance, and are thus easier to score and to analyze. A verbal score of four points was used as it is easy to remember and describe accurately. Furthermore, it is generally agreed that a rating scale with an odd number of choices allows respondents to take a 'sit on the fence' option and the results may be too nonspecific. With an even number scale, such as the one used here, a forced choice results on either side of the scale which is necessary for making tentative conclusions in this type of study. At the end of Sections 2 and 3 respondents were given an opportunity to make suggestions. This was done in order to encourage participation and the potential of greater understanding. The survey contained a total of 30 questions with five multiple-choice questions on demographics, 23 multiple-choice and rating questions, and two open-ended questions at the end (See Appendix D). The two open-ended questions gave the participants an opportunity to give their own opinion on the educational use of audio technologies in study group contexts and their own possible role.

Questions 1 to 5 provided demographic information on gender, age, qualifications, working experience, and personal experience of studying at a distance. Question 6 attempted to elicit feelings on the availability in study centers of supplies and equipment. Fourteen questions (7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20) surveyed opinions on the uses of radio, audio tape, and teleconferencing equipment in distance education. Eight questions (21, 22, 23, 24, 25, 26, 27, 28) tried to identify opinions on obstacles to the use of the three audio technologies under focus. Question 29 identified respondents' willingness to use these technologies, and asked them to give evaluative statements on their reasons for using them. Question 30 surveyed their feelings on their new role in the event of these technologies being integrated with print in study group distance education. Thus, the study instrument covered not only the extent of the availability of critical material resources in study centers, and the perceived role and hindrances to the use of appropriate technology. It also investigated the perceived reasons for using audio technologies as well as the perceived role of facilitators when a multimedia approach to distance education is adopted in study groups.

Procedure

The instrument was pilot-tested on four randomly selected members of the population (30.76 % of the total sample). The four participants came to the Education Services Center, Mount Pleasant, Harare, to complete a first draft of the survey instrument containing 32 questions. The purpose of this exercise was to check for any ambiguity in the questions.

Three respondents pointed out that question 4 on 'experience with learning at a distance', did not relate to the rest of the questions. This question was modified to include the media used if the response was a positive one. Responses to question 6 showed some confusion in the nature of the resources under scrutiny. There was, therefore, a need to

specify the supplies and equipment that were expected to be available and/or found at study centers. The question was rephrased to enable participants to rate the availability of specific items on a scale of 1-4. Questions 12 and 25 were misunderstood by all 4 sample cases, and were removed. The results of the pilot test were not used in the data analysis. To initiate the study, after arrival at the University of Zimbabwe, the thirteen subjects were given information concerning what they were expected to do but no information on the hypotheses of the survey. They were also introduced to some key technical terms in the study, such as, media, logistics, technology, audio technologies, interactive radio, and teleconferencing.

Participants in a three-hour focus group session viewed video clips, listened to an audio tape, watched a demonstration on audio-vision for remote rural areas, took part in discussion and completed a questionnaire. Specifically, they viewed a teleconferencing video on distance education in the United States of America and a video of Professor Kinyanjui of the Commonwealth of Learning and Dr. Rwambiwa of the university of Zimbabwe, discussing and demonstrating the possibilities of teleconferencing in Zimbabwe. They watched a demonstration by Dr. Rwambiwa on how audio-vision tape can be used in a rural setting. He did so using an accompanying audio-script where he read a script to a second person who in turn flipped open illustrations beamed on a screen through a transparency.

Participants also viewed a video lesson on English Literature at the Cambridge School Certificate level that was produced in the Midlands Province of Zimbabwe and listened to a Biology lesson on an audio cassette. After viewing and/or listening to each technology, a discussion based on the leading questions outlined above followed. The discussion focused on the presentation, its effectiveness, suitability and applicability in study group contexts. The discussions were tape recorded for later analysis by the

researcher. At the end of the focus group participants completed the questionnaire. The completed questionnaires were collected and mailed to the researcher for analysis.

Data Analysis

The focus group discussions were coded into categories and described to throw some light on what participants feel about the technologies that were demonstrated. Descriptive statistics are the tool of analysis of the data in this section.

Data are coded along the lines of the identified subject headings used in the questionnaire. In addition, reasons for and obstacles to the use of audio technologies are coded according to an ordinal scale and then rank ordered. The main tool for analyzing these data are non-parametric statistics because the data of interest are in the form of ranks and the sample is small. The Friedman Test, a two-way analysis of variance for rank ordered data, is used to determine if there are any significant differences in the population distributions. The level of confidence is set at .05. To establish the relationship between the demographic characteristics of the facilitators and audio technology preference, Kendall's Coefficient of Concordance, W, is calculated. The evaluative statements on reasons for using audio technologies and the perceived role of facilitators after the integration of these technologies with print, are analyzed by means of descriptive statistics.

CHAPTER 4

Results

The results section is divided into: 1. the data based on the focus group; 2. the data based on actual study facilitators and study group situations; and, 3. the data based on perceptions and attitudes of the facilitators. According to Kaufman (1987) the data under 2 are referred to as 'hard' data while that under 1 and 3 are referred to as 'soft' data.

A total of 13 participated in the focus group and 13 completed questionnaires were returned. The return rate was 100%.

1. The Focus Group: How Facilitators view Information Technologies

The first task of this study was not only to view and listen to selected communication technologies that are used in distance education in order to lay some guiding principles for using these technologies, and to prepare for the questionnaire. Participants also discussed the role of and whether each of the technologies that were demonstrated could be used in study group distance education for the out-of-school secondary level learners. They talked about where video cassettes, audio cassettes, and teleconferencing fit into their day-to-day work as study group facilitators. For no apparent reason, however, they did not talk specifically about radio, the most widely available communication technology in Zimbabwe. Not surprisingly, facilitators expressed many intensely held opinions during the discussions.

In the focus group, facilitators volunteered many positive comments about the communication technologies that they saw being used as instructional media in either face-to-face and/or distance education. When asked what these technologies could do in study groups, there was unanimous agreement. They were particularly positive about the role these devices can play in study group distance education. For instance, facilitators

want information technologies to supplement study materials as well as their own presentation. Most are attracted by the potential of these technologies to: increase tutor-student and student to student interaction; motivate students to learn; present information in a more interesting way; increase access to high quality education; and, explain difficult concepts. Implicit in this point of view is the assumption that these technologies should only be used to convey course content that is difficult and cannot be effectively delivered by a print or lecture mode.

Some facilitators stated that information technologies, especially video, should be used in those cases where they can do better than the text and to complement their own efforts. For instance, a biology or chemistry teacher and text may be able to describe the structure of molecules by using a combination of words and physical models. Many facilitators, however, maintain that if a video sequence can more effectively convey the same information, then it is appropriate to use the technology. On the other hand, one or two facilitators expressed reservations about using audio cassettes and radio in teaching subjects, such as Mathematics, which require examples to develop understanding. Others would modify the guiding principle by stating that some of these technologies, for example, audio and video could be effectively used for revision. There are also others who were critical about an English Language lesson in a form 4 class, produced in the Midlands Province of Zimbabwe, that they viewed, because they felt that it is too teacher-dominated and lacks student participation.

In the focus group, facilitators were unanimous in expressing a liking for teleconferencing because of its potential for increasing tutor-student interaction including reaching more people at the same time, as well as for promoting active learning. Taking the contrary position, one facilitator was skeptical about teleconferencing alleging that it contradicts some major tenets of distance education, such as, studying alone and separation of the

teacher and the student. Still another facilitator raised the issue of accessing these technologies. And one facilitator stated that using these technologies in study groups may help to boost enrollments at these centers, and suggested that some students in regular schools may opt for distance education as a result.

When asked to assess the value of the focus group session, facilitators were unanimous in expressing their satisfaction and desire for the immediate integration of communication technologies with print in study group distance education.

The information presented in the 'soft' data section of this chapter, paints a more detailed picture of the views of facilitators on the subject. In addition to detailing their positive and negative feelings on specific items and audio technologies, the section offers evaluative statements on why facilitators would use these technologies if they were available. It also offers facilitators' perceived roles in a multimedia study group distance education in Zimbabwe.

2. Hard Data: The Facilitator and the Study Group Reality

Description of the Sample

Demographics of the Facilitator Survey

The majority (46.15%) of the sample fell into the 24-29 age group. Another large percentage (30.77%) fell into the 30-34 age range. Two sample cases (15.39%) fell into the 40-44 age group, while 1 sample case (7.7%) fell into the 18-23 age range. Table 1 represents the age range of the sample. A further examination of the results revealed that 2 sample cases (15.39%) were female.

