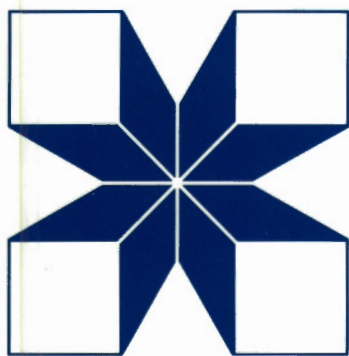


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C A N A D A

UNE STRATÉGIE DU DÉVELOPPEMENT DES RESSOURCES HUMAINES

COMMUNICATIONS DÉCOULANT
DU SÉMINAIRE-ATELIER TENU
À YAOUNDÉ, CAMEROUN,
DU 2 AU 5 FÉVRIER 1988

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Le Centre de recherches pour le développement international, société publique créée en 1970 par une loi du Parlement canadien, a pour mission d'appuyer des recherches visant à adapter la science et la technologie aux besoins des pays en développement; il concentre son activité dans six secteurs : agriculture, alimentation et nutrition; information; santé; sciences sociales; sciences de la terre et du génie et communications. Le CRDI est financé entièrement par le Parlement canadien, mais c'est un Conseil des gouverneurs international qui en détermine l'orientation et les politiques. Établi à Ottawa (Canada), il a des bureaux régionaux en Afrique, en Asie, en Amérique latine et au Moyen-Orient.

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This series includes meeting documents, internal reports, and preliminary technical documents that may later form the basis of a formal publication. A Manuscript Report is given a small distribution to a highly specialized audience.

La présente série est réservée aux documents issus de colloques, aux rapports internes et aux documents techniques susceptibles d'être publiés plus tard dans une série de publications plus soignées. D'un tirage restreint, le rapport manuscrit est destiné à un public très spécialisé.

Esta serie incluye ponencias de reuniones, informes internos y documentos técnicos que pueden posteriormente conformar la base de una publicación formal. El informe recibe distribución limitada entre una audiencia altamente especializada.

Une stratégie du développement des ressources humaines

Communications découlant du séminaire-atelier
tenu à Yaoundé, Cameroun, du 2 au 5 février 1988

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Project Title

Researching Training Needs for Human Resource Development in West Africa

(Research Project Into Potential for
Development of Resources in Research &
Development in West Africa)

Submitted by: Robert Gatto

Dated: February 25, 1988.

Problem Identified

Human Resources Development within the context of Research and Development activities in West Africa has not made much progress if compared to what is achieved in other parts of the world. UNESCO statistics state that only 0.4% of the Research and Development (R&D) scientists and technicians of the world are in Africa against 0.9% for Oceania and Arab States ; 22.3% in North America ; 18.5% in Asia ; 22.3% in Europe and 36.6% in the USSR.

In addition, the project research showed that the finances for the budgeting operations of the countries identified shows that a large portion of each country's total budget is derived from foreign aid donated by Western nations. The following is an example of foreign aid received to operate finances within selected countries of West Africa.

<u>Country</u>	<u>%</u>	<u>of National Budget</u> <u>from Outside</u>	<u>Received</u>
Burkina Faso		58.8%	
Congo		66.6%	
Ivory Coast		28.3%	
Mali		33.3%	

Design & Approach Used

An **action research model** was used to study this issue and establish a structure to proceed with concrete suggestions for action APPENDIX ONE. Data was gathered from a group of more than 30 specialists representing the countries of West Africa. This group was assembled in conference sponsored by the **Government of Canada**, International Development research Centre and facilitated by the **University of Yaounde, Cameroon, West Africa**.

Several of these international experts in human resource development were requested to present papers for discussion at the conference that reflected their countries' positions on the need for human resource development in Research & Development and some of the barriers to introducing a plan for this development. This writer presented two position papers on the subject at that seminar:

1. Ghana: A case study of Training Needs Assessment.
2. Profiling Training Needs: Occupational Analysis.

The conference was held from February 2nd, to 5th, 1988.

Represented were several countries from within Africa and included Canada, the United States and Japan.

The conference participants presented more than one dozen position papers on the subject outlining a number of approaches to deal with the issues. Other resource participants were present to provide expert inputs reflecting their respective agencies, including:

- a) USAID
- b) International Development Research Centre
- c) Organization for Economic Cooperation and Development
- d) Foundation for International Training

Subsequent to the initial data gathered, follow-up research into each position was conducted by the author. A position paper was developed to focus on the experts' assessment applied to the Training Needs Assessment model.

Research included a study of available literature and application of data gathered was made to prepare the position paper titled Training Needs Assessment Report...APPENDIX TWO.

