THE ZIMBABWE BULLETIN OF TEACHER EDUCATION

VOLUME 5 No. 3 SEPTEMBER 1997

The Zimbabwe Bulletin of Teacher Education is published three times a year by the University of Zimbabwe, Department of Teacher Education, Faculty of Education.

The Zimbabwe Bulletin of Teacher

Volume 5 No 3 September 1997

ISSN No-1022-3800

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FRED ZINDI &
ROBERT AUCOIN

INTRODUCTION

It has long been established that the advantages of distance education include its cost-saving potential and flexibility. "Once the initial capital outlay is made and materials produced, unit costs decrease with expansion" (Fay Chung, 1992).

One of the most serious obstacles to distance education for many years has been the perception on the part of traditional educators and the general public who view distance education as second rate. However, given the modern trends in distance education design and technology which now address internal efficiency and the intrinsic quality of studying at a distance, one begins to question whether there is now a shift in perception between distance systems of education and traditional ones. This paper looks at such development in Zimbabwe and Canada, two countries known for unique and successful approaches to distance education.

THE STATE OF DISTANCE EDUCATION IN ZIMBABWE

(i) The Pre-independence Period

It was in 1954 that the Central African Correspondence College was established in the then Federation of Rhodesia and Nyasaland mainly to alleviate the problem of lack of educational facilities for those Africans who could not be accommodated into existing educational institutions. The Judges Report commissioned by the Rhodesian government in 1962 recommended study by correspondence for primary school leavers who wished to further their educational careers but failed to find places in existing secondary schools. By 1975, 60% of Zimbabwe's Africans taking Junior Certificate and O'Level examinations were doing so through distance education. Most of these students were registered with colleges such as Rapid Results College and Transworld Tutorial. Those who took degree programmes were mainly registered with the University of South Africa. It was rather ironical that although the majority of Zimbabweans were opposed to the policies of apartheid South Africa, they still sought their advanced education from this regime which they paid for in foreign currency such as British sterling or US dollars. The majority of degreed African secondary school-teachers in Zimbabwe before independence had obtained their qualifications from the University of South Africa (UNISA). By 1979, over 3,500 students had graduated through correspondence colleges or distance education.

(ii) The Post-Independence Period

The main post-independence distance education programme initiated by the Zimbabwe government in the 1980s was the Zimbabwe Integrated Teacher Education Course (ZINTEC) (which was a UNICEF/Zimbabwe Government Programme of Co-operation). This was es-

tablished to alleviate teacher shortage caused by the rapid expansion of the education system at independence. Four colleges in Mutare, Masvingo, Harare and Gwanda enrolled over 5000 trainee teachers in the first six years of the inception of ZINTEC. By 1986, 3903 teachers had graduated from ZINTEC. The programme involved students spending 16 weeks in residence learning theories of education as well as their teaching subjects. This was followed by three and half years of on-the job experience for the students who were assigned to primary schools to teach while simultaneously receiving supervision and distance education modules on both educational theories and teaching courses. After passing the distance education programme students would then go back to the colleges for another 16 weeks before taking the final examinations.

The 1982 mid-term evaluation of ZINTEC programme showed that, on the whole, pupils taught by ZINTEC student-teachers had better results in their national examinations than those taught by other teachers (Chivore, 1982). The reason given for the effectiveness of the ZINTEC programme was that most students who received distance education courses were able to put theory into practice while they learnt on the job, unlike the students from conventional colleges who spent most of their three years learning theory and were only able to apply it after they had completed their training.

On the basis of another ZINTEC evaluation in 1986, the Ministry of Higher Education moved to transform the ZINTEC National Centre into the National Distance Education Centre. However, due to a drop in the growth of educational opportunities from 72 percent in 1980 to 54 percent in 1986, the Ministry decided to phase out two of the ZINTEC colleges (Mutare and Masvingo) which have since become conventional colleges, but still adopting a more or less ZINTEC approach where students spend two years in residence and one year of supervised teaching practice in the field.