TABLE I

Facilitator Age

Range	Percentage (%)
18-23 years	7.7
24-29 years	46.15
30-34 years	30.77
35-39 years	-
40-44 years	15.39
45 years and above	-

Qualifications of the Sample

Subjects were asked to indicate the number of subjects they passed at the Cambridge School Certificate level and other qualifications they may possess. Table II a. shows that the average academic qualification is 6 subjects. Sixty-nine percent have 6 or more subjects passed at the School Certificate level. Only 1 (7.69%) of the sample cases has less than 5 subjects. Regarding other qualifications, Table II b. shows that 38.46 percent possess either 2 or 3 Advanced level subjects, while 2 of the sample cases (15.38%) are degreed.

TABLE II a.

Qualifications of the sample

	Count	Percentage (%)
Less than 5 O level subjects	1	7.69
Five O levels	3	23.08
Six O levels	4	30.77
Seven O levels and above	5	38.46

TABLE II b.

Other Qualifications of the Sample

	Count	Percentage (%)
2 Advanced Levels	4	30.77
3 Advanced Levels	1	7.69
Bachelor of Science degree	2	15.38

Courses Studied at a Distance

When asked if they had taken any course by correspondence, 69.23 percent of the total sample answered positively. The remainder, 30.77 percent answered in the negative. Table III a. shows these percentages.

TABLE III a.

Distance Study Experience

YES		NO	
Count	Percentage (%)	Count	Percentage (%)
9	69.23	4	30.77

The respondents who answered in the affirmative were asked the types of instructional media they had used. Table III b. shows that 89 percent used only print while one respondent (11%) used a combination of print, radio, and audio cassettes.

TABLE III b.

Type of Media Used

	Count	Percentage (%)
Print only	8	89
Print with radio	-	-
print with audio cassettes	-	-
A combination of the 3 media	1	11

Years Worked as a Facilitator

The respondents were asked the number of years they had worked as facilitators in study groups. Table IV shows that the majority (53.85%) had been facilitators for 5 years and

more. A sizable percentage (30.77%) had worked in this capacity for 1-2 years and a small number, two (15.38%), had been facilitators for 3-4 years.

TABLE IV

Years Worked as a Facilitator

	Count	Percentage (%)
Less than one year	-	-
1-2 years	4	30.77
3-4 years	2	15.38
5 years and above	7	53.85

Availability of Supplies and Equipment

Respondents were also asked to indicate the extent to which certain supplies and equipment were available in their study groups. The information was categorized into the two main groupings of supplies and equipment as shown in Tables V a. and V b. below. Respondents used a rating scale of 1-4, with 1 representing the highest degree of availability and 4 total unavailability.

With regard to supplies Table V a. shows that 69.23% of the sample have chalk all the time, 7.69% almost always have chalk, and 23.08% rarely have it. On study materials, the majority (53.85%) indicated that they almost always have; another large number (38.46%) that they always have while only 1 sample case (7.69%) said that it rarely has. The availability of textbooks was also not evenly distributed across the continuum.

The majority (38.46%) indicated that they almost always have textbooks, and 30.77% said that they rarely have. Two respondents (15.38%) indicated that they have textbooks always and another 15.38% that they never have.

TABLE V a.

Availability of Supplies

	Rating in Percentage			
Supplies	Always have (1)	Almost always have (2)	Rarely have (3)	Never have (4)
Chalk	69.23	7.69	23.08	-
Study materials	38.46	53.85	7.69	-
Textbooks	15.38	38.46	30.77	15.38
Stationery (paper, pens)	30.77	53.85	7.69	7.69

On stationery, as the above table shows , 53.85% indicated that they almost always have and 30.77% said that they always have while the remainder of the sample 15.38%, were evenly distributed between rarely have and never have.

With respect to the availability of equipment, the majority (84.62%) indicated that they never have a radio. (See Table V b.) One sample case (7.69%) said it always has, and another (7.69%) said it almost always has. On audio tape players, the majority (92.31%) said that they never have, while only one sample case (7.69%) said it always has.

Lastly, on the telephone, a small number (23.08%) indicated that they always have. One sample case (7.69%) said it almost always has, while the majority (69.23%) said that they never have.

TABLE V b.

Availability of Equipment

	Rating in Percentage			
Equipment	Always have (1)	Almost always has (2)	Rarely have (3)	Never have (4)
Radio	7.69	7.69	-	84.62
Audio tape player	7.69	-	-	92.31
Telephone	23.08	7.69	-	69.23

3. Soft Data: Perceptions and Attitudes of Facilitators

3.1. Role of Audio Technologies in Study Groups

Facilitators' reasons for using audio technologies as instructional media were focused on in this part of the study. The facilitators who participated in the focus group were asked to respond to a questionnaire containing a list of 14 reasons for using three audio technologies as instructional media in study groups and to suggest modifications and/or additions to the list. They were asked to indicate the extent to which they agreed or disagreed that each item was a reason for using radio, audio tape and teleconferencing in study groups. They could choose from four alternatives: strongly disagree, disagree, agree, and strongly agree. These responses were weighted 1, 2, 3, and 4 respectively.

Facilitator responses to the items are summarized in Table VI which shows the mean and the rank of each reason by technology.

TABLE VI

Means of ratings of reasons by technology need area, with ranks of the three audio technologies *

	Type of audio technology need		
Reason	Radio	Audio tape	Teleconference
To explain difficult concepts	2.77 (3)	3.23 (2)	3.85 (1)
To motivate students	2.92 (3)	3.23 (2)	3.92 (1)
To increase my effectiveness	2.85 (3)	3.46 (2)	3.54 (1)
To encourage active learning	2.54 (3)	2.92 (2)	3.92 (1)
To deliver instruction	3.15 (3)	3.31 (2)	3.69 (1)
To increase student material-facilitator interaction	2.38 (3)	3.23 (2)	4.00 (1)
To increase tutor-student interaction	2.62 (3)	3.15 (2)	3.62 (1)

TABLE VI - continued

	Type of audio technology need		
Reason	Radio	Audio tape	Teleconference
To make special announcements	3.77 (2)	2.69 (3)	3.85 (1)
To respond to student needs	3.15 (3)	3.23 (2)	3.85 (1)
To counsel students	3.31 (2)	3.15 (3)	3.69 (1)
To provide learners language listening experiences	3.54 (2)	3.46 (3)	3.69 (1)
To discuss issues in print materials	2.31 (3)	3.15 (2)	3.77 (1)
To provide alternative views	2.77 (3)	3.15 (2)	4.00 (1)
To collect views of experts etc.	2.92 (3)	3.54 (2)	3.85 (1)
Mean Rank	**(2.77)**	**(2.21)**	**(1)**

** The numbers in the table are composite ratings. The numbers in parentheses are ranks. The ratings of each row are ranked to show differences among the three columns of audio technology need areas for each reason, with the higher ranking indicative of greater perceived preference.*

The initial analysis focused on whether the facilitators significantly differentiated among the audio technologies by educational problem area. The analysis was important both as a study goal and for determining the need for subsequent analysis to consider possible differences in the perceived educational use of each audio technology to alleviate specific instructional and learning problems in study groups. The data in Table VI was used to calculate a Friedman (x^2 r) analysis in which differences among the columns are focused on and with regard to rank ordering of reason preference means rows.

The results of the analysis [x^2 r (df = 2) = 23.29; $p < .05$], shows that the facilitators of Harare Region distinguish significantly among the 3 audio technologies as related to perceptions of educational problem areas. Significant differences in how these audio technologies are perceived and rated by the facilitators thus exist. The mean rankings of the three audio technologies are, therefore, significantly different. Teleconferencing has the highest mean ranking followed by audio tape and radio is last. The differences of mean rankings also show that audio tape is marginally higher than radio. These mean rankings are 1, 2.21 and 2.77 for teleconferencing, audio tape and radio respectively. The distinctions of radio, audio tape and teleconferencing are shared by the facilitators in terms of influencing their preference for an appropriate technology to address educational problems in study groups. The differentiation among audio technologies meant that further analysis of the data, to show differences in perceived educaional problem area appropriateness by technology need, was necessary.

For this exploratory study, it was also important to establish the relationship between facilitator demographic characteristics and audio technology preference. Of particular interest was whether gender, age, study group facilitating experience, education, and distance education experience had any significant influence on how facilitators rated the three audio technologies. Kendall's Coefficient of Concordance, W, a measure of

association of the ranks, was used to determine any association between the column ranks of the three technologies. Since the pattern of relationship between the variables was the same, only three variables were computed to show this pattern of association. Unlike in the previous analysis (Table VI), the focus was on row differences (See Table VII). Table VII presents means of audio technology preference for the facilitators with ranks and the Kendall coefficient of concordance, W, for the variables compared.

