World Maritime University

The Maritime Commons: Digital Repository of the World Maritime University

World Maritime University Dissertations | Dissertations

1990

Education methods and marine and maritime careers

Antunio de Cassia Sousa Barbosa
WMU

Follow this and additional works at: https://commons.wmu.se/all_dissertations

Recommended Citation

Sousa Barbosa, Antunio de Cassia, "Education methods and marine and maritime careers" (1990). *World Maritime University Dissertations*. 1018.
https://commons.wmu.se/all_dissertations/1018

This Dissertation is brought to you courtesy of Maritime Commons. Open Access items may be downloaded for non-commercial, fair use academic purposes. No items may be hosted on another server or web site without express written permission from the World Maritime University. For more information, please contact library@wmu.se.

WMU LIBRARY

WORLD MARITIME UNIVERSITY

EDUCATION METHODS AND MARINE AND MARITIME CAREERS

by

ANTÚNIO DE CÁSSIA SOUSA BARBOSA

Republic of Cape Verde

A paper submitted to the faculty of the World Maritime University in partial satisfaction of the requirements for the award of a

MASTER OF SCIENCE DEGREE

in

MARITIME EDUCATION AND TRAINING

(MARINE ENGINEERING)

The contents of this paper reflect my personal views and are not necessarily endorsed by the university.

Signature: António Sousa Barbosa

Date: Oct 7th 1990

Supervised and assessed by:

CHARLES E. MATHIEU

Professor

Maritime Education and Training

World Maritime University

Co-assessed by:

JUAN ANTONIO LOPEZ CORTES

Navigation Lecturer

Centro de Formação Naútica (1987/1988)

TABLE OF CONTENT

Page

ABSTRACT ---------- v

MAP OF CAPE VERDE ---------- vi

POEMA DO MAR (POEM OF THE SEA) ---------- vii

BACKGROUND ---------- viii

Brief Outline of Republic of Cape Verde --- viii
Infrastructure in Maritime Industry ------- ix
An overview of CFN ---------- xi

CHAPTER I: INTRODUCTION ---------- 1

CHAPTER II: CURRICULUM DESIGNING ---------- 5

2.1 Introduction ---------- 5
2.2 The Concept of Design ---------- 5
2.3 Specifying the Learning Outcome ------ 7
2.4 Evaluation in Teaching ---------- 11
2.5 Grading and Development of Tests ----- 14

CHAPTER III: TEACHING METHODS ---------- 20

3.1 Introduction ---------- 20
3.2 Lecture and Discussion ---------- 20
3.3 Role-Play ---------- 24
3.3.1 Types of Role-play ---------- 27
3.4 Laboratory Teaching ---------- 28

CHAPTER IV: TEACHING AND TRAINING AIDS ---------- 33

4.1 Introduction ---------- 33
4.2 Static Media: Audiovisual ---------- 34
4.3 Dynamic Media: Film and video -------- 37
4.4 Interactive Media: Computers --------- 40
4.5 Selection and Use of Media ---------- 42

CHAPTER V THINKING IN TEACHING ---------- 45

5.1 Introduction ---------- 45
5.2 Teaching Critical Thinking ---------- 45
5.3 An Approach to Teaching Thinking ----- 48
5.3.1 Thinking in Action ---------- 49
5.4 Teacher's Role in the Education Process 50

CHAPTER VI COMPUTER IN EDUCATION ---------- 52

6.1 Introduction ---------- 52
6.2 Computer Literacy ---------- 52
6.3 Planning for Use of Computer --------- 54
6.4 The Computer as Tool in School ------- 56

CHAPTER VII MARINE AND MARITIME CAREERS ---------- 58

7.1 Introduction ---------- 58
7.2 Maritime Administration ---------- 58
7.3 Maritime Transportation ---------- 60
7.3.1 Oceangoing Opportunities ------- 60
7.3.2 Portside Opportunities --------- 62
7.4 Ship Repair ---------- 64
7.5 Fishing ---------- 65
7.5.1 Education ---------- 66
7.5.2 Administration and Management -- 66
7.5.3 Seagoing Fishing Career -------- 67
7.6 Oceanography and Marine Sciences ---- 68
7.7 Miscellaneous Marine & Maritime Careers 69
7.7.1 Pilot ---------- 69
7.7.2 Admiralty Law ---------- 70
7.7.3 Marine Archaeology ---------- 71
7.7.4 Commercial Diving ---------- 71
7.7.5 Marina Facilities ---------- 72

CHAPTER VIII CONCLUSIONS AND RECOMMENDATIONS ------ 74

8.1 Conclusions ---------- 74
8.2 Recommendations ---------- 76

APPENDIX A ---------- 85
Table A ---------- 86
Table B ---------- 87
Chart no.1 ---------- 88
Chart no.2 ---------- 89
Chart no.3 ---------- 90
Table 2.1 ---------- 91

REFERENCE ---------- 92

BIBLIOGRAPHY ---------- 95

ABSTRACT

Taking into account that the **CENTRO DE FORMACAO NAUTICA** is a relatively recent educational institution (Jan, 1984), standards should be continuously reviewed and improved whenever and wherever appropriate. This practice would certainly enrich its program.

