PD-ABC-116

ZIMBABWE/B.E.S.T.

Basic Education and Skills Training Project

FINAL REPORT

In Collaboration:

Government of Zimbabwe
Agency for International Development
Academy for Educational Development

Sponsored by:

Government of Zimbabwe
United States Agency for International Development

Implemented by the:

Academy for Educational Development
1255 23rd Street, N.W.
Washington, D.C. 20037

Telephone: 202/862-1900
Telex: 197601 ACADED WSH

FINAL REPORT

ZIMBABWE BASIC EDUCATION AND SKILLS TRAINING (BEST)

U.S.A.I.D. CONTRACT NO. 613-K-606-C-00-4010

March 28, 1984 - January 31, 1990

This document fulfills the requirements of the contract for a final report covering Project accomplishments, methods, and recommendations.

TABLE OF CONTENTS

Table of Contents continued

I. INTRODUCTION

BASIC EDUCATION AND SKILLS TRAINING (BEST)

March 28, 1984 - January 31, 1990

This chapter briefly reviews the background leading to this study of basic education and skills training in Zimbabwe, describes the objectives and scope of study, discusses implementation activities, and indicates the arrangement of this report.

In March 1984, the contract for the Basic Education and Skills Training (BEST) Project was awarded to the Academy for Educational Development. More than 50 long-term and a dozen short-term consultants worked on Project activities before it ended in January 1990. Most of those consultants provided assistance in developing and teaching courses at the technical colleges and at the University of Zimbabwe. Some of the University consultants were located in the medical science departments and participated in a program to strengthen the capacity of the Faculty of Education to provide training to the Government of Zimbabwe personnel responsible for educational management and planning. The Project also assisted the Ministry of Education (now divided into the ministries of Primary and Secondary, and Higher Education) with computerizing its examinations, data management, student tracking, and planning systems.

A. BACKGROUND

The Basic Education and Skills Training Project (BEST) was part of a larger work force planning and institutional development program funded by USAID. It was intended to provide resources to enable the Government of Zimbabwe (GOZ) to carry out needed reforms in its educational and training systems. The country's long history of colonization and minority rule left independent Zimbabwe with an inadequate formal education system and tertiary level technical training institutions. This history also left an insufficient staff and trained personnel to meet the economic development needs of the nation and the expansion needs of the educational and training institutions open, for the most part, at one time only to the privileged minority. After achieving independence from the British Government in 1980, the Government of Zimbabwe took significant steps toward rapidly expanding the opportunity for education and training for its full

population.

The BEST Project, in conjunction with other government programs, sought to redress these critical issues related to education and economic development through external training programs which provided resources to assist in the expansion of Zimbabwe's internal training and educational institutions. Long- and short-term consultant personnel, recruited and financed by the BEST project but selected and appointed by the Government of Zimbabwe, were to provide the technical training and education personnel needed to expand training and educational opportunities in the country. Consultant personnel were also to help implement new methods and approaches in order to bring about a more relevant, effective, and efficient educational and training system in concert with the expansion of educational and training opportunities and equitable access.

In newly independent Zimbabwe, as in many other developing countries, the education and training systems were highly labor-intensive, and the national budget was strained to meet the labor costs of those systems. Without the infusion of new methods and means for delivery of education that could significantly increase the efficiency of these systems, the opportunity for expansion would remain severely constrained even though quality might be improved. Zimbabwe's emphasis on improved student-teacher ratios, multiple-session use of facilities, intensified but shorter personnel training programs, mediated instruction, shared government and community school financing, and investments in longer-range planning and analysis had all begun to be put into motion when the BEST project was initiated.

The Project's resources, and the personnel and training they support, were intended to benefit the educational and training systems by introducing and implementing:

- A more efficient use of educational resources
- Improved quality of teaching
- Improved relevance of the curricula
- Improved and more equitable distribution of resources, particularly to rural areas

- Strengtnened management and administrative capacities.

In short, the emphasis underlying the BEST investment was to contribute to a more cost-beneficial education and training system while meeting the immediate goals of increased access and equity.

In the vocational and technical training sectors, plans had been drawn for expanding and developing regional training centers, vocational training schools, and polytechnic colleges as well as a national vocational center in Harare. The plan for the new National Vocational Training System would require significant increases in the instructional staff. No institution existed in Zimbabwe to meet the higher and technical college personnel needs. The necessary short-term emphasis on expatriate staffing for some of these developments were to be met, in part, through the BEST project.

Technical education traditionally has been the most costly on a per student basis. In recognition of the competing forces for technical personnel, quantitative expansion of the instructional work force was essential. This expansion was to be coupled with needed curricula reforms. Means for improved instructional delivery, nonformal education approaches and strategies, on-the-job training, and self-instructional methods would need to play a role in expanding the technical training system to ensure its affordability and accessibility on an equitable basis. Similar investments in the formal education sector were also planned.

On March 29, 1984, the Academy for Educational Development (the Academy) signed a contract with the Agency for International Development (A.I.D.) to provide technical expertise to the Government of Zimbabwe (GOZ) in support of the Basic Education and Skills Training (BEST) Sector Assistance Program Grant. The Academy was to recruit and provide administrative support for both long- and short-term technical experts required by the BEST sector program. Most long-term experts - those recruited for one or more years - would serve as employees of the Government of Zimbabwe. These individuals normally would fill positions within either the Ministry of Labour Manpower Planning and Social Welfare (M/LMPSW) or the Ministry of Education (MOE), including their respective training institutions and colleges. Most of these positions would be those which were vacant due to the acute shortage of trained Zimbabwean professional and technical personnel.

In addition to long-term experts, the Academy was also to put forward short-term experts, those recruited for less than one year, to provide specialized consultation or advisory services. It was anticipated that these individuals would not be recruited to fill existing positions within the Government of Zimbabwe, but would perform specialized professional and technical services in areas required by the GOZ in support of the objectives of the sector program.

At the minimum level of effort, it was expected that the Academy would identify and recruit approximately 800 person-months of short- and long-term technical assistance; at the maximum level of effort, approximately 1,600 person-months of technical assistance would be provided. It was anticipated that a major share of the long-term technical assistance recruited under the contract would be instructors for the existing and planned technical colleges and schools under the jurisdiction of M/LMPSW. Requests for technical assistance would be generated by the appropriate ministry. A BEST program working committee, consisting of USAID/Zimbabwe and all of the ministries involved in the sector assistance grant, would monitor and approve all technical assistance requests. USAID would issue a Delivery Order (D.O.) which, when signed by various GOZ and USAID officials and accepted by the Academy, would become the contractual mechanism for providing the assistance. The total value of the services to be provided under the Academy's contract was to be $11,473,097.

B. OBJECTIVES AND SCOPE OF THE PROJECT

The objectives of the BEST Project were:

- To provide trained personnel to fill instructional positions in the fields of engineering, education, and business.

- To assist in developing more relevant, effective, and efficient education and training systems.

Project activities over a five-year period encompassed the provision of instructors to fill faculty positions, the creation of new academic and training programs, and computerization efforts designed to assist the Ministry of Education in improving the management of educational systems.

C. IMPLEMENTATION

During the course of the Project, five amendments were made to the core contract. The first, on January 30, 1985, gave the Project authority to recruit long-term technical assistance personnel under the ZIMMAN Project Grant. The ZIMMAN funds were designed for technical training in selected areas and for the training of trainers. Many of these funds were going to the University of Zimbabwe for upgrading staff through advanced degree programs in the United States. It was assumed that, in some cases, long-term technical assistance personnel would be recruited to fill the vacancies created by those away being trained and to provide in-service staff training. The ZIMMAN contract was administered by the Institute of International Education, with whom the Project was sharing office space in Harare. It was discovered that USAID and the GOZ defined "long term" differently. Rather than have two USAID projects recruit similar long-term technical assistance personnel in technical or professional areas, it was decided that only the Academy would recruit long-term personnel.

The second amendment, on December 5th of the same year, increased the core contract's budget from $1,051,700 to $1,248,785, to reflect the actual and anticipated costs of administering the contract without a change in the level of effort. On April 13, 1987, the core contract was again amended, for the third time, to raise the ceiling on the amount of Delivery Order activity the contract would support. The original contract anticipated $10,000,000 of activity; the amendment raised that amount by $2,000,000 more. The fourth and fifth amendments were related to the extension of the core contract from March 29, 1989 through December 31, 1989 and again for the month of January 1990. The fourth amendment increased the core contract budget by $210,334, to cover the costs of administering the contract for nine months. The fifth amendment was a no-cost amendment to allow for the closing out of technical assistance expenses and for preparing the final report.

Delivery orders were also amendments to the Project in that they committed funds to be spent. A total of 21 delivery orders (D.O.s) were issued during the course of the Project, which covered both long- and short-term technical assistance and provided for supplies and occasional critical participant training needed to ensure the success of some delivery order activities. While a complete list of the delivery orders appears in Appendix A, the following listing gives some indication of the distribution of the Project's activities:

Activities	Delivery Orders
• Vocational Education (M/LMPSW)	3,5,9,14,15 and 17
• University of Zimbabwe	8,18 and 19
• Computerization/Data Management	
M/LMPSW - planning	11
MOE - data management and planning	10
MOE Examinations Branch	1,2,4,16 and 20
National Scholarships	13 and 21
• Other:	
MOE teacher training	6 and 7
M/LMPSW - libraries	12

STAFFING

During the first four years of the Project, almost all of the principal figures involved at GOZ, USAID and the Academy remained unchanged. As a result, there was a continuity of program activities and a commonality of purpose and understanding supporting Project efforts. For the Academy, Drs. Rudi Klauss and Kenneth Schank were the Field Coordinators, and Dr. John Hatch served as the Home Office Coordinator. Even when the Ministry of Education (MOE) became the Ministries of Higher Education (MOHE) and Primary and Secondary Education (MOPSE), most of the people either managing or directing Project-related activities for the GOZ also moved and continued with their designated responsibilities. Mr. Rob Blair remained the Registrar of the University until the last few months of the Project. At USAID, though there were three or four education and human resources officers, Dr. Richard Shortlidge saw the Project through from its inception for more than three years, while Dr. Golden Chekenyere served as Project Specialist throughout the Project.

D. ORGANIZATION OF REPORT

This report is divided into four chapters and three appendices, as follows:

I. Introduction

II. Accomplishments - records the achievements of the BEST Project from its inception in March 1984 through its conclusion in January of 1990.

III. Methods - describes the technical assistance recruitment and support and the computerization process.

IV. Recommendations - suggest ways that similar USAID projects might be able to enhance their effectiveness and efficiency.

