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Case Study on Distance Education for Teacher Education in Mauritius

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Acronyms and abbreviations

ADEA	Association for the Development of Education in Africa
CONFEMEN	Conférence des Ministres de l'Education des pays ayant le Français en partage
MLA	Monitoring Learning Achievement
NESIS	National Education Statistical Information Systems
PASEC	Programme d'Analyse des Systèmes Educatifs des Pays de la CONFEMEN
PRSP	Poverty Reduction Strategy Papers
SACMEQ	Southern Africa Consortium for Monitoring Educational Quality
SAP	Structural Adjustment Programs
UNESCO	United Nations Educational, Scientific and Cultural Organization

ABSTRACT

Teacher training is a key element in an attempt to modernise teaching methods so as to render education more widely accessible and improve the quality of learning. Owing to the lack of qualified teachers in Sub-Saharan Africa and to the inability of face-to-face training institutions to fill this gap adequately, many countries have begun to adopt distance training, using printed material, the radio, television, audio and video cassettes and, in some cases, the Internet or the CD-ROM. However, in spite of its high educational potential, this training method has met with only mitigated success, as regards policy, teaching and organisation.

The present case study of a Mauritian experience in the field of distance in-service teacher training bears on the assessment of the *Advanced Certificate in Education* (ACE) programme by teachers trained between 1993 and 1998. The quantitative analysis of the data collected by means of a questionnaire was completed by a qualitative analysis of semi-structured interviews carried out by school managers and inspectors, which focused on the way in which ACE contributed to improving learning outcomes in the classroom.

The distance training methodology focusing more on learning than on teaching, on flexibility, autonomy and collaborative work is, on the whole, very much appreciated by teachers to the extent that it favours the development of new pedagogical approaches in the classroom. However, institutional constraints (rigid time-tables, overcrowded classrooms) do not always leave much room for innovation. Still, to those who felt they were intrinsically motivated and professionally committed, the ACE provided an opportunity to reflect on their own classroom practices, to improve some of them as far as possible, and to engage in a life-long learning process of professional development.

If, on the whole, teachers showed more interest in the educational methodology component of the programme than in the content component of the disciplinary areas (languages, mathematics, sciences), the school inspectors are of opinion that the ACE should have focused on the development of teaching skills as opposed to mere theoretical pedagogical knowledge.

A “more successful” teacher training programme is the one which, more than any other, enables the teacher to move from an axiological (pertaining to values) and methodological (based on procedures) perspective to a praxological (action-oriented) and epistemological (taking into account knowledge studies and their limits) one.

1. STATUS OF DISTANCE EDUCATION IN SOME SELECTED COUNTRIES OF SUB-SAHARAN AFRICA (SSA)

1.1. Introduction

1. Teaching as a subject has, for years, attracted the attention of researchers on education at whatever level- primary, secondary or even tertiary-, and using whatever delivery method, whether face-to-face teaching, distance education or mixed mode approaches. It is generally considered that the way teachers are trained to acquire knowledge and skills is bound to influence how learning will be imparted to the pupils and how learning outcomes will be affected. Studies on teacher education have shown, for example, that the focus on rote learning in developing countries is often related to the level of qualification and training of teachers (DFID 2001:9). Most of the researchers on teacher education underline that training approaches depend as much on pedagogical underpinnings as on contextual specificities. Increasingly, they are claiming that more than infrastructural development to increase access or curriculum change to accommodate new content areas, it is the way in which the new curricula are transacted by teachers that will make the difference between what has been labelled as the "traditional" tendency based on behaviourist assumptions and "progressive" approaches inspired by elements of constructivism (Perraton, 2002, p10). Increasingly, teacher education institutions more than other training institutions are concerned by the transformation along the continuum from being essentially teacher centered to facilitating guided active learning, greater participation and the development of reflective practices. It is these underpinnings that will most likely determine the organizational principles and structure of teacher education at distance and constitute the basis of pedagogical modernization towards both increased access and enhanced quality.

1.2. What is distance education and open learning?

2. As a methodology, Distance education (DE) is generally defined as an educational process in which the learner is separated from the instructional base or teacher either in space and/or time for a significant proportion of his learning (ADEA, 2000). Open learning, in turn, is a philosophy of learning based on the principle of flexibility to increase access and equity to education and training. It is an organized educational activity that uses a variety of media and/or teaching materials, in which "constraints on study are minimized in terms either of access, or of time and place, pace, method of study, or any combination of these" (Perraton 2002).

2. DISTANCE EDUCATION FOR TEACHERS IN SOME SELECTED COUNTRIES

3. Distance education for teachers in SSA goes as far back as the nineteen seventies. The Educational Television Project (ETP) of Côte d'Ivoire was launched in 1971 to increase access to formal education and provide in-service teacher education. In 1976 alone, more than 2000 trainee teachers graduated. However, for social and pedagogical reasons the ETP came to an end six years later (ADEA 2003). In 1976, Nigeria established a dedicated distance education college for both initial and continuing professional development of teachers. Likewise, in many sub-Saharan countries, in spite of little government policy on teacher education at a distance, institution-level initiatives for enhancing pupils' learning and teacher competencies have been implemented before the establishment of national policies. In Mauritius the use of audiovisual materials and correspondence courses for improving teaching and learning was advocated as early as 1971 when Mauritius College of the Air was set up before Government's policies on distance education were spelt out more than 20 years later in The Master Plan for Education 2000 and Beyond (1992).

4. Nowadays, it is fully acknowledged that Distance Education is particularly appropriate to reach widely dispersed teacher populations without disrupting their personal, professional and social lives. It suits best countries where face to face institutions cannot respond urgently and adequately to increasing demands for teacher education due to lack of space and facilities following the introduction of Free Primary Education (Lesotho). In his selection of distance based teacher education projects, Christopher Yates ( ) refers to pre-service and in-service programs for teachers in Botswana, Kenya, Nigeria, Swaziland, Tanzania, Uganda and Zimbabwe. The high enrolment rate of some of these projects augurs well for the future of distance education for primary school teacher development. The Kenya Program enrolled almost 8 500 unqualified primary teachers, the National Teachers Institute of Nigeria, more than 186 700, the Northern Integrated Teacher Education Project of Uganda, more than 3000 in a single cohort.

5. In Francophone countries of sub-Saharan Africa where distance education is being used for the professional development, in-service training of teachers, heads of schools, and inspectors has remained the major thrust area (Seddoh, RESAFAD, No.2). With the exception of Madagascar, Congo and Djibouti where higher education is the priority, most countries, including Burundi, Cameroon, Central African Republic, Chad, Côte d'Ivoire, Gabon, Guinea, Senegal and Togo are relying upon distance education for pre/in-service training of the education personnel or for preparation of professional examinations. With the increasing support provided by *Agence Intergouvernementale de la Francophonie* to the *Association francophone Internationale des Directeurs d'Enseignements Scolaires* for the training of heads of schools in Bénin, Burkina Faso and Sénégal, it would appear that Francophone countries are pomoting training in school administration and management rather than pedagogical training of teachers as is the current practice in Anglophone countries.

6. In 1994, 21 000 trainees graduated through the distance-run National Certificate in Education (Nigeria), a figure comparable to the total admissions of 58 colleges of education. In Botswana where annual intake of unqualified teachers is between 600 and 1000 it would take 200 years to train the whole teacher population through the conventional system. Upgrading of academic and professional qualifications of holders Primary Teacher Certificate to the diploma level in Botswana is implemented through distance education because teachers cannot be released to attend traditional

courses "without undermining the educational system". The increasingly high teacher attrition rate due to change of jobs and HIV/AIDS (more than 15% in Malawi) is prompting for quick and cost-effective solutions to shortage of qualified and trained teaching staff. The Domasi College (Malawi) with an annual intake of more than 900 distance teacher-learners is catering for more than all conventional colleges in the country where continuing professional development of teachers can only be ensured through the distance mode because of the lack of bed-space in conventional face to face university colleges. This dual-mode institution uses distance education for teacher education to enhance quality of education in less privileged Community Schools, increase equity and access, reduce gender disparity, improve the perception and commitment of teachers, increase female participation in tertiary education and improve the global efficiency of the school system which accommodates only 26% of primary school leavers in secondary education. In post-apartheid South Africa, the Open Learning Systems Education Trust uses interactive radio to improve in-service training of teachers in order to implement the policy shift in language teaching from a content-based to outcome-based curriculum and reduce disparities between schools for different ethnic groups.

7. For these reasons, among others, distance education as a delivery mode was recommended by the World Conference on Higher Education (Paris,1998), the World Forum on Education (Dakar, 2000) and the ILO/UNESCO Committee on the Application of the Recommendations concerning the Status of Teachers (Geneva,2000).

8. However, although in terms of pedagogical and professional efficiency, on the job continuing training through distance education optimizes the opportunity to apply knowledge and skills acquired immediately in classroom situations, in many African countries, distance education is generally considered as second-best or second-chance education and, in a few cases, as a "face-saving" strategy in response to educational crisis. The long tradition of face to face training of teachers has no doubt contributed to the mixed feelings about distance education (Malawi). Quality assurance of both the products (learning materials, infrastructure and personnel) and of the process (face to face teaching, tutoring, counselling) remains the best advocacy for distance based teacher education.

2.1. Delivery

9. Print remains the predominant medium both in Anglophone and Francophone countries although the use of other technologies is not excluded. Programs in Nigeria combine the use of printed materials, tutorials, and teaching practice supervised by educators from local higher education institutions. Learner support is provided during the weekends and school vacations in study centres spread over the country (Nigeria), some of which are equipped with learning resources including audiovisual materials. In addition to face to face teaching and printed courses the combination of media also includes audio cassettes (Botswana). In Lesotho, students of the DTEP are provided with face-to-face sessions not only at the NTTC, but also at the District Resource Centre, the Farmers Training Centers, the Institute of Extra Mural Studies and the Education Resource Centres nearest to where they live or work. More importantly, all sites and centres have a tutor in charge who is a full-time NTTC staff dedicated to the DTEP. All NTTC students are allocated a site, and a tutor-counsellor. The Centre for Continuing Education is planning to use other technologies, including interactive video conferencing, computer-based instruction and internet-based learning. In South Africa, interactive radio to promote English as a second language is used both to improve the language and teaching competency of primary school teachers and to teach primary school children. Programs are supported by training workshops, printed materials including structured and well-planned language curriculum designed to foster new

teaching practices, and regular visits of coordinators. They are sent on air by the South African Broadcasting Corporation and by community radio stations. Schools which cannot receive the programs are provided with tape recorders and audio cassettes.

10. The majority of programs offered in Francophone countries of sub-Saharan Africa belongs to sub-regional or international organizations such as the *Réseau Africain de Formation à Distance* (RESAFAD) and the African Virtual University (AVU). Training programs offered by both the RESAFAD and the AVU are characterised by the integration of various media, including ICT to support course delivery and student learning. According to Roberts & Associates (1998), the Internet/CD-ROM, satellite, radio, and audiocassettes are more predominant in Francophone than in Anglophone or Lusophone countries. RESAFAD has set up local networks in a number of countries including: Bénin, Burkina Faso, Côte d'Ivoire, Central African Republic, Gabon, Guinée, Mali, Sénégal and Togo where school teachers, head teachers, counsellors and inspectors have been trained in the use of the Internet, in management of distance education and in provision of learner support while the AVU which offers internet-based and satellite-linked distance education programs operates in Sénégal, Bénin, Mauritania, Rwanda, Burkina Faso, Niger and Burundi.