This project tackles the broad subject of Education Methods, with regard to the following issues:

* Curriculum Design
* Education Techniques
* Training Aids
* Thinking in Teaching
* Computer in Education

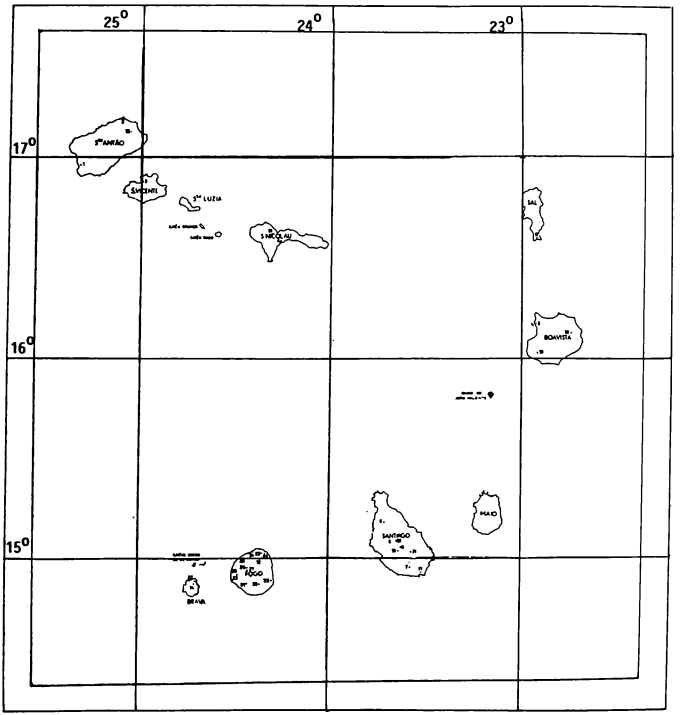
In considering the above subjects this project is intended to contribute in upgrading existing standards in general pedagogical knowledge, curriculum knowledge, knowledge of learners and their characteristics, knowledge of educational contexts, and knowledge of educational ends.

Additionally, this project identifies and analyzes several careers related to marine and maritime activities which are vital to the life of the islands.

Last but not least, this project proposes some suggestions and recommendations as a contribution to the betterment of **CENTRO DE FORMACAO NAUTICA.**

MAP OF CAPE VERDE ISLANDS

Latitude North of Equator; Longitude West Greenwich



POEMA DO MAR

O drama do Mar,
o desassossego do Mar,
sempre
sempre
dentro de nós!

O Mar!
cercando
prendendo as nossas Ilhas,
desgastando as rochas das nossas Ilhas!
Deixando o esmalte do seu salitre nas faces dos pescadores,
roncando nas areias das nossas praias,
batendo a sua voz de encontro aos montes,
baloiçando os barquinhos de pau que vão por estas costas...

O Mar!
pondo rezas nos lábios,
deixando nos olhos dos que ficaram
a nostalgia resignada de países distantes
que chegam até nós nas estampas das ilustrações
nas fitas de cinema
e nesse ar de outros climas que trazem os passageiros
quando desembarcam para ver a pobreza da terra!

O Mar!
a esperança na carta de longe
que talvez não chegue mais!...

O Mar!
saudades dos velhos marinheiros contando histórias de tempos passados,
histórias da baleia que uma vez virou a canoa...
de bebedeiras, de rixas, de mulheres,
nos portos estrangeiros...

O Mar!
dentro de nós todos,
no canto da Morna,
no corpo das raparigas morenas,
nas coxas ágeis das pretas,
no desejo da viagem que fica em sonhos de muita gente!

Este convite de toda a hora
que o Mar nos faz para a evasão!
Este desespero de querer partir
e ter que ficar!

(Ambiente, 1941)

A BRIEF OUTLINE OF THE REPUBLIC OF CAPE VERDE

The Republic of Cape Verde is located some 600 km off the coast of West Africa, with its closest point being Cap Vert, Senegal. This archipelagic state is made up of ten islands and five islets which are divided into two groups: leeward and windward. The leeward islands consist of Santiago which is the largest, Maio, Fogo and Brava. The windward islands are made of Santo Antao, Sao Vicente, Sao Nicolau, Boavista, Sal and Santa Luzia. The land area of Cape Verde is 4033 square km, whereas the combined land/sea area is 52 000 square km. The population is estimated at 370 000 (see tables A and B appendix A).

Cape Verde became an independent nation on 5 July 1975 after five hundred years of Portuguese ruling. It is believed that the islands were first discovered in 1460 by two navigators sailing for the king of Portugal.