Organizational and Interpersonal Approach Used

Data gathered at the seminar in Africa was compared to literature on the subject. Direct contact with these experts from around the world enhanced the data gathering. Visits to research and development institutes in the Cameroon provided local characteristics and cultural factors for consideration.

The author's personal documentation from previous studies in Africa were applied towards this new research in order to increase the validity of analysis of the situation and construct potential solutions.

Expected Impact of Research on Future programs

It is projected that the outcome of the research will be of assistance to the standing committee established from the Conference as a basis for a major thrust into human research development in West Africa sponsored by the Government of Canada (International Development Research Centre). The emphasis of this thrust will be in the training of professional and technical expertise with particular emphasis on Research and Development.

Decisions made from this research may be of assistance to this sponsoring agency's future direction in West Africa. To facilitate human resource development this agency established two offices in East and West Africa to coordinate these initiatives. It is projected that specific training and development programs will originate from this seminar. Canada could take the lead in offering on-site training for R-D specialists.

References

- **"Improving the Efficiency of Educational Systems"**, USAID (project Summary).
- **"A Formacao de Recursos Humanos par Pesquisa no Brasil"**, Salvador, Brasil.
- **"A Holistic Framework for Training in R-D Management"**, Foundation for International Training, Ontario Canada.
- **"Développement des ressources humaines"** C.U.S.S. Yaounde, Cameroon.
- **"University/Industrial Relations in Japan : Implications for Human Resource Development"**, Centre for Educational Research and Innovation, Organization for Economic Cooperation and Development (OECD).
- **"Elements of Individual and Collective Strategies for Training Research and Development Personnel"**, Ecole Nationale Supérieure Polytechnique, University of Yaounde, Cameroon.
- **"Estimating Future Occupational Needs in Sierra Leone : A policy approach"**, Educational Program for the National Development, Sierra Leone.

APPENDIX ONE

JOB ANALYSIS
PROCEDURES
FOR
TRAINING NEEDS ANALYSIS

INTRODUCTION

Purpose of Needs Analysis Project

The needs analysis project is described as a two phased approach to development.

The end products of the whole project are :

1. A detailed analysis of training needs for a specific job ;
2. Comprehensive data on tasks performed in a specific job ;
3. Skills & knowledge required to perform tasks ;
4. Defined Objectives to design training to meet job needs.

Phase one is described by a sequence of events to be undertaken to achieve initial activities in the needs analysis project. These activities include :

- a. Conducting interviews with subject matter experts (SME) from the designated job ;
- b. Documenting the information in a structured format;
- c. Validating the information with those management responsible for the job ;
- d. Providing course designer with a Needs Assessment report describing training objectives and support documentation.

Phase two in the needs analysis project describes a strategy for applying methods and procedures required to implement activities in phase one.

The strategy describes the following :

- Needs Assessment Report Summary ;
- Job Analysis Report ;
- Origin of Job Functions ;
- Origin of Tasks ;
- Origin of Skills & Knowledge ;
- Origin of Training Objectives ;
- Course Participant Profile.

Job Analysis Report

Key Area (Job Title)
Job Functions
Job Tasks
Job Elements
Skills & Knowledge Training Objectives

JOB ANALYSIS REPORT

Describe the Job Analysis By :

- * One Key Area
- * Broad Job Functions
- * Specific Related Tasks

Describe Job Functions By :

- * Major Job Groupings
- * Related Task Clusters
- * One End Result

Describe Job Tasks From :

- * Internal/External Procedures
- * Skill/Knowledge Application
- * Machine/Technology Application
- * Decision-making Application
- * Problem Analysis/Solving Events
- * Oral/Written Job Communications

ORIGIN OF JOB FUNCTIONS

☐ Groups of Tasks Performed
in One Major **KEY AREA**

☐ Groups of Tasks that Describe
a Specific Start/Sequence of Events
and One **END RESULT**

☐ Groups of Tasks that Produce
One **PERFORMANCE RESULT**

☐ Groups of Tasks that Achieve One
Measurable **PERFORMANCE STANDARD**

☐ Groups of Tasks Undertaken within
Common **PERFORMANCE CONDITIONS**

SKILLS & KNOWLEDGE SUMMARY

Elements of each Task describes
Skills & Knowledge

Origin of Tasks ELEMENTS

Described as :

Activities in support of Each tasks

Ways to accomplish Each task

Components of a Complex task

Elements Clustered to achieve Each task Establish Prerequisite Knowledge required Elements applied describe Skill needs