11. Programs which are being offered by RESAFAD aim at initial and in-service training for teachers of primary school, continuing professional development for school principals and inspectors (Central African Republic, Congo, Burundi), for teachers of French as a second language (Cameroon, Côte d'Ivoire, Gabon, Guinée), as well as professional examination preparation (Chad, Mauritania).

12. The AVU uses print-based distance education and the Internet to train practising teachers (Mauritania, sénégal).

13. According to Tessa Welch, the quality of the majority teacher education programs using distance in Africa is poor in terms of improving practice. More school-focused and classroom-based in-service teacher education provision should be encouraged to enable teachers to reflect upon and improve their own practice.

2.2. Quality assurance

14. Where there exists a national quality assurance system, as in Nigeria (the National Commission for Colleges of Education) the recognition of qualifications is not an issue. Programs offered by the Nigerian Teachers' Institute are nationally recognized. Learning materials produced. The Distance Teacher Education Program of NTTC (Lesotho) has to be approved by the Faculty of Education Board, the Academic Planning Committee and the Senate of the National University of Lesotho to which it is affiliated. The DTEP which is of Diploma level is accredited by the NUL. Highly qualified and experienced faculty of the NTTC provided the content expertise and the COL's assistance was sought and obtained for instructional design, editing and presentation. The responsibilities of course team members, including the editor, the reviewer, the technical designer, the local and international instructional designer were explicitly defined and adhered to. Milestones, deliverables and deadlines were established. Induction sessions on effective learning were conducted by subject tutors. The Diploma in Education for upgrading the qualifications of trained primary school teachers offered by the Domassi College of Higher Education (Malawi) is accredited by the University of Malawi which also determines the entry requirements for the program, i.e four credits including English at the Malawi School Certificate Examinations. In order to ensure the credibility of the program no teaching experience is recognized as a substitute for academic requirements. Candidates who are short-listed are put through an aptitude test in Communication, Numerical Skills, and Reasoning Skills. Selection is done on the basis of performance and

entry qualifications. Instructionally designed materials were developed only after appropriate training in course design for distance education was conducted for academic staff concerned. Six-week face to face sessions were organized annually. These focus on anticipated difficulties of students on what is expected of them so they can "manage the rest of their work on their own". To ensure comparability of standards, in addition to continuous assessments course examinations moderated by External Examiners of regular programs of Domassi College are held twice annually. Results of distance education students are comparable to and, in some cases, even better than conventional students. "There is no pattern of consistently better performance of any of the two groups to justify the superiority of any of the programs over the other" independently of the mode of delivery.

2.3. Management

15. Programs are managed academically by dual-mode institutions (University of Botswana) or by dedicated distance education institutions (Distance Education College of Nigeria). Publicly funded teacher education through distance education is generally run in collaboration with the Ministry of Education (Botswana) which also ensures the optimal use of all existing resources and infrastructure in the sector for the purpose, including study centre coordinators, secondary schools, laboratories and Education Centres (Botswana) through proper planning. In Lesotho, the National Teacher Training College (NTTC) which is a mixed mode teacher education institution is a department of the Ministry of Education and is affiliated with the National University of Lesotho (NUL). Domassi College of Education is a mixed-mode institution using the existing staff for its distance education program. The program is accredited by the University of Malawi. However, it is noted that staff members are more committed to the regular program and that distance education is perceived as "something" extra.

16. In Francophone Africa, programs delivery is managed collaboratively by the regional/international organisations (RESAFAD, Agence de la Francophonie and AVU) and the local partner institutions (Abidjan Teacher Training College, University of Bénin, Yaoundé College of Education), through local inter-institutional collaboration (Burkina Training Institute and Institute for Teacher Education) or by the Ministry of Education (Central African Republic).

2.4. Cost-effectiveness

17. Comparative costs of conventional and distance based teacher education point to the cost-effectiveness of distance education where the critical mass of students exists. According to Puryear (2002), research suggests that distance education programs for teachers can be developed at a cost between one to two thirds of conventional programs. In Tanzania, the cost per DE successful trainee is half of that for an equivalent residential course. Yates argues that although very few studies have been carried out on distance education for teachers and still fewer have compared the teaching effectiveness of both approaches, comparative studies in non-African countries (Sri Lanka and Indonesia) suggest that the distance and conventional modes can be equally efficient for training teachers. In some cases distance based programs are more effective, except in changing attitudes.

18. While calculating the cost-effectiveness of distance education for teachers on the basis of fixed, variable, unit, module completion costs etc., research underline that greater consideration should be given opportunity costs and the conditions in which programs are implemented. Due to competing priorities, in many countries it is not easy

to determine whether costs are more important than effectiveness, access and equity through distance education and open learning.

2.5. Policy development in distance education for teachers

19. Although the development of a national policy framework for distance education is still envisaged, some countries (Botswana) have adopted implementation strategies in line with their national policy on education to set up pre-tertiary distance education institutions to increase access to educational programs. In 1992, the Master Plan for Education 2000 and Beyond, an official policy document on education in general defines the objectives of distance education as follows:

- To improve access to education and skills for new groups such as the unemployed, housewives and school drop-outs;
- To increase access to tertiary education in a variety of subjects; and
- To upgrade teacher qualifications

20. However, in Mauritius as in many countries of SSA, new policy guidelines are required on institutional development, organizational structure, capacity building, resource allocation, shared use of expertise and facilities, admission procedures, technology application, intra/inter-institutional collaboration, partnerships with private providers, quality assurance/control, accreditation of courses, credit transfer, award of qualifications and mainstreaming of distance education.

21. In Francophone Africa, the wishful thinking of decision makers is rarely translated into national policies or action plans (Jean Valérien, 2003). As a result, coordination at institutional level is often difficult and ineffective when more than one institution are involved. In Guinée, initial training of primary teachers falls under the Ministry of Training while primary school inspectors and teacher trainers are trained by the *Institut des Sciences de l'Education* whose parent ministry is the Ministry of Higher Education.

22. The development of national DE policy frameworks is a crucial step in teacher training/retraining in the light of the "changing faces" of distance education, the rise of civil societies and the expansion of trans-national education.

3. SOME ISSUES AND CHALLENGES

23. High drop-out rates (39% in 1997-2000 for Nigeria) are related to unaffordability of course materials, time constraints because of competing priorities, especially during examination period, late delivery of materials, long distance travel to study centers, failure to participate in compulsory practicum, lack of learner support, lack of learning resources in study centres, lack of quality tutors, tutoring being assimilated to traditional teaching, lack of interaction between learners and with tutors. So far the success and failures of distance education for teacher education have been thinly documented. The development of a house style of writing modules for distance education and of local capacity in the production of self-instructional materials (Lesotho), and in supporting learning augurs well for quality distance education for teachers. Greater attention should be paid to in-depth studies of "good practices" in distance based teacher education in SSA. This emerging area of research for teacher development and school improvement will very likely, contribute to the enhancement of regular teacher education programs as well.

24. Although mixed-mode approaches contribute to access, for Carol Thomson there is a moral imperative to ensure that the lack of quality does not undermine the advancement of the South African society. She suggests that due to "inadequate and inferior schooling, many practicing teachers studying through distance education are ill-equipped for resource-based distance learning. She also underscores the need for delivery models to ensure "deep learning" through proper support services (Thomson @nuac.za)

25. Neither access nor equity can be ensured without ensuring quality. Quality distance based teacher education is a dependable for equity in access to tertiary education and to the teaching profession. While conventional teacher education programs admits 27% women, enrolment through distance education represents 43%. Home study is easier for pre- and post-natal mothers. For students with professional and social commitments, the flexibility of distance education which is "not tied to a fixed calendar of the academic year" (Domasi College, Malawi) accommodates that of individual progress of teacher-learners who can stop and resume studies without having to repeat the whole year.

26. The Botswana Centre for Continuing Education which offers the Diploma in Primary Education underlines, among others, the following quality criteria for ensuring the success of distance education in a nascent context:

- Quality design, development, and production of instructional materials
- Application and use of delivery technologies
- Presentation of learning materials
- Enhancing student participation through proper techniques
- Existence of quality control and quality assurance systems to avoid skepticism surrounding the quality and status of distance education induced by dubious external providers.
- Existence of quality control and quality assurance systems to avoid skepticism surrounding the quality and status of distance education induced by past experiences ('grossly ineffective' secondary education at distance based on traditional approaches, in Malawi. Chinwenje, 1998)
- Integration of distance education as part of the University mission rather than leave it as an initiative of the Centre of Continuing Education

- Reduction of "initiative fatigue", i.e. the multiplicity initiatives to transform university education such as online learning, semesterisation and performance management
- Enough lead time required for course development (Lesotho)
- Beyond technical know-how in materials development provided through short crash courses, professional grounding in theoretical work is necessary (Domasi College) the integration of academic advancement and professional development using distance education for teachers is an area of research. Distance education for teachers should not lose focus of school pupils or else the school system will remain a symbol of disparity in quality, in spite of the observed increased access (Domassi).
- The curriculum shift to the "academic" advancement of teachers does not undermine the importance of needs-oriented professional development

27. In terms of learner support services, effectiveness depends on face to face tutorials, timely feedback and accessibility to learning resources through library services.

4. MAURITIAN CASE STUDY ON MULTIPLE MEDIA DEOL FOR TEACHER EDUCATION

4.1. The advanced teacher's certificate program

4.1.1. Historical perspective

28. Initial pre-service teacher education for primary school teachers started in Mauritius during the colonial days. The Teacher's Training College for men was set up in 1902 followed by a women's college in 1903. In 1926, the two colleges were combined. Due to economic recession, the college was closed down in 1932. In 1941, the Ward Report recommended that no new teacher should henceforth be employed in any primary school unless he/she has successfully passed through a course of professional training in Mauritius or elsewhere.

29. The Teacher's Training College reopened in Beau Bassin in 1942. At first the college accepted students with very low academic qualifications. These students were made to follow a one-year course of academic and professional studies followed by a year's school practice, under the supervision and guidance of the college tutors in the primary schools.

30. It became imperative later for candidates to possess a minimum of 5 credits at "o" level to be admitted to the Teachers Training College to follow the 2-year full time program leading to a Teacher's Certificate qualification. Those who successfully completed the program were automatically eligible for employment as primary school teachers. When the Teacher's Training College closed its doors in the late 1970's the Mauritius Institute of Education (MIE) took over the responsibility for teacher education.

31. In 1983, some 300 trainees were recruited for the first time by the MIE for a two-year full time course leading to the Teacher's Certificate. In the years that followed, successive cohorts of trainees were admitted on the same program before they ultimately joined the teaching force.

32. As from the late 1980's, Mauritius having already reached the objectives of universal primary education committed itself to quality improvement of teaching and learning in all primary schools. It soon became evident that the two-year initial teacher training program was not sufficient to prepare the trainee teacher to teach effectively for the rest of his/her career.