In the mesh of African ancestry, Catholicism, and Western civilization, it has not always been possible to discern whether the European or the African influence predominates. Rather, the interweaving has been so complete that it is most appropriate to speak of the evolution of a separate culture with its own distinctive customs, folklore, cuisine, music, literature and language.

The climate is tropical dry with an average temperature of twenty seven degrees Celsius; it is windy during the

months of October to May. Rain has been very scarce and whenever it falls it does so in an erratic manner. At this moment the country is experiencing its twentieth year of consecutive drought. Due to this situation the social fabric of the country has changed drastically.

As far as the economy is concerned, the equivalent of over 80 percent of Cape Verde's GDP comes from exterior sources. Most of this is in form of remittances (typically 40 percent of GDP) and grants (30 percent of GDP); the rest comes in long-terms loans for the creation of economic structures such as agricultural and fisheries projects. Indeed, for most of its years of independence, Cape Verde has been able to maintain a positive balance of payments as a result of remittances and the grant-in-aid received from foreign government, non-governmental organizations and international bodies.

The culture of the Cape Verde islands is diverse and with little difference from island to island. The mother tongue of the Capeverdeans is 'Crioulo', which is based on Portuguese morphology and African phonetic system with loan words from both stock.

INFRASTRUCTURE IN MARITIME INDUSTRY

Since the early years of this century Cape Verde has served as a bunkering port for international shipping crossing the Atlantic. To facilitate this service the government has embraced itself in building some related infrastructure.

There exist port facilities in five islands, the

largest port being Porto Grande in Sao Vicente, which can berth deep draft vessels (11 meters). In addition, there are three SBM facilities in three different islands to accommodate large tankers that call to discharge oil or to bunker. There are two projects to build a port in Boavista and the expansion of the main port in Sao Vicente. The port on São Vicente island has a cold storage facility for 600 tonnes.

A ship repair yard (Cabnave) has been built since 1983 and serves mostly fishing vessels that operate in the region and the national merchant fleet. The yard provides facilities for vessels up to 110 meters long and 2800 tonnes displacement with six dry dock parks. In addition to Cabnave, a small ship repair yard (Onave) serves wooden ships and glass reinforced plastic vessels of small dimensions. This yard has been in operation for well over fifty years, and in fact it has become quite obsolete.

The merchant fleet is numerous but is mostly composed of low tonnage (under 1500 gross tones) which trade among the islands as well as carrying imports from northern Europe. Figures released in 1988 indicate the existence of thirty two vessels registered under Capeverdean flag totaling 15 500 gross tonnes

The maritime administration has provided aids to navigation in many points of the islands as an attempt to promote safety. Furthermore there exist three radio stations to service shipping in the area.

In 1984 a nautical school was inaugurated whose aim was to train ship officers. Further information on this school is presented in the following section of this

background.

The Cape Verde became a member of IMO on 24 August 1976. Since then it has adopted the following international conventions:

SOLAS 74	in 28 April 1977
COLREG	in 28 April 1997
FAL	in 28 April 1977
Load Lines	in 28 April 1977
Olso Conv.	in 28 April 1977
STCW	in 18 Sept. 1989

C AN OVERVIEW OF CFN

Centro de Formação Naútica, CFN, was created in January 1984 as a result of a cooperative agreement between the governments of Cape Verde and Norway. The school was to be run by foreign experts under the management of IMO until the project expires (Dec. 1991). In the meantime national staff is to be provided with training in order to take over the project when it expires. In fact, some teaching staff members have taken advantage of this opportunity to go abroad in pursuit of technical expertise necessary to take over all aspects of CFN operation.

The academic structure of CFN is divided into three departments, engine, deck and radio and electronics. The departments operate separately except when assigned common courses take place.

The administrative work of the school is greatly supported by the teaching staff due the lack of trained

administrative personnel. Additionally, the teaching staff gets involved in the promotion of social activities concerning the students.

The recruitment of teaching personnel has been troublesome, and even those who get recruited eventually quit within an year or two. This is attributed mainly to financial incentives which seems to be lower than in other sectors and the fact that a clear teacher career path has not been defined. Most of the teachers work on a yearly contract basis which is automatically renewed if neither party objects.

According to national needs only a group of 20 students are enrolled every two years and alternatively between deck and engine departments. The radio and electronics students are enrolled every three years in a batch of 15. The admission criterion is that the student has completed the "Curso Complementar" which corresponds to 11 years of schooling, in the science group (including math and physics).

CHAPTER I

INTRODUCTION

Education is considered in many societies as the backbone of its development program. No development policy can be successfully accomplished without having a sound educational system at all levels. In fact in many western societies education is considered to be an investment for the future.

On the 27th of January 1984, in the ninth year after independence, the Republic of Cape Verde inaugurated its first maritime training institute known as *" CENTRO DE FORMAÇÃO NAÚTICA"*, hereunder CFN. The creation of this maritime training institute was a hallmark for the history of the Islands as far as its maritime interests were concerned and was a good step in the right direction. Steps to guarantee its continued operation must be seriously considered.