TABLE VII

Means of audio technology preference for the facilitators as stratified by three demographic variables, with ranks of column means *

	Mean ratings						
	Gender		Age		Education		
Technology	Male	Female	Young	Middle	O level	A level	Mean
	n = 11	n = 2	18-29 yrs (n = 7)	30-44 yrs (n = 6)	n = 6	n = 7	rank
Radio	2.87 (3)	2.84 (3)	3.05 (3)	2.79 (3)	3.04 (3)	2.66 (3)	|3|
Audio tape	3.15 (2)	3.54 (2)	3.35 (2)	3.05 (2)	3.26 (2)	3.09 (2)	|2|
Teleconf.	3.77 (1)	4.00 (1)	3.79 (1)	3.82 (1)	3.83 (1)	3.76 (1)	|1|
	W = 1		W = 1		W = 1		

** The numbers in the table are mean ratings. The numbers in parentheses are ranks. The ratings of each column are ranked to reflect the differences among the three audio technologies as rated by type of demographic variable. The higher the rank the greater the perceived audio technology preference.*

As can be seen from the table, all the variables showed a perfect positive relationship, W = 1, in terms of the ranking of the three audio technologies by the facilitators. No interesting within demographic variable differences, therefore, obtained. However, the higher preference of teleconferencing, followed by audio tape is quite apparent for the sample of the facilitators with radio being the less preferred. All the stratified demographic variables seem to significantly influence how the facilitators perceive the educational role of the three audio technologies. Put differently, neither age or experience, significantly differ in influencing the facilitator preference for each technology. The same can be said of the other demographic variables.

To determine whether the facilitators had any significant preference for a particular reason across the audio technology need areas, a Friedman test was computed on the column rank orderings of the reasons. As in the previous analysis (Table VII), the focus was on row differences (See Table VIII). The analysis $[x^2 r (df = 13) = 9.61; p > .05]$, shows a non-significant difference in the preference of the facilitators for any specific educational problem (reason) across types of audio technologies. In other words, the "logical" distinctions of educational problem areas seem not to be shared by the facilitators in terms of influencing their preference for a particular audio technology.

TABLE VIII

Means of ratings of reasons by technology need area, with ranks of the 14 reasons *

	Type of audio technology need			
Item	Radio	Audio tape	Teleconference	**Mean rank**
To explain difficult concepts to learners	2.77 (9.50)	3.23 (6.50)	3.85 (6.50)	**(7.50)**
To motivate students to learn	2.92 (6.50)	3.23 (6.50)	3.92 (3.50)	**(5.50)**
To increase my effectiveness	2.85 (8)	3.46 (2.50)	3.54 (14)	**(8.17)**
To encourage active learning	2.54 (12)	2.92 (13)	3.92 (3.50)	**(9.50)**
To deliver instruction	3.15 (4.50)	3.31 (4)	3.69 (11)	**(6.50)**
To increase student-material interaction	2.38 (13)	3.23 (6.50)	4.00 (1.50)	**(7)**
To increase tutor-student interaction	2.62 (11)	3.15 (10.50)	3.62 (13)	**(11.50)**
To make special announcements	3.77 (1)	2.69 (14)	3.85 (6.50)	**(7.17)**
To respond to student expectations	3.15 (4.50)	3.23 (6.50)	3.85 (6.50)	**(5.83)**
To counsel students	3.31 (3)	3.15 (10.50)	3.69 (11)	**(8.17)**
To provide learners language listening experiences	3.54 (2)	3.46 (2.50)	3.69 (11)	**(5.17)**

TABLE VIII - Continued

	Type of audio technology need			
Item	Radio	Audio tape	Teleconferencing	**Mean rank**
To discuss issues in printed materials	2.31 (14)	3.15 (10.50)	3.77 (9)	**(11.17)**
To provide alternative viewpoints	2.77 (9.50)	3.15 (10.50)	4.00 (1.50)	**(7.17)**
To collect views	2.92 (6.50)	3.54 (1)	3.85 (6.50)	**(4.67)**

** The numbers in the table are composite ratings. The numbers in parentheses are ranks. The ratings of each column are ranked to reflect the differences among the 14 reasons as rated by type of audio technology. The higher the rank the greater the perceived reason's preference.*

According to this analysis, there is no significant difference in how the study group facilitators perceive the 3 audio technologies across the educational problems that they attempt to alleviate. As a result, what may be perceived as a motivation problem in education by facilitators of learning in other societies, for instance, may not be separate from extending the learning environment, or increasing productivity for the Zimbabwean study group facilitator in Harare Region. We conclude, therefore, that the type of educational problem to be addressed does not significantly influence facilitators' audio technology preference in study group distance education in Harare Region.

3.2. What Facilitators Consider Obstacles to the Use of Audio Technologies

Another question of interest in this study was what facilitators consider to be the obstacles to the use of radio, audio tape and teleconferencing in study groups. The facilitators were asked to indicate the extent to which they agreed that each listed factor was an obstacle to the educational use of these technologies. As was the case in the previous question, they chose from four alternatives, strongly disagree, disagree, agree and strongly agree. The responses were weighted 1, 2, 3 and 4. Table IX shows the mean and the rank of each potential obstacle by technology.

TABLE IX

Means of ratings of potential obstacles by technology need area, with ranks of the three technologies *

	Type of audio technology need		
Potential Obstacle	Radio	Audio tape	Teleconferencing
Lack of a national policy on technology in study groups	2.62 (2)	2.46 (3)	3.15 (1)
Lack of funding by Colleges	2.69 (2.5)	2.69 (2.5)	3.00 (1)
Lack of funds at study groups	3.08 (3)	3.23 (2)	3.31 (1)
Logistics (e.g. batteries, thefts)	2.69 (2)	2.38 (3)	3.00 (1)
Failure by Colleges to incorporate technology	3.08 (2.5)	3.08 (2.5)	3.38 (1)
Own negative attitude	1.62 ((2)	1.77 (1)	1.38 (3)
Lack of training in using the technology	2.23 (2.5)	2.23 (2.5)	2.62 (1)
Lack of information on suitable educational broadcasts	2.15 (3)	2.69 (2)	2.77 (1)
Mean rank	**(2.44)**	**(2.31)**	**(1.25)**

* *The numbers in the table are composite ratings. The numbers in parentheses are ranks. The ratings of each row are ranked to show differences among the three columns of audio technology need areas for each obstacle, with the lower ranking indicative of greater perceived preference.*

The analysis focused on whether there was a significant difference in the facilitators' differentiation of the three technologies by potential obstacle. A Friedman's analysis of variance in which differences among the columns are focused on and with regard to rank ordering of the potential obstacles was computed (See Table IX).

The Friedman test revealed that the facilitators differentiate audio technologies according to the perceived obstacle [x^2 r (df = 2) = 6.81; p< .05]. The mean rankings of the three technologies are significantly different. Radio has the lowest mean ranking (2.44), followed by audio tape (2.31) and teleconferencing (1.25) has the highest . According to these results, the facilitators of Harare Region view teleconferencing as having the most problems. Ironically, radio has the least problems and yet, judging by the responses to the reasons question, described earlier, it is the least preferred technology.

Because the results were significant, it was necessary to do a further analysis of the data to determine if the facilitators distinguished among the potential obstacles across the technology need areas. A Friedman test was calculated focusing on the row differences (See Table X). Table X presents means of audio technology preference for the facilitators, with ranks of the obstacles on which the Friedman test (x^2 r) was calculated.

TABLE X

Means of ratings of potential obstacles by technology need area, with ranks of the 8 obstacles *

	Type of audio technology need			
Potential obstacle	Radio	Audio tape	Teleconference	**Mean rank**
Lack of national policy on technology in study groups	2.62 (5)	2.46 (5)	3.15 (3)	**(4.33)**
Lack of funds by Colleges	2.69 (3.50)	2.69 (3.50)	3.00 (4.50)	**(3.83)**
Lack of funds at centers	3.08 (1.50)	3.23 (1)	3.31 (2)	**(1.50)**
Logistics (e.g. batteries)	2.69 (3.50)	2.38 (6)	3.00 (4.50)	**(4.67)**
Failure by Colleges to incorporate technology	3.08 (1.50)	3.08 (2)	3.38 (1)	**(1.50)**
Own negative attitude	1.62 (8)	1.77 (8)	1.38 (8)	**(8)**
Lack of training in using the technology	2.23 (6)	2.23 (7)	2.62 (7)	**(6.67)**
Lack of information on suitable educational broadcasts	2.15 (7)	2.69 (3.50)	2.77 (6)	**(5.50)**

* *The numbers in the table are composite mean ratings. The numbers in parentheses are ranks. The ratings of each column are ranked to reflect the differences among the 8 obstacles as rated by type of technology. The lower the rank the greater perceived obstacle's preference.*

The Friedman test [x^2 r (df = 7) = 18.22; $p < .05$], shows a significant difference in the preference of the facilitators for obstacles across the types of audio technologies. There are significant differences between the potential obstacles as rated. The analysis also shows that the study group facilitator in Harare Region appears to distinguish the three audio technologies according to the obstacles that each presents.