Appendix A - Delivery Orders
Appendix B - Long-term Technical Assistance
Appendix C - Short-term Technical Assistance

II. ACCOMPLISHMENTS

The monthly reports of the field and home offices record project activities for each month. They are, perhaps, the best record of how achievements occurred as the project proceeded. Those reports, as well as trip reports of project staff and short-term consultants, can be found in the 11 semi-annual reports of the Project. Those reports, in turn, covered the four services that the Academy was contracted to provide:

- Logistical, managerial, and financial services for administration of the technical assistance component of the sector assistance program
- Identification and recruitment of short- and long-term technical experts required to implement the BEST sector program
- Coordination and liaison on matters related to the technical assistance requirements of the program
- Assistance to the Ministries of the Government of Zimbabwe involved in implementing the BEST program to prepare plans and requests for short- and long-term technical assistance.

A. TECHNICAL ASSISTANCE PERSONNEL

Before describing the achievements of the long- and short-term technical assistance personnel, it should be noted that Project staff, and particularly long-term Field Coordinator, Dr. Rudi Klauss, contributed a significant technical assistance element which does not appear in the overall description of technical assistance. Because of his background in public administration and his experience with development management, Dr. Klauss provided needed assistance to both USAID and the GOZ in developing delivery orders and ensuring that they were carried out as effectively as possible. While his successor, Dr. Kenneth Schank, was in the position for just 20 months, his experience with vocational and technical education enabled him to provide advisory assistance to these aspects of the Project. Ms. Grace Ruredzo, the Administrative Assistant to the Field Office efficiently bridged the needs of both the Project and the requirements of the Government.

The home office staff also made a concerted effort to meet the expectations of USAID, the GOZ, and the requirements of the delivery orders. Dr. John Hatch, Home Office Coordinator, directed the home office effort and personally recruited most of the OPEXers. Mrs. Edrena Harrison, who served as the Business and Logistics Manager during the last three and a half years of the Project, saw that financial and logistical needs were met in a timely, efficient, and effective manner. Together, the Field Office and the Home Office provided technical assistance to the Project in addition to that provided by the long- and short-term technical assistance personnel.

Short-term consultants are listed in Appendix C in relation to the Delivery Order under which their services were required. Appendix B lists the 52 long-term technical assistance personnel (Operational Experts), who were recruited and placed at the University of Zimbabwe, various technical colleges, and in the Ministry of Labour Manpower Planning and Social Welfare. Most of them were employed as lecturers, whose fields of expertise included:

Automotive Engineering
Civil Engineering
Electrical Engineering
Mechanical Engineering
Mining Engineering
Architectural Design
Computer Science
Educational Administration
Educational Psychology
Curriculum Planning
M.D. Anesthesiology
M.D. Ophthalmic Surgery
M.D. Microbiology
Veterinary Science
Industrial Training
Business Studies
Applied Physics
Library Science

The courses they taught ranged from Craft Theory to Workshop Supervision, Electronic Data Processing and Business Systems Design, Manufacturing and Engineering Production, General Surgery, Anesthesiology, and Eye Surgery, and Comparative Foundations of Education, Educational Administration, and Learning Theories. They also taught support courses in physics, mathematics, science, statistics, and economics.

A number of OPEXers were moved into such leadership positions as department chairmen in recognition of their training and organizational abilities. Some departmental staff were unhappy with the principals' decisions to put OPEXers in leadership positions, but many of the newer Zimbabwean staff were appreciative of receiving new leadership. At the Harare Polytechnic Institute, the Chairman position was given to OPEXers in the Bachelor of Technology - Mechanical, Computer, and Manufacturing Engineering programs. The Computer Chair position at the Technical College Bulawayo was held in succession by two OPEXers. Further, the Chairman position for a number of functioning committees was held by OPEXers at both the University and the technical college.

B. ASSISTANCE TO THE TECHNICAL COLLEGES

1. Curriculum and Instruction

Teaching was the principal responsibility of the OPEXers assigned to the technical colleges (Kwe Kwe, Bulawayo, and Harare Polytechnic). They were recruited because following Independence Zimbabwe experienced the departure of a large number of skilled persons. In most departments there were few, if any, Zimbabweans available to carry on instruction. Those who did serve as instructors consisted of expatriates on contract, retired Rhodesians who decided to remain in Zimbabwe, and a few Zimbabweans who had limited work or teaching experience in their fields. Hence, by teaching classes that would not have otherwise been offered, the OPEXers were of immediate assistance to Zimbabwe's manpower development needs.

In several cases, the OPEXers assigned to the technical colleges taught in two distinctly different programs. Their lecturing involved several sections in the vocational (diploma) program as well as responsibilities in the Bachelor of Technology program. Some of the students serving on apprenticeships were in the City and Guilds programs and attended regular class sessions at the technical colleges in a regular rotation. Some OPEXers also taught those students in the Diploma courses. Courses taught by OPEXers regardless of levels, were as follows:

Craft Theory - Machine Tools
Craft Theory - Refrigeration
Craft Workshop -Electrical
Craft Level - Welding
Drawing/Print Reading
Electrical Principles
Shop/Industrial Safety
Craft-level - Sheetmetal
Concepts of Information Processing
Manufacturing Workshop
Motor Vehicle Technology
Welding Inspection
Craft-Level Sheetmetal
Diesel Technology Craft-Brakes
Technical Drawing/Orthographic
Computer Operations and Packages
Management Information Systems
Diesel Technology Craft-Steering
Diesel Technology Craft-Chassis (Heavy Equipment)
Diesel Technology Craft-Injector/Fuel Pumps
Craft-Level Sketching and Development
Calculus - Apprentice
Science - Apprentice
Advanced Craft Auto Service
Microcomputers in Business
Thermodynamics
Machine Design
Applied Heat
T3/4 Math
T5 Management
Statistics
Economics
Electronic Data Processing
Business System Function
COBOL Project
Engineering Production
Functions and Analysis of
Business Systems

In addition to teaching, the OPEXers were expected to assist with strengthening the capacities of their fellow teachers through example and counterpart training. Their presence allowed some of their fellow instructors to go for further training. For whatever reasons, the M/LMPSW failed to nominate any Zimbabweans for further training, except during the last two years of the Project, which precluded any planned coordinated training in association with the OPEXers. Further, counterparts were not assigned for the Bachelor of Technology program. This occurred probably because there were no Zimbabweans with advanced degrees available. The dichotomy between salary and working conditions existing between governmental and industrial employment meant that the experienced Zimbabweans were constantly being attracted away from the technical colleges, thereby adding to the Government's inability to develop a trained teaching force. Individual OPEXers however, did report that many of the younger staff would come to them for assistance. Others reported that their procedures were copied

or mandated as the way those particular activities should be carried out but, over all, there was no formalized training of counterparts.

The third area to which it was expected that the OPEXers would contribute was that of curriculum reform, that is, bringing curriculum up to date and making it more relevant to the needs of industry. One OPEXer, Dr. Donald Neff, was specifically recruited to work in the M/LMPSW on these problems. It was not uncommon for six, eight, or even ten syllabi to be taught for one course or examination, thereby causing a poor showing by many students on the examination. Dr. Neff's most significant contribution was helping to establish a unified curriculum among the several technical colleges.

The activities by OPEXers in the areas of curriculum development and revision contributed significantly to the growth of the Technical College programs. The review and modification of examinations, which led to a clarification of objectives and a more realistic approach to the use of tests as a teaching tool, was useful to the lecturers teaching in the various programs.

Most of the OPEXers involved at the technical colleges found discrepancies in courses of study, inconsistencies in curriculum sequences, and poorly structured examinations or examination questions. As a result they addressed these problems with their department chairs, principals and as participants on revision committees. The following list illustrates a number of their other activities:

- Prepared an analysis of the proposed Bachelor of Technology program, with specific recommendations for its improvement
- Wrote a new course outline for solid state electronics
- Developed and supervised COBOL payroll requirement specification program
- Developed a new National Intermediate Diploma Programme
- Conducted a preliminary investigation of Harare Polytechnic's administrative system
- Developed Bachelor of Technology Computer subjects syllabus

- Prepared the final draft of the committee design for the VTS refrigeration curriculum

- Completed a detailed instructor's guide implementing the present syllabus, which included study questions and test question banks

- Wrote "Tables and Formulas for Machine Tool Speeds"

- Prepared computer program for science and engineering mechanics

2. Supervisory Training

When the Ministry of Labour Manpower Planning and Social Welfare requested a specialist in manpower analysis to work with the Department of Industrial Training, Operational Expert Lee Scott was recruited to assist with the development of a technical field manual, to develop an evaluation system, and to prepare manpower training officers. His initial work was to develop a task analysis system. The Technical Field Manual and Guide for the system was designed, developed and produced for use in the training of field staff. The manual contained 85 profiles on the backgrounds necessary to fill a given job as well as the tasks for the worker. The manual was designed for both training purposes and for actual field application.

One of the tasks of manpower training officers was to determine the qualifications of foreign recruits. The evaluation of the expatriate work permit required the development of a standard analysis system that would ensure uniform responses. Because the 85 profiles in the Technical Field Manual reflected the most common employment situations in Zimbabwe, they were used as the basis for developing the standard analysis system. After receiving training on the system, a high standard of uniform responses was demonstrated by the training officers.

Mr. Scott also helped to develop a plan for the initial training of manpower training officers from each region over a three-month period on the use of the task analysis system. Three of these officers were to be selected on the basis of their understanding of the analysis process and designation as senior manpower training officers, to train

other manpower training officers. Mr. Scott taught many of the initial training sessions and provided training to the Director of Industrial Training so that he could continue the training.

3. Computer Training

While some OPEXers were involved with computer training at the Polytechnic, a specialist in computer education and training was recruited in 1985 to help establish a major program in computer science and computer-assisted vocational training at the Technical College Bulawayo. Over a five-year period two OPEXers provided leadership in formulating the plans, readying the space, overseeing the contracting for equipment, and installing and establishing the Computer Centre. The Technical College Bulawayo Computer Centre went into service in May 1987. In addition to providing computer training, the Centre served as a service laboratory for the general student and faculty populations. It made computer time available for tutorials in statistics, calculus, and differential equations and it served as an enrichment facility for the required science subjects within the various technical programs.

The basic course of study consisted of computer operations and packages that introduce the student to the theory and practice of present-day systems. This program prepared students to take the National Diploma Examination for electronic data processing, with documentation in the COBOL program. There were also programs leading to the National Intermediate Diploma (NID) and Higher National Diploma (HND) courses, the latter placing emphasis on systems analysis and design. The use of the microcomputer in business for accounting information systems, electronic data processing for audit and control concepts, and general management were integrated into the program, thereby reflecting the applications of the computer in the business world.