Results of Skill & Knowledge summary

Establish Origin of Training Objectives

ORIGIN OF TRAINING OBJECTIVES

Described for Each Performance Objective

Described by ranking Tasks in order of :



Importance to the Performance Outcome



Frequency of Application



Consensus by Subject Matter Experts
through a Weighted Value Matrix

Summarised through Skills & Knowledge
from tasks of high importance
and frequency

Described As : One Measurable Result
Required Training Conditions

Course Participant Profile **Summary**

Personal Characteristics

- Targeted Occupational Group & Level
- Projected Professional Career Needs
- Projected Preferred Learning Styles

Minimum Entry Level Course Requirements

- Basic Entry Level Experience
- Required Entry Level Skills & Knowledge
- Minimum Entry Level Education

Rationale :

To enable the course designers to develop content appropriate to candidates' needs

Needs Assessment Report Summary

☐ Job Analysis Report
Key Area
Job Functions
Related Tasks

☐ Skills & Knowledge Requirement
Task Elements
Application Skills
Prerequisite Knowledge

☐ Training Objectives
Task Ranking
Performance Outcome
Priority Sequenced

Includes : Target Population Description

APPENDIX TWO

TRAINING NEEDS ASSESSMENT

INTRODUCTION

Based on the model described in APPENDIX ONE, this report provides the detailed analysis of data received at the "Yaounde" conference in February 1988 and further research in professional references on human resource development for third world countries.

The training needs assessment is described in seven stages of detail as follows:

1. **Target Population Profile** describing the intended participants of the training.
2. The **Key Area** that describes the job in global terms.
3. **Job Functions** that segment the global job into major functions.
4. **Detailed Tasks** that specify application of the major functions.
5. **Elements of Tasks** that provide classification of tasks.
6. Skill & knowledge required to perform detailed tasks.
7. **Training Objectives** identifying conditions, standards and results of **Job Functions**.

The seven stages of description summarizes the **training needs assessment** based on the Yaounde conference and support literature. Reference papers at this conference were analysed and data extracted that focused on the development of human resources to train in the various disciplines required for advancement of research & development in the developing countries of West and North Africa.

An **application training approach** to training needs for human resource development of research & development was taken because of the vast field of knowledge required in both **Fundamental Research** and **Applied Research**. The "National Register" provides a current occupational listing of research of over nine hundred areas of scientific specialization. Twenty years ago there were only fifty four different specialties. In addition, developed countries with extensive experience in R-D project from 70% to 85% of the research is carried out by the industrial sector into their individual specializations.

TARGET POPULATION PROFILE

The designated candidate for training has post secondary education and is mandated to train operational resources to carry out the fundamental and applied research directed by their associated organization. The candidate undertakes to train specialists in task application in order to apply the basics of research and development.

The candidate identified for training will in turn train resources in the following four broad technological areas:

1. Research national social & technological programs.
2. Coordinate research and development application to user level.
3. Contribute to scientific & technical research related to specific industries.
4. Resolve specific local problems to conclusion.

The candidate in this Training Needs Assessment will perform the training function to develop human resources in the above areas.

This target population has a broad base to draw from considering the numbers of students enrolled in post secondary institutions exemplified by the following that is representative of many West African countries :

Ivory Coast.....	16,000 Students,
Nigeria.....	100,000 Students,
Cameroon.....	5,000 Students.

KEY AREA

The area describing the job is **“Training Development of Occupational Specialization”**. This area focuses on the development of Occupational Trainers distinct from Pedagogical Trainers undertaken by educational faculties within universities. The area differs considerably in application tasks and the required skills & knowledge to carry out occupational training.

Occupational specialization focuses on the development of in-house training of technologists as well as formal institutional training of specific application skills & knowledge. The product output of this area is reflected in job skills with immediate transferability to the work environment.

JOB FUNCTIONS

Job Functions within the key area of training development focuses on five (5) segments of the global description:

1. Occupational Analysis,
2. Course Content Design,
3. Course implementation, and
4. Course assessment.
5. Training Program Management

JOB TASKS

Tasks to be performed by the designated candidate will include the following specific to the four functional areas described:

Occupational Analysis

- How to Analyse Employees' Performance.
- How to Identify Appropriate Performance Training.
- How to Describe Tasks for Training.
- How to Describe Objectives for Training.

Course Content Design

- How to Structure On-Job Training.
- How to Structure Formal class Training.
- How to Design Individualized Training Plans.
- How to Select Appropriate Training Methodology.
- How to Develop Technological Lesson Content.