Further examination of the data revealed that of the 8 items in the obstacles question, only one (own negative attitude) focused on the facilitator as a potential obstacle. The means of the responses to the item were radio 1.62, audio tape 1.77 and teleconferencing 1.38. These means indicate that over four-fifths of the facilitators do not agree that this item constitutes a serious obstacle. Of the 8 obstacles listed in this question, this one ranked the lowest (8), for all the technologies. Two other low ranked items were "lack of training in using the technology" (6.67) and "lack of information on suitable educational broadcasts" (5.50).

Two items out of the 8 items on the obstacles question were ranked quite high by the facilitators. The item about "lack of funds at study groups" was ranked first for both radio and audio tape (1.50) and (1), respectively. It was ranked second for teleconferencing (2). The "failure by Colleges to incorporate technology" into study group distance education, was also considered to be a serious obstacle to the use of audio technologies in study groups. Its rankings were 1.50, 2 and 1 for radio, audio tape and teleconferencing respectively.

The obstacles question also addressed the issue of logistics. Out of the 8 items in this question, this item was ranked 3.50 for radio, 4.50 for teleconferencing and 6 for audio tape. The item which was ranked as the third primary obstacle by the facilitators is the "lack of funding by Colleges". The rankings were 3.50 for radio and audio tape, and 4.50

for teleconferencing. The lack of a national policy on technology in study groups was also considered to be a serious obstacle. It was ranked 4.33 overall and 3 for teleconferencing.

3.3. Feelings about Audio Technologies

It was important for the goal of this study to find out whether the facilitators would use appropriate technology if it was available in study groups. In addition, they were asked why they would use it. The facilitators, for a variety of reasons, all responded in the affirmative. The reasons they gave ranged from motivating students to enabling them to understand difficult conceptual information. One interesting reason given by some respondents involved the opportunity the three audio technologies afford students to experience different delivery modes of instruction. They feel that this can enhance learning.

When asked about their facilitation role in study groups after the integration of audio technologies with print, some felt that it would be easier since they would not be expected to teach as much as is the case now. The students will have alternative sources of information. One respondent suggested that the job of the facilitator would be a high technology one, in which s/he must be trained to use the sophisticated equipment and to evaluate learning materials.

CHAPTER 5

Discussion, Recommendations and Conclusions

The study set out to investigate the perspectives of study group facilitators on the use of appropriate communication technology in order to alleviate learning and teaching problems in study group distance education in Zimbabwe. In so doing the study provided a means through which the hypotheses set out in Chapter 3 could be validated or refuted.

When the reasons for using audio technologies are divided into categories according to the problem area which they attempt to solve, the findings generally supported that the facilitators of Harare Region recognize and value the different capacities of radio, audio tape and teleconferencing to alleviate learning and teaching problems in study centers. These problem areas are to explain difficult concepts, to increase productivity, to motivate students, to convey generic skills and to expand the learning environment (Lewis, 1985).

The data showed that the highest mean ranking went to teleconferencing, followed by audio tape and radio was last. This was not only consistent with the response pattern on all the 14 questionnaire items on the reasons question. It was also consistent with the views expressed by the facilitators during the focus group and with some of their suggestions. During the focus group, the facilitators stressed the importance of engaging students in the learning process. They seemed especially to appreciate teleconferencing's ability to get students into an interactive learning mode. They also seemed to appreciate audio tape's convenience and flexibility which permit discussion and play-backs, as well as its potential for revision. Some of the facilitators' most critical comments were, however, directed at radio and audio tape which they alleged do not engage students in interactive learning. For instance, comments during the focus group such as, "only the instructor talks" and "students cannot respond or ask questions immediately" highlight the facilitators'

misgivings about radio and audio tape as instructional media for the distance learner in study group settings. Since they were not exposed to interactive radio during the focus group, their views may be understandable. This also helps to explain why Bates and others (1982) talk of radio as the forgotten medium.

The findings indicate that the facilitators believe the three audio technologies can help to explain complex concepts to study group students. The one questionnaire item in this category which dealt with the teaching and learning of conceptual information was ranked 7.50 out of 14. The majority of respondents (mean of 3.85) agree that teleconferencing can help students to master difficult concepts better than radio or audio tape. The means for radio and audio tape were 2.77 and 3.23 respectively. Radio has the lowest mean rating and this was the case on almost all the items in this question. This finding seems to confirm what Curran and Murphy (1989) found in their study of distance education at the second level in six African countries. These two researchers found that radio programs are unpopular with distance learners to the extent that they are not listened to. For not listening to such educational broadcasts, students give reasons ranging from irrelevant material to inappropriate broadcast times.

The data also indicate that the facilitators have some notions about the different capacities of radio, audio tape and teleconferencing to increase learning effectiveness in study centers. The mean rankings of three questionnaire items in the increasing productivity category demonstrate this. The specific items were: to increase student-material and facilitator interaction; to increase my effectiveness as a facilitator; and to increase student-college tutor interaction. They were ranked 7, 8.17 and11.50 out of 14 respectively. During the focus group, and in response to the question whether they would use the audio technologies in study groups if they were available, the facilitators were unanimous.

They all said that they would use these technologies, though for a variety of reasons including to increase learning and their effectiveness as facilitators of learning.

That the facilitators believe the three audio technologies can help them to address the problem of motivating their students is shown by their responses to four items in the "to motivate students" category as well as by their comments during the focus group. The mean ranks of 5.50 for "to motivate students to learn", 9.50 for "encouraging students to be more active learners", 7.17 for "making special announcements", and 5.83 for "to respond to students' expectations that communication technologies be used in study groups" show that the facilitators value the educational role of these technologies in this problem area. The rankings for motivating students and for responding to their expectations are quite high which may be indicative of the low motivation among study group students, and their desire for the integration of print with audio technologies. These data may also suggest that most of the facilitators in the sample, think these technologies should be incorporated into courses to satisfy real or imagined student needs and expectations.

The study also found that the facilitators believe audio technologies can help them to deal with the problem area of conveying generic skills such as providing them with language listening experiences, delivering information to students in study centers and at home, counseling them and discussing issues covered in print courseware. These items were ranked 5.17, 6.50, 8.17 and 11.17 respectively. Because providing listening experiences in language was ranked so high, with radio ranking second on this dimension, suggests that the facilitators are concerned with the English language ability of their students and value the role that radio can play to solve problems in this area. This should not be surprising since English is one of the most important subjects on the curriculum. It is a requirement for training and employment in most occupations in Zimbabwe.

The data indicated that the facilitators consider the problem area of expanding the learning environment an important one. The two items in this category of providing alternative views to those covered in print materials and collecting views or experiences of experts, specialists and witnesses were ranked 7.17 and 4.67 out of 14. The high ranking of both these items seems to contradict the view widely held by the principals of distance teaching institutions in Zimbabwe that their study materials are self-contained and that students do not require any supplementary materials to do well in national examinations.

The data also showed that the study group facilitators of Harare Region recognize the obstacles to the use of the three audio technologies in study group distance education. In addition, some of the most challenging problems appear to be deeply imbedded in prevailing circumstances at study centers. For instance, the study found a serious lack of radios, audio tapes and telephones in study centers. The lack of funds at the centers was found to be the primary obstacle to the use of audio technologies. Implicit in this response is the assumption by the facilitators that there is not enough money in study centers to buy and maintain the necessary equipment. Given that the study group students are among some of the poorest in Zimbabwe, their assumption is understandable. Moreover, as Kinyanjui (1993) points out, integrating print with communication technologies in distance education is not necessarily cheap. In addition, technologies vary considerably in their fixed and variable costs (Bates, 1991). In developing countries with weak economies and shortage of qualified educational technologists, such as Zimbabwe, access and selection of the appropriate technology are big issues and tend to cause decisioning problems.

The findings also point to the problem of logistics at the centers. Security and power supply at study centers are not adequate. Breakages into schools, where most of the study groups are based, are common in most urban centers. There is no regular supply of

electricity. As one respondent put it, "audio technology has mainly one disadvantage in our Zimbabwean situation, i.e. lack of reliable electricity power supply". Batteries are not generally cheap either when available. One other finding at the study center level was that the facilitators do not agree that their own negative attitude toward the introduction of new technology in distance education is an obstacle. This finding is consistent with what Lewis (1985) found in his study of the perceptions of university and college teachers in the United States of America towards using communication technologies as instructional media.

A further finding of the study was that the use of appropriate technology in study centers is hindered, not only by obstacles at the centers themselves, but by those beyond the centers as well. The data indicated that the failure by Colleges to incorporate audio technology into study group distance education is a major obstacle. This finding is consistent with the generally accepted view in distance education that distance teaching institutions determine the instructional media for their programs (Perry & Rumble, 1987; Holmberg, 1981; Baath, 1979).

Another interesting finding was that Colleges do not have the money to integrate print with audio technologies. The assumption by the facilitators that Colleges do not have the money is a curious one, and in the absence of any further research, does not seem to have any justification.