During the process of decolonialization, experienced by Cape Verde in the mid 70's, the educational system experienced major setbacks typical of young nations. The process of decolonialization was accompanied by an urgent need to produce highly skilled manpower. Unfortunately much of this technical manpower must be trained overseas, and the process of training overseas encourages the resulting highly skilled specialist to remain overseas or re-emigrate. Many programs for overseas training have, in fact, accelerated the degree of migration of skill from the developing country to developed countries.

In order to counteract this typical and enduring

problem facing young nations, education planning must be carefully designed and properly fitted in the National Development Policy. Further, it is necessary to see that these plans are carefully coordinated with other programs of economic and social development, so that the educational system is not out of tune with other programs in the development process.

It must be realized that the education process is like a chain reaction, where the product of one level becomes the input to a next higher level. As the needs and standards of society change from age to age, so the education pattern must change in order to meet its proposed objective.

A developing society may therefore almost be defined as a country that lacks technical skills required not only to service its present level of development but also to accelerate its development. It follows, therefore, that from the point of view of the economy, one of the urgent requirements of the developing nations is the development of cadres of technically skilled people.

These urgent needs would only be met if a sound educational program is set forth and implemented. In addition, the lack of technical expertise leads people to carry out tasks only by their past experience in an empirical fashion. This approach is of course inefficient, ineffective, and frustrating.

The function of education can not be only limited to the attainment of technical skills. It also contributes to transmission of culture. Without some means of inheriting, as well as extending, the culture of each new

generation would have to start afresh. Culture depends upon continuity, and schools help to provide it by transmiting accumulated knowledge, skills, values and beliefs.

The concept of preparedness for working life is another function of education that schools perform. On the contrary, to other non-human animals, human beings must be educated and prepared to cope with daily activities of the conventional society we live in.

This process of learning and/or teaching may be accomplished by different methods and approaches. The purpose of this project is to analyze the diverse components of an educational system. This analysis in turn would raise the sense of awareness among the teaching staff at CFN in regard to matters pertaining to the education system. It further should provide guidance in solving the problems that educators and schools administrators face while exercising their activities.

This project is addressed mainly to the teaching staff at CFN. However, it would be available for presentation to other sectors of maritime industry interested in matters of education and training.

Recognizing that the national staff is growing in number, some means of providing them with relevant information in the pursuit of their activities is of utmost importance.

The main issues that this project will address are the following:

Education Technology and Methods
Curriculum Designing
Thinking in teaching
Use of Computers in Education, and
Careers related to Maritime Industry.

Preceding the development of these topics, there is a chapter providing some background information on Cape Verde. This project will conclude with a chapter to summarize all information presented and provide specific recommendations. Other additional information of interest will be supplied in Appendices.

CHAPTER II

CURRICULUM DESIGNING

2.1 INTRODUCTION

In order to accomplish the objectives of education, curricula must be properly designed and developed. When educators and school administrators seek clear purposes and better strategies for their teaching and teaching problems they are reflecting on curriculum questions.

This chapter, Curriculum Designing, is intended to address issues such as the basic needs of education, the evaluation in teaching, the setting of priorities, the organization of work, the purpose of a curriculum, grading, and the development of tests. It is also intended to help upgrade the standards of education at the Centro Formacao Nautica with regard to those issues.

2.2 THE CONCEPT OF DESIGN

> "***Design is the core of all professional training. It is the principal mark that distinguishes the professions from the sciences***".
>
> **Herbet Simon (1969,p55)**

Educational systems would be doomed to failure if at an early stage its purposes are not clearly defined.

Before going further it is necessary to define curriculum. According to Pratt[15]," a curriculum is an organized set of formal educational and/or training intentions". He goes on further to make his definition

explicit. " (1) A curriculum is intentions, or plans. They may be merely mental plans, but more commonly exist in written form. (2) A curriculum is not activities but plans, or a blueprint for activities. (3) A curriculum contains many other kinds of intentions, such as what learnings students are to develop, the means of evaluation to be used to assess learning, the criteria according to which students will be admitted to the program, the materials and equipment to be used, and the qualities required of teachers." In a word curriculum is a system that links together in an organized form the diverse components of education.

The whole concept of design is present in our daily life at various levels. Some designs fail to achieve what they were set to achieve, for example the automobile that is recalled to correct design defects, the gadget that fails to meet its promises. These failures are not deliberately designed into those systems; rather they are not deliberately designed out. Disappointment with human design leads some people to distrust the very concept of design. But a rejection of design implies a rejection as the prelude to action, and hence a rejection of responsibility itself.

Design is ethically neutral; it may be applied to worthy or to unworthy ends. But in the absence of design, worthwhile ends can be achieved only by accident. It must be remembered that cure for bad design is a better design. The contributions of designing in education can not be overemphasized. Pratt[15] points out some benefits of design as follows: " (1) Design focuses attention on goals. (2) Design increases the probability of success. (3) Design improves economy of time and effort.