The location of internship positions for the advanced students in the EDP program was introduced and developed by Dr. Henry Williams, an OPEXer, as a means of carrying over the lessons of the classroom to the job market. It also served as an introduction for the student to a potential future employer, thereby easing the transition to full-time employment. The internship generally consisted of a six-week period in business or industry and gained increased support from the leaders in the commercial sector.

At the end of the Project, the physical facility of the Computer Centre consisted of 60

computers, distributed in a series of classrooms, with eight machines reserved for faculty usage. An adequate supply of spares were on hand, but consumable supplies such as print paper were not as readily available. Sufficient software was available, both in pre-programmed form and in open disks. Equipment for the development of graphic displays was available for both black-white and for multicolored printout, again reflecting applications common to the needs of the business and industrial community.

4. Bachelor of Technology Program

The rationale for introducing the Bachelor of Technology program was to fill a manpower gap that existed in engineering and business management skills within commerce and industry in Zimbabwe. The graduates of this program are expected to fill either vacant positions or those occupied by expatriate contractor personnel. It was also expected that this group of graduates would represent a pool from which future instructors for the technical college system could be drawn. This strategy should help to reduce the existing critical shortage of qualified personnel to teach craft and technician-level courses in the existing and expanding technical education system. The Bachelor of Technology program offers degrees in electrical engineering, mechanical engineering, civil engineering and business studies. The engineering degrees entail a five-year program that includes an industrial component. The business studies program is offered in a four-year format.

In the summer of 1985, Dr. Myron Lewis of the New York State University College, Buffalo, was recruited to assist the M/LMPSW and Harare Polytechnic staff in developing the guidelines for the program. In early November, he joined Mr. Robson Muringi, Deputy Secretary, Ministry of Labour Manpower Planning and Social Welfare; Mr. Elias Mufuka, Deputy Secretary, Public Service Commission Dr. Robert Appiah, Dean of Engineering, University of Zimbabwe in interviewing and selecting OPEXers to help develop and teach the Bachelor of Technology program. By March 1986, the first group of students had begun courses.

Polytechnic staff had to be convinced that a cross-disciplinary program was functional, especially because Diploma program staff were needed as instructors. The program's focus on an integrated or comprehensive engineering program for all Bachelor of Technology engineering majors, while both a practical and a more efficient use of resources, was contrary to the accepted norm of discrete departmental control and a

single, theoretical major field of studies. During the last year of the Project, issues of program control between the degree-granting University and the instructing Polytechnic had to be resolved.

The program has proved to be popular with the students and has been generally well received by industry, particularly now that some students have proven their competence during their internships. Even the University, which is assuming responsibility for the direction of the program, has accepted the Bachelor of Technology concept as useful and viable for Zimbabwe and has modified its basic engineering programs to focus more on practical applications and less on theory. While no new Zimbabwean staff has been developed for the upper levels of Bachelor of Technology instruction, some are available for the lower level courses, and new expatriates have been recruited to fill vacancies at Harare Polytechnic and for the newly established program at Bulawayo.

5. Special Activities

While the OPEXers and their families participated in their communities in various ways, frequently providing services such as working with the Computer Society of Zimbabwe, they also contributed their services to their departments and colleges in a number of ways, as follows:

- Committee Chair, Department Policy Study
- Computer Steering Committee
- Internship Supervisor
- Chair - Craft Theory Examination Committee
- Guest Lecturer, Automated Machinery Tools, University of Zimbabwe
- Head of Mechanical Engineering for the Bachelor of Technology program
- Department Librarian
- Mechanical Division Advisory Committee
- Acting Head of Bachelor of Technology Accounting
- Coordinator: Zimbabwe Agricultural Show Career Day
- Basketball Coach Bulawayo Tech
- Track and Field Coach.

An example of some of the special contributions made is the work of OPEXer Charles Wright, lecturer in architectural design in the Civil Engineering Department, Harare

Polytechnic, who completed the Facilities Requirement Report and the Master Development Plan for the Harare Polytechnic College Campus. The focus of this effort was to determine the accommodation and facility needs required to support the installation of the new Bachelor of Technology Program. The needs analysis required a study of classroom space and workshop/laboratory requirements as each year's projected intake was considered, and as well as the needs established for the five-year program when fully implemented. Such an analysis required incremental calculations and consideration for additional equipment and storage for laboratory equipment and supplies. The report, which included step-by-step plans for both institutional, recreational, and dormitory space, and illustrations of the projected completed facility, required approximately 600 hours to prepare. Color renderings for submission by the Principal to a Planning Committee were also produced.

Through the urgings of the Bachelor of Technology OPEXers, the Ministry agreed to purchase specific supplies needed to carry the program forward. The Project assisted by ordering and shipping the equipment. Later, at the request of many OPEXers, the Ministry agreed to a one-time allowance for the purchase and or importation of critical instructional supplies or hardware approved by the departmental chairs and principals. Throughout the Project, assistance was provided to the Ministry in selecting and distributing of textbooks and reference materials provided through the services of the Brother's Brother Foundation (Pittsburgh, Pennsylvania) and the Harare Rotary Clubs, needed by the technical colleges. Dr. Schank made three visits to the government storage facility to make selective bibliographies of available titles during the last year of the Project alone. Finally, many of the OPEXers donated, upon their departures, the books, reference, and instructional materials that they had brought with them to the technical colleges.

C. THE UNIVERSITY OF ZIMBABWE

Technical assistance to the University was divided into two activities, one funded through ZIMMAN and the other through BEST. While the activities of the OPEXers were similar, the purposes of the programs differed. The OPEXers on the Zimman program were recruited to fill vacancies created by Zimbabweans on training. In addition to teaching, they were expected to enhance or develop course offerings in their specialities. While the BEST funded OPEXers also taught regular courses, they were

expected to provide support in the development of a new graduate emphasis in educational administration.

1. ZIMMAN Project

Eight OPEXers were recruited to fill critical vacancies in departments where junior-level Zimbabweans had been sent for advanced degree training under the ZIMMAN Project. While the Project failed to find a suitably qualified person in anatomy, those selected served in the following disciplines:

- Anesthesiology
- Ophthalmic surgery
- Microbiology
- Veterinary science, with a specialty in large animal surgery
- Mechanical engineering, with specialties in metallurgy and in manufacturing processes
- Business studies, with a specialty in finance
- Electrical engineering, with a specialty in electronics

The OPEXers involved, either on the University campus or at the University's hospital teaching facility, exhibited a high degree of dedication to their work. Some highlights of their contributions include:

- An OPEXer in mechanical engineering had two of his students win top awards in designing and producing their Senior Projects, this being accomplished in spite of student strikes and University closure.
- The OPEXer in veterinary science volunteered to evaluate and treat the Government of Zimbabwe horses used in the mounted military troop. He also provided surgical procedures to several race horses, thereby restoring them to competition.
- The OPEXer in anesthesiology participated in the first open heart surgery in Zimbabwe.

All of the OPEXers also instructed their peers in their specialties, particularly where they had developed new syllabi or courses for their departments.

2. BEST Project

Four OPEXers were recruited for the Faculty of Education as part of a project to strengthen the administrative, planning, and management capabilities of the M/LMPSW and MOE. Specifically, they were to:

- Enhance the capacity of the University of Zimbabwe to support an expanded graduate research degree program and to expand training activities in vocational and technical education.
- Support staff development activities within the Ministry of Education
- Support staff development activities within the Ministry of Labour Manpower Planning and Social Welfare.
- Promote communication among the University and two ministries
- Support research on education.

To cite examples of all of the courses taught and participation in all activities would be difficult. The following excerpt from one OPEXer's six-month report is presented to demonstrate the depth and breadth of the OPEXers' work:

> "Coordinated the team research being conducted by 26 members of the department of Curriculum Studies in the secondary schools of Zimbabwe... "Taught the M.Ed. class "Reorganizing the Primary Schools" during first term: Taught the two-week Diploma in education course during January. The 19 members of the class were taken from both primary and secondary school, regional education officers and lecturers in teachers' colleges. Taught the Curriculum Issues course during Term 1 for the full-time students in the B.Ed. Technical Education program... Presented three lectures to the M.Ed. class in "Research Methods" during May... Observed 11 student teachers on the Graduate C.E. program in Marondera area secondary schools. Held individual conferences with 24 members of the Department on various topics. Served on the "Examination Panel" for the Department in addition to serving on the curriculum theory program examination panel... Co-authored with two members of the Department and did the editing of a booklet: "Guidelines for B.Ed. Technical Subject Project" (with Special Reference to the Metalwork and Woodwork subjects)... In process is another booklet "Handbook for Organizing and Conducting In-Service Workshops" which I am co-authoring with another member of the Department... Presented a paper at the January Conference on Science Teaching held on the UZ campus... Presented a paper to a meeting of regional education officers at the request of the Curriculum Development Unit of the Ministry of Primary and Secondary Education during February. Worked with 11 M.Ed. and 4 Ph.D. students on developing proposals for their dissertations. Served as Coordinator of the

B.Ed. Technical Education (woodwork, metalwork, building and technical drawing) curriculum theory course during Term 1."

Human Resources Research Centre

The Human Resources Research Centre (HRRC) was established with Project funds at the University of Zimbabwe as a support unit for the Faculty of Education. The objective of the Centre was to provide a computerized educational research capability for University faculty; graduate students in M.Ed. and Ph.D. programs, many of whom held positions in the Ministry of Primary and Secondary Education, the Ministry of Higher Education, regional education offices, and teachers colleges; and for those in leadership roles in primary, secondary, and technical education.

The role of OPEXer Dr. Victor Levine in the establishment and operation of the HRRC was multi-faceted and was divided into two phases. The first was the identification, ordering, and supervision of the installation of the computer network. The next phase involved working with the Faculty of Education in developing a database which would support the educational research capability for the graduate programs. In order for this aspect of the program to remain open-ended, systems needed to be structured for continuing to add to the databank. Because many graduate students had not been trained in the use of the computer as a research instrument, programs were developed which enabled them to use the computer. These programs remain in place to provide for the training of future students who will need this information.