The lack of a national policy on using appropriate technology in distance education was found to be another problem in the integration of audio technologies with print in study group distance education. Although the government of Zimbabwe has regulations which govern the administration of private correspondence colleges (The Education Act, 1987),

it is silent about the use of appropriate technology other than print. As a result the colleges produce and distribute what they can afford according to their budgets and anticipated profits. In the process the quality of the material, both in terms of content and presentation, is sacrificed.

The findings of the study suggest that the facilitators of Harare Region see audio technologies as instructional media which can help to enhance Zimbabwe's distance teaching institutions' capacity and their own to communicate information to students in study centers. They also view them as tools that can help in addressing a wide range of student learning needs. As observed during the focus group, the facilitators think that the appropriate role of communication technologies is to do things print cannot do and which they cannot do competently themselves.

Analyses of the data also suggested that, despite their limited experience in the educational applications of appropriate technology in distance education, the facilitators of Harare Region are aware of the obstacles to the use of audio technologies in study groups. The findings further indicated that the facilitators are unanimous in their desire and preparedness to use these technologies in study centers if available. It is also noted that the facilitators' perceptions of their role in study groups, when audio technologies are incorporated with print in study group distance education, were more positive than anticipated. The facilitators viewed the complementarity among appropriate audio technology, print, and themselves in study groups, as likely to significantly contribute to the enhancement of learning and enrollments in study centers. Distance teaching institutions are likely to derive huge financial benefits from the increased enrollments.

In light of the findings of this study, it is recommended that further research be undertaken on this issue as well as on other areas of technology applications in distance education. Any such further research could well include a much larger number of study group facilitators and involve all the educational regions of Zimbabwe. Moreover, the questionnaire could be adapted in some areas and then used to secure rankings of, for example, students, principals of distance education colleges, college tutors, Responsible Authorities of study centers, and officials of the Ministry of Education. In addition to the use of the questionnaire, further research could profitably adopt interviewing procedures and focus group techniques.

It is also recommended that discussions on the feasibility of using appropriate technology in study centers, be held between officials of the Ministry of Education and the representatives of the distance education colleges, including the Responsible Authorities of study groups. Perhaps also there are other issues which claim attention and would emerge in such discussions.

From this preliminary study's findings, it is evident that solutions to current problems in respect of the use of appropriate technology in study groups, may call for the adoption of new forms of organization and delivery of distance education. Furthermore, using audio technologies in study groups may not only help to improve the quality of education offered in these centers. It may also demonstrate the special advantages and opportunities provided by this particular educational pathway which is necessary if it is to gain popularity with the people. Within the theoretical framework of distance education, it is therefore, suggested that the Ministry of Education gives priority to staff development in educational technology and distance education. This will help the Ministry to produce the human qualities and skills needed to spearhead a multimedia distance education program in Zimbabwe.

This original study has provided some direction for the future planning of the integration of communication technologies, especially radio, audio tape and teleconferencing, with print in study group distance education in Zimbabwe. The study has supported the notion of a multimedia approach in the practice of distance education in study groups in Harare Region. It has also reported a need for further research on the issues forming the heart of this study. The need for discussions between the Ministry of Education and the representatives of distance education colleges, as well as the Responsible Authorities of centers was suggested. In addition, the need for developing personnel in educational technology and distance education, was also suggested. No attempt, however, has been made to offer a detailed examination of how these general recommendations could be implemented. Rather it was the intention to present them for further exploration and discussion with all the interested parties.

REFERENCES

Abernethy, D.B. (1969). The political dilemma of popular education: An African case. Stanford, California: Stanford University Press.

Agency for International Development (1990). Interactive radio instruction Newton, MA: Educational Development Centre.

Anzalone, S. (1989). *Educational technology and the improvement of general education* in developing countries. In Technology and teaching: Elements of Sustainability in Developing Countries. Washington D C.: The World Bank.

Atkins, W.A. Jr. (Dec. 1975). What is instructional systems development? Educational Technology. *17- 21.*

Baath, J.A. & Willen, B. (1981). 'On the Nature of Distance Education'. Distance Education, Vol. 2.

J.A. (1979). Correspondence education in the light of a number of contemporary teaching models. Baath, Malmo: University of Lund, Department of Education.

Bates, A.W. et al. (1982). Radio: the forgotten medium? Milton Keynes: Open University Institute of Educational Technology, Paper No. 185.

Bates, A.W. (1984). Broadcasting in education: An evaluation. London: Constables.

Bates, T. (1984). 'The Growth of Technology in Distance Education' in T. Bates (ed.) The role of technology in distance education. London: Croom Helm.

Bates, A.W. (1989). Towards a European Electronic University: Technology and course design for European-wide distance education. EADTU Heerlen, Holland.

Bates, A.W. (1990). Media and technology in European distance education. Heerlen: European Association of Distance Teaching Universities.

Bates, A.W. (1990). 'Applications of New Technologies (including computers) in Distance Education'. Paper presented at the Round Table on Training, Vancouver, Canada April 1990.

Bates A.W. (1991). Technology applications in distance education (Booklet Two). The Commonwealth of Learning/ Open Learning Agency, Vancouver.

Bates, A.W. (1991). Selecting technologies (Booklet Three). The Commonwealth of Learning/ Open Learning Agency, Vancouver.

Bates, A.W. (1992). *Technology for teaching and training: a guide for decision making.* London: Kogan Page.

Briggs, L.J. (ed.) (1977). Instructional design principles and applications. Englewood Cliffs, New Jersey: Educational Technology Publications.

Clark, J. (1986). 'Community Education and the concept of need'. International Journal of Lifelong Education, 5 (3).

Coldevin, G. (1980). 'Broadcasting Development and Research in Kenya'. *Journal of* Educational Television 6 (2) pp. 61-67.

Coombs, P. H. (1968). The world education crisis. Cambridge: Oxford University Press.

Curran, C. & Murphy, P. (1989). Distance education at the second level in six counties in Africa. HEDCO, Dublin.

Dorsey, B.J. (1989). 'Educational Development and Reform in Zimbabwe'. Comparative Education Review, Vol. 33, (1).

Durbridge, N. (1983). Design implications of audio and video cassettes. Milton Keynes: Open University Institute of Education Technology, Paper 222.

Durbridge, N. (1984). 'Audio Cassettes' in Bates, T. (ed.) The role of technology in distance education. London: Croom Helm.

Evans, K.M. (1984). Planning small scale research. Berkshire N.F.E.R. Publishing Company Ltd.

Gachuhi, D. & Matiru, B. (ed.) (1989). Handbook for designing and writing distance education materials. Bonn: ZED, Republic of Germany.

Gagne', R.M. (1968). 'Educational Technology as Techniques'. Educational Technology, 8 p. 5-13.

Garrison, R. (1990). 'An Analysis and Evaluation of Audio Teleconferencing to facilitate Education at a Distance'. American Journal of Distance Education, Vol. 4, No. 3.

Grundin, H. (1984). ' Radio ' In Bates, A.W. (ed.), The role of technology in distance education. London: Croom Helm.

Hall, B.L. & Dodds, T. (1977). Voices for development: the Tanzanian National Radio study. Cambridge: International Extension College.

Harris, W.J.A. (1978). The home study adult in Africa: Nigerian correspondence students. Manchester Monographs.

Hendrikz, E. (1979). 'Education for the new Zimbabwe'. Oxford Review of Education Vol. 5, No. 1.

Holmberg, B. (1985). Status and terms of distance education. Sweden: Lector Publishing.

Imhoof, M. & Christensen, P. (ed.) (1986). Teaching English by radio: Interactive radio in Kenya. Washington, DC.: Academy for Educational Development.

Jamison, D. & McAnany, E. (1978). Radio for education and development. London: Sage Publications.

Kabwasa, M. & Kaunda, T. (1973). Correspondence education in Africa. London: Routeledge and Kegan Paul.

Kashambwa, A.C. (1990). ' Formal Education Broadcasting in Zimbabwe '. Paper presented at the African Conference on Radio Education in Harare, Zimbabwe.

Kaufman, R.; Rojas,A. & Mayer, H. (1993). Needs assessment: A user's guide. Englewood Cliffs, N. J.: Educational Technology Publications.

Kaufman, R. (1987) Needs assessment: Concept and application. Englewood Cliffs, N. J.: Educational Technology Publications.

Keegan, D. (1980). On defining distance education. London: Croom Helm.

Keegan, D. (1982). 'From New Delhi to Vancouver: Trends in Distance Education' in A. Daniel, M. Stroud & J. Thompson (eds.) Learning at a distance: A world perspective. Edmonton: Athbasca University.

Kerlinger, F.N. (1985). Foundations of behavioural research. New York: Holt, Rinehart and Winston.

King, A.R. & Brownell, J. A. (1966). The curriculum and the disciplines of knowledge: A theory of curriculum practice. New York: John Wiley and Sons Inc.

Kinyanjui, P.E. (1976). A study of distance learners in Kenya. London: Routeledge and Kegan Paul.