At independence a number of local and privately-owned distance education colleges also sprang up. For instance Zimbabwe Distance Education College (ZDECO) offered 'O' Level, 'A' Level and degree programmes. By 1990 nearly 20,000 Zimbabwean Students had enrolled with ZDECO. (Ndlovu, S. 1993).
IN 1985, the Zimbabwe Integrated System of Secondary Education (ZISSE) was launched in order to develop methods of reducing teaching costs without compromising the quality of education by conbining half-time face-to-face teaching with qualified teachers, with half-time supervision of self-study groups by mentors using distance learning materials. A total of 1800 students were enrolled but numerous problems were encountered in the implementation of ZISSE. The Ministry of Education did not come up with the supply of materials agreed upon. Teachers went without pay for long periods (sometimes up to 12 months). There was a general shortage of teaching staff, a shortage of transport and mentors were unwilling to implement the project which seemed to them to have no direction at all. By 1990 the ZISSE concept was almost history as less than 100 students were still in the ZISSE books.

In 1989, the Adult and Non-Formal Education Division of the Ministry of Education and Culture established the Zimbabwe Institute of Distance Education (ZIDE) to complement private distance education college. ZIDE concerns itself more particularly with study groups and its main work is to promote distance education and to popularize the study group system.

On the whole, distance education in Zimbabwe has expanded tremendously since independence.

In 1993 the University of Zimbabwe established a Distance Education Centre. 3,000 stu

dents enrolled for the September 1993 and January 1994 courses and paid fees which were much higher than those paid by full time students. According to President Mugabe, who is also the chancellor of the University, Zimbabwe will save an estimated $163 million in foreign currency which is the amount currently paid to correspondence colleges such as the University of South Africa (UNISA) by Zimbabwean students registered with foreign institutions. Plans are already at an advanced stage for the Centre for Distance Education to offer degree courses to school-leavers in all disciplines taught at the University of Zimbabwe. It is envisaged that once this is accomplished, Zimbabwe's much needed foreign currency will no longer be spent on those who are still enrolled with institutions such as UNISA.

In an address given by Edmund Garwe, the former Minister of Education in Zimbabwe (in October 1996), it was agreed that emphasis should be made on the need for a new technological thrust in the development of distance education. With assistance from the Zimbabwe-Canada General Training Facility (ZCGTF), the technologies which were put in place in addition to existing ones include:
-text and graphics design for instructional materials using desktop publishing as a means of producing effective and motivating instructional print materials;
-interactive radio instruction which provides an audio-visual interactive link between the instructor and learners through the use of radio and cassette recorders, and
-production of education video materials.

In the past, distance education institutions in Zimbabwe relied on traditional technologies such as print media and radio only, but due to the advancement of computer technology and educational video equipment, instruction and learning through distance education have also changed to include this new technology, even though this is still limited.

The Government Correspondence Primary School in Zimbabwe is probably the only school in the whole of Africa that gives distance education at primary school level. Plans were underway in 1996 to equip it with audio-visual conferencing and computer-based communication technologies and to expand its functions to include on-line access to distance education literature around the world and to turn it into Zimbabwe's Distance Education Document Centre.

Zimbabwe is however still struggling with the creation of new content for the internet mainly due to a shortage of telephone lines. The University College of Distance Education (UCDE) was set up in 1993 after the William Commission's (1989) recommendations in order to respond to increased school enrolment. After Independence (1980) the school system began to churn out at least 7000 'A' level graduates yearly who had university entry qualifications yet only a third of these students were absorbed by the four universities in Zimbabwe. Given the shortage of university places on one hand and the quest for a university education on the other, distance education became the alternative for most of them. However, the initial programmes were in Educational Administration only. These have since been expanded and the mode of instruction at the UCDE uses print media which is principally in the form of modules and study guides but also supplemented by face-to-face tutorials, residential sessions, audio cassettes and video cassettes. Although plans are underway to introduce new technology such as audio-conferencing, and computers, the desire to keep distance education affordable in a country where tuition fees are determined by salaries (one has to work a whole year to afford a decent computer) has been the main reason why the University College of Dis-

tance Education's advancement in technology has been limited.

The Government Correspondence Primary School which is getting assistance from the Canadian government will, no doubt, expand its distance education technology base to include upper primary education programmes and perhaps pre-service teacher training programmes such as the Zimbabwe Integrated National Teachers Education Course (ZINTEC) programme which provides trainee primary school-teachers with distance education materials.

According to Garwe (1996) the future role of the Government Correspondence Primary School, apart from the functions already outlined above, will be to provide efficient and effective distance education at primary school level up to Grade 7 and to other distance education providers under the Ministry of Education. It is therefore a matter of time before the ZINTEC programme begins to benefit from the new technology at the Government Correspondence Primary School.