Some of the HRRC's research completed during the Project was not only for the benefit of the individual student but was also action-based, for the use of a specific Ministry or curriculum unit. As a result of one research study, administrators are taking a new look at teacher preparation and certification standards that are expected to have an impact on college and university programs as well as on future hiring practices. As the various research studies were completed, the desk-top publication capability built into the computer network was put into use. During 1988-89, 14 research papers were printed, bound, and made available to interested parties on a regional basis. In addition, the HRRC established the Zimbabwe Journal of Educational Research and has issued four Occasional Papers, as follows:

1. "Policies for Primary and Secondary Education in Zimbabwe: A response to the World Bank Report"

2. "Policies for Higher Education in Zimbabwe: A response to the World Bank Report"

3. "In-Service Training in Zimbabwe: An analysis of the relations amongst education and training, industry and the state"

4. "Educational Research in Zimbabwe: Some key issues and questions."

The HRRC is obviously on its way to becoming a significant resource for the University as well as for managers and policy-makers within the Government who are concerned about the structure and quality of education in Zimbabwe.

D. COMPUTERIZATION

A major activity of the Project was the computerization of various aspects of the Ministry of Education. This activity represented a focus that was not originally envisioned for the Project, but one that was effective in promoting Project objectives. Prior to Independence, in 1980, most of the black population had been denied the opportunity for basic education. The promise of free and available schooling for all Zimbabwean children, however, was one of the cornerstones of the revolution. The rapid expansion of the public schooling system after Independence quickly overcame the limited, and primarily manual, systems for accounting, student tracking, teachers' salaries, supplies, examinations, and planning.

Prior to the BEST Project's development, Kurt Moses, the Academy's Director of Systems Services, had been hired as a short-term consultant by USAID to assist MOE with computerizing its planning and examination systems. In addition to seeing that a few personal computers were brought in, a plan developed to use them, and that optical scanning equipment be used for the Grade Seven Examination, Mr. Moses drafted a comprehensive plan for computerization of the Ministry. The focus was first on establishing an efficient examination system, which was needed because the system was producing incomplete results three months after they were needed. The second focus was on developing a comprehensive regionalized database to assist with centralized planning. The last activity was the development of a system of tracking Zimbabweans sent for training outside the country. This plan then became the blueprint for the support provided to the Ministry of Education under the BEST program.

1. Examinations Branch

The first Project activity was to provide on-site technical assistance during the actual administration and processing of the Grade Seven Examination to ensure that the examination results were available on schedule in December 1984. The enterprise was successful, proceeding from a six-month delay in 1983 to an on-time delivery in 1984. In addition, the consultant for this activity, Mr. Eric Eno, continued to work with the Ministry of Education in developing an independent capacity within the Examinations Branch to administer and process examinations. He also carried out the following tasks:

- Completed review of the 1984 Grade Seven and Junior Certificate Examinations to improve the examination processing procedures to be used in 1985.
- Assisted in the development of long-range plans for strengthening of the capacity of the Examination Branch to process examinations.
- Provided additional training for officers in the Examination and Account Branches of the MOE in data management and applications.
- Investigated possibilities for local production of the Grade Seven answer sheets beginning in 1985.

Recognition that a five-fold increase in the number of examinations expected to be processed over the next five years indicated that the Ministry's examinations processing systems had to be revamped and more fully automated. Mr. Eno was retained to assist with the:

- Acquisition and modification of examinations software that would be flexible enough to be used for existing and future examinations, which incorporated modules that optimized the use of the Optical Mark Readers, and supported on-line records inquiry and updating
- Development of new optical mark forms to speed up the registration process for candidates
- Acquisition of new mailing containers to improve the efficiency in handling all optical mark forms
- Development of improved storage and distribution systems, and a system for coding, and for retrieving marked forms
- Development of specifications for, and procurement and installation of, additional hardware.

It was discovered that local production of marks forms that worked effectively on the equipment available could not be achieved. As a result, the Project ensured that there was a sufficient supply of forms and mailing labels to last the Examinations Branch into the 1990s. Additional equipment was also needed to handle basic processing because sharing resources with the Treasury's Computer Bureau became impractical.

By the end of the Project, the Examinations Branch had its own trained administrative and processing staff as well as its own facilities. Because of inevitable glitches, Mr. Eno was involved with this activity into 1988. This activity eventually represented approximately one-tenth of the Project's resources.

2. Computerization of Regions and Management Improvement

This activity, the second major computerization step outlined in 1982, also involved one-tenth of the Project's resources and was divided into three phases. The first involved a detailed design of custom software for the personnel, payroll, budgeting and communications functions within the Ministry of Education's regional offices. Software is the key to the effective operation of the entire system. Bids were requested for equipment capable of running the software described during the design phase, and having sufficient capacity for each region. Because the equipment had to be capable of being serviced locally, and to assist localization efforts, only Zimbabwean firms were allowed to bid on the software design and hardware procurement. Computer Products Group, Inc. (CPG) was the successful bidder, proposing the use of Wang products. Mr. Moses assisted the Ministry and USAID with both the bidding process and contract negotiations.

Forms design was begun along with the software changes, building on earlier work to simplify the overall process involved in administrative transactions. Training and familiarization courses for potential users began, and training software was developed for use with the customized software package. This approach allowed clerks in the regional offices to refresh their memories after their courses and new personnel hired at later points to receive cost-effective training. Six machines, one in each of three regions as well as in the Planning Division, Finance Section, and Staffing Section at Head Office, were installed.

Phase Two included completion of the custom software, installation of computers at additional regional sites, and completion of field testing. At this point, the redesigned forms were entered into the system and the system integrated with that of the Treasury Computer Bureau. This phase also began the process of unifying all of the teacher payroll and leave records into one system, a process that produced some unexpected savings when funds were discovered being paid to schools which had been closed. Phase Three saw the completion of computer installation at all sites, the beginning of management training for the system, and the requisition of spares to use in the project into the 1990s.

Throughout this activity a Coordinating Committee consisting of USAID, Ministry, AED, and Ministry of Works personnel met monthly to discuss progress, problems and needs. The Field Coordinator and a locally hired technical consultant, Mr. Alastair Watermeyer, attended for the Project, while Mr. Moses provided technical oversight from Washington, D.C., through the Home Office Coordinator and on periodic visits. The computerization effort, while not having completely eliminated much of the tedious paperwork, has given the MOE, now MOPSE, the capacity to respond to regional needs more rapidly as well as to develop plans and budgets for the system.

3. Scholarship Tracking

The final step of the computerization of the MOE eventually took place for a new ministry, the Ministry of National Scholarships (MNS), beginning at the end of 1987. It built on the work completed by a consultant provided by the Project to M/LMPSW in 1985, which delineated the basic design, data requirements, and customization required to make the current system more inclusive and responsible. The completed computerized system allowed MNS to track all scholarship grant donations for study outside of Zimbabwe, applicants for those scholarships, and scholarship recipients through their training and return. The result is that the Government is better able to plan for manpower training.

The new project progressed in four steps, with the able assistance of consultant Bruce Geisert:

- Completion of design requirements (including physical renovations needed for hardware and software)
- Development of a user-friendly software system (completed in the United States by MNS employee, Cleophas Dzinotyiweyi, and Mr. Geisert)
- Installation of the equipment and software, followed by staff training; and,
- Final revisions and fine-tuning of the system, including production of final documentation; training; and specification of hardware spares.

The MNS computerization was finished within a year as planned and was, therefore, put into operation before the BEST Project ended. Work has begun to bring into the system all pre-1989 paper files relating to Zimbabweans in training abroad.

4. Planning for M/LMPSW

The Project responded to a request by the M/LMPSW divisions responsible for vocational, technical and industrial training for assistance in strengthening their administrative and planning capacities. Two consultant were sent to assist these divisions in planning and implementing microcomputer applications to support program administration and development. They provided familiarization training for Ministry staff in the application of computerized planning and budgeting models as well as in the initial application of software programs to priority areas.

The Division of Vocational and Technical Training was specifically concerned with developing and using databases on the staffing and budgetary requirements of the existing technical colleges and head office, modeling future staffing and budgetary projections, and establishing a system to monitor staff development requirements. The Division of Industrial Training received assistance with preparing a study for designing a computerized tracking system for the Apprenticeship Authority. The consultants assisted with the preparation of a strategy for developing additional microcomputer applications in areas that were suitable for automation within these two divisions and which could be accomplished through follow-on technical assistance. Their assistance included training of Ministry staff on the use of two microcomputers and supporting software.

E. OTHER PROJECT ACTIVITIES

Other Project activities can be divided into the requested and the voluntary. The former consists of Delivery Order generated technical assistance and the latter of voluntary and unanticipated Project activities. While these activities did not make large contributions, they were significant and useful additions to the overall development and strengthening of the educational systems in Zimbabwe.

1. Technical Assistance

The Project twice assisted the Ministry of Education's involvement with teacher training, both efforts involving Belvedere Teacher Training College. The first supported the consultative visit of Dr. Hugh Gloster, President of Atlanta University, to the opening of the college and for subsequent meetings on teacher education. Mr. Mzava, Director of Teacher Education in the Government of Tanzania, was the second consultant. He specifically addressed education for self-reliance and teacher education. Mrs. Esi Honono was locally recruited for a year to assist the M/LMPSW's Zimbabwe Institute for Development Studies and Harare Polytechnic library systems with their development.

2. Educational Study

In conjunction with the interviewing of OPEXer candidates for the technical colleges, the Project arranged for the interview teams from GOZ to visit vocational and technical training institutions in the United States. These visits provided the Zimbabweans with a better understanding of the background and experiences of those recruited as well as information about a variety of models of vocational and technical training. Especially useful were visits to institutions offering a Bachelor of Technology degree program. The Project also assisted in both arranging a program of visits for, and in escorting MOE's Minister, Dr. Mutumbuka, on a study tour of community college systems in December 1987.

Similar planning assistance was provided for three MOE officials to visit and study in the United States in order to become familiar with the capabilities, problems, and issues regarding the establishment of a computerized system of data management. That visit took place while the Ministry's own systems were being planned. Once the MOE system was under way, the senior management officials from Bulawayo, Harare, and Ministry

headquarters were given an intensive training program in "Microcomputer Systems Management for Development."

3. Other Activities

Through the efforts of Dr. Schank and OPEXer Ron Cox, Diesel/Heavy Equipment lecturer at the Harare Polytechnic, contacts were made with ZEMCO's training department and the Caterpillar Manufacturing Company of Peoria, Illinois, to obtain a slide series on engines and transmissions. The slide series, with a value in excess of $900, was donated to the Polytechnic. This addition to the audio-visual capability for instruction in this area was of particular importance because of the need for qualified mechanics in the construction industry.