Course Implementation

- How to Plan & Organize On-Job Instruction.
- How to Plan & Organize Formal Class Training.
- How to Prepare for Training Delivery.
- How to Deal With Individual Feedback.
- How to Conduct Group Interaction Sessions.
- How to Design, Develop Training Support Aids.

Course Assessment

- How to Conduct On-Job Performance Observation.
- How to Analyse Performance Results.
- How to Identify Appropriate Solution to Performance Problems.
- How to Measure Pre and Post Training Results.

Training Program Management

- How to Organize Training a Schedule,
- How to Establish Resource Requirements.
- How to Assess Training Expertise.
- How to Evaluate Training Program Results.

It is projected that training content will focus on six major technological areas:

- 1.Food Sciences,
- 2.Fishery Technology,
- 3.Computer Sciences,
- 4.Forestry Engineering,
- 5.Population Sciences, and
- 6.Animal Husbandry.

JOB ELEMENT

The elements of the job to be performed by these trainers is an extract of detail that cummulatively allows the participant to perform tasks. Each task described above has several elements:

How to Analyse Employees' Performance:

- Describe the Job requirements,
- Identify the level of employee performance,
- Establish weakness to be overcome,

How to Identify Appropriate Performance Training:

- Describe the Gap between Job requirements and performance expectations,
- Document end result of training,
- Establish observable performance.

How to Describe Tasks for Training:

- Sequence each task in the job,
- Establish critical tasks to be performed,
- Organize tasks clustered within each Function.

How to Describe Objectives for Training.

- Document Observable Outputs,
- Describe Standards of Performance Outputs,
- Identify conditions to achieve performance.

How to Structure On-Job Training.

- Plan the sequence of Applied Learning,
- Create Situational Job Events,
- Provide a strategy to replicate Job Events.

How to Structure Formal class Training.

- Document a Comprehensive Lesson Plan,
- Develop support teaching aids,
- Prepare a Course Training Manual.

How to Design Individualized Training Plans.

- Identify specific areas of weakness,
- Select appropriate content from Comprehensive Lesson Plan,
- Time Line individuals expected progress.

How to Select Appropriate Training Methodology.

- Create/reproduce tools appropriate to the Job,
- Simulate Conditions of Job Performance,
- Apply job techniques to achieve end results.

How to Develop Technological Lesson Content.

- Interview specific Subject Matter Expertise (SME),
- Observe On-Job performance by SME,
- Review Trade/Job documentation.

How to Plan & Organize On-Job Instruction.

- Recreate job environment,
- Plan outcomes in sequence based Interviews, Observation,
- Organize performance events.

How to Plan & Organize Formal Class Training.

- Establish simulated environment,
- Model performance events,
- Select candidates with common set of Outputs.

How to Prepare for Training Delivery.

- Review the detailed Lesson Plan,
- Establish Conditional Time Lines,
- Pilot test delivery of Lesson Plan.

How to Conduct On-Job Performance Observation.

- Establish Job Results, expectations,
- Document Pre and Post Training,
- Record performance variances.

How to Analyse Performance Results.

- Establish performance Gap,
- Determine cause of Gap ie.
 - * Inadequate training
 - * Environmental constraints
 - * Lack of entry level skills.

How to Organize Training Schedule.

- Build a Timed Sequence of Conditional learning,
- Pilot test each learning event,
- Establish Participant entry level.

SKILLS AND KNOWLEDGE REQUIRED

The training strategy requires that there be a detailed documentation of skills & knowledge required to perform the technological functions of each specialization. To achieve this documentation the trainer must refer back to the **occupational tasks and elements to each task**. This activity is separated into :

Skills

A description of applied observable abilities that contribute to performance of tasks and derive from the action to be taken by each element of the task. It must be noted that applied technological teaching, the trainer teaches to the tasks and their respective elements and NOT to skill. Skills are acquired while performing the tasks within the training.

Knowledge

This refers to the **entry level understanding** that each trainee must have to perform the tasks. It must be noted that in applied technological teaching the trainer does NOT teach knowledge. It is expected that the student has already acquired this before entering into the training. If this is lacking, training must be more theoretical and less applied.

Training Objectives

Training Objectives describe the conditions, standards and results of **Job Functions**. Each job function must be described by one (1) Training Performance Objective (ie. a lesson plan that identifies five functions of the job technology is described by five Training Performance Objectives). The Performance description must be of sufficient detail to be **observable when achieved by the learner**.

CONCLUSIONS

Each area of the training plan provides the candidate with a comprehensive **road map** to develop technological training in specific subject content required to conduct the research and development directed by organizational mandate.

The training methodology chosen represents a professional strategy for human resource development to ensure application of Research and Development in West Africa.