33. In 1988, the Salaries Commissioner, Mr D. Chesworth, made a specific recommendation to the effect that all primary school teachers should be given the opportunity to follow an in-service part-time course leading to a Diploma in Education. In view of the urgency for upgrading the basic teachers' qualifications and to improve educational standards in schools, the Commission recommended that: "*there should be created by the Ministry, in conjunction with the TEC and appropriate institutions, two-year part-time courses for primary school teachers and Deputy Head Teachers, the successful undertaking of each module entitling teachers to one incremental credit for the first part and two incremental credits or the final part*" (Report of the Salaries Commissioner, Mr A. Chesworth, pp136, Sept 1988). This recommendation was not applied as such. Negotiations were held between the Ministry of Education and Science, the Teacher's Unions and the MIE. The final decision was that an Advanced Certificate in Education (ACE) would be awarded to all primary school teachers who would

successfully complete the 2-year part-time course at the MIE. The proposed training program received the full support of the Government as well as the Teacher's Union. The originally planned ACE, required teachers to attend lectures on the MIE campus in Réduit on two full days a week and Saturday mornings. However, it was soon realized that this was impracticable because of the large number of classes that were left unattended in primary schools during school hours. Further negotiations took place between the Ministry of Education and Science, the Teacher's Union and the MIE. The final agreement was that the contact time would be limited to one full day a week during term time and some days during the holiday period for intensive training.

34. In February 1991, the first ACE Program was officially launched at the Curriculum Development Centre at Beau Bassin. Some 600 general purpose teachers and 100 Asian language teachers were selected to follow the program. The academic staff of the MIE serviced the courses with the help of some part-time lecturers, mainly primary school inspectors. The program ended in December 1992. From this first experience it became clear that at the rate at which the training was proceeding (i.e 700 every 2 years) it would take more than 10 years to offer the program to all the 4000 primary school teachers. Furthermore, the acute shortage of teachers prevailing during that period prompted the Ministry of Education and Science to review its decision to release teachers on a one full day per week basis as this meant that a large number of classes would be left unattended. The Ministry started to look for alternative approaches to run the training program with minimal interference in the normal classroom schedule.

35. In 1991, a mission headed by the President of the Commonwealth of Learning, Prof. J. Maraj visited the MIE with a view to finding a solution to the problem of release of teachers. After a thorough study of the situation, he proposed the use of Distance Education as the best alternative. Given the lack of local expertise in this area, visits to Distance Education Centres in India, Kenya and Australia were organized for the academic and non-academic staff of the MIE and in April 1992, a team from the Indira Gandhi National Open University sponsored by the Tertiary Education Commission spent 4 weeks at the MIE to train the academics in the design, planning, writing, editing and evaluation of distance education material. Following this in-house training some 120 DE Units were written and produced in the six core subjects namely English, French, Education Studies, Mathematics, Environmental Studies I and Environmental Studies II.

36. In January 1993, the first of 1200 General Purpose teachers and 235 Asian Language teachers were selected on the basis of seniority by the Ministry of Education and Science for the program. The DE material for this course included both subject content modules and pedagogy modules. A mixed mode approach was adopted which required trainees to undertake self study of course materials and to attend face-to-face sessions on the MIE campus for 12 full days every year. An agreement was reached between the Ministry of Education and Science and the Teacher's Union for the release of teachers on six full days during term time and teachers would come voluntarily for six days during their holiday time to attend the face-to-face sessions. This formula which proved to be quite practicable has been maintained to date.

37. A Distance Education Unit was set up at the MIE in 1991 with 2 academic and 12 administrative staff to manage the day to day running of the ACE program. In 1993, following the restructure of the MIE, a Centre for Distance Education was created to look after all the DE courses at the MIE. The Centre has the same status as the four other schools at the MIE. The DE Unit and the Centre for DE have both serviced the ACE programs indicated in the table below.

Table 1 Advanced certificate in education – general purpose

Intake	Enrolment	Passes	Cumulative total
1991 - 1992	566	544	
1993 - 1994	1249	1094	1638
1995 - 1996	994	906	2544
1997 - 1998	219	191	2735
1998 - 1999	345	255	2990
2001 - 2002	428	363	3353
2003 - 2004	440	On going	

Table 2 Advanced certificate in education – Asian language & Arabic

Intake	Enrolment	Passes	Cumulative total
1991 - 1992	107	102	
1993 - 1994	224	213	
1995 - 1996			
1997 - 1998	174	166	
1998 - 1999	138	108	
2001 - 2002			
2003 - 2004	55	On going	

Table 3 Advanced certificate in education – Rodrigues island

Intake	Enrolment	Passes	Cumulative total
1994 - 1995	70	43	
2001 - 2002	89	58	101

38. In 2001, the duration of the ACE Program were reduced from 2 years (4 semesters) to 18 months (3 semesters) to accommodate the introduction of the Teacher's Diploma.

39. No formal full-scale evaluation of the ACE Program has been undertaken since it started in 1991. However, through informal feedback obtained from the students or the Teacher's Union, certain changes have been brought in the program over the years. These changes relate mainly to the content of the courses. Following representations made by the Unions, the idea of writing 120 Units of about 20 pages each was abandoned. The actual number of Units produced was 90 with a total number of pages of around 1800.

40. Certain adjustments were also made in the assessment procedures. Each of the six courses was assessed on the basis of four assignments, one of which was necessarily done on the spot on campus and deals with a limited number of units to be specified beforehand.

5. AN ANALYSIS OF THE ADVANCED CERTIFICATE IN EDUCATION

41. In terms of outcomes in classroom situations, quality is defined as the attainment by all children, up to their full potential, of the instructional objectives defined for them in the national curriculum in core subjects such as languages (English, French, and any one of the following: Hindi, Urdu, Tamil, Telegu, Marathi, Arabic, Modern Chinese), Mathematics, Environmental Studies (Science, History and Geography), Creative Education, Health, Physical Education, Computer and, since recently, Computer Studies and Human Values. Given that quality learning outcomes cannot be expected without effective instruction processes and, therefore, without quality teacher education (initial and continuing), an assessment of the effectiveness of the Advanced Certificate in Education offered through the distance mode to upgrade the professional knowledge and the pedagogic competency of primary school teachers is proposed. The study is completed by an analysis of the training offered to primary school teachers (not necessarily the same sample population) in the integration of media materials into classroom teaching. This complementary and convergent approach (oriented towards supporting the same national primary school curriculum) although not integrated in the same training program seeks to assess the potential of alternative cost-effective teacher education strategies for enhancing learning outcomes in classroom situations.

5.1. Methodology

42. Following a series of open-ended interviews with teachers, Head Teachers, School Inspectors and Lecturers from the Mauritius Institute of Education, a questionnaire was designed, vetted, pre-tested and finalised by a Research Team set up at the Tertiary Education Commission and comprising representatives from the MIE. The questionnaires were distributed to all primary schools through the Regional Directors and the Area Inspectors of the Ministry of Education & Scientific Research. Out of 1 316 filled questionnaires received from General Purpose teachers, excluding Rodriguans, a random sample of 479 responses have been analysed for the purpose of this study. This figure represents 19.4% of the teacher population (2 462) trained through the ACE from 1993 to 1998.

43. The analysis of teachers' perceptions of the program, in general, and of its various aspects, including the quality and relevance of the course materials, the face-to-face sessions and the tutoring services as well as their perceptions of their own difficulties as distance learners is based on a study of the responses which they have provided on a 4-point scale from "strongly disagree" to "strongly agree". Their open responses to two items of the questionnaire related to the strengths and weaknesses of the program, and suggestions for improvement as well as the content analysis of fifteen 30 – 45 minute semi-structured interviews conducted with other teachers (5), Head Teachers/School Inspectors (10) on the overall contribution of the ACE program seek to obtain their views on:

- the potential of distance education methodology for teacher education
- the extent to which the ACE has contributed to the enhancement of learning outcomes in the classroom situations.

5.2. Some of the main findings

5.2.1. Potential of distance education methodology for teacher education

44. About two thirds of the teachers (66.8%) agree that the Educational Core component of the ACE program has led to their professional development. Nearly one fifth of them (17.9%) "strongly agree" with the statement in the questionnaire. Strong disagreement has been expressed by only 2.3% of the respondents. While 84.7% of the teachers view positively the contribution of the Educational Core to their professional development, only 76.6% of them have a similar opinion of the Subject Areas. This discrepency could be explained, among others, by the fact that a large majority of the teachers (86.7%) had at least the "O" Levels, some of whom held even higher qualifications such as "A" Levels, Diplomas and Degrees. It can, therefore, be presumed that they have sufficient knowledge of the Subject Areas (English and French Languages, Mathematics, for teaching at primary level.

45. However, a large proportion of the teachers perceive the course to be too theoretical, especially, the Educational Core (68.9%). Among them, almost one fifth (19.2%) "strongly agree" with the statement. Although the Subject Areas are seen to be less theoretical (61.2%), still the proportion of teachers who view it as such is very significant and level of "strongly agreement" very high:(17.3%).

46. The balance between the theoretical and the practical components of the course is considered to be more inadequate for the Educational Core (50.5%) compared to the Subject Areas (43%).

5.2.2. Contribution of the ACE to the enhancement of pupils' learning outcomes

47. The view that the course was too theoretical, in particular, the Educational Core, is confirmed by the affirmation of more than half the respondents (56.6%) that the real classroom situation was not sufficiently taken into account by the ACE. Among those who expressed this opinion, almost one fifth (19.7%) "strongly agree" with the statement that the classroom situation was not sufficiently taken into consideration.

48. However, the high level of disagreement with this statement of the questionnaire both for the Educational Core (38%) and the Subject Areas (36%) is significant taking into account the level of non-responses (6.7% for Educational Core and 19.0 % for Subject Areas).

5.2.3. Improving teaching in the classroom

49. A large majority of the teachers (70.6%) opine that the Educational Core of the ACE program has contributed to improve their teaching skills. Among them, 17.2% strongly agree with the statement of the questionnaire to this effect. Although a lesser percentage (64.1%) is of the same opinion concerning the Subject Areas, they represent almost two thirds of the respondents.

50. Similarly, 70.4% of the teachers strongly agree/agree that the Educational Core of the course has helped them introduce new teaching techniques in their classes compared to only 38% for the Subject Areas. The dissenting opinion on the two

components of the program can be explained by the fact that the Educational Core and Subject Areas focus respectively on pedagogic and content knowledge.

51. However, it is noted that more than one fifth of the teachers (20.3%) strongly disagree with the proposal that the Educational Core has helped them introduce new teaching techniques in their classes.

5.2.4. Relating to learners

52. Both components of the program are reckoned to have helped the teachers relate properly to their students. The contribution of the Educational Core which includes courses on "Factors affecting achievement", "Social, Personal & Cognitive development", "Learning difficulties", "Evaluation & Assessment" has been useful in providing teachers with a better understanding their students (69.1%) and in helping them with their learning difficulties (70.4%).

6. FACE-TO-FACE SESSIONS

6.1. Providing academic support

53. This type of learner support seeks to facilitate the understanding, acquisition and reutilisation of new knowledge offered by the course.

54. More than half of the respondents consider that the face-to-face sessions were helpful in removing difficulties and doubts pertaining to the course content (56.6%). They also feel that the sessions did provide them with such additional information/detail that was felt necessary to understand the course content properly (59.1%).