The Project helped arrange, and then coordinate, a series of mini-seminars by Ms. Deborah Slawson, a Kodak expert on photocopy repair who was on temporary assignment to Mozambique, Zimbabwe, and Zambia. The Polytechnic, Delta, and other technical training programs with electronics courses benefited from her training on trouble-shooting and preventive maintenance as well as from having some of their copiers repaired.

Project assistance was provided to the Human Resources Research Centre through its willingness to administer a small grant from the Ford Foundation of external funds for materials and publications acquisition. As a personal gesture, and on his own time, Field Office Coordinator, Dr. Rudi Klauss co-taught a course at the Institute of Development Studies and occasional modules on public administration at the University.

III. METHODS

Because the principal objective of the Zimbabwe BEST Project was to provide and support short- and long-term technical assistance to the Government of Zimbabwe to assist with strengthening the educational system, the basic methods involved were those of recruitment and logistical support. Because the Project became so heavily involved in computerization, other methods used were computer hard- and software definition, procurement, specification and oversight, and localization. The Project's management system provided consistent support to all Project activities.

A. TECHNICAL ASSISTANCE RECRUITMENT AND SUPPORT

The precise technical assistance requirements of the GOZ were unknown when the BEST Project contract was signed, but the scope and anticipated number of person years of assistance had been projected. Technical assistance needs were specified through delivery orders for consultant services for specified technical scopes of work over the life of the Project. These delivery orders were generated by the ministries and institutions involved, passed through the BEST Program Working Committee for approval, written up, and then signed by GOZ and USAID personnel before being sent to the Academy for acceptance and action.

Through the involvement of the Project's Field Office Coordinator, the Academy was usually well aware of what delivery orders were in process. The BEST Project helped to write background pieces for the D.O.s and developed the draft budgets for the Delivery Order activity for USAID's use. Because the D.O. preparation process, which included identification of needs and approval by the BEST Working Committee, was lengthy, the Project was asked to begin the recruitment process prior to receiving the Delivery Order. This action was possible as long as special funds necessary for recruitment, such as advertising, were not required, since normal expenses related to recruitment were funded by the CORE budget.

1. Selection

For most long- and short-term personnel needs, the first resource was the Academy's Registry of 3000 consultants. Because of the number of engineering OPEXers anticipated, one Delivery Order allowed for advertising in professional journals and Sunday newspapers across the nation. Between those resources, word of mouth, and the Peace Corps' Hotline for newly returned Volunteers, a special collection of more than 1,200 engineering and vocationally oriented potential consultants was developed for the BEST Project.

Once identified, the lists of candidates for specific D.O.s were reduced and sent to the field office for transmittal to the appropriate ministry or the University for further examination. Short-term candidates were usually rank ordered by preference, and the Home Office contacted them in order until one accepted. A salary was then negotiated, using A.I.D.'s 1420 Form, flight arrangements were made, and approval to travel sought, before the consultant was accepted. For long-term consultants, once a reduced list of three or four candidates per position was returned, references were checked and interviews were arranged.

For Technical College employment, a team from the M/LMPSW and Public Service Commission joined a US vocational educator to conduct the interviews in the United States These were usually held over a week or more in two or three places around the country. The GOZ team would select its finalists before they left the country. For the University, an interview committee of U.S. academics and a person recommended by the department who knew the University, (often a Zimbabwean in the US.), was established. Dr. Hatch served as Recorder. Interview notes and the committee's recommendations were forwarded to the University for final selections.

2. Orientation

After the OPEXers were selected and confirmed, they completed required Zimbabwean forms, A.I.D.'s Biographical Data form 1420, and had the physical, X-rays and TB tests required by Zimbabwe. Each was sent an OPEXers Handbook, which the Project compiled to be used as a guideline for preparing for departure. It contained information concerning salary computation, allowances, shipping, storage, orientation, reporting requirements, suggestions about what to take, spouse employment, and Customs

regulations. OPEXer allowances had been negotiated by the GOZ and USAID during the first eight months of the Project. They represented, in part, an attempt by the GOZ to have similar conditions for all expatriate employees and yet not allow payments which would greatly differentiate OPEXers from their Zimbabwean counterparts. Thus, all OPEXers received a one-time settling-in allowance, which essentially covered the costs of setting up a home, but no other allowances were paid in Zimbabwe.

When the OPEXers were ready to depart for Zimbabwe, they would have received GOZ clearance, signed and returned their employment contracts with the University or M/LMPSW, received travel approval from USAID and been sent their tickets. All OPEXers and accompanying families were routed through the Project's home office for a brief but comprehensive orientation, usually completed in a day. This orientation consisted of slides of Zimbabwe and a film on working in different cultures. They were followed by discussions about living and working in Zimbabwe, led by Dr. Nyorovai Whande, then a Zimbabwean graduate student, or Mrs. Phillia Garwe, wife of the Zimbabwean Ambassador to the United States. A thorough review of the OPEXer's contract with both the OPEXer and his or her spouse was followed by a discussion about what to expect on arrival, lingering issues about Project support, and reminders about general cross-cultural adaptation adjustments.

The OPEXers were met in Harare by the Field Coordinator. If they were going to the University, they were usually met also by a member of the appropriate academic department. They were taken either to available University housing or to a hotel where they stayed until housing was available, or were posted to Bulawayo or Kwe Kwe. The field office had its own orientation manual and welcoming procedures which included: getting the OPEXer officially on the payroll, welcomed to his or her department, registered with the U.S. Embassy and the GOZ, and started on the process of clearing freight through Customs. The Field Coordinator also reviewed with the OPEXers what to expect and focus on for the next week and what the limited role of the field office would be once the OPEXers were established in work with their Zimbabwean employers.

3. Support

Continuing support for most OPEXers by the field office consisted of forwarding mail and providing an ear for concerns or frustrations. There were some emergency situations, such as dog bites, heart problems, family illnesses, and conflicts with landlords or occasional GOZ officials in regulatory bodies, which required intervention or assistance. The Field Coordinator visited or saw most OPEXers at least once a quarter, read their six-months reports, and arranged informal gatherings to meet USAID staff or visiting AED staff. The home office staff deposited the OPEXers' U.S. dollar salaries in their U.S. bank accounts, paid for storage, sent a brief monthly newsletter of the Project and the Academy activities, and looked after their insurance claims.

Both offices combined to support the OPEXers when they finished their contracts. On a regular basis this meant providing them with guidelines for end of service requirements, including a checklist of all of the various GOZ, U.S. Embassy, and Project expectations which had to be met before they could leave. Once they had left Zimbabwe, the Home Office reimbursed them for travel costs, helped them look after their shipping, and arranged for their storage to be delivered to their homes. At the end of the Project there were 23 OPEXers who would be leaving within two weeks of one other. Special arrangements were made for a group orientation to discuss pre-departure requirements and options with shippers, travel agents and USAID, and for clearing their reimbursements before Project funding ceased.

B. COMPUTERIZATION PROCESS

The Project assisted the GOZ with computerizing the:

- Ministry of Education's data management systems
- Examinations Branch of the MOE
- Ministry of National Scholarships
- Human Resources Research Centre at the University
- Computer Centre at the Technical College Bulawayo.

All but the last two activities built upon a consultation that Mr. Kurt Moses had with the Ministry of Education shortly after Independence. Because of his interest and his knowledge, Mr. Moses became the Project's official and unofficial resource for all of these efforts.

As the Academy's Director of Systems Services, Mr. Moses was committed to ensuring that Zimbabweans responsible for managing and using the systems participate actively in all aspects of planning and decision-making. This approach frequently required long discussions so that informed and supportable decisions could be made. Another concern was to develop systems that were adaptable, flexible, and as simple as possible for the purposes for which they were envisioned, so that they would be used and could be maintained and serviced in Zimbabwe. In practice, this meant using micro-computers and avoiding state-of-the-art software or hardware which had not been fully tested for durability and compatibility. Within the A.I.D. constraints of having to purchase equipment and supplies from the United States, it also meant that caution was needed to ensure that the equipment selected could be maintained and repaired by experienced Zimbabwean firms.

The Project became involved in all aspects of the computerization efforts. In the computerization of the regional offices of the MOE, Mr. Moses worked with a Ministry team to devise specifications for bids, evaluate the bids, and develop the final contract with a local firm. Dr. Klauss provided a similar but more distant service for the Computer Centre at Technical College Bulawayo. Both project offices provided oversight to the procurement processes, including assisting with arranging for customs clearances for the equipment requested. Mr. Moses and the field office continued to monitor each project and were available to assist with problems and to help integrate and adapt of the systems, as necessary.

C. PROJECT MANAGEMENT

Long-term associations with the Project by key personnel considerably aided the project. Both Dr. Klauss and Dr. Hatch participated in the best and final bidding process in Harare, and went out together at the start to establish the logistics and expectations of the Project. They communicated almost daily by way of telexes, weekly by telephone, and exchanged monthly Progress Reports.

Whenever Dr. Klauss or Dr. Schank were to be out of the country for more then ten days, Dr. Hatch would arrive prior to their departure for orientation, and then manage the Project from Harare during their absence. This was at least an annual event, with Dr. Klauss spending three days to a week in the home office during his vacations. Both thus gained an appreciation for the organizations with which each office had to interact, as well as a sense of the daily operations of each office. The swaps also made it possible for Dr. Hatch to experience administering all facets of technical assistance, recruitment and computerization support, sensitizing him to what the home office could do to ease the work sent to the field.

The Academy's project directors, Messrs. Stephen Moseley and Earl Yates, visited the Project almost annually. Their visits provided them with first-hand knowledge of Project accomplishments and plans, which supplemented the quarterly project review meetings held in the home office. The monthly progress reports from both offices were shared with the Project Director as well as with USAID and A.I.D.'s Africa Bureau office responsible for Zimbabwe and his or her counterpart at AFR/TR/EHR. The semiannual reports were also read by the Project Director, sent to required A.I.D. offices, and shared with key people in the Government of Zimbabwe.

D. CLOSEOUT OF THE PROJECT

When the contract was extended from March through December, more than 20 OPEXers were asked to continue their contracts to finish the Zimbabwean academic year, which ended in December. It was hoped that more Zimbabweans would be identified who would be able to be assigned to work with the OPEXers in order to take over their responsibilities, but the GOZ was unable to find sufficiently qualified local instructors and so brought in expatriates under another external aid project. This approach did allow for some transfer of information about courses and syllabi; but there were still vacancies when the OPEXers left. At the University, because of the nature of the ZIMMAN program, most of the OPEXers work was more easily taken on by existing or newly trained staff.