Kinyanjui, P.E. (1993). 'Planning, Administration and Management of a Distance Education System: Practical Guidelines for Zimbabwe'. Keynote Address at Policy makers' workshop in Harare, Zimbabwe.

Koumi, J. (1992). 'The UK Open University's use of audio-vision: audio-cassettes with supplementary visual materials'. Paper presented at the Conference on world education crisis, Robinson College, Cambridge, UK, September, 1992. International Extension College.

Laurillard, D. (ed.) (1987). Interactive media. Chichester: Ellis Horwood.

Lewis, R.J. (1985). Faculty perspectives on the role of information technologies in academic instruction. Washington, DC.: Learning and Technology Services.

Madge, J. (1967). The tools of social science. London: London Green and Company Ltd.

Mason, R. & Kaye, A. (ed.) (1989). Mindweave: Communication, computers and distance education. Oxford: Pergamon.

Meed, J. (1976). 'The use of radio in the Open University's multi- media educational system'. Educational Broadcasting International, Vol. 9, No. 2.

Monette, M. (1979). 'Needs assessment: A critique of philosophical assumptions'. Adult Education, 29 (2).

Morgan, L. & Feldman, D. (1977). 'Needs Assessment in Higher Education: Mott Foundation Community College Model'. Educational Technology, 27 (11).

Moore, M. (1979). 'Needs Assessment: A Further Comment'. Teaching at a Distance, 52.

Murphy, P. (1992). 'Effectiveness of full-time Second-level Distance Education in Three African Countries' in P. Murphy & A. Zhiri (ed.) Distance education in Anglophone Africa: Experience with secondary education and teacher training. The World Bank: Washington DC.

O'Bryan, K.G. (1981). Writing for instructional television. Washington: Corporation for Public Broadcasting.

Oppenheim, A.N. (1982). Questionnaire design and attitude measurement. London: Heinemann.

Parker, L. & Olgren, C.H. (1984). The teleconferencing resource book. Amsterdam: New Holland.

Perraton, H. (1983). Alternative routes to formal education: Distance teaching for school equivalency. Baltimore: Johns Hopkins University Press.

Perraton, H. (1993). Distance education for teacher training. London: Routledge.

Perry, W. (1984). The state of distance education worldwide. Open University: Milton Keynes.

Perry, W. & Rumble, G. (1987). A short guide to distance education. International Extension College: Cambridge.

Radkun, A.S.S. (1992). 'The Indonesian Junior High Schools: An innovative contribution to Nine-Year Basic Education'. Jarkata: Centre for Communication Technology for Education and Culture, Ministry of Education and Culture.

Reiser, R.A. & Gagne', R. (1982). Selecting media for instruction. Englewood Cliffs, New Jersey: Educational Technology Publications.

Robinson, B. (1984). 'Telephone Teaching' in A.W. Bates (ed.) The role of technology in distance education. London: Croom Helm.

Robinson, B. (1983). 'Telephone teaching and audio- conferencing at the British Open University' In Bates, A.W. (ed) Media and technology in European distance education. Heerlen: European Association of Distance Teaching Universities.

Rowntree, D. (1982). Educational technology in curriculum development. London: Harper and Row.

Rwambiwa, J.P. (1988). 'Trends in media in distance education'. In Grant, R. (ed.) The education crisis in Zimbabwe: What is distance education? Harare: Rapid Results.

Salomon, G. (1979). The interaction of media cognition and learning. London: Jossey-Bass.

Sewart, D. (1982). 'Distance Teaching: A Contradiction in Terms"? Teaching at a Distance, 8 p. 5-13.

Singh, A. (1992). Perspectives on distance education: Distance education in India. Vancouver: The Commonwealth of Learning.

Sparkes, J. (1984). 'Pedagogic differences between media' In Bates, A.W. (ed.) The role of technology in distance education. London: Croom Helm.

Stewart, D.W. & Shamdasani, P.N. (1990). Focus groups: Theory and practice. Newbury Park. California: Sage Publications.

Tchombe, T. M. (1990). 'The status of educational broadcasting in Cameroon'. Paper presented at the African Conference on Distance Education, Harare.

Tennant, M. (1985). 'The Concept of "need" in Adult Education'. Australian Journal of Adult Education, 25 (2).

The Open University (1992). Tutoring by telephone: A handbook. Milton Keynes: Open University Press.

Tilson, T. (1990). 'Radio education: An economic perspective'. Paper presented at the African Conference on Radio Education, Harare.

Wakatama, M.A. (1983).Correspondence Education in Central Africa: An alternative route to higher education in developing countries. Lanham, MD: University Press of America.

Whitt, E.J. (1991). 'Artful Science: A Primer on Quantitative Research methods'. Journal of College Student Development, 32.

World Bank (1988). Education in Sun- Saharan Africa: Policies for Adjustment, revitalization and expansion. Washington, DC.

World Bank (1980). Education sector policy paper. Washington, DC.: The World Bank.

Young, M.; Perraton, H.; Jenkins, J. & Dodds, T. (1980). Distance teaching for the third world: The lion and the dockwork mouse. London: Routledge and Kegan.

Zimbabwe Ministry of Education and Culture (1984). 'Chief Education Officer's Circular Minute No. 17 of 1984: Education by Correspondence'. Harare.

Zimbabwe (1987) 'Education Act, 1987 (No. 5 of 1987)'. Harare: The Government Printer.

Zimbabwe Ministry of Education and Culture, Secretary's Annual Reports for the years ended 31st December, 1990- 93. Harare: The Government Printer.

Zimbabwe Ministry of Education and Culture. Annual Reports prepared by the Adult and Distance Education Section , 1990- 93. Harare.

Zimbabwe, (1992). Census 1992 Preliminary Report. Harare: Central Statistics Office.

APPENDICES

APPENDIX A: TRANSITION RATES FROM GRADE 7 INTO FORM 1

SINCE 1979

Year	Grade 7	Form 1	Transition %	Those not absorbed into Form 1
1979	97 117	22 201	22.86	74 916
1980	97 099	18 352	18.90	78 747
1981	140 680	22 201	15.78	118 479
1982	148 886	97 752	65.66	51 134
1983	168 769	110 725	65.61	58 044
1984	181 050	138 904	76.72	42 146
1985	212 100	148 002	69.78	64 098
1986	288 729	166 168	57.55	122 561
1987	325 902	202 899	62.26	123 003
1988	305 136	211 816	69.42	93 320
1989	281 715	200 650	71.22	81 065
1990	295 128	201 912	68.42	93 216
1991	280 847	193 706	68.97	87 141
TOTALS	2 823 158	1 735 288		1 087 870

Source: Zimbabwe Ministry of Education, Planning Section.

APPENDIX B: STUDY GROUP ENROLLMENT AND STAFF SINCE 1981

Year	No. of groups	Enrollment			No. of Facilitators
		Male	Female	Total	
1981	615	27 342	12 531	39 873	872
1984	620	28 818	12 321	41 139	909
1987	406	18 506	11 561	30 067	706
1990	362	19 641	11 241	26 882	659
1991	409	19 133	13 588	32 721	758
1992	345	14 419	11 015	25 434	643

Source: Zimbabwe Ministry of Education, Planning Section.

APPENDIX C : CONSENT FORM

I would very much appreciate your agreement to participate in this study, which as you may already know from the opening remarks of the research assistant, is about your understanding of what role appropriate technology can play in study group distance education. I want to assure you that this is in no way a test reflecting your intellectual aptitude. Please be also assured that the data obtained in this study will be treated with the strictest confidentiality and will not be reported in a way that reveals your identity.

By signing the bottom of this form, you indicate your agreement for participating in the study. You may, of course, discontinue at any time. While I certainly hope that you will participate, your decision not to or to discontinue once started will not prejudice your right to participate in future studies I or others may be conducting.

CONSENT: By signing this form, I agree to participate in this study on the facilitatator's perception of the educational role of appropriate technology in study group distance education for secondary level learners in Zimbabwe. I understand that I have the right to discontinue participation at any time.

Name: _____

Address: _____

_____

Name of study group: _____

Date: _____

Signature: _____

APPENDIX D: STUDY GROUP FACILITATOR SURVEY

To Participant

You are asked to help in a scientific study by answering the questions in this blank. The purpose of this questionnaire is to have your honest opinions on the applications of appropriate technology in study group distance education. Your responses will help the Ministry of Education and the distance teaching institutions that supply your students with study materials to formulate appropriate policies on integrating print with audio technologies to enhance learning in study groups. Your responses to all the questions will, therefore, be highly appreciated. All information will be kept confidential and you need not write your name. Only totals and percentages will be reported.

SECTION I : BACKGROUND INFORMATION

Please **circle one number only** for questions in this section

1. What is your gender?

A. Male	1
B Female	2

2. In what age group would you classify yourself?

A 18- 23 years	1
B. 24- 29 years	2
C. 30- 34 years	3
D. 35- 39 years	4
E. 40-44 years	5
F. 45 years and above	6

Circle one number only for each question on this page.