55. The Educational Core is viewed more positively than the Subject Areas in facilitating the understanding of the content of the course (59.9% against 52.2%) and in supplementing the course materials (63.9% against 54%). However although the proportion of teachers who "strongly agree" with the proposals in the questionnaire on the usefulness of face-to-face meetings in facilitating understanding and in providing supplementary information is less than 6% and 9% respectively.

56. The lower degree of satisfaction concerning the Subject Areas (53.3%) and the relatively high level of non-responses (more than 20%) point to the difficulty of teachers to affirm unequivocally the usefulness of the Subject Areas in providing academic support. However, since as far as 78% of the teachers considered that they had sufficient previous knowledge of the Subject Areas to follow the course, their expectations in terms of content knowledge may have been higher than that provided by the ACE course.

57. The majority (61.5%) believe that they could have managed the course satisfactorily without attending these sessions. Among them, 67.6% expressed this opinion concerning the Educational Core and 55.3% for the Subject Areas. A very high proportion of teachers "strongly agree" that they could have managed the course satisfactorily without the Educational Core (23%) and the Subject Areas (19%).

6.2. Providing pedagogic training

58. This type of support relates to pedagogical content knowledge in the various disciplines as opposed to pedagogical knowledge on teaching and learning in general. It involves training teachers to acquire the principles and skills unique to teaching particular subjects prescribed by the school curriculum.

59. Almost two thirds of the teachers (65.1%) agree that the face-to-face sessions were helpful in providing pedagogic training corresponding to the content of the course materials. This training was provided more satisfactorily for the Educational Core (69.3%) than for the Subject Areas (60.3%).

6.3. Providing self-learning techniques

60. These techniques are particularly helpful in setting realistic objectives, in planning the use of appropriate learning resources and in managing learner's time.

61. The majority of teachers strongly agree/agree that the face-to-face sessions contributed positively in regulating their progress through the course work. Although 88.1% of them believe that they had sufficient previous knowledge to follow the Educational Core, given their long teaching experience, still 69.5% of them consider that this component was more helpful than the Subject Areas (60.5%).

6.4. Sustaining learner's motivation

62. An appropriate learning environment and a stimulating learning experience are crucial in keeping distance learners motivated throughout the program.

63. 71.8% of the teachers opine that the Educational Core of the face-to-face sessions was helpful in keeping them motivated in their studies. This opinion was expressed by 62.4% of them for the Subject Areas. Although the level of non-responses is quite significant (22.1% for Subject Areas and 10.6% for Educational Core), teachers' high motivation for their studies as provided by the face-to-face sessions can be explained by their satisfaction with the infrastructure put in place for these sessions (52.4%), their appreciation of the sufficient time release facilities to attend face-to-face meetings (68.5%) and the opportunity available for the much needed peer-interaction by both the Education Core (60.9%) and the Subject Areas (55.7%).

7. TUTORS

64. Tutors have a key role to play in distance-run programs. Their role as managers/facilitators of learning, places greater emphasis on a one-to-one and small-group tuition. Their services have been categorised as academic counselling, educational counselling, personal counselling, and administrative counselling. Only the first two are analysed for this study.

7.1. Academic counselling

65. This form of counselling focuses on the difficulties encountered by teachers to come to grip with the course content.

66. More than three quarters of the respondents (77.03%) think that the tutors were knowledgeable about the Educational Core. 16.5%. of them "strongly agree" with the proposal in the questionnaire. Although less have expressed the same opinion for the Subject Areas, they account for (67.0%) of the positive responses.

7.2. Educational counselling

67. Educational counselling refers to the communication process between the tutor and the trainee-teacher that focuses on developing effective self-learning strategies.

68. 64.9% of the teachers claim that the tutors of the Educational Core display good teaching/tutoring skills compared to 58.0% for Subject Areas. The high level of non-responses (21.3%) and negative responses (20.7%) for the Subject-Areas seems to indicate that tutoring for this component has not been very effective in terms of educational counselling in of tutoring.

8. COURSE MATERIALS

69. The pedagogical design of distance education materials seeks to promote supported learning, self-evaluation and application of new knowledge in classroom situations.

8.1. Promoting supported learning

70. The structured presentation of the learning materials is generally viewed positively by the trainee-teachers. Educational Core units more than the Subject Area units. The majority of the teachers find that the aims and objectives of the Educational Core units (83.5%) and the Subject Areas units (74.1%) were clearly stated. The proportion of "strongly agree" which is 19.2% and 16.5% respectively is relatively high. For more than three quarters of them the content of the Educational Core units was adequately related to the learning objectives (77.7%) and stimulated learning (76.4%) compared to 69% and 70.9% respectively for the Subject Areas.

71. The presentation of the content in a logical sequence (76.4% for Educational Core and 70.6% for Subject Areas), the readability of the language (84% for the Educational Core and 72.8% for Subject Areas) and the illustrations and examples were well perceived.

72. Almost three quarters of the teachers find that the style of the presentation of the Educational Core units (74.7%) and the Subject Areas (69.1%) contribute sufficiently to self-learning.

73. The learning activities which are considered to be distributed uniformly throughout the unit (69.5% for Educational Core; 65.1% for Subject Areas), helped them in clarifying new/difficult concepts (74.7% for Educational Core and 67.8% for Subject Areas) and in reinforcing learning properly (74;0% for Educational Core; 69.1% for Subject Areas).

8.2. Promoting self-evaluation

74. The contribution of the learning activities (in-text questions, assignments) towards self-evaluation was valued high. The majority of the teachers view that the in-text questions allowed them to make purposeful revisions and periodic self-assessment both in Educational Core (77.7%) and in Subject Areas (70.6%).

75. Assignments were viewed as closely related to the objectives and the content of the units. (81.8% for Educational Core; 73.1% for Subject Areas). They were graded in terms of difficulties and motivating (71.2% for Educational Core; 69.1 for Subject Areas), helpful in applying new knowledge (68.8% Educational Core; 61.7% for Subject Areas) and have contributed in preparing teachers for the examinations (70.9% for Educational Core; 64.7% for Subject Areas).

8.3. Improving classroom learning

76. More than three quarters of the teachers (77.0%) "strongly agree/agree" with the opinion that the Educational Core has prompted them to reflect on their own teaching practice. Among them a significant number (17.8%) "strongly agree" with the statement. However, a lesser percentage (66.5%) hold the same opinion for the Subject Areas.

77. The majority of teachers reckon that the learning activities of the course materials helped them in applying new learning in the classroom situation (62.4% for Educational Core; 57.8% for Subject Areas).

9. DISCUSSION

78. The contributions of the ACE to quality learning in the classroom situations have been studied from the teachers' perceptions of the usefulness of the various components of the program in enhancing the way they teach, manage pupils' learning and relate to them. These include the design of the course materials, the learning activities and the learner support services that were set up. An analysis of the teachers' responses to the closed items of the questionnaire pertaining to their perceptions of the ACE, to changes brought into their day-to-day teaching practice by the course, and to their relationship with pupils, colleagues and the school environment is proposed. This analysis is supplemented by overall comments from teachers on the strengths and weaknesses of the program as well as by the views of Head Teachers and School Inspectors on post-ACE teachers' performance in their classroom teaching in order to provide some insight on the impact of program on quality of primary education in Mauritius.

9.1. Teachers' perceptions of the ACE program

79. The ACE is an 18 month program comprising five courses on the Subject Areas of primary school curriculum, namely, English, Environmental Studies I, Environmental studies II, French, Mathematics, and one Educational Core component on Education and Curriculum Studies which comprises modules on Child Development, Learning & Motivation, Types of Curriculum and Classroom Organisation, Teaching Methodologies and Pupils' Achievement.

9.1.1. Teacher's perceptions of the usefulness of the educational core and the subject areas

80. The majority of the teachers strongly agree/agree that the Educational Core has contributed to improve their teaching skills (70.6%), helped them to promote new teaching techniques (70.4%), and to understanding their students better (69.1%).

81. Although, in general, the Subject Areas are viewed less positively than the Education Core, more than half of the teachers consider that they have been equally useful in improving their previously acquired teaching skills (64.1%), in applying new learning (57.9%), and in better understanding (60.7%) and supporting (63.1%) their students with their learning difficulties. As it could be expected, given the focus of the Subject Areas on content rather than on pedagogic knowledge, their impact on innovative pedagogical practices is less apparent. In fact, only 38.0% of the teachers find that this component of the program has enabled them to introduce new teaching techniques, "*particularly to foster learning among learners who cannot learn with the traditional teaching methods*" (Teacher's comment). Some head teachers believe that apart from the content knowledge which is increasingly available through the Internet, and the theoretical knowledge of teaching methodologies, "*ACE should focus on teaching techniques which can be applied in classroom situations.*"

9.1.2. The educational potential of ACE in promoting new teaching and learning approaches

82. The distance mode which places the onus on the learner uses a variety of media and combines the principles of learner-centredness, flexibility, autonomy, supported and collaborative learning (ADEA, 2003). Learning activities include the self-

study of specifically designed materials, attending tutorials and face-to-face sessions occasionally, answering in-text questions and working out assignments.

83. More than half of the teachers view that their own learning experience through the ACE has contributed in developing and applying new teaching and learning approaches in their classes. Both the Educational Core (62.2%) and the Subject Areas (58.0%) of the program have been appreciated. This "inductive approach" to quality teaching and learning has been provided to teachers not only by what the ACE program has taught them in terms of professional knowledge but also by how learning was structured and organised by the instructional design of the course.

84. The majority of teachers is of the opinion that Educational Core materials have clear objectives (83.5%,), their learning objectives are related to the treatment of the unit content (77.7%), they are logical in their presentation (76.4%), they stimulate learning (76.4%), they encourage self-learning (74.7%), they take into account and reinforce previous learning (74.4%).

85. They also consider that the assignments, in particular, encourage problem-solving (68.9%). After having gone through the distance delivered ACE, some teachers realise that they "*also can promote new learning in their classrooms if they can adopt clear objectives and appropriate teaching strategies as they benefitted from the ACE*" (teacher's comment).

86. The relationship between how teachers manage their own learning through the distance mode to upgrade their qualifications and the way learning is, subsequently, transacted in their own classes has been highlighted in other studies on continuing teacher education (Rumajogee, 2000).

10. TEACHERS' OPEN-ENDED RESPONSES TO THE STRENGTHS AND WEAKNESSES OF THE ADVANCED CERTIFICATE IN EDUCATION

87. Teachers were also invited to comment openly on the strengths and weaknesses of the ACE program, to identify the modules from which they have most or least benefitted and to explain why.

88. In this section their responses, whenever related to quality improvement in classroom teaching and learning, have been analysed and put into perspective in the light of qualitative data collected from head teachers and school inspectors through open-ended interviews.

10.1. The Advanced Certificate in Education: a "refresher course" or an "upgrading course"?

89. The successive cohorts that enrolled for the Advanced Certificate in Education from 1993 to 1997 comprised teachers who graduated in the early 1980's through the Mauritius Institute of Education (MIE) Teachers' Certificate in Education as well as those who, some thirty years ago, had completed the pre-service Teachers' Training College Certificate run by the Ministry of Education & Cultural Affairs. Both their responses to the open-ended questions relating to the strengths and weaknesses of the program and the views of Head Teachers and School Inspectors on their performance in the classrooms point to the relationship between their perceptions of the ACE and their initial training at the Teachers' Training College or the Mauritius Institute of Education.