Currently, ZINTEC, still follows teacher training methods through distance education for two main reasons: (i) the programme is cost-effective when compared to the conventional teacher education programme and, (ii) it is the fastest way of producing more teachers since after only 16 weeks' attendance of a residential programme, the students are sent into the field to effectively take classes while the rest of their training continues through distance education.

The Zintec programme today still follows the traditional technology of print and radio. Radio 4 which was established immediately after independence (1980) mainly for educational broadcasts is quite popular among distance education students. No attempts have yet been made to make television another media for regular distance education programmes perhaps due to the fact that there are only two channels that operate in the whole country and also coupled with the non-existence of televisions in most of rural Zimbabwe where there is no electricity.

The Zintec programme in the early 1980's also relied on the use of audio cassettes. Since there were no local audio-cassette manufacturers, most of the cassettes used were imported. Lack of foreign currency, coupled with the fact that some students refused to return cassettes to the centres after use forced distance education educators to abandon the use of audio-cassettes as a delivery system for distance education.

With the introduction of computer-based technology, video delivery, audio conferencing delivery and audiographic delivery which all seem to be the future for Zimbabwe a lot of distance-education technocrats are beginning to wonder whether print-based delivery systems will survive.

Since most of the influence for this new technology such as electronic mail, facsimile machines and video delivery is coming from Western countries, it only makes sense to trace distance education back to its beginnings in the West before an attempt is made to answer questions surrounding the future of distance education in Zimbabwe, particularly with regard to media development.

In the case of Zimbabwe, it is only fair to make comparisons with Canada, a country which has been instrumental through the ZCGTF in the development of new technology (such as

video and audio conferencing) in order to have a clearer picture of Zimbabwe's future trends in distance education design and technology.

It is when the progress, the successes and failures of distance education in Canada since the 18th Century are clearly understood that one would be able to give answers to questions such as: "Will print-based courses survive in Zimbabwe?" or "Will media-based courses dominate in the future?" since Zimbabwe is closely following in the footsteps of developments in Canada.

HISTORICAL BACKGROUND TO DISTANCE EDUCATION IN WESTERN COUNTRIES (INCLUDING CANADA)

The Emergence of Print

It could be argued that correspondence education, and therefore, by extension, distance education, as we know it, could not exist without the emergence of relatively cheap printing technologies. In fact these technologies really extend back as far as the original Gutenberg printing press and it was only at this time that people could begin to learn on their own time, in their own homes at their own convenience, the very hallmark of correspondence education. Previous to that people relied on the expert knowledge of teachers and priests or the chance pamphlet printing on parchment. The emergence of a movable type printing press enabled people to obtain relatively cheap texts for home use and this, we submit, was the beginning of correspondence education. Was this distance education? That depends on one's definition of distance education. In this paper we shall employ the definition that requires distance to have some sort of interactivity or face-to-face contact with a teacher or human learning resources. Using this definition then this new print medium is definitely not, in and of itself, distance education.

However, it is generally accepted that correspondence education was the precursor to distance education. As printing technologies became more advanced, cheaper and achieved higher quality so too did the actual content of the print. Of course that was a slow process as it took several centuries to perfect print as a medium. In fact it has been shown (McLuhan, 1964) that until the year 1700 most of the print materials to emerge from the World's printing presses were merely print versions of texts that had existed on parchment for centuries before Gutenberg even dreamed of a movable type printing press. As such it took several centuries for the two technologies of content and printing to merge into one. It took almost another two centuries before these merging technologies achieved the degree of quality and affordability that was necessary to begin popular correspondence education. Clearly correspondence education has had a long uphill battle in this and many other regards. Distance education has now appeared to have taken up the cause.

The time lag that occurred between the emergence of the printing press and original content for the press was, in fact, a precedent setting time lag. It is clear that there is always a time delay between the emergence of new technologies and the development of content designed specifically for those technologies. More importantly, during this delay, people have inevitably used the new technology as if it were old technology. In the case of the printing press people spent years using the new technology (printing press) to print old texts (in this paper we will refer to content as a technology). It took several centuries before new texts were created for the printing press.