Because most of the remaining OPEXers would be teaching well into December, the Academy requested an extension of the CORE contract for three months to allow for paying bills, completing paper work, and deobligating delivery orders. A month's no-cost extension was allowed, which covered the period that the OPEXers would have to return

home, receive their shipments, remove their belongings from storage, and submit bills for reimbursement forms. Because of the numbers involved, shipping agents in the U.S. and Zimbabwe were examined for capability, responsibility, and thoroughness. Vendors were informed of the closing date, as were the bank, estate agent, and travel agencies. Most importantly, the Pre-departure Handbook was reviewed and special meetings held with OPEXers collectively and individually to ensure they understood what they had to do to guarantee proper disengagement with their employers, USAID, the U.S. Embassy, and the Project. Mrs. Harrison, the Project's Business and Logistics Manager, organized the U.S. side of activities and then went to Zimbabwe for the first three weeks in December to oversee the actual closing down of the field office and the Project's disengagement from Zimbabwe. In January, she continued with the follow-up logistical and financial activities.

IV. RECOMMENDATIONS

1. OPEXers should be selected by the local employers.

The selection of OPEXers for the BEST Project was carried out through departmental hiring or by senior-level authorities empowered to make the selections. Where OPEXers were to be civil servants, a member of the Civil Service Commission was included on the selection panel, thereby reducing potential problems of suitability. That process should be repeated in other projects, because it makes it clear that the OPEXer is working for, and at the request of the local employer and not for the contractor.

2. Counterparts should be provided for OPEXers.

While some peer teaching did take place, the OPEXers did not have designated counterparts with whom to work and for whom they were responsible for upgrading. Such a relationship would have been welcomed by the OPEXers, and was one of the attractions of the positions. Especially where a new program such as the Bachelor of Technology is instituted and dependent overwhelmingly on expatriate staff, designating counterparts ensures that there is an understanding of the developmental process that went to the establishment of the new program, as well as the creation of staff trained to carry out the program.

3. The availability of counterparts should determine the rate at which OPEXers are fielded.

The Best Project provided almost 40 long-term OPEXers in a two-year period, because the M/LMPSW had a need to continue to train as many Zimbabweans as possible. While the availability of OPEXers meant that many courses could be offered, and that students could progress through their programs of study, M/LMPSW did not implement a training program to either upgrade current staff or train new Zimbabwean staff to replace the OPEXers. Had the number of OPEXers recruited been tied either to Zimbabweans identified for upgrading on a 1 to 1 or 1 to 2 matching basis, or if at least an equal number went for training, then the Project could have been assured of being more than a stop-gap instructional program. By phasing in OPEXers, the number triggered by the availability of an agreed to, previously designated, number of counterparts, the Project would have both met the needs of the moment and ensured that Zimbabwe would have

been more self-sufficient in trained institutional personnel in the future.

4. OPEXers should be expected to provide upgrading as part of their responsibilties.

The OPEXers were carefully selected because of the specific skills and knowledge which they could bring to the training programs. In addition to imparting their knowledge and teaching their skills to students in the training programs, the OPEXers could also have been used to up-grade the skills of other instructors within these departments. This approach would have made prudent use of the talent available if counterparts were unassigned. The upgrading could have taken many forms, from regularly scheduled topical presentations and demonstrations to tutoring. Upgrading of existing staff would have allowed them to teach many of the courses that the OPEXers were teaching when the OPEXers left.

5. To maximize the value of technical assistance personnel, projects should ensure that basic reference materials and instructional supplies are available to the personnel.

Twice during the Project, the OPEX technical instructors at the Polytechnic requested basic reference materials and teaching supplies so as they could teach the courses they had been asked to teach and have the essential instructional items requested. These items requested were high of high priority and essential if the courses were to be offered. Had the Project not been able to get approval to spend the funds, the value of the instructors for enhancing the quality of vocational education in Zimbabwe would have been greatly reduced.

6. Those who will be most directly involved in managing computer software should work on the software's development.

Specialized software was developed for the Ministry of Education and the Ministry of National Scholarships during the Project. The MOE software was developed by a local firm which provided training and adaptations but the MNS system was developed in the US. The MNS systems' designated manager was sent to the US first for technical training and then was assigned to work with the software developer. Because he was involved in the software's development he knew how to make many adaptations, was able to ask for precise technical backup support, and most importantly, the system was designed

precisely to provide him with the information he needed as a manager.

7. Where more than one agency or jurisdiction is involved in a project activity, representative responsible individuals from each agency should be constituted as a working group to monitor that activity.

The development of the Computerization Working Group as a guidance and problem-solving mechanism for a special activity that involved more than one agency for its success was useful. The Working Group which met monthly and was chaired by the MOE, reviewed problems, suggested solutions and discussed anticipated needs. Minutes were kept and responsibilities for actions were assigned. The meetings allowed for frequent and regular discussions by all parties involved with the effort of computerization, which precluded minor problems from escalating; allowed for adjustments in plans, based on discovered needs, about which all were informed; and helped maintain both a collegial approach to problem-solving and a shared sense of mission. The model could be productively used for both subproject activities or for a major single project where different constituencies must contribute for the activity's goal to be achieved.

APPENDIX A

DELIVERY ORDERS

DELIVERY ORDER NO.	FUNDING SOURCE	DATE SIGNED	COMPLETION DATE	ACTIVITY	BUDGET
D.O. 1	BEST	05/10/84	03/31/85	Eric Eno was assigned to improve the exam processing procedures for Grade 7 and Junior Certificate.	$ 91,518.
D.O. 2	BEST	09/06/84	11/30/84	New IBM PC was purchased for Exam Branch to be used mainly for administrative purposes in education.	9,000.
D.O. 3	BEST	01/02/85	Active	This fund was provided to recruit twelve long-term contractors to assist Ministry of Labor Manpower and Social Welfare (MLMPSW) in critical areas in the newly established National Vocational Training and Development Center (NVDTDC) and technical colleges.	1,496,714.
D.O. 4	BEST	01/04/85	Active	Eric Eno, short-term consultant, was assigned by AED to assist Ministry of Education in support of administration and processing of Grade 7, Junior Certificate, and "O" Level exams.	249,799.
D.O. 5	BEST	01/04/85	Active	Delivery Order provided funds for short-term technical assistance for MLMPSW to assess equipment specifications and procurement of that equipment for technical colleges in Zimbabwe, library needs, computer studies and competency-based training.	82,276.

DELIVERY ORDER NO.	FUNDING SOURCE	DATE SIGNED	COMPLETION DATE	ACTIVITY	BUDGET
D.O. 6	BEST	03/27/85	03/85	Dr. Hugh Gloister, leading U.S. educator, participated in opening of Belvedere Teachers College.	5,429.
D.O. 7	BEST	04/29/85	05/04/85	Dr. Mzava, Director of Teacher Education, was the guest speaker at the Gweru Ministry of Education Conference. His speech was on the role of education in social transformation.	1,473.
D.O. 8	ZIMMAN	06/26/85	Active	Eight professors were recruited to teach in critical skill areas in various faculties of the University of Zimbabwe under ZIMMAN funding.	960,073.
D.O. 9	BEST	06/26/85	Active	Involves twelve long-term teaching courses at all levels (accountancy engineering, business studies, computer science) in Bulawayo Technical program.	1,584,468.
D.O. 10	BEST	07/15/85	Active	Kurt Moses is providing technical assistance, as may be required, to carry out the project on schedule. Hardware is being procured through CPG/Wang for the computerization of MOE.	1,655,000.
D.O. 11	BEST	09/26/85	Active	Short-term consultants (Louis Simmons and Ray Maloy) worked with MLMPSW Division and industrail training to strengthen administration and planning through computer applications.	78,459.
D.O. 12	BEST	09/25/85	08/31/86	Librarian specialist, Esi Honono was assigned for one-year as a consultant to the Zimbabwe Institute of Developmental Studies (Harare) within MLMPSW.	18,117.

DELIVERY ORDER NO.	FUNDING SOURCE	DATE SIGNED	COMPLETION DATE	ACTIVITY	BUDGET
D.O. 13	BEST	09/25/85	Active	AED Staff consultant, Kurt Moses, worked with Ministry in developing requirements of the scholarship tracking system.	9,822.
D.O. 14	BEST	11/01/85	Active	13 lecturers were hired primarily for the Bulawayo Technical program under two-year contracts.	1,826,160.
D.O. 15	ZIMMAN	10/17/85	Active	Four long-term contractors are working in various fields within the technical colleges.	497,352.
D.O. 16	BEST	07/01/86	08/86	This delivery order provided funds for supplies (optical mark answer sheets and mailing labels) in support of the Examinations Branch of the MOE for Grade 7 and Junior Certificate exams.	53,500.
D.O. 17	BEST	08/20/86	Active	This delivery order was assigned to purchase and install computer hardware, software, and related servies for the Bulawayo Technical College.	349,967.
D.O. 18	BEST	11/23/86	Active	Five long-term contractors are to be hired as professors for the University's Staff Development Program and short-term assistance is to be acquired in preliminary project and system design, selection of hardware and software.	750,000.
D.O. 19	BEST	12/18/86	09/02/87	Originally, the sum of $77,912 was for the procurement of computers, workstations, printers, and software, and related servies to be located at the University of Zimbabwe. This delivery order was later closed and the funds were transferred to Delivery Order 18.	Deobligate

DELIVERY ORDER NO.	FUNDING SOURCE	DATE SIGNED	COMPLETION DATE	ACTIVITY	BUDGET
D.O. 20	BEST	06/25/87	Active	More funds were added for procurement of optical mark answer sheets and mailing labels in support of the Ministry of Education Examinations Branch.	498,000.
D.O. 21	BEST	11/18/87	Active	Delivery order provided funds to design and implement a scholarship/student tracking system for the Ministry of Labor, Manpower Planning and Social Welfare.	280,000.