90. Teachers who had their pre-service training at the Teacher's Training College in the 1970's find the ACE program "*extremely enriching*" especially in terms of the subject knowledge they acquired. They are quite appreciative of the new knowledge they gained in areas such as History and Science which did not form part of the curriculum when they were trained some thirty years ago. They also consider that the ACE has allowed them to reflect on their own teaching practices, to improve some of them and, in many cases, to feel more confident in what they are currently experimenting within their classes.

91. Teachers who have been trained since the 1980's tend to view the ACE as a "refresher course" more than as an "upgrading course", as it was meant to be. Given their relatively more recent pre-service training at the MIE, they consider that they have not benefitted much from the program in terms of the subject knowledge, especially in languages and mathematics. Even in terms of new pedagogic knowledge and techniques, most of them did not have high expectations at the time they joined the ACE. For most teachers the ACE was "*simply adding some value*" to their previous knowledge which as many as 88.1% of them considered sufficient enough to follow the program. However, although "*nothing was new*" (Teacher's comment) to those who consider that the MIE Teachers' Certificate in Education covered part of the ACE, this program " *has been a stimulus to our existing knowledge… in better understanding our students and in improving our already obtained techniques which we were not motivated to use, so far*" (Teacher's comment). They have become more interested in their pupils and developed the tendency to spend more time to interact with them and their commitment to child-centred teaching-learning approaches gradually led to better lesson planning,

individualised teaching and more proactive involvement in the administration and management of school-based activities.

92. With the exception of those who were "*internally motivated and professionally committed*" (School Inspector's comment) and who perceived the ACE as new learning experience, it would appear that among those who received their pre-service training before the 1980's were less prepared to embark on a lifelong professional development process. Those who were more academically oriented were interested in "*the knowledge they acquired for their personal development to… complete the ACE successfully rather than to improve their teaching*". Taking into consideration their advanced age (62.6% of them were between 45 to 59 years old), it can be surmised that many of these teachers enrolled for the ACE for reasons other than their professional development: "*If I followed the course, it was merely to have the incremental credit, a higher salary and better retirement*". It should be noted that after successful completion of the ACE teachers were entitled to three additional increments in their salary.

93. According to head teachers, although the age of the teachers is a determining factor of the level of professional involvement, the degree and type of motivation is equally important: "*the level of improvement varies depending on the individual teacher. Those who were naturally self-motivated, took better advantage of the ACE program in terms of knowledge acquisition compared to those who were only attracted by the salary increment… trainees who benefited in terms of subject knowledge from the program showed apparent improvement in their teaching. These teachers were teaching with much more self-confidence*" (head teacher's comment).

10.2. Contribution of the ACE to the development of professional knowledge

94. For the purpose of this paper, professional knowledge refers to both subject and pedagogic knowledge but differs from pedagogic competency. This includes teachers' capacity to use and/or adapt a variety teaching skills and techniques, to manage pupils' learning and to evaluate their achievements.

95. Depending on the educational background or initial training of teachers, the emphasis on subject knowledge in teacher education programs may vary. As far as the ACE is concerned, with the exception of a few subject areas such as Environmental Studies and Mathematics, trainee teachers, Head Teachers and School Inspectors alike consider that the ACE program should have placed the premium on the shift from pedagogic knowledge to pedagogic competency. They also recognise that the onus rests with as much the training institution as with the teachers themselves and that an enabling school environment is crucial for the improvement of teaching efficiency.

10.2.1. Subject knowledge

96. Subject knowledge refers to the capital of new knowledge that trainees shnees should acquire in order to teach a given subject as efficiently as possible. In Mauritius, besides the traditional 3 R's (Reading, wRiting & aRithmetic) through the teaching of English, French and arithmetic, the modernisation of the school curriculum is placing a lot of emphasis on new subjects such Environmental Studies (EVS), mathematics, and recently, computer studies. Teachers' appreciation of new professional knowledge provided by the ACE modules to master and ably teach EVS subjects such as history of Mauritius (Dutch Mauritius, French period, British period…) and geography of Mauritius (physical, human, economic) has been variously highlighted in their open-ended responses and confirmed by head teachers' and school inspectors' comments: "*The*

program allowed us to go deeper in certain topics, especially in New Mathematics (as opposed to Arithmetic) and Environmental Studies".

97. Teachers who had their pre-service training at the Teacher's Training College some 30 years ago found the ACE program extremely useful in teaching these subjects which did not form part of the curriculum at their training. However, teachers who had completed their pre-service course more recently, have expressed the opinion that they have not benefited much from the ACE program in terms of the subject knowledge, including languages. Some pointed out that subjects which did not appeal to all teachers such as arts & crafts or music were not dealt with adequately despite their importance in school curriculum.

98. Others are of the opinion that the new subject knowledge which they have acquired is more relevant to the upper primary section than to lower primary which should be considered to be equally important. Although most of the head teachers agree that the teachers' knowledge of the subject matter has improved, they underline that the level of improvement varies from one individual to another.

99. They also pointed out that teachers who were intrinsically motivated, took greater advantage of the ACE program in terms of knowledge acquisition compared to those who were only attracted by the salary increment. According to head teachers and inspectors, trainees who benefited in terms of subject knowledge from the program became more confident in their ability to teach and visibly showed some improvement in their teaching.

10.2.2. Pedagogic knowledge

100. Pedagogic knowledge refers to knowledge about the learner and about learning. In addition to professional knowledge of the content areas (environmental studies, English, French, Oriental languages and Arabic) teachers were also trained in educational studies (personal, social & cognitive development, learning & motivation...) and in broad teaching principles: teaching of Environmental Studies, teaching of reading & writing for languages.

101. A large majority of them was more appreciative of the Educational Core components than of the Subject Areas and expressed the opinion that they have benefited significantly in terms of knowledge about child development, child psychology and general principles of learning. However, for some of them, topics of major interest such as Remedial Education and Curriculum Studies were not tackled seriously. Although some teachers think that the new pedagogic knowledge has helped them to improve on their teaching, many insist that this knowledge cannot be put into practice given the prevailing conditions at school and in the classroom. Factors such as crammed classroom, overloaded curriculum, timetable constraints, lack of incentives and motivation have not been taken on board while elaborating relevant teaching strategies.

102. Head teachers have divergent views about the improvement in the pedagogic knowledge of trainee teachers. Some are convinced that the ACE has helped the trainees to considerably improve their teaching while others argue that although there has been some improvement in trainees' knowledge of child development and psychology, teaching and learning theories, this was much below their expectations and less visible in their teaching efficiency.

103. Although the general pedagogical knowledge has been valued as useful "*up-to-date theories in education applicable to Mauritius*", pedagogical content knowledge to skillfully teach specific subjects has been identified as insufficient. With the exception of the unit on environmental studies "*which allows teachers to move deeper in certain*

topics" (teacher's comment), no reference is made in the ACE Program handbook of "Suggested Teaching Strategies".

104. Besides the need for content-specific teaching competencies, head teachers also view that the ACE does not take into consideration the specificities of the teaching-learning context: "…*the current problems being faced at the school level have never been discussed further and in details to find solutions for better teaching…teachers were not trained to work with children with learning difficulties* (head teacher's comments)…", "*the part of the course concerning technique/acquisition of skills can't be fully implemented due to overcrowded classes and lack of learning materials*" (head teacher's comment).

105. Head teachers have also expressed the opinion that the ACE does not equip them sufficiently to adopt individualised teaching-learning strategies according to the student's cognitive profile: *"…the behaviour of the members of the new generation at school and of children with special needs have to be given much more attention…we have not been prepared for that*".

106. Head teachers also believe that within an appropriate balance between theory and practice, teachers would have benefited more if the training was activity-based and included practical sessions not only on the teaching of specific subjects but also of different topics such reading and comprehension, essay writing, grammar. Some of them have suggested that more emphasis should have been placed on teaching strategies and that ACE should have a specific module on the various teaching techniques highlighting the advantages and disadvantages of each of them.

10.2.3. Pedagogic competency

107. This includes all the professional skills of the teacher to communicate and relate properly with pupils, to plan and organize lessons effectively, to manage the classroom efficiently, to develop and use a rich repertoire of teaching strategies and to evaluate learning outcomes properly. Although pedagogic competency can be interpreted as "actualised" professional knowledge, it cannot be considered to be a direct outcome of professional knowledge.

108. Although some teachers claim that the program has, to a certain extent, opened or expanded their outlook on their roles and responsibilities as teachers, Head Teachers stress that the shift from professional knowledge to pedagogic competency depends, in large measure, on their commitment to career-long improvement in their "appropriation" of professional knowledge, professional skills and professional values. They have mixed feelings about the extent to which the program has brought about this commitment. They claim that there have been some positive changes but that these changes are far below what one would expect from such a program.

109. The large majority of Head Teachers insist that teachers who completed the ACE program still lack the basic professional skills. They attribute this weakness to the fact the training program has a strong theoretical bias and lays much emphasis on the content aspects and did not provide the teachers with the opportunity to reflect, to try out, to experiment and to innovate. Some Head Teachers believe that the ACE tutors themselves are cut off from the reality of the classroom and that some of the "bookish" techniques proposed are not applicable in the local context.

110. Some teachers admit that the ACE program has enabled them to develop some of the basic professional skills. However, the majority insist that the training program has failed to provide them with the necessary professional skills to allow them to teach effectively. They claim that they face problems to apply the new theories about

pedagogy in the planning, organizing, managing and evaluating their lessons. They attribute these problems to weaknesses in the training program but also to the conditions that prevail in schools and in the educational system as a whole.

111. While some teachers consider the ACE to be "*a well-devised program…a praise-worthy initiative for 'uplifting' the level of education in Mauritius*"(teacher's comment), some of the modules, namely English and French, are considered "*stuffed…overloaded and difficult…too high to put into practice at primary school level*" (teachers' comments). It would appear that with the exception of environmental studies which were "*captivating, interesting*" and, to some extent, mathematics which was "*based on logic*", the subject area modules, remained too content-focused and examination-oriented:

112. "*…the tutors talked about the contents of the books and nothing more…science is taught on the blackboard, within the four walls while it is a very practical subject, especially in primary education*" (teacher's comment). "*…teachers should be given more of teaching techniques so as to increase efficiency in teaching specific subjects*"(teacher's comment). "*…so far as languages are concerned, instead of the subtleties of English or French which do not represent any interest for primary school children, teachers should be trained in language teaching techniques…this is what they lack…their knowledge of these languages is sufficient to teach at primary level*" (teacher's comment).

113. One is led to believe that the dichotomy between subject knowledge and pedagogic knowledge on which teacher education curriculum and training of teachers are based does not encourage any interfacing between the two or allow the same "content" specialist tutor of the MIE to 'transversally' provide knowledge **OF** the subjects, **ON** the subjects and **ABOUT** teaching them, as a result of which "*…practically no incentives towards real applications in real classroom situation is done while we are working on subject areas*" (teacher's comment) and although "*the courses helped to update our knowledge it didn't solve real difficulties which we were facing with the children*" (teacher's comment).