Radio

Although there were many communications technologies to evolve between the accessibility of print and the emergence of popular radio it was radio that, more than any other medium, captured the imaginations of the general population (see Dieuzeide, 1986, Perraton, 1984 and Yeh, 1983). The technology of radio was developed very early in the 20th century, but, in terms of educational content, it took almost another 40 years before the technologies merged. This seems like a long time until one remembers that it had taken several centuries for the two aspects of print technologies to merge. Of course the first applications of radio were to simply emulate what had been done before in print. That is to say that the first radio programmes consisted of people reading print materials over the airways.

Government and educators were quick to realise the potential of radio as an educative or inculcating force. This is obvious when one examines the radio farm forums in Canada in the 1940s which were emulated in many parts of the world including what is now Zimbabwe (Nwaerondu, 1994 & Zindi and Aucoin, 1995). In these farm forums experts appeared on local and national radio broadcasts with programmes pertinent to farming communities. These programmes included topics such as farming techniques, marketing strategies as well as community based programmes. These forums proved to be a unifying force in otherwise disperse farming communities in rural Canada as people gathered at neighbours' houses in order to listen to the programmes. More important then was the socialization process that occurred immediately after the programmes as people discussed what they had just heard and made community plans regarding how the programme's ideas could be implemented. It can be argued that this was in fact, the beginning of distance education as we now know it. These radio forums proved to be very successful and the model on which they are based was later adopted by many African countries including Tanzania and Zimbabwe soon after independence (Zindi and Aucoin, 1995).

Television

In the 1950s relatively cheap television technology made educational prospects as exciting as they had been earlier in the century with radio (Staven, 1985). In this case the emergence of the raw electronic technology and the content was much faster than that of either print or radio. As we saw with both print and radio, television followed the pattern that the first television programmes were simply televised radio programmes. However, within a decade television had come into its own as potentially the most powerful medium known to humankind. The Canadian government and indeed other Western governments, were quick to latch on to television as a great disseminator of education and information. It can even be argued that the effective use of television was what won the 1960 presidential election for John F. Kennedy (McLuhan, 1964).

However, it took yet another decade before educators in the West became cognisant of the power of the television medium. Television, as a raw medium, had actually taken a step backwards from radio from a distance educators' point of view due to it's apparent lack of interactivity. An attempt at solving this problem began in the late 1960s when educational television departments were established all over North America from Berkeley in the west to Sir George Williams University (now Concordia University) and Memorial University in the east. Public broadcasting stations were also established at this time especially in the United

States where they continue to flourish and act as a model for the rest of the educational

broadcasting world. In fact an entire television broadcasting bandwidth (UHF or ultra high frequency) was specially created for the express purpose of educational television in the United States (Buckland, 1991). Canada followed suit soon after by establishing such stations as TV Ontario, now one of the world leaders in the production of educational television materials and programmes.

Audio-Visual media mixed Presentation

The next step in the evolution of distance education technologies involved an attempt at incorporating several already existing media into one package. Probably the most familiar example of this application were filmstrip/audiocassette presentations. As most readers probably remember these formats were notorious for being problematic. Many problems commonly associated with this media were simply due to outdated equipment. Both the filmstrips and the cassettes were known for their poor quality and aged recordings.

This medium did not remain popular in classrooms for very long and by the late 1980s, had all been but relegated to dusty closets and storerooms throughout Canada and the United States. As a distance education delivery system a/v filmstrips and audio cassettes never gained much popularity for the simple reason that most people did not have film projectors in their homes. In addition to this filmstrips were behind the times since, by the time the content caught up with the technology people were already experimenting with home video in the form of VHS and Beta as well as home video cameras. In light of these newer technologies filmstrips and audio tapes were strictly archaic.

Audio conferencing

The next major advance in distance education technologies took a major leap forward as well as accompanying newer ideas in educational content development. Audioconferencing, where people are linked via telephone networks, emerged in the 1970s as a viable alternative to the problems associated with the lack of interaction found in educational television (Cookson, 1995). Another breakthrough occurred at this time when distance educators began to employ more of a media mix. At the time this media mix was known as multimedia. However, the term multimedia has since taken on a slightly different connotation - namely that of a media mix all developed, produced and delivered on a computer screen.