APPENDIX B

LONG-TERM PERSONNEL

NAME	D.O.#	START DATE	END DATE	DURATION	STATUS	SERVICES	QUALIFICATIONS
Asiouez Aid	014	04/22/86	12/21/89	2 Years	Active	Lecturer, Electrical Engineering, Harare Polytechnic Inst.	Ph.D. Illinois Institute of Technology; 9 years experience in research, Electrical Engineer in Algeria; Assistant Professor in Algeria and Northwestern Illinois University.
Jonas Amoapim	009	01/24/86	01/23/88	2 Years	Active	Lecturer, Electric. Engineering, Bach. of Applied Techno. Harare Polytechnic Institute.	Ph.D., Vocational Education, Oregon State University; M.S. Electrical/ Electronics, Rochester Institute of Technology; Associate Professor, University of Wisconsin-Stout.
Louis Brittingham	015	03/21/89	12/21/89	2 Years	Active	Lecturer, Automotive Engineering, Harare Polytechnic Institute	A.S. Automotive Technology, Central Texas College; experience includes logistics engineering, shop management, training, tool and equipment maintenance, troubleshooting and repair.
Calvin Brooks	009	05/30/86	05/29/88	2 Years	Active	Lecturer, Mechanical Engineering, Harare Polytechnic Inst.	M.S. Mechanical Engineering, U. of Maryland; 20 years as Associate Professor, U. of Distict of Columbia; Institute Dar-es-Salaam Technical College.
Billie Ann Brotman	008	01/01/87	12/31/87	1 Year	Complete	Lecturer, Business Administration, Harare Polytechnic Institute	Ph.D. in Economics and Labor Relations; 9 years teaching experience in Business Finance, International Finance and Financial Institutions
George Cavaliere	009	11/14/85	12/13/89	3 Years	Active	Lecturer, Mechanical Engineering, Bachelor of Applied Technology, Harare Polytechnic Inst.	M.S. Mechanical Engineering, Polytechnic Institute of Brooklyn; Professor of Mechanical Engineering Technology, New York City Technical College.
James Cech	003	08/08/85	08/07/87	2 Years	Active	Lecturer, Automotive Engineering, KweKwe Technical College	Certified in Engineering Repair and Tuneup, Heating and Air Conditioning Systems, Manual Transmission and Direct Line and Auto Transport Specialist Consultant,USAID;Cooperative Farm Mechanic, U.S. Peace Corps.

NAME	D.O.#	START DATE	END DATE	DURATION	STATUS	SERVICES	QUALIFICATIONS
Hiróyasu Chiba	014	02/24/86	12/22/89	2 Years	Active	Lecturer, Computer Science, Bachelor of Applied Technology, Harare Polytechnic Institute	M.S. Computer Science, University of Houston; 18 years programming and management experience in real-time and commercial applications.
Norman Clark	008	01/25/88	12/31/89	1 Year	Active	Lecturer, Dept. of Anesthetics, Univ. Zimbabwe	M.D. Loma Linda University; Assistant Professor in Anesthesiology, University of Utah School of Medicine; Director Anesthesia, Cardiac Transplantation Team, University of Utah; Volunteer physician with S.A.W.S. and COSIGN, Thailand and Cambodia.
Ronald Cox	003	05/05/85	12/04/89	3 Years	Active	Lecturer, Automotive Engineering, Harare Polytechnic Institute	Certification Hydraulics, Algebra/Trig. Driver Education; Diploma Equipment Repair; Equipment Specialist; US Army; Technical Institute, Botswana.
Edward DeSanto	003	05/05/85	12/04/89	3 Years	Active	Lecturer,Mechanical Engineering, Harare Polytechnic Inst.	Qualified welder; 30 years work experience including 8 years Swaziland and Botswana; U.S. Peace Corps.
Ross Duncan	003	09/02/85	09/01/87	2 Years	Active	Curriculum Developer Computer Science	Ed.D. Adult Education, George Washington University, Sr. Training Analyst, Analytical Systems Eng. Corp., 25 years experience, curriculum development and training.
Labib Eldoky	009	09/17/85	12/17/89	3 Years	Active	Lecturer, Mechanical Engineering, Bachelor of Applied Technology, Harare Polytechnic Inst.	Ph.D., Mechanical Engineering, Univ. of Kansas, 14 years teaching experience, 5 years industrial experience in U.S. and Egypt.
Myrna Estep	018	08/31/87	03/31/89	2 Years	Active	Lecturer,Education U. of Zimbabwe	Ph.D., Indiana University; 12 years experience in higher education and US government in Philosophy, Education, Cultural foundations, systems analysis.

NAME	D.O.#	START DATE	END DATE	DURATION	STATUS	SERVICES	QUALIFICATIONS
H. Hugh Gibson	014	02/03/86	02/02/88	2 Years	Active	Lecturer,Computer Science, Bachelor of Applied Technology, Harare Polytechnic Institute	M.B.A., in Counseling, University of Puget Sound; B.S. Mechanical Engineering, University of Washington, 11 yrs. engineering experience, 3 years counseling experience; U.S. Peace Corps, Nepal.
Esi Honono	012	09/01/85	08/31/86	1 Year	Active	Librarian, GOZ, MO Labour	M.L.S., Library and Information Systems University of Philadelphia (recruited locally).
Nasr Hosny	009	07/21/86	12/21/89	3 Years	Active	Lecturer,mechanical engineering, Harare Technical College	Ph.D., Mechanical Engineering, Univ. of British Columbia; Researcher Engineer, Hydro-Quebec Research Institute, R&D Engineer PATAMAX Electronics, 18 years experience.
Stephen Howell	008	06/02/86	06/01/88	2 Years	Active	Lecturer,mechanic-engineering, Univ. of Zimbabwe	Ph.D., Chemical Engineering, University of British Columbia; M.Sc. Mechanical Engineering, Southern Methodist, 3 yrs. Assistant Professor, University of the Pacific.
Robert Illinik	003	06/10/85	06/09/87	2 Years	Active	Lecturer,mechanical engineering, Bulawayo Technical College	Ed.D., Vocational Education, UCLA; 45 years work experience, Mcahinist, mechanical engineer, technical advisor teacher trainer, instructor Vocational Education.
Lynn Ilon	018	09/30/87	03/31/89	2 Years	Active	Lecturer,Educational Foundations, U. of Zimbabwe	Ph.D., International/Intercultural Development Education, Florida State University; experience in statistics and research design, economics and educational evaluation.
David Katzenstein	008	02/24/86	02/23/87	1 Year	Active	Lecturer, Medicine and Microbiology, U. of Zimbabwe	M.D. University of California at San Diego, Assistant Professor of Medicine Division of Infectious Diseases, U. of Minnesota.
W. Joseph King	008	06/02/86	06/01/88	2 Years	Active	Lecturer Dept. of Electricl Engineering, U.of Zimbabwe	M.S., Electrical Engineering, U. of California, Asst. Professor U. of Pacific and Bakersfield College, Lawrence Livermore Labs.

NAME	D.O.#	START DATE	END DATE	DURATION	STATUS	SERVICES	QUALIFICATIONS
Victor Levine	018	02/16/87	01/23/88	3 Years	Active	Lecturer in Education Administration, Harare Polytechnic Institute.	Ph.D. Economics; 5 years teaching experience in educational administration; visiting lecturer and technical advisor of IEES Project at University of Zimbabwe in 1985-86.
Johnnie Mapp	009	01/24/86	01/23/88	2 Years	Active	Lecturer, Business Studies, Bachelor of Applied Technology, Harare Polytechnic Institute	Ph.D. Accounting, University of Georgia (Athens); M.B.A. Business Administration, Jackson State University; Assoc. Professor, Norfolk State University.
Gerald Mattison	003	02/04/86	12/03/89	2 Years	Active	Lecturer, Electrical Engineering, Harare Polytechnic Institute	Licensed Master Engineer, 30 years experience in electrical engineering, maintenance, construction, installation and quality control.
Omar Mazzoni	014	06/12/86	06/01/88	2 Years	Active	Lecturer, electrical Harare Polytechnic Institute	M.Sc. Electrical Engineering, Polytechnic Institute of Brooklyn, Project Manager Nus Corps, Supervising Engineer for Gibbs and Hall, Inc.
Ronald Michaels	003	05/05/85	12/04/89	3 Years	Active	Lecturer, Civil Engineering, Harare Polytechnic Inst.	B.S. Engineering Physics, University of Tennessee. 20 years engineering experience including work in Ghana and Saudi Arabia.
Osama Mostafa	014	03/03/86	03/02/88	2 Years	Active	Lecturer, Electrical Engineering, Bachelor of Applied Technology, Harare Polytechnic Inst.	Ph.D., Electrical Engineering, Purdue University; 12 years experience in electrical energy systems, planning and analysis, robotics, computer applications, and mathematical modelling; 8 years experience.
Donald Neff	003	06/24/85	06/23/87	2 Years	Active	Curriculum Develment Officer; M. of Labour	Ph.D., Vocational Technical Education, Ohio State University; President, Washington Technical College.
Richard Omoruyi	003	06/24/85	12/24/89	3 Years	Active	Lecturer, Computer Sciences, Harare Polytechnic Inst.	M.B.A., Management Information Systems, So. Illinois U., Communications Data Analyst, Westec Services; Instructor State Tech. Institute of Memphis.

NAME	D.O.#	START DATE	END DATE	DURATION	STATUS	SERVICES	QUALIFICATIONS
Bart Parker-Ross	009	04/01/86	03/31/88	2 Years	Active	Lecturer, Data Processing, Harare Polytechnic Institute	B.A. San Francisco State University, experience designing and developing educational software. Programmer/ Analyst/Lecturer.
Macauley Peters	018	08/21/89	12/31/89	2 Years	Active	Lecturer, Education University of Zimbabwe	M.Ed. Adult Education and Community Development and Educational Planning, University of Manchester, Lecturer in Botswana, Zambia.
Daniel Powers	003	03/10/86	12/08/89	2 Years	Active	Lecturer, Mechanical Engineering, Harare Polytechnic Institute	Journeyman Tool and Die Maker; 12 years experience tooling and machine tool applications, quality control and training.
Raziq Qazi	014	03/11/86	12/20/89	2 Years	Active	Lecturer, Engineering, Bachelor of Applied Technology Harare Polytechnic Institute	Ph.D., Soil and Water Engineering, Michigan State University; 23 years experience in hydrology, water research and computer applications includes 9 years teaching and curriculum development experience.
Jerald Reece	018	06/03/88	12/31/89	1 Year	Active	Lecturer, Curriculum Studies, U. of Zimbabwe	D.Ed., Secondary Education, University of Nebraska, Lincoln; M.S.E. Drake University; 19 years Professor of Curriculum and Instruction. New Mexico State Director North Central Assoc. of Colleges and Schools.
Ronald Roman	008	02/03/88	03/31/89	1 Year	Active	Lecturer, Dept.of Metallurgical Engineering and Technology	Ph.D., Colorado School of Mines, Vice President Operations L-Bar Products, Adjunct Associate Professor New Mexico Institute of Mining.
Chris Rutkowski	015	02/10/86	12/08/89	2 Years	Active	Lecturer, Electrical Engineering, Harare Polytechnic Institute	B.S. Physics, B.S. Electrical Engineering, Aachen, West Germany; 8 years experience in electrical engineering, computer programming and training; experience in Botswana and Mozambique.
Linda Salas	015	02/11/86	2/10/88	2 Years	Active	Lecturer,Architecture, Harare Polytech.	B.S. Architecture, Calif. Polytech. State U, 5 years experience in design, drafting, model building,site inspection.