(4) Design facilitates communication and coordination of projects. (5) Design reduces stress."

In view that the CENTRO DE FORMACAO NAUTICA, here under CFN, has had a mixed management (national and international) since its creation, it has been difficult to work things out as far as designing the curriculum is concerned. This lack of planning has contributed in some way to the erratic functioning throughout the past six years. It must be realized that the time taken up to plan and organize work will be caught up at later stages and will in the final analysis be well worth the investment.

Designing curriculum requires a full scale mobilization of human and material resources in order to precisely evaluate the needs and the constraints. A listing of these needs and constraints should be worked out so that every item can be analyzed.

2.3 SPECIFYING LEARNING OUTCOMES

"Education must have an end in view, for it is not an end itself".

Sybil Marshall, educator.

Very often students seek to know the need or reasons for having such and such courses. They also wonder about their purposes. This concern about what they are doing in classrooms is fair and normal. Therefore the academic staff should give some attention to what it is they hope their students will achieve as a result of their studies.

Pratt[15] points out that the very first stage in the

actual design of a curriculum is the writing of the curriculum aim. It is relatively straightforward, but its importance must not be underestimated. He identifies the aim as a leading component of the curriculum, therefore any change or defect in the aim affects the entire curriculum.

If educational and training needs have been identified and assessed a statement of aim can be drawn. An aim should address in general terms the purpose of education, however, its generality will obviously depend on the scope of curriculum.

Pratt[15] suggests that six main criteria may be applied to curriculum aims. " Aims should (1) specify an intention; (2) identify a significant intended change in the learner; (3) be concise; (4) be exact; (5) be complete; and (6) be acceptable".

In view that an aim is too general as a rule to provide guidance to specific instructional decision, they must be broken down into their component elements. The breaking down of an aim defines the curriculum objectives.

> **"The fundamental problem facing curriculum specialists is to establish a consistent relationship between general goals, on the one hand, and specific objectives that guide teaching on the other". (Caswell, 1966, p5)**

Once the objectives have been identified, the faculty then must adopt a system of teaching and learning which would enable the students to progress towards the attainments of these objectives.

According to Miller[2] objectives tell the student what the minimum level of acceptance for his or her eventual performance is to be, and under what conditions it will be achieved. To be meaningful, any statement of objectives must specify observable, preferably measurable, changes in the learner's behavior at the end of the course.

Several are the reasons for specifying objectives. Rowntree[1] claims that some important benefits are attributed to the practice of clearly formulating one's objectives in behavioral terms. He summarizes them as follows:

[1] (Behavioral objectives) make it possible for teachers to communicate their intentions more clearly to colleagues and students.

[2] They provide a framework for the selection of content and structure.

[3] They guide in the selection of appropriate teaching and learning methods.

[4] They help the teacher decide what are the most appropriate means for evaluation and assessment.

Objectives are supposed to state as clearly and unambiguously as possible what students should be able to do as a result of working through their course. In writing objectives, statements should suggest the kind of behavior that students will be required to demonstrate in order to show that the objective has been achieved. Most educationalists propose three broad divisions in grouping objectives,- knowledge, skills, and attitudes. Nevertheless several refinements of each division have been proposed.

"The most common of these refinements is the taxonomy developed by Bloom and his colleagues. They call the three divisions 'domains': cognitive (knowledge and intellectual skills), psychomotor (physical skills) and affective (feelings and attitudes). These domains have been subdivided to provide hierarchies of objectives of increasing complexity" (Newble[10]).

In the area of knowledge objectives (the cognitive domain), Bloom's taxonomy has been widely applied. He proposes six levels of subdivision: knowledge, comprehension, application, analysis, synthesis, and evaluation. However, for everyday use these levels tend to collapse into three subdivisions: recall of information, understanding and problem solving (Newble[10]).

In regard to skill objectives (the psychomotor domain) little has been developed to break it down. However some sort of hierarchy is assigned to the achievement of the objectives. For example, well qualified or very competent; familiar with or competent; awareness or minimal familiarity.

And lastly, the attitudinal objectives (the affective domain) are not very well developed.

2.4 EVALUATING AND TEACHING

" Evaluation is aimed at judging quality or worth of something - an educational program, worker performance, or student's attainments".

Traditionally evaluation is seen as a way of assessing, or measuring one's performance. Although it is one of the most complex components of an educational system little attention is paid to its practicing. Mixed opinions have been versed about this issue. Some criticize it for its usefulness, others for its uselessness. Either way, it seems that evaluation of performance is a must in today's school.

Since it appears to be that little is known about this cumbersome concept let's pause and attempt to clarify it. Firstly let's pose the following question; what are the functions of evaluations? An assumption that is widely made is that evaluation serves only a single purpose. That is to help the teacher make grading decisions. This misconception leads us to underestimate the real potentials of evaluation.