114. Consequently, the shift from professional knowledge to pedagogic competency was operated informally in the work environment on the basis of the principles of "*team-teaching which consists in optimising the expertise of any colleagues with skills and techniques unique to the teaching of a particular subject area for whole school community*" (head teacher's comment).

115. Both head teachers and teachers consider that the team-teaching approach which have been promoted by the "doers" among the ACE trainee teachers (les fonçeurs) may be interpreted as an indirect but beneficial spin off of the program.

10.2.4. Work-place professional development

116. Teachers who were internally motivated and professionally committed considered that the ACE encouraged the sharing of classroom experiences and good teaching techniques at the school level and contributed significantly in the emergence of a school as a learning organisation. The collaborative approach to on-the-job professional development is viewed as a major attitudinal shift from competition to cooperation observed among teachers. For head teachers this shift is as a direct carry over of the cooperative learning approach which ACE trained teachers are striving to foster among their own pupils.

117. In addition to changes in their socio-professional day to day practices adopted to enhance school performance, internally motivated teachers stressed the

tremendous contribution of the optimum use of the ACE materials which were specifically designed for self-professional development both within training institutions and on their periphery. "*During the ACE training period, in schools or even when we met socially, we discussed and shared the new trends in education…the vision for a better education. This helped to put me on tract*"(teacher's comment).

118. This change in the relationship to learning as a once-off step to an on-going process of self-improvement implies a singular change and refers to a change in the perception of one's life history as an individual (Rumajogee, 2000. p 146). " The individual is neither a simple incarnation of the social group nor the product of environmental factors. He is a singular subject, that is an original human synthesis constructed throughout his life" (Charlot et al. 1992). In this sense, the ACE may have contributed to a lifelong process of change through a number of perceptional shifts.

10.2.5. Perceptional change of the self and the socio-professional environment

119. The ACE course has brought about significant changes teachers' perception of themselves and of their role in their professional environment. Its contribution in terms of self-esteem has been underscored by more than many: "*It gave me much confidence in my status…because I got a better knowledge content-wise…and about the teaching profession."* (teacher's comment). *"They became more confident in many difficult situations that cropped up in their working environment thanks to the varied teaching and learning approaches acquired through the ACE when these could be adapted to the specific context*"(head teacher's comment).

120. It also provided others with the opportunity for self-introspection to take cognizance of their own weaknesses in professional and pedagogic knowledge*: "The course was highly beneficial to me as I came to realize how important certain of my weaknesses were in some areas and that I could improve my teaching skills…by looking for more recent information and for new ideas about teaching methods*." (teacher's comment).

121. In terms of professional relationship with their colleagues, the major transformation has been the shift from self-conceitedness to some sort of corporate identity. The school project and community development become as important the classroom. Greater sharing of self-conceived learning resources, innovative ideas and classroom-based practices became part of the school culture, despite the lack relevant supports: "*this change of mentality from competition to collaboration is noticeable, particularly, among teachers who have been trained through the ACE*" (head teacher's comment).

122. For some teachers, the ACE impacted very positively upon pupil-teacher relationship. This relationship has become increasingly characterised by the shift from teacher-centredness and content-oriented approaches to greater learner-centredness: "*having once more gone through the experience of a learner myself, ACE taught me to understand why my own pupils can get bored and feel not interested…and I am ready to change my way of teaching and to encourage the weaker ones to work for their betterment*" (teacher's comment).

123. In a more holistic perspective, the classroom-based teacher, increasingly, saw himself not only a citizenship education teacher but also as an agent of social transformation: "*By reading and researching more about the learning needs of my pupils, I also became conscious that even weaker pupils can improve themselves and their school performance to make themselves more responsible citizens of our country*" (teacher's comment).

10.2.6. Classroom management

124. Although some of teachers believe that they have benefited globally in terms of "*personal knowledge*" (teacher's comment), professional knowledge of the content and teaching methodologies, others consider that their management of the school curriculum has improved through proper lesson planning and better structured daily teaching notes, as a result of which "*I was able to teach more, better and easier*." (teacher's comment). They also believe that they have learned a lot about management by "*sharing their experiences with school colleagues who have tried to put into practice what they acquired through the ACE*".

11. CONDITIONS OF CHANGE

125. Despite some teachers' perception that "*the ACE course was too theoretical…much geared towards content, and tailored to equip them with academic knowledge rather methodological approaches*", for those who, notwithstanding contextual constraints, have operated the shift from the axiological (value-related) and methodological (procedure-focused) perspectives to the praxeological (action-oriented) and the epistemological perspectives (study of knowledge and its limits) as suggested by Barbier (1996) through reflexive observation, experimentation, and experience, the ACE became more an emancipatory process to engage in educational changes than a conditioned classroom behaviour for teachers: "*I cannot deny that the ACE has helped me in some ways in my professional development…and encouraged me to go beyond and to innovate… but with some improvement such as more time, more discussion for better understanding of the course (*in more than one perspective*), it became more fruitful…although it could have been better*."

126. For MIE lecturers, it is more important to stress the adequateness between theoretical and practical knowledge rather than to oppose one to the other. Borrowed bookish theories which are not grounded on classroom practices are less useful than properly mastered theories underpinned by examples drawn the local context. Rather than providing trainees with a set of "pedagogical recipes", teacher education programs should build up on the right balance and interaction between theory and practices.

127. MIE lecturers and teachers alike have pointed to the crucial need of appropriate follow-up of the implementation of the training program in schools by the school heads/inspectors/lecturers or through subject workshops and "*individual counselling*". Teachers in particular, consider that their continuing professional development could be enhanced by genuine co-sharing of school-based teaching experiences and pedagogical expertise rather than by the latent power relationship between lecturers/inspectors and teachers/trainee teachers.

128. All in-service teachers following the ACE operate under the primary school inspectorate of the Ministry of Education & Scientific Research. During and after their training period they are not supervised by MIE lecturers. They are inspected more occasionally than regularly by school inspectors with little or no training to provide contextual pedagogical advice. This "balkanisation" between in-service training and classroom teaching is far from contributing to the follow-up of what has been achieved during the ACE program. A "network" of resources persons including properly trained and experienced school inspectors, head teachers, mentors/pedagogical advisers is currently being envisaged to promote the internalisation, integration and application of acquired knowledge into classroom teaching (MIE lecturer).

129. For ACE trainee teachers, the partnership between theoreticians of teacher education and practicing school teachers in developing teacher development programs is considered fundamental not only in striking the appropriate mix and in fostering constructive cross-fertilisation between theory and praxis but, more importantly, in developing ownership of the training.

11.1. Integration of complementary support materials in classroom teaching

130. Given that the ACE is viewed as "*too theoretical*" although "*very stimulating*", some teachers believe that "*the program could have been enhanced by the use of more media materials*" (teacher's comment) and that their classroom teaching also would benefit more from the integration of audiovisual aids. Head teachers and inspectors consider that the "open learning" approach underpinning the ACE has contributed, in a large measure, to their interest in the utilisation of other media than print, including radio and video, "*for improving pupils' learning, especially in low performing schools*" (teacher's comment) "*by demonstrating practical activities anchored in real classroom situations*" (head teacher's comment) since, it was pointed out, "*ACE was a too four-walled training program and there was no room for practical demonstration classroom*".

131. The ACE is an essentially print-based upgrading program supported by face-to-face tutoring. Its objective to enhance teaching and learning in classroom situations in primary schools is also being currently promoted by the Audio-Visual Project (AVP) of the Mauritius College of the Air (MCA) which has for the past ten years or so been involved, as expected, in "supplementing teaching by the use of relevant (media} instructional programs for various levels", "enhancing learning by introducing larger variety of teaching aids in the classroom, namely: radio and video"(Master Plan In Education: A Blue Print for the nine year school system, MoE&SR, 1992). The MCA is also actively engaged in teacher-training in the effective utilisation of media in education by conducting workshops on media integration for practising all primary teachers, including ACE trained ones.

132. Given that both the MIE ACE program and the MCA AVP aim at improving teaching and learning in primary education, it has been considered useful to include some information on the integration of audiovisual materials in primary classrooms, notwithstanding the fact that the focus of this paper is on the use of print-based rather than media-based distance education. However, this information is provided as an annex to the main paper but not as an integral part thereof in order not to affect the coherence of the study.

133. The use of media as a complementary rather than alternative support is geared towards enriching teaching and learning based on the same primary school curriculum. However, although the AVP and the ACE are both convergent and complementary they cannot be considered to be integrated. The training workshops on media use into classroom teachings are targeted at the primary school teacher population as the ACE programs but the sample populations of the two studies differ.

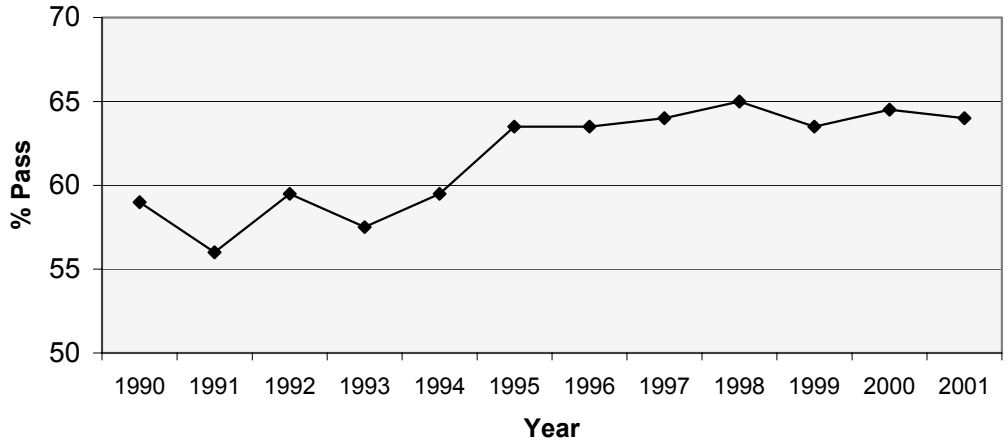
12. IMPROVEMENT OF LEARNING OUTCOMES AS MEASURED BY PUPILS' PERFORMANCE AT EXAMINATIONS

134. The distance based Advanced Certificate in Education has been offered from 1993 to 1998. On the assumption that teaching effectiveness has started influencing learning outcomes in classroom situations as from year one of the course, the performance of pupils at the Certificate of Primary Education examinations from 1993 to 2001 is taken as a indication of the relation between professional upgrading of teachers through the ACE and quality improvement in primary schools.

135. The Certificate in Primary Education (CPE) is obtained after the completion of six years primary education and successful performance at national examinations held at the end of every year. Pupil's achievement at the CPE examinations is evaluated by the grade obtained in each of the following subjects: English, Mathematics, French, Environmental Studies, Asian Languages and Arabic. Grade A carries 75 marks and above, Grade B from 60 to 75, Grade C from 50 to 60, Grade D from 40 to 50, Grade E from 30 to 40 and Grade F (Failure) below 30. All pupils must pass in at least four subjects in order to be awarded the CPE.