In Canada, it was at this time that distance educators began to realise the need for full-scale systemic and systematic planning in the design of education. This included three very broad steps to the design of educational courses:

1. Needs assessment and analysis
2. Systemic design of instruction
3. Formative and summative evaluation

The reason for the importance of these three steps was that educational designers realised that their distance education packages would be offered to the students "as is". In other words there was no opportunity for teaching "by the seat of one's pants" as it were. Once the course materials were out there was little that could be done to fix errors or correct items that could work better. Once the student had the educational materials in his or her

possession there was no way to make corrections. Before too long course designers of regu-

lar, face-to-face courses were also using these methods. The idea was to create courses, both at a distance and face-to-face that would be perfect, both pedagogically and aesthetically. In other words, first time designers were concerned with systemically designing courses that were effective vehicles for learning, as opposed to effective vehicles for teaching.

Computers

In one form or another computers have arguably been around since the time of Pascal in the 17th century when he invented his mechanical adding machine. And of course the Chinese had been using the abacus for centuries before that. However, most manifestations of the computer have been deemed user unfriendly by all but the most hardened of computer users right until this decade. Even today there are many who still scoff at the notion of computers in education or research in anything other than maths or the sciences. It is true that, until recently, computers tended to be big, clunky main frame based monsters that required more time for training than what was available to the student in a one term course.

With the improvement of user interfaces, particularly in the last five years computers have become more entrenched than ever in all milieus of life, including education. As with all other media, it is taking some time for the technology of content to catch up to the technology of the computer itself. For proof of this it is only necessary to walk into any Canadian high school physics laboratory and count the number of unused Commodore Pet computers gathering dust at the back of the laboratory or in a storage closet.

Recently, people have begun to recognise the power of the computer as medium, content and manager in all applications. More and more often computers are being touted as the all encompassing medium. That is to say that there is the potential within the computer to include all other media including print, audio, video and, in the future, virtual reality. If we might be permitted to misquote McLuhan, it has become obvious that computers can also act as the medium, the message (content) and the manager.
A typical scenario might run as follows:

> Student A logs on to his computer from home to start the days' lesson. Before he begins the computer suggests that, before starting the days' lesson, he begin with a pre test. This pre test, the computer explains, does not count towards the student's final mark, but, it will help the computer decide what are the student's strengths and weaknesses before starting the actual lesson. The student agrees to take the pre-test and a network installed database generates a unique random pre test which the student then prints out and completes off-line. When the test is completed the student returns to the computer to input his or her answers and the test is immediately marked and feedback is given. Based on the results of the test the computer will point out where the student is weak and prescribe a lesson or series of lessons based on those results. The prescription might include readings from a preassigned text, viewing of videotapes, listening to audio tapes or maybe a visit to a relevant museum or homepage on the internet. After "taking" the pre-

scription the student would be invited to take another test to determine his or her progress. If the student achieved a predetermined level of success he or she would be permitted to continue to the next lesson. Otherwise he or she would be encouraged to continue with other materials.

Obviously some people would argue (and we would agree with them) that this scenario is a fairly cold and heartless way of learning. There is little or no interaction and what interaction does exist is not of the human variety. However, we would also argue that there are many people who would prefer this kind of learning. In addition we would point out that nowhere are we advocating that this be the only or even primary mode of delivery for distance education courses. It is merely a tool. In this case it is a management tool.

However, distance education still has a long way to go before the technology of content catches up with the technology of the computer as a machine. Recent formative evaluations conducted by students at Concordia University in Canada seem to bear out this opinion. Should we then toss our hands in the air and say "Well this medium is very expensive with little or no results and we should forget about it?"

The Situation in Canada Today

As has already been outlined in this paper that distance education has simple print correspondence education as its roots. In the early days this was the only choice for someone who wanted to learn outside of the formal classroom. Today we have almost reached the opposite extreme. There are so many methods of distance education available today that both the student and the educator can easily become confused. Not only are there many types of technologies available, but, there are many hybrid technologies available with an equal number of vendors trying to sell all this stuff to unsuspecting people. The whole world of distance education, then, has become very confusing, especially to the lay person.

At York University in Toronto, Canada, the use of videoconferencing is commonplace for much of distance education. Videoconferencing, despite all of its obvious merits, is still relatively new and many people in Canada are still learning about its abilities and its limitations. Despite the advantages, we are now in danger of getting too much caught up in the technology and not the content. There are too many technologies available to us and too many people trying to sell us technologies that we do not need or understand. The result is that some administrators are caught up with the idea of simply keeping up with the Jones'.