According to Pratt[15] evaluations have much wider function, at least eight of which may be considered.

[1] To inform learners of their attainment
[2] To diagnose areas of strength and weakness
[3] To guide decisions about the students's future
[4] To inform interested agencies of student competence
[5] To provide feedback into the instructional system
[6] To provide an operational target for the learner
[7] To license candidates for a profession or occupation
[8] To promote minimal educational equality

Analyzing evaluation under the above perspective, by its function, we would be better motivated to cast it. In addition, it removes the heavy burden that teachers keep in the back of their minds that evaluation serves solely

to reward or punish students.

The complexity of evaluation may be eased off if regarded along with the performance criteria. It is known that objectives identify desirable states in the learner, most of which are personal and undetectable.

The role that performance criteria plays is to specify actions on the part of the subject that will allow valid inferences that such a state have come about. David Pratt[15] thereby suggests that the concept of a performance criterion belongs within the criterion-referenced model; the educator who specifies a performance criterion is concerned with establishing a standard that the student is to meet, regardless of his or her rank relative to other students. In this regard it does not depend how well one does, but rather whether or not the student has achieved the objective.

It is common that the performance criterion will specify some important factor in performance; (1) the activity to be performed; (2) required speed; (3) standard of accuracy; (4) equipment and materials available; and (5) environmental conditions.

He points out that detailed specification in the performance criteria is beneficial to learners in various ways. If they know beforehand what is required, they can practice the skill on their own and evaluate their own capabilities. This practice has the benefit of taking away the anxiety that students experience from not knowing where they stand.

Experimental research suggest that the provision of specific guidelines for self-evaluation improves both the accuracy of self-estimates and the performance of the learner (Carr,1977).

As mentioned earlier evaluation is the process of making judgments. In 1967 Scriven introduced the terms "formative" and "summative" evaluation to describe the various roles of evaluation in curriculum development and instruction. The former applies when it is of interest to monitor the instructional process, to determine whether learning is taking place as planned. Whereas the latter one determines if learning is sufficiently complete to warrant the learner advancing to the next segment of instruction.

The difference between these two groups of evaluation is essential for test development and test use in classroom. Formative evaluation is of extreme importance since it provides feedback to the teacher and to the students about how the learning process is taking place. Teachers should carry formative evaluation as frequently as is possible in order to gather the most information available. Several means might be used to accomplish such a goal. Observations, classroom questioning, short test or quizes, and homework assignment are some methods that should be used.

Despite all the criticism of evaluation, it is pointless to teach without evaluating. Ebel[3] argues that if tests were abandoned some other means of assessing educational achievement would have to be used in their place. No other means that is as efficient, as dependable, and as beneficial to the process of education

has yet been discovered.

2.5 GRADING AND DEVELOPMENT OF TESTS

Some means to measure students' achievements is essential in educational institutes. It seems that grades are the best way of measuring such achievements.

The assigning of a grade as a measure of one's achievement in the learning process obviously requires the development of tests. Due to the importance that grades represent, they must be reliable and valid to serve their purposes of stimulating, directing, and rewarding students effort to learn.

Since testing and grading go hand in hand this section will address these issues simultaneously.

Teachers often find difficulties in assigning grades. The problems of using grades to describe student achievement have been persistently troublesome at all levels of education. A fundamental reason why the problems of grading are difficult to solve is that grading systems tend to become issues in educational controversies.

The basis for assigning grades within an educational institute should be consistent. The grading policy should be uniform and invariable when used among instructors, among courses, or among departments.

Explicit definitions for each grade must be made clear so that extraneous factors do not play a role in the process of assigning grades. Research has shown that some

instructors deliberately use high grades as a reward or low grades as punishment for behavior unrelated to the attainment of instructional objectives.

According to Ebel[3], a grading system is essentially a method of communicating measurements of achievement. It involves the use of a set of specialized symbols whose meanings ought to be clearly defined and uniformly understood by all concerned.

Unfortunately at CFN the problem of assigning grades has never been addressed, and in many instances it depends merely on the instructors. This practice has caused some inefficiency in measuring the students' achievements and consequently benefiting them or hurting them. It must never be forgotten how powerfully an assessment can affect students, particularly if it is one on which their future may depend. This influence may be either positive or negative and even harmful.

Another question that the assigning of grades often faces is its validity. Several components contribute to determining course grades. And these components should reflect students' competence with respect to the instructional objectives, and also they should be academically oriented.

Unfortunately teachers often evaluate extra-academic values such as personalities or attitudes to assign grades. Ebel[3] argues that various aspects of students performance have been labeled as potentially invalid grading components because they represent behaviors that do not reflect directly the attainment of the important objectives of instruction.

It seems that if teachers are aware of these matters their judgments made about academic progress would be more accurate and more meaningful. Therefore teachers must prepare written definitions of the performance standards to be used for assigning grades.