NAME	D.O.#	START DATE	END DATE	DURATION	STATUS	SERVICES	QUALIFICATIONS
Milford Lee Scott	003	11/14/85	11/13/87	2 Years	Active	Senior Manpower Training Officer Ministry of Labour	Certificate in Engineering and Teacher Training; 28 years experience in vocational, industrial and technical training, apprenticeship systems.
William Sheehan	009	05/30/86	05/29/88	2 Years	Active	Lecturer, Harare Polytechnic Inst.	M.Sc. Engineering, Clarkston College of Technology, licensed Engineer; 20 years Professor of Electrical Engineering, Alfred State College.
Marlin Sheridan	014	02/21/86	02/20/88	2 Years	Active	Lecturer, Civil Engineering, Bachelor of Applied Technology, Harare Polytechnic Inst.	Ph.D., Civil Engineering, University of Michigan, 40 years experience in all areas of civil engineering, including experience in Greece, Iran, Turkey, Ecuador and Argentina.
Arthur Sutton	009	01/05/86	01/04/88	2 Years	Active	Lecturer, Electrical Engineering, Bachelor of Applied Technology, Harare Polytechnic Inst.	M.S., Electrical Engineering, Rose Hulman Institute of Technology, Professor of Electrical and Computer Engineering, California State Polytechnic University.
Edward Usenik	008	05/17/88	12/13/89	1 Year	Active	Lecturer, Veterinary Science, University of Zimbabwe	Ph.D., Veterinary Medicine, University of Minnesota; Professor College of Veterinary Medicine, Louisiana State University, University of Minnesota, Professor Faculty of Veterinary Medicine, University of Nairobi,Kenya.
Gordon Vandervort	014	06/02/86	12/21/89	3 Years	Active	Lecturer, Engineering Sciences, Harare Polytechnic Inst.	Ph.D., Astrophysics and Physics, over 30 years experience as visiting Professor in developing countries and U.S.in Physics, Math and Aerodynamics.
Henry Williams	014	02/16/87	02/15/89	2 Years	Active	Lecturer, Computer Studies, Bulawayo Technical College	Ph.D. in Mathematics, 8 years experience in the fields of computer systems analysis, deisgn and implementation.

NAME	D.O.#	START DATE	END DATE	DURATION	STATUS	SERVICES	QUALIFICATIONS
Jack Wilson	009	12/12/85	12/11/87	2 Years	Active	Lecturer, Business Studies, Bachelor of Applied Technology, Harare Polytechnic Institute	Ph.D., Business Administration, California Western University, Professor, Florida Junior Colelge.
Charles Wright	009	03/10/86	12/08/89	2 Years	Active	Lecturer, Architectural Engineering, Bachelor of Applied Technology, Harare Polytechnic Inst.	B.S. Architectural Engineering, California Polytechnic University, 20 years experience in planning and architectural engineering including 3 years in Micronesia.
Peter Young	008	04/24/86	04/23/88	2 Years	Active	Lecturer, Dept. of Surgery, University of Zimbabwe	M.D., University of Toronto; over 20 years Ophthalmology practice, 3 years Lecturer University of Toronto.

APPENDIX C

SHORT-TERM PERSONNEL

NAME	D.O.#	START DATE	END DATE	DURATION	STATUS	SERVICES	QUALIFICATIONS
Nasser Abdelilah	010	01/14/86	01/17/86	3 days	Complete	Assisted with recruitment for Ministry of Education's Regional Computerization Effort	Senior Systems Analyst, Chief-of-Party for the SAUDOS Project.
Ernest Bay	001	05/20/84	06/02/84	16 days	Complete	Optical Scanner Training, Ministry of Education	Field Service Area Supervisor, National Computer Systems, Inc. Performed earlier optical scanner training for AED, 1983.
	004	02/14/86	04/02/85	7 days	Complete	To provide refresher computer training course to Treasury Computer Bureau Staff.	
Eric Eno	001	07/16/84	03/30/85	153 days	Complete	Grade 7 examination administration support; Ministry of Education	Founder, Director: The Little Computer Could Co. Consulted for Pragma Corp. in project design and education planning. Information system analysis and development planning analysis for AED 1980-82.
	001	04/01/85	03/31/86	66 days	Active	Grade 7, ZJC Software development and implementation/training, Ministry of Education.	
Hugh Gloster	006	03/27/85	04/02/85	4 days	Active	Speaker, Belvedere College Opening Ceremonies, Ministry of Education	President, Morehouse College, Atlanta, Georgia.
Vijay Kumar	013	01/03/86	01/10/86	6 days	Complete	Technical Expert, to assist MO Labour w/ developing scholarship tracking system	D.Ed., Education, University of Massachusetts. Amhearst

NAME	D.O.#	START DATE	END DATE	DURATION	STATUS	SERVICES	QUALIFICATIONS
Hrand Kurkjian	010	10/17/85	12/17/85	32 days	Complete	Automation specialist, regional computerization effort, Ministry of Education	MEA, Engineering Administration, 35 years experience in management, computer services, public administration, systems design and development.
Myron Lewis	009	07/08/85	07/16/85	6 days	Complete	Member of Interview Panel, Recruitment Effort, Ministry of Labor	D.Ed., Administration and Vocational Education, State University of New York, Professor Buffalo State College.
	005	08/12/85	08/25/85	14 days	Complete	Consultant/Advisor for the Bachelor of Technology equipment and staffing	
	014	11/25/85	11/27/85	3 days	Complete	Member of Interview Panel, Recruitment Effort, Ministry of Labour	
Roy Malloy	011	04/07/86	04/28/86	22 days	Complete	To assist the Zimbabwean M/LmPSW in planning and implementing micro-computer applications to support program administ. and development in vocational and tech. training.	President and owner of MEGAS Corp. (Medical, Educational, and Government-applied Systems) which provides management consulting services, specialized computer hardware, and software consulting to educational and governmental environments.
Patrick Millar	004	05/10/87	06/05/87	6-½ days	Complete	Technical support to make necessary modifications to the M. of Education examinations system for Grade 7 and Jr. Cert.	Founder, C.F. Tully Associates, specialization in applications software.
	004	01/88	03/88	5 days	Complete	Review of work to be done on the examination results processing/reporting system	Technical Director, C.F. Tully, Systems Engineer, ICL Zimbabwe.

NAME	D.O.#	START DATE	END DATE	DURATION	STATUS	SERVICES	QUALIFICATIONS
Kurt Moses	001	11/20/84	12/01/84	15 days	Complete	Coordination and evaluation; Ministry of Education	Director, Systems Services Division, Academy for Educational Development.
	010	07/15/85	07/15/88	260 days	Complete	Coordinator of Regional Computerization Effort, MO Education	Director, Systems Services Division, AED.
	013	02/03/86	02/06/86	3 days	Complete	Assisted MO Labour with completing Scholarship Tracking System	Director, Systems Services Division, AED.
	010	04/23/87	05/09/87	16 days	Complete	To check progress on Delivery Orders; initiate new phases in D.O. 10	Director, Systems Services Division, AED.
Irigo Mzava	007	05/02/85	05/04/85	3 days	Complete	Panel Member, Panel Discussion "Education for Self-Reliance" conference on "Role of Education in Social Transformation", MO Education	Director of Teacher Education, Ministry of Education, Government of Tanzania.
David Oscarson	014	11/15/85	11/22/85	7 days	Complete	Member of Interview Panel, Recruitment Effort, MO Labour	D. Ed., Technical Education and Business Administration, Virginia Polytechnic Institute, Associate Professor Department of Industrial Technology, University of Houston.
William Redfield	005	08/22/85	08/31/85	10 days	Complete	Presentor "The Competency-Based Vocational Education Alternative" Ministry of Labour	D. Ed., Education, University of Virginia, Professor, Department of Educational Leadership, Florida State University.

NAME	D.O.I	START DATE	END DATE	DURATION	STATUS	SERVICES	QUALIFICATIONS
William Reynolds	005	06/30/85	07/20/85	15 days	Active	Developing Planning Strategies for Vocational Technical Education for Government of Zimbabwe; MO Labour	Director, Vocational Technical Training Academy for Educational Development.
Louis Simmons	010	03/03/86	03/27/86	21 days	Complete	Technical Assistance Consultant for MO Labour with developing a Scholarship Tracking System	M.S., Computer Science, American Technological University. Self-employed consultant, micro-computer hardware and software sales.

NAME	D.O.#	START DATE	END DATE	DURATION	STATUS	SERVICES	QUALIFICATIONS
Other Short-Term Personnel Include:							
Bruce Geisert	17	01/03/86	01/15/87	23 days	Complete	Review RFP response documents for computer procurement, assist with analysis and negotiations	President Software Innovations; Program Technician U.S. Peace Corps; Systems Analyst B.O., Inc.
	18	07/02/87	07/31/87	12 days	"	Review bids, conduct client responses, rank bids, participate in final negotiations	
	18	03/14/89	03/27/89	2 days	"	Assess HRRC implementations, develop recommendations for expansion, outline maintenance and expansion consideration.	
	21	12/01/87	01/15/89	21 days	"	Design of Scholarship Tracking System	
	21	04/01/88	08/30/88	100 days	"	Development of software, training of software mgr.	
	21	11/01/88	11/31/88	14 days	"	Installation of software, initial training	
	21	03/01/89	04/01/89	21 days	"	Final training on software	
	21	10/13/89	12/15/89	30 days	"	Post implementations review specifications for additional equipment, procurement of equipment, final report	
Daniel Householder	18	03/20/87	03/21/87	2 days	"	Interviewing assistance vocational candidates	Professor of Vocational Education, Texas A & M
Gail Jaji	18	03/20/87	03/27/87	2 days	"	Interviewing assistance vocational candidates	Professor of Curriculum, University of Zimbabwe
Edna McBreen	18	03/20/87	03/26/87	3 days	"	Interviewing assistance vocational candidates	Independent Consultant, Ph.D. Vocational Education, Technical Assistant AID for Vocational Education in Africa
Alastair Watermeyer	10	05/86	07/89	100 days	"	Consulting advisor on implementation of D.O.10 activities w/computeriz.	President, Alastair Watermeyer, Inc.,Pres.Computer Society of Zimbabwe.