3. How many O Level subjects do you have?

A. Less than five (5)	1
B. Five (5) subjects	2
C. Six (6) subjects	3
D. Seven (7) subjects and above	4

E. Other qualifications (e.g. 2 A levels, Certificate in Education). Please specify:

---

4. Have you ever taken any course by correspondence?

A. Yes	1
B. No	2

4.1. If yes what form of media did you use?

A. Print only	1
B. Print with radio	2
C. Print with audio cassettes	3
D. A combination of all the three media	4

5. How many years have you worked as a study group facilitator (mentor)?

A. Less than one year	1
B. 1-2 years	2
C. 3-4 years	3
D. 5 years and above	4

6. On a scale of 1-4 **rate the availability at your study group of the supplies and equipment** below that you may need to do your job: **1= I always have; 2 = I almost always have; 3= I rarely have; 4= I never have.**

Please circle one number that applies to you on each line.

Supplies	**Rating**
A. Chalk	1 2 3 4
B. Study materials (lectures)	1 2 3 4
C. Textbooks	1 2 3 4
D. Stationery (paper, pen, etc.)	1 2 3 4

Equipment	**Rating**
E. Radio	1 2 3 4
F. Audio tape players	1 2 3 4
G. Telephone	1 2 3 4

SECTION 2.: REASONS FOR USING AUDIO TECHNOLOGIES

Choose from four (4) alternatives: 4= Strongly Agree (SA), 3= Agree (A), 2= Disagree (D), 1= Strongly Disagrees (SD).

Distance educators cite various reasons for incorporating information technologies into their courses. Please indicate the extent to which you agree or disagree that each of the following items is a reason for you to incorporate each technology into study group distance education courses.

Please, **circle only one number per line,** the one which best applies to you.

Item	Audio technology	SA	A	D	SD
7. To explain difficult	radio	4	3	2	1
concepts to students	audio tape	4	3	2	1
	teleconf. equipment	4	3	2	1
8. To motivate students	radio	4	3	2	1
to learn	audio tape	4	3	2	1
	teleconf. equipment	4	3	2	1
9. To increase my	radio	4	3	2	1
effectiveness as a	audio tape	4	3	2	1
facilitator (mentor)	teleconf. equipment	4	3	2	1
10. To encourage students	radio	4	3	2	1
to be more active	audio tape	4	3	2	1
learners	teleconf. equipment	4	3	2	1

Please circle only one number per line, the one that applies best to you.

Item	Audio technology	SA	A	D	SD
11. To deliver instruction	radio	4	3	2	1
to students in study	audio tape	4	3	2	1
centers and at home	teleconferencig equipment	4	3	2	1
12. To increase opportunities	radio	4	3	2	1
for student- material and	audio tape	4	3	2	1
facilitator interaction	teleconferencing equipment	4	3	2	1
13. To increase opportunities	radio	4	3	2	1
for student and college	audio tape	4	3	2	1
tutor interaction	teleconferencing equipment	4	3	2	1
14. To make special	radio	4	3	2	1
announcements to students	audio tape	4	3	2	1
(e.g. on exams.)	teleconferencing equipment	4	3	2	1
15. To respond to student	radio	4	3	2	1
expectations that audio-	audio tape	4	3	2	1
technologies be used					
in study groups.	teleconferencing equipment	4	3	2	1

Please circle only one number per line, the one that applies best to you.

Item	Audio technology	SA	A	D	SD
16. To counsel students on	radio	4	3	2	1
subject options, career	audio tape	4	3	2	1
opportunities etc.	teleconf. equipment	4	3	2	1
17. To provide distance	radio	4	3	2	1
learners with listening	audio tape	4	3	2	1
experiences in language	teleconf. equipment	4	3	2	1
18. To discuss material or	radio	4	3	2	1
issues covered in printed	audio tape	4	3	2	1
materials	teleconf. equipment	4	3	2	1
19. To provide alternative	radio	4	3	2	1
viewpoints to those	audio tape	4	3	2	1
covered in print materials	teleconf. equipment	4	3	2	1
20. To collect the views or	radio	4	3	2	1
experiences of specialists,	audio tape	4	3	2	1
experts or witnesses	teleconf. equipment	4	3	2	1

Please write any other suggestions in the space below.

SECTION 3.: OBSTACLES TO USE OF AUDIO TECHNOLOGIES

Please indicate the extent to which you **agree or disagree** with each of the factors below which some educationists say are **obstacles or hindrances** to the use of audio technologies for instructional / learning purposes. **Circle** the appropriate response for **each technology** using the following scale:

1 = Strongly Disagree (SA), 2 = Disagree (D)

3 = Agree (A), 4 = Strongly Agree (SA)

Please **circle** one number only per line for each technology

Factors	Audio technology	SD	D	A	SA
21. Lack of national policy	radio	1	2	3	4
on use of this technology	audio tape	1	2	3	4
in study group distance educ.	teleconf. equipment	1	2	3	4
22. Lack of funding by distance	radio	1	2	3	4
teaching institutions to support	audio tape	1	2	3	4
the integration of print with this technology	teleconf. equipment	1	2	3	4
23. Lack of funds at study group	radio	1	2	3	4
level to support the use of	audio tape	1	2	3	4
this technology	teleconf. equipment	1	2	3	4
24. Logistics (e.g. batteries,	radio	1	2	3	4
electricity, scheduling	audio tape	1	2	3	4
time and thefts)	teleconf. equipment	1	2	3	4

Please circle one number only per line for each technology

Item	Audio Technologies	SD	D	A	SA
25. Failure by Colleges to	radio	1	2	3	4
incorporate technology	audio tape	1	2	3	4
into courses	teleconf. equipment	1	2	3	4
26. Own negative attitude	radio	1	2	3	4
toward use of technology	audio tape	1	2	3	4
in distance education	teleconf. equipment	1	2	3	4
27. Lack of training in using	radio	1	2	3	4
the technology	audio tape	1	2	3	4
	teleconf. equipment	1	2	3	4
28. Lack of information about	radio	1	2	3	4
present educational broadcasts	audio tape	1	2	3	4
that are suitable	teleconf. equipment	1	2	3	4

Write any other suggestions in the space below.

SECTION 4.: FEELINGS ABOUT AUDIO TECHNOLOGIES

29. If audio technology was available in study groups would you use it and why?

Circle Yes or No and state why.

Yes

Because----------

No

Because----------

---

30. Presently your students may expect you to teach them most of the time. How would you see your job as a facilitator of learning in the study group if audio technologies were to be integrated with print materials? Would students' expectations of your role **remain the same or change, and why?**

Thank you for completing this questionnaire. Please hand in your completed questionnaire to Mr. E. J. MUTI.

APPENDIX E: REASONS FOR USING AUDIO TECHNOLOGIES: RESPONSES

Reasons	Technology	SD (%)	D (%)	A (%)	SA (%)	Mean	Rank R	Rank A	Rank T	Mean % Agree
To explain difficult	R	7.69	30.77	38.46	23.08	2.77	9	5	5	
concepts to	A	-	7.69	61.54	30.77	3.23				**84.62**
students	T	-	-	15.38	84.62	3.85				
To motivate	R	7.69	15.38	53.85	23.08	2.92	6	6	3	
students to	A	-	7.69	61.54	30.77	3.23				**89.75**
learn	T	-	-	7.69	92.31	3.92				
To increase my	R	-	38.46	38.46	23.08	2.85	8	2	14	
effectiveness as	A	-	7.69	38.46	53.85	3.46				
a facilitator	T	-	23.08	-	76.92	3.54				**76.92**
To encourage	R	15.38	23.08	53.85	7.69	2.54	12	13	4	
students to be	A	-	30.77	46.15	30.77	2.92				
more active learners	T	-	-	7.69	92.31	3.92				**79.47**
To deliver instruction	R	-	15.38	53.85	30.77	3.15	4	4	10	
to students at centers	A	-	15.38	38.46	46.15	3.31				
and at home	T	-	7.69	15.38	76.92	3.69				**87.18**
To increase student-	R	23.08	23.08	46.15	7.69	2.38	13	7	1	
material and	A	-	7.69	61.54	30.77	3.23				
facilitator interaction	T	-	-	-	100	4.00				**82.05**
To increase student	R	7.69	38.46	38.46	15.38	2.62	11	9	13	
and college tutor	A	-	15.38	53.85	30.77	3.15				
interaction	T	7.69	7.69	-	84.62					**74.36**
To make special	R	-	7.69	7.69	84.62	3.77	1	14	6	
announcements	A	15.38	23.08	38.46	23.08	2.69				
to students	T	-	-	15.38	84.62	3.85				**84.62**