Another issue to be addressed in this section is the concept of test development. In fact there exists a variety of types of tests, and each one of them serves a specific purpose. However, whatever test form teachers use, they should seek to make measurement as objective as is possible. A description of the purpose of the test should anticipate the stages of test development. This description should include the reasons for testing, what it is intended to measure, how tests scores are to be used or interpretations to be made of them. Once these questions are properly dealt with the procedures for the test development or test selection should be easier to follow.

Whatever the purpose of the assessment, the method used should satisfy the following three requirements:

-Validity
-Reliability
-Practicality

The task of checking the validity of tests might not be an easy one, but it can be improved if tests are carefully matched with the course objectives, content and teaching methods; test methods are used that are appropriate for the objectives specified; and a range of test methods are employed.

Concerning reliability, it can be improved by writing test instructions that are simple, clear, and unambiguous; checking to make sure test time limits are realistic; and ensuring that questions are clear and suitable for the level of students.

In regard to practicality, instructors should seek an assessment scheme that is feasible. In order to achieve feasibility instructors must have the skill to administer, mark and grade the assessment.

In addition they must be able to interpret the results accurately, find out if the assessment scheme demands too much time, and if the scheme requires special resources (e.g. labour, material or equipment) and also if they are readily available.

According to the assessment planning, teachers should be aware of the assessment methods available to them. Of the most common types of assessment widely used in today's educational institutes are:

-essay type test
-short-answer test
-objective test (multiple-choice,true-false,matching)
-oral examination
-structured practical assessment
-self-assessment

These types of tests serve specific objectives and they must be used accordingly in order for them to be effective.

For instance the essay type test may be used to indirectly measure attitudes, values and opinions. For

example when instructors seek to measure the ability of their students regarding the writing abilities the essay type test is the most appropriate. When using the essay type test teachers should bear in mind the question of reliability. Whenever possible the marking of this test should be carried out by different markers as an attempt to improve reliability.

On the other hand the short-answer type test is used when the purpose of assessment is to cover a wide content area. It is advantageous when teachers want students to avoid cramming, and they are required to give an answer, rather than to select or guess. This kind of test should be employed when formative evaluation is the aim. However short-answer type tests are inappropriate to measure complex learning outcomes.

Other test formats where the marking of the answers is objective are labeled as objective tests. Under this category, tests such as multiple-choice, true-false, and matching are the most popular. Although the marking of the answers is objective, proper care should be exercised when designing these kinds of tests. The characteristics of objectives tests is that they are of high reliability and time saving in scoring. In many disciplines, especially in science and technology this type of test is very useful.

In regard to multiple-choice test items, they are adaptable to measurement of most important educational outcomes: including knowledge, understanding, and judgement.

The other methods of assessment mentioned above should

be used whenever they seem to be practical and reliable. For instance the direct observation type of assessment is very useful when it is intended to evaluate the performance of a technical skill, e.g. dismantling a pump, an engine, and so on. The oral examination seems to be appropriated in assessing the learning in specific courses such as foreign languages, history, et cetera.

Once the tests are developed and the results found teachers must be able to interpret them carefully and assign the corresponding grades. However, tests scores should be more than just the means for assigning grades. They are important educational tools, and they should be so treated.

Actually students learn from tests, providing inadequacies are discussed alive and without bias. Teachers should bring to light the ability to see relationships, implications or application of material.

CHAPTER III

TEACHING METHODS

3.1 INTRODUCTION

The most important question that any teacher can ask when considering the use of a particular teaching technique, is why they want, or perhaps do not want, to use that particular technique. The key issue is how it fits into the whole learning process.

There are several means of conveying information and enhancing learning in instructional institutions. This chapter will address the issues of educational techniques and teaching methods used in today's school. Some techniques and methods will be analyzed and discussed, amongst which are lectures and discussion, role-play, and laboratory teaching.

3.2 LECTURE AND DISCUSSION

Basically, a lecture is a teaching session in which the teacher is the principal speaker. Although fifty minutes is the usual length of time for lectures, it is common practice to give a much shorter lecture, say ten minutes in length, at the beginning of a laboratory or workshop session. The degree of formality in lectures can be varied considerably to suit the audience, the occasion and the purpose of the particular lecture.

As with any other method of teaching, it is important to decide whether or not a lecture is the most appropriate

tool. According to Miller[2], quoting the main findings of a research on the effectiveness of lectures, the following summarizes five purposes for which lectures are suitable.

Lectures may be used effectively to:

[1] present factual information and general principle in a cost effective way

[2] survey the themes that unite various topics or aspects of the subject

[3] teach the application of a discipline's basic principles

[4] inform students of recent discoveries or new interpretations in the discipline

[5] demonstrate strategies and skills of problem solving.

On the other hand lectures have not been shown to be as effective as discussion for:

[1] changing attitudes

[2] enabling students to arrive at a deeper understanding of the subject.