This race to keep up has resulted in some fairly silly situations including the following true

anecdote which concerns a man who one of the authors recently met at a conference. This man is the person responsible for distance education for an unnamed Canadian province. In his own words his mandate is essentially to keep pace with the province next-door in terms of distance education. So whatever their neighbours do, he must also do, and do it better if he can. This is particularly true of technologies since the province next-door has enjoyed considerable success in recent years in developing the latest in communication technologies.

However, the answer to these seemingly absurd scenarios is not to give up on technology, as some of our collegues are tempted to do. The solution is to educate ourselves on all the emerging technologies, understand the educational implications of each and make informed decisions based on these implications. When one does that one quickly realises that there is no "best" technology. Each technology finds its forte in distance education applications and we need to recognise what those strengths are.

As we begin to learn about distance education technologies, we are continuing to struggle with content. We have reached the stage in distance education where most technologies including videoconferencing, internet and multimedia, function (at least technically) flawlessly. Throughout Canada, extremely complicated videoconferencing technologies are used without any technical problems.

However, people's learning styles have changed over the years. Research suggests that attention spans are shorter. Formative evaluations conducted by the Children's Television Workshop over the last 25 years have demonstrated time and time again that, for effective learning to take place, teachers must know their learner (See Sammur, 1990, Mielke, 1990). In the case of distance education in Canada, that often means being more visually stimulating. This might be in the form of pictures, videos or simulations. More and more this also means using computers, even if the students do know more about computers than the teachers.

In essence then we have reached the stage where standardized learning is no longer as effective as it may have once been. Instructional designers and teachers alike will now have to reassess their students and themselves as well as their courses continually to ensure that effective learning is taking place. This means that faculty will most probably no longer be able to rely on their 20 year old notes for classes they have been teaching for as long. It means faculty will have to familiarize themselves with the latest technologies, whether they use them all the time or not.

What does this mean for distance education and technology? We can no longer divorce technology from content. McLuhan was right on the money when he said that the medium is the message. The technology needs to be designed with content in mind as well as content now needs to be designed with the technology in mind. In other words distance educators need to stop designing courses for new technologies using older technologies. Much the same as television producers had to stop producing radio programmes on television. We now need to develop instructional models specific to the media, be it computers, videoconferencing, audiographics, internet or multimedia.

Conclusion

The Future? - Virtual Reality?

Where will distance education be in the future? Of course no one can answer that question. It might include more satellite technologies and maybe even virtual reality systems. It does appear that the technological changes to society in general and to distance education in particular are coming faster than we can deal with. It seems that long before we get control over one technology another one has already come to replace it. The saying that by the time one gets his or her brand new computer home from the store it will already be out of date is surely an exaggeration, but, it is an exaggeration that is not far from the truth. Current research suggests that the optimum learning environment is one that employs a media mix. Future systems will then require flexibility on the part of the instructors, learners and, perhaps most importantly, the instructional materials.

Although developing nations like Zimbabwe are finding it increasingly difficult to keep pace with these new technologies, it must be emphasized that the original print-based courses will continue to survive for a long time to come as the beginning of print-based independent study can be traced back to the letters of the Apostle Paul, Jewish scholars and to New England in the 1800s when distance education 'reading circle' materials were sent to housewives. Print-based courses have therefore a well-documented history of success and there will always be students who wish to be unhampered by fixed schedules or fixed sites. Print-based courses are also still effective, flexible and inexpensive when compared to the electronic media. It is therefore difficult to conclude whether or not electronic media-based courses will dominate in the future. One thing for certain is that they will make studying easier for some.

According to the 1990 UNESCO report, for distance education to succeed in Africa, educators, planners and governments must work together and focus on three main areas: informa-

tion and research, the training of specialists and the production or acquisitions of materials. Future distance educators will have to show flexibility in their needs assessment; provide training for local experts, increase local participation; use indigenous channels of communication and improve the two-way flow of information.

There is a need for governments to adopt comprehensive policy on distance education a swell as effective co-operation with Distance Education Colleges. For as long as distance education is viewed as a poor cousin of the formal education system, then it will not be able to fulfil its role of increasing educational opportunities. There must therefore be adequate funding for distance education programmes as well as adequate supply of materials, technologies and transport before distance education can realize its potential.

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