APPENDIX E - Continued Reasons for Using Audio Technologies: Responses

Reasons	Technology	SD (%)	D (%)	A (%)	SA (%)	Mean	Rank R	Rank A	Rank T	Mean % Agree
To respond to	R	15.38	-	38.46	46.15	3.15	5	8	7	
student expectations	A	-	23.08	30.77	46.15	3.23				
on use of appropriate technology	T	-	-	15.38	84.62	3.85				**87.18**
To counsel students	R	-	7.69	53.85	38.46	3.31	3	10	11	
students on subject	A	-	15.38	53.85	30.77	3.15				
options etc.	T	-	7.69	15.38	76.92	3.69				**89.75**
To provide students	R	-	-	46.15	53.85	3.54	2	3	12	
with listening	A	7.69	-	30.77	61.54	3.46				
experiences in language	T	-	7.69	15.38	76.92	3.69				**94.87**
To discuss material/	R	23.08	30.77	38.46	7.69	2.31	14	11	9	
issues covered in	A	7.69	7.69	46.15	38.46	3.15				
print courseware	T	-	-	23.08	76.92	3.77				**76.92**
To provide	R	15.38	7.69	61.54	15.38	2.77	10	12	2	
alternative views to	A	-	23.08	38.46	38.46	3.15				
those in print materials	T	-	-	-	100	4.00				**84.61**
To collect the views	R	15.38	15.38	30.77	38.46	2.92	7	1	8	
or experiences of	A	-	15.38	15.38	69.23	3.54				
specialists etc.	T	-	-	15.38	84.62	3.85				**84.61**
Mean percentage agreeing										**84.07**

Total Population = 13

R = Radio; A = Audio tape; T = Teleconferencing

SD = Strongly Disagree; D = Disagree; A = Agree; SA = Strongly Agree

APPENDIX F: OBSTACLES TO INSTRUCTIONAL USE OF AUDIO TECHNOLOGIES: RESPONSES

Obstacle	Technology	SD (%)	D (%)	A (%)	SA (%)	Mean	Rank R	Rank A	Rank T	Mean% Agree
Lack of national policy	R	38.46	-	23.08	38.46	2.62	5	5	4	
on use of audio technology	A	38.46	7.69	23.08	30.77	2.46				
in study groups	T	23.08	-	15.38	61.54	3.15				**64.10**
Lack of funding by distance	R	23.08	15.38	30.77	30.77	2.69	3	3	3	
teaching institutions to	A	30.77	7.69	23.08	38.46	2.69				
support audio technology	T	15.38	7.69	15.38	61.54	3.23				**66.67**
Lack of funds at study	R	23.08	7.69	7.69	61.54	3.08	1	1	2	
group level to support use	A	15.38	7.69	15.38	61.54	3.23				
of the technology	T	15.38	7.69	7.69	69.23	3.31				**74.36**
Logistics (e.g. batteries,	R	15.38	30.77	23.08	30.77	2.69	4	6	5	
electricity, scheduling	A	30.77	15.38	38.46	15.38	2.38				
time and thefts)	T	7.69	15.38	46.15	30.77	3.00				**61.54**
Failure by Colleges to	R	15.38	7.69	30.77	46.15	3.08	2	2	1	
incorporate audio	A	7.69	23.08	23.08	46.15	3.08				
technologies into courses	T	15.38	-	15.38	69.23	3.38				**76.92**
Own negative attitude	R	61.54	23.08	7.69	7.69	1.62	8	8	8	
toward use of technology	A	53.85	23.08	15.38	7.69	1.77				
in distance education	T	69.23	23.08	7.69	-	1.38				**15.38**
Lack of training in	R	38.46	23.08	15.38	23.08	2.23	6	7	7	
using the technology	A	38.46	23.08	15.38	23.08	2.23				
	T	30.77	15.38	15.38	38.46	2.62				**43.59**

APPENDIX F - Continued Obstacles to Instructional Use of Audio Technologies: Responses

Obstacle	Technology	SD (%)	D (%)	A (%)	SA (%)	Mean	Rank R	Rank A	Rank T	Mean% Agree
Lack of information about	R	23.08	38.46	38.46	-	2.15	7	4	6	
present suitable educational	A	15.38	23.08	38.46	23.08	2.69				
broadcasts for study groups	T	7.69	30.77	38.46	23.08	2.77				53.85
Mean percentage agreeing										57.05

Total Population = 13

R = Radio; A = Audio tape; T = Teleconferencing

SD = Strongly Disagree; D = Disagree; A = Agree; SA Strongly Agree

APPENDIX G: SPECIFIC COMMENTS FROM THE FACILITATOR SURVEY

At the end of Sections 2 and 3 of the questionnaire and in questions 29 and 30, the respondents were asked to make suggestions or any comments they had not in other parts of the questionnaire. The suggestions and comments were reviewed and summarized. Some trends were revealed, the most frequent being the following:

> "Distance education is neglected. It should be supported more by government and the Responsible Authorities of study groups so that funds can be made available for purchasing the basic equipment for implementing a multimedia distance education program in study groups."

> "The different media make learning more real and interesting to study group students which may result in increased enrollment and higher profits for correspondence colleges. Also, some students in conventional schools, who are frustrated by the quality of education they get and the high fees they pay, may be attracted to study groups."

> "Communication technologies by putting information across in different and interesting ways, help to motivate students to learn, promote better understanding of information, and help to promote interactive learning."

> "These technologies will not only supplement and complement print materials from the Colleges. They will also be a valuable source of information for the facilitator."

> "Students will not expect the facilitator to teach them all the time as is the case now. However, weaker students may continue to rely on the facilitator as a source of information, but the gifted will depend more on the alternative sources made possible by the communication technologies."

> "The facilitator's role will dramatically change from that of a teacher to that of a facilitator of learning. Furthermore, the facilitator's job would become a high technology one in which s/he must be trained to use sophisticated equipment and to review/ assess material before students view or listen to it, in order to be able to give maximum help to those who may need it."

APPENDIX H: SPECIFIC COMMENTS FROM THE FACILITATOR FOCUS GROUP

During the focus group different communication technologies were presented to the facilitators. They were requested to brainstorm answers to the suggested questions Only quotations that were particularly interesting or unique are included below:

Teleconferencing

"Presents information in a lively and interesting manner; a lot of student- tutor, and student- student interaction possible."

"Has the capacity to reach more people and to enhance the quality of education Presenters have to prepare their lessons thoroughly. Students get the same type of education irrespective of where they are."

"Eliminates distance and the separation of the student and the teacher, an advantage as well as a disadvantage. It is a disadvantage in the sense that it negates separation of the teacher and student, one of the fundamentals of distance education."

"Lessons can be recorded for use later, particularly for revision."

"Students can communicate directly and immediately with the teacher at the other end of the line."

Video

"Since learning for many people is facilitated by visual and auditory means and by practice, not just by alpha-numeric texts, video helps to make learning real and more meaningful to distance learners."

"Increases interest of students and motivates them to learn."

"Difficult topics, including those in Mathematics, can be taught on video since students can witness physical demonstrations."

"Stop button is convenient for discussion and note-taking."

"Presenters should guard against dominating the lesson in order to maintain student interest."

Audio

"As in the case of video, the stop button is good for taking notes and for discussion."

"Very appropriate for presenting information on difficult topics and for revision."

"May not be equally useful across the subjects. For example, it is of limited use in Mathematics where students need to see examples of problems worked out."

"Like all the other media, it requires thorough preparation on the part of the presenter."

"It helps to reduce student boredom and dependence on the facilitator and print materials."

General

"Would like to see communication technologies used in study groups."

"Access will be a big problem for study groups."

"Using these technologies w.ll help to lure students to study groups."

"Lets have more and similar workshops on the educational use of communication technologies in study groups."

APPENDIX I: LETTER OF REQUEST

Ministry of Education and Culture
P.O.. Box CY 121
Causeway, Harare

27 January, 1995

The Regional Director
Harare Region
ATTENTION: Mr. Bowora

Dear Sir

RE: Request to facilitate communication with Harare Mentors to participate in a Research Study on the educational use of appropriate technology in study groups by Mr. C. M. Gundani

Date: **Thursday, 9 February, 1995**
Time: **9.00 a.m.**
Venue: **The Education Services Centre**

As a follow-up on our discussion in your Office, in the above regard, on 25 January, 1995, and subsequent telephone conversations with Mr. Mupita, Deputy Regional Director, Secondary, I now write to request your permission and assistance in connection with this proposed study. Your assistance in informing the mentors, whose names appear on the attached list, to report at the Education Services Centre at 9. 00 o'clock in the morning on 9 February, 1995, would be greatly appreciated. With your permission, Mr. Taddious Pasipanodya, an Officer based at the Centre, could be in a position to help your Education Officer (Non-formal Education) to contact the respective mentors.

For any further information please feel free to contact me. Thanking you in advance for your cooperation.

E. J. MUTI
A/ Chief Education Officer (Adult and Distance Education Section)
For Secretary for Education and Culture