12.1. Overall pass rate at the certificate of primary education

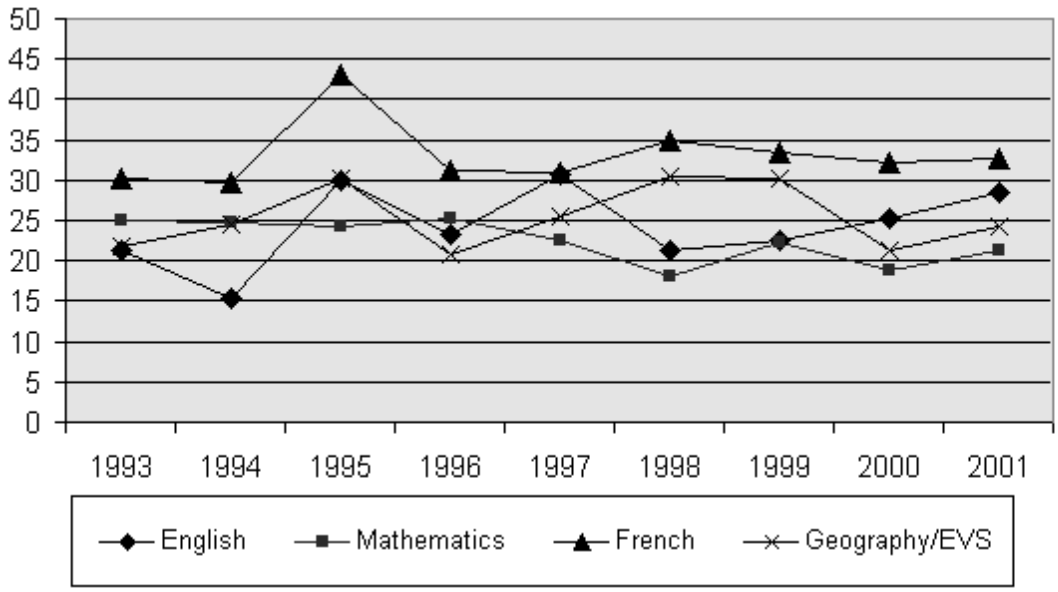
Graph 1 Percentage pass at CPE level, Mauritius



136. Every year from 1993 to 2001, some 25,000 to 28,000 pupils have been taking part in the CPE examinations. From 1994 to 2001, the pass percentage has increased sensibly, except in 1999. The pass percentage for girls only went up from about 60% in 1994 to 69% in 1998, 2001 and 2002. For boys and girls taken together, the pass rate between 1994 and 2001 has gone up from below 60% to almost 65% in 1998, 2000 and 2001.

12.2. Subject performance of pupils at the certificate of primary education

Graph 2 % of students who achieved grade A from 1993 to 2001

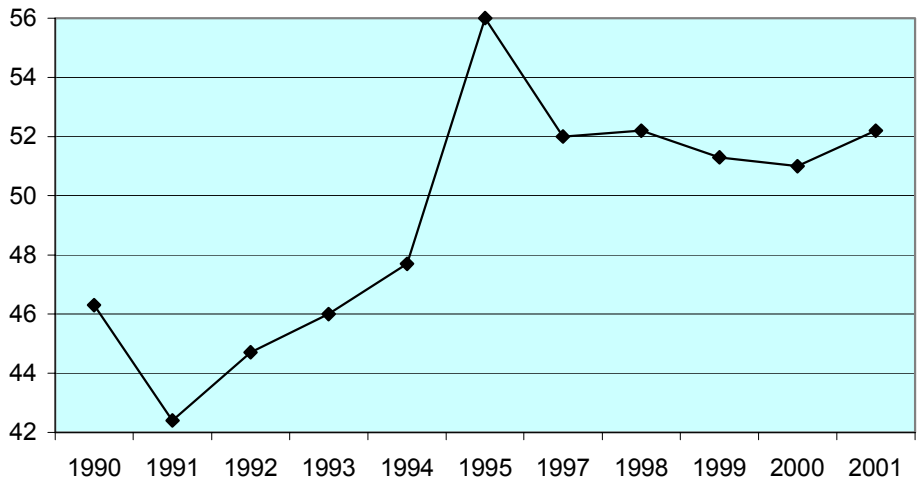


137. Although the overall performance of pupils at the CPE has improved almost steadily from 1993 to 2001, this does not seem to be the case the subject performance. Between 1994 and 1995, the number of pupils having obtained the Grade A (75 marks and above) has increased in all subjects, except Mathematics. Between 1998 and 2001, pupils' performance in English and Mathematics has improved but not in French. Their performance in Environmental Studies gone up from 1996 to 1999 but gone down since.

12.3. Pupils' equal performance in all subjects

138. This is measured by the Twenty more Index, that is " the percentage of pupils performing equally well in all subjects" (Mauritius Examinations Syndicate, 2003), i.e. "scoring 20 or more grade points". The TMI indicates the from 1994 to 2001, the number of pupils who could progress uniformly in all subjects, has increased significantly.

Graph 3 Twentymore index: Mauritius



139. The direct relation between upgrading teacher qualification and pupils' achievement at the CPE from 1994 to 2001 is difficult to judge. In 1994, the CPE question papers were redesigned when the learning competency project was introduced. The "elbows" in the line graphs from 1994 to 1995 for the overall pass rate at CPE, for pupils' equal performance in all subjects, and for subject performance, except in Mathematics, would suggest that new design of examination papers and the introduction of Essential Learning Competencies1 and Desirable Learning Competencies2 in 1994 has had a more tangible influence on the evaluation of pupils' than qualitative teaching on their achievements. However, the enhanced performance teachers may have contributed to sustain that of pupils from 1994/5 onwards.

13. A STUDY OF THE COST-EFFECTIVENESS OF THE ADVANCED CERTIFICATE IN EDUCATION

140. The rationale for adopting distance education rather than conventional face to face teaching to upgrade in-service teachers' qualifications and skills without disrupting classroom teaching. The ACE program, however, included elements of face-to-face tutoring and expected students to work at a distance. The program lasted for 5 years involved was some 5,500 teachers

141. The program was launched in1993 on the basis two assumptions:

- the physical infrastructure and human resources already existing would be utilised at no additional cost to the MIE although some additional facilities would be required and depreciation would worked out on the basis of the number of contact hours.
- the duration of the program, if conducted by the conventional face-to-face method would have been of three years.

13.1. Analysis

142. Generally, the cost of distance education programs varies with the choice of media or technology and the type of learner support provided. It was noted that ACE program made little use of technology and that face-to-face tutoring was limited to full 12 days per year.

143. The pattern of expenditure for distance education programs differs from that of the conventional face-to-face education, with different relationships between fixed and variables costs. In conventional education, staff costs are generally the largest single item in the budget, sometimes around 90 per cent of the total cost. Staff costs tend to vary with the number of students and as such the conventional face-to-face training is labour intensive.

144. In distance education, on the other hand, teaching can be recorded in advance, reproduced, and distributed to large numbers of students, using the same staff. While significant costs have to be incurred in developing the teaching and learning materials, the costs of teaching one additional student or group of students may be modest. Distance education is therefore more capital intensive than conventional education with higher fixed costs, mainly for the development and production of teaching materials, and lower variable costs, as fewer teaching hours are devoted to the teaching of each student or group of students.

13.2. Economies of scale.

145. When comparing the costs of conventional and distance education, or looking at the consequences of expanding or contracting a program, considerations have to be given to the behaviour of the costs involved.

The number of students: As the number of students grows, for a given program, the total fixed cost is shared between a larger number and the cost per student decreases.

The number of options within a program: If all students follow the same course, with no options, the cost of course development is minimized. In contrast, the cost of course

development rises with each option, the more choices, the fewer students there are on any one option. Thus the unit cost will tend to increase as the number of options increases.

Sophistication of the teaching media used: A very important element which may affect both fixed and variable costs, concerns the sophistication of the teaching media used. A program that uses print alone is likely to have lower costs than one that uses a variety of media. Television appears invariably to be more expensive per hour than radio. Computer conferencing requires investment in computer hardware and software and heavy expenditure of tutor time in monitoring computer conferences. Production costs for the various media are fixed, and do not vary with the number of students. Distribution costs for print, and reproduction costs, however, are likely to vary with the number of students.

Student support, organization, supervision and assessment of classroom practice: As with face-to-face teaching, the costs of supervising classroom practice are likely to vary according to the number of trainee teachers.

146. In order to calculate the cost of the program it was necessary to identify all the costs, annualize the capital costs in terms of depreciation, and then calculate the unit costs. In identifying the costs, the project write up for the program prepared by the Mauritius Institute of Education was used and as far as possible the budget presented in the write up was compared with actual expenditure. Costs were identified in terms of space required, equipment, furniture, materials, training of staff, consumables, labour and other resources.

147. The unit of cost used here is the cost per student. Given that the existing infrastructure of the MIE has been used for the program, no further investment was required for this item. The depreciation on such facilities has therefore not been fully charged to the program. Instead an estimate of depreciation for space requirements, equipment and furniture for the program has been included in the costing to provide a fair estimate of the cost and also to facilitate comparison with the cost of the conventional face-to-face method. The depreciation cost has been worked out on an hourly basis. It has also been noted that such depreciation cost was quite low and this, as already pointed out, was due to the fact that the ACE course was not capital intensive as the use of technology was very limited.

13.3. Findings

148. On the basis of the above, the unit cost of the ACE course by distance was as follows:

	Total (Rs)
Stationery & printing	3,200,000
Technical assistance	900,000
Visit of MIE staff abroad	600,000
Payment for courses abroad	900,000
Fees for lecturing & marking	3,790,000
Audio visual aids	450,000
Incidentals	350,000
Winding up & course evaluation	900,000
Depreciation	173,000
Total	11,263,000
No. of students	5,500
Unit cost	2,048

149. For comparative purposes the unit cost of running the same course on the basis of the conventional face-to-face method has been worked out as follows:

	Rs
Salaries teaching	41,066,667
Salaries non teaching	1,750,000
Other administrative costs	6,422,500
Training	1,500,000
Depreciation	1,380,000
Total	52,119,167
No of students	5,500
Unit cost	9,476

150. It is observed that the unit cost of the program under the distance mode is Rs 2,048 whereas under the conventional face-to-face method Rs 9,476, i.e. about 4.6 times less. The evidence is consistent with other studies that distance education can have economic advantages as compared with other methods of teacher training.

151. ELC represents the levels of learning in a particular subject comprising such basic knowledge, understanding, skills, abilities, interests, attitudes and values which are considered minimum but essential for all students to acquire at the end of a particular standard or stage. They can be regarded as attainment targets below which learning is not sustainable. In other words, they are the “minimum vital”.

152. DLC: The ELC are a must for all students while DLC are optional, though desirable, for every one to exercise his higher order mental faculties and can thus be used to discrimate amongst high flyers.

14. ANNEX

Integration of audio-visual material into classroom teaching

1. Introduction

The Mauritius College of the Air (MCA) is a parastatal organisation under the aegis of the Ministry of Education and Scientific Research. It produces radio and television programs for pre-primary, primary and secondary schools, the tertiary sector as well as for the general public. It broadcasts supplementary and enrichment programs via the national network, the Mauritius Broadcasting Corporation and organizes training workshops in media integration for in-service teachers of primary schools both in Mauritius and in Rodrigues, another island which forms part of the Republic of Mauritius.

In line with the implementation of the reform plan in the primary sector of education, the MCA embarked, at the start of 2002, on the production of a series of new video programs, for upper primary classes in newly-introduced subjects like science, history and geography, health and physical education, creative education amongst others.

With a view of optimizing the use of video lessons, the MCA held seven workshops for primary school teachers, last year, on the integration of video materials into classroom teaching. One standard six teacher from each school of the country attended the workshops.

A workshop was also run in Rodrigues for teachers of standards four, five and six. Three teachers from each of the 13 schools of the island were invited to attend. Assessing the impact of the new video lessons on pupils and teachers has become an integral exercise of the MCA.

To achieve this objective, two clusters of schools have been set up for a long-term follow-up. Fifty-three teachers were given the necessary training on the utilization of media materials in their classroom teaching. Since the implementation of the reform plan in the primary sector of education, some three hundred and thirty primary school teachers have been trained.

New subjects, both examinable and non-examinable have been introduced, the teaching time-table has witnessed major changes and teachers were called upon to adopt new pedagogical approaches, new techniques and attitudes that focus on the teaching/learning process rather than on the Certificate of Primary Education, a highly competitive examination at the end of primary schooling as was the case previously. Accordingly, the Mauritius College of the Air has been brought to produce video programs in most, if not all, the subjects being taught in the primary schools of the country.

With the breaking down of Environmental Studies (EVS) into history/geography and science and the introduction of other non-examinable subjects such as human values with a view to promoting the overall development of the Mauritian child, the need for supplementary materials was more than ever before felt in the upper primary classes. Teachers were provided with video lessons to improve the quality of teaching and, especially, engage in more teacher-pupil interaction. In this regard, the workshops on media integration into classroom teaching have proved to be an invaluable asset to teachers.

2. Objectives of the workshops

- Marketing MCA's new productions among end-users.
- Highlighting the relevance of the video programs to the new teaching / learning environment.
- Integrating the video programs in the teaching / learning process.

The skills that were imparted to teachers were as follows:

- **Identifying appropriate video programs/sections of programs that would benefit students.**

Teachers' attention was drawn to the fact that the video lesson was designed to support and supplement their teaching. The themes dealt with were all identified by teachers, primary school inspectors and panel leaders of the National Curriculum Centre for Research and Development. Teachers were told that they could use video programs as they wish and when they want to. They were also advised to select bits and pieces of any program depending on the needs of their students and their teaching objectives.

- **Preparing the class prior to viewing the programs.**

Arousing the interest / curiosity of the pupils is a necessary, preliminary exercise. This can best be achieved by introducing a theme / topic, asking questions and inviting reactions and by probing into the previous knowledge acquired by the learners.

Such activities prepare the audience for active listening and viewing. Teachers were made to understand the fact that alertness is an indispensable element in viewing a video extract for educational purposes as opposed to passive viewing for entertaining oneself while watching a film, an animated cartoon etc….

- **Exploiting the video program.**

During the workshops, teachers are asked either to play the whole program through for general familiarization and then go through it again and exploit the material or to reveal each part of the program step by step or even just use a segment. The same techniques can be applied to language as well as to science programs.

The choice however is dictated by particular circumstances - level of the class, previous knowledge, complexity of the theme / topic, interest of students and degree of motivation amongst others.

- **Stopping the video rewinding, freezing pictures, reviewing sequences / parts of video for consolidation purposes.**

One of the major strengths of the video is that the camera can take the pupils to everyday places and situations and revisit them as many times as they wish. Pictures can be frozen on the screen, allowing the in-depth exploitation of a frame from the video like a still picture and examining it in detail. Discussing and reviewing sequences allow a more efficient absorption of notions, facts and details. The powers of observation are sharpened facilitating the grasping of complex, subtle notions.

- **Viewing images without sounds and inviting pupils to react and / or anticipate**

Television is a very dense medium for both sound and vision. For education purposes, splitting up sound and vision proves to be a useful way of focusing attention on either the commentaries or the images.

Grasping fully the pictures contributes to a better understanding of what is being said. Obviously, students should be familiar with the context. They can then invite to guess. This exercise stimulates conversation and activates prediction skills and the use of future

time referents. Teachers are advised to play a reasonable length of the video with a view to allowing ample scope to pupils to predict or anticipate.

- **Listening to sounds without pictures**

Another interesting exercise but not necessarily appealing is to eliminate the visual aspect of the video and allowing only the sounds to run. This can be done either by turning all brightness off or by covering the screen.

Listening to sounds without images promotes listening skills and helps pairing sound with images. It also develops visualization and gives practice in descriptive skills.

The practical aspect of this exercise is shown to the teachers during the workshops.

- **Class – splitting**

An activity that may be time-consuming but rewarding is to split the class into two groups, sending half out of the room and playing a selected extract of the video without sound to the other half. The same extract is then played to the other group but with pictures only. The two groups then meet to blend the sounds and the pictures. Teachers are told that this activity gives rise to very useful discussion among pupils as well as promotes interaction between them and develop oral skills.

- **Devising exercises focusing on the consolidation of themes / topics / notions**

Teachers who participate in the workshops on the integration of video into classroom teaching are strongly advised to devise post-viewing activities for their pupils to consolidate the notions acquired.

These include oral and written exercises, consolidating scientific notions, role-playing, vocabulary acquisition, sentence-structures, drawings, outings, etc…

Video programs, if properly exploited can constitute ideal material to support the teaching/learning process using a different medium from the traditional 'chalk and talk' method, for revision purposes, to make students acquire the Essential Learning Competencies as well as Desirable Learning Competencies through the selection of appropriate curriculum-based and enrichment programs.

3. Model classes

Several workshops have also been held at the request of Area Inspectors and Head-Teachers for schools in the 'Zone d'Education Prioritaire' - ZEP. These workshops took the form of practical sessions grouping between twelve and eighteen teachers and a standard VI class of around twenty pupils.

Producers of educational video programs of the Mauritius College of the Air exploited the video in classroom situations to share with the teachers the techniques of integrating audio-visual materials in the teaching/learning process.

4. Impact of workshops

Workshops conducted by the Mauritius College of the Air have, so far, constituted the best platforms for direct contact with the users of its products. Teachers felt free to voice their opinions on the effectiveness of the video programs with every participant agreeing that they did enhance the quality of teaching and facilitated the assimilation of concepts, notions and ideas.

The teachers following these workshops were unanimous in stating the relevance of the programs to the syllabus. They appreciated the mass of information contained in each program conceding to the fact that they would never be able to compile such material to boost the quality of teaching.

They also commented on the pedagogical importance of the video as an efficient tool for the average pupil and the slow-learners.

A user-friendly evaluation questionnaire filled by the participants revealed that teachers are in a dire need of additional material in Science, Geography and History. The video programs in the above-mentioned subjects were therefore most welcomed.

Teachers are generally in favor of short documentaries and the MCA has reacted to their request by producing videos not exceeding thirteen minutes. These documentaries are exploited in studio and integrated in longer programs. Schools can opt for either of these formats or both.

Various suggestions on how to respond to teachers' needs are also made in the course of the workshops. The request for video support on specific themes or topics not only for Science, History and Geography but also for the teaching of English and French was strongly expressed.

Teachers also comment on various other aspects of the video programs, namely on the level of the language used, tone and rhythm of commentaries, diction, the quality of images, etc.

Request for video support in newly-introduced but non-examinable subjects such as Civic Education and Creative Arts have also been made at the workshops and the demand for such material is most likely to increase in the near future. The practical components of Health and Physical Education and Information Technology are highly appreciated as they provide teachers with ready-made material which only needs application.

Some teachers complain that they are not aware of some of the video productions available at the MCA despite the fact that an updated catalogue of programs is made available to each school. Others complain of the absence of an audio-visual room, poor viewing conditions, bad state of equipment, i.e the TV set and the VCR as well as VHS cassettes which get damaged due to high humidity and bad storage conditions.

As these questions arise regularly, the MCA has included a thirty minute contact in each workshop with technicians and officials of the National Resource Centre. The technicians of the MCA provide participants with practical hints on operating a TV set and a VCR as well as with advice on preserving VHS cassettes in the best conditions. Officials of the National Resource Centre explain to the participants all the facilities - free dubbing, loaning of cassettes, documentation - that the MCA is ready to put at the disposal of the schools.

5. Reaching the user

The video programs of the MCA have a targeted audience - students, teachers, members of the public, including parents. In this case, the formal programs are geared to upper primary classes and teachers.

The multi-pronged distribution network comprises the following:

- airing the programs on the national broadcasting station.
- free dubbing of cassettes for all schools.

- loaning of cassettes to schools.
- sale of cassettes either at the MCA or through the video-bus which visits several regions of the country.
- promotion of MCA programs during workshops.

6. Series of video programs for primary schools

- **Teleschool junior**

Teleschool Junior caters for the needs of pupils at the primary level in subjects like English, French, Mathematics, Arabic and Oriental Languages (Hindi, Urdu, Tamil, Telugu, Marathi, and Modern Chinese) as well as the newly-introduced subjects such as Science, History and Geography, Creative Education and Health and Physical Education.

Since January 2002, the Teleschool Junior studio-based 26-minute programs have been enriched with the inclusion of video documentaries.

These video documentaries are produced in line with the curricula of the various subjects. Their short duration (5 - 7 minutes) takes into account time-constraints in classroom teaching. They are at the disposal of teachers, schools and parents.

On the other hand, the studio-based programs provide useful pedagogical hints on the way specific topics can be dealt with through the participation of subject specialists and children.

- **Edusurf junior**

Edusurf Junior is a 26-minute program intended for children which covers a wide range of topics of general interest for that age group in such fields as science, environment, history, creative, learning skills and crafts.

Based on the concept that learning can be fun, it aims at creating scientific and civic awareness and providing cultural enrichment. The studio-based format generally includes extracts from hands-on experiments.

- **Video programs produced for primary schools**

Year	Teleschool junior	Edusurf junior	Total
2000	70	17	87
2001	55	2 4	79
2002	71	16	87
Total	196	57	253

7. Programs previewed during workshops

French

- De l'abeille au miel
- Le crocodile

Science

Importance of animals

Health and physical education

- Introduction to health and physical education
- Endurance

History and geography

Myself and my family

Creative education

Assemblage

8. Costing

The cost of organizing a one-day workshop on the integration of Audiovisual materials into classroom teaching for 262 teachers in each of the five regions is as follows:

	MU Rs
VHS tapes	14,960
Resource persons	10,000
Lunch and refreshments	43,230
Stationary	7,500
Overhead	4,310
Rs	**80,000**

The training cost per participant is approximately US $ 10

The production cost of one 7-8 minute video program, including tapes, presenters, use of equipment and music copyright is Rs 60 000. Assuming that the 7 documentaries were used for the workshops, the total cost of the project is as follows:

	MU Rs
Production of materials	420,000
Training of teachers	80,000
TOTAL	**500,000**

Spread over a total number of 22,500 pupils of standard VI, the cost of the activity per pupil is around Rs 25.00 i.e slightly less than US $ 1.

9. Conclusion

Following the implementation of the reform plan in the primary sector of education and the introduction of new subjects- examinable and non-examinable, it is obvious that more support material will be needed in schools.

Multimedia materials including audio and video programs as well as CD ROMs should be increasingly viewed as important components to support the teaching and learning process.