Once the lecture has been found to be the most appropriate method, teachers must be aware of external factors that may hamper the proper conduct of a lecture. Prior to lectures, teachers should visit one of the lecture rooms to check for example the position of plugs, screens, blackboard, and the view of these from different parts of the room. If facilities are found to be in need of improvement, some action must be taken.

Newble[10] point out some attributes of a good lecturer as:

[1] Presents the material clearly and logically.

[2] Enables the student to understand the basic principles of the subject.
[3] Can be heard clearly.
[4] Adequately covers the ground.
[5] Maintains continuity in the course.
[6] Is constructive and helpful in his/her criticism.
[7] Shows an expert knowledge of the subject.
[8] Adopts an appropriate pace during the lecture
[9] Includes material not readily accessible in textbooks.
[10] Is concise.
[11] Illustrates the practical applications of the theory of the subject.

In the view that teaching is a complex, challenging activity, teachers should from time to time reflect on their methods, and consider ways of improving their existing skills and of developing new ones.

For the lectures to be effective a few tasks should be worked out before the actual presentation of them. The very first item teachers should be concerned about is the definition of the purpose. This is followed by the identification of content which should include the main ideas, theories and examples. The above two items should be considered in a free thinking mode. The final step is finalization of the plan. The rough content plan must be revised and structured in a logical sequence. It should not be forgotten that the path to success in lecturing is careful planning.

In addition to lectures, the discussion method is a valuable tool in teaching, therefore teachers should consider it in their repertoire. Mckeachie[8] argues that

discussion techniques seem particularly appropriate when an instructor wants to do the following:

[1] Help students learn to think in terms of the subject matter by giving them practice in thinking.

[2] Help students learn to evaluate the logic of, and evidence for, their own and others' positions.

[3] Give students opportunities to formulate applications of principles.

[4] Help students become aware of and formulate problems using information gained from readings or lectures.

[5] Use the resources of members of the group.

[6] Gain acceptance for information or theories counter to folklore or previous beliefs of students.

[7] Develop motivation for further learning.

[8] Get prompt feedback on how well objectives are being attained.

Again, as nothing is perfect, teachers should be aware of drawbacks of the discussion method. Sometimes teachers face the problems of getting participation in a discussion, handling emotional reactions of students, and making progress toward the course objective.

In a discussion group, the teacher's job is not to sell students on a particular solution, but rather to listen and to teach them how to solve problems themselves. If teachers find that there is some difficulty in starting a discussion they should use some procedures available to them for starting a discussion going. McKeachie[8] discusses a few ways that discussions can be started. He suggests starting discussion with a

common experience, with a question, or with a controversy. Any of the above techniques can be used according to the subject area being studied.

3.3 ROLE-PLAY

" The idea of role-play, in its simplest form, is that of asking someone to imagine that they are either themselves or another person in a particular situation. They are then asked to behave exactly as they feel that person would. As a result of doing this they, or the rest of the class, or both, will learn something about the person and/or situation. In essence, each player acts as part of the social environment of the others and provides a framework in which they can test out their repertoire of behavior or study the interacting behavior of the group" (van Ments[11]).

As a technique, role-play has proved to be very powerful. It is highly motivating and enables students to put themselves in a situation they have never experienced before; in particular it opens the way for them to put themselves in other´s shoes.

Because the technique is so powerful, it is essential that teachers approach it in a systematic way and are aware of the different ways of using it. As with any other tool there are better and worse ways of using it. It is important to use the right type of role-play to fit the specific circumstances or training objectives.

Role-play can to a certain extent help to change the student´s attitude or behavior. To read or hear about

something is not the same as experiencing it, and it is often only by actual experience that understanding and change can come about. The opportunity to place the student in a situation which imposes on him the same type of constraints, motivations and pressures that exist in the real world can be used in a variety of teaching situations.

Another major area where conventional methods need to be supplemented is that of interpersonal and communication skills. No matter how much reading and observing the student undertakes, the only way to develop these skills fully is by using them in actual interpersonal situations.

Morry van Ments[11] suggests a summary of the advantages of role-play in the following list:

[1] Enables students to express hidden feelings.
[2] Enables student to discuss private issues and problems
[3] Enables student to empathize with others and understand their motivations.
[4] Gives practice in various types of behavior
[5] Portrays generalized social problems and dynamics of group interaction, formal and informal.
[6] Gives life and immediacy to academic descriptive material.
[7] Provides opportunity for non-articulate students and emphasizes the importance of non-verbal, emotional responses.
[8] Motivational and effective because it involves activity.
[9] Provides rapid feedback for both student and tutor.

[10] Is student-centred and addresses itself to the needs and concerns of the trainee; the group can control content and pace.

[11] Closes gap between training and real life situations.

[12] Changes attitudes.

[13] Permits training in the control of feelings and emotions.

He goes on further to group the above list in three main headings.

[1] Positive and safe in dealing with attitudes and feelings.

[2] Relates closely to the outside world.

[3] Highly motivating.

As one would expect there is no perfect teaching technique. There are several areas of disadvantages of role-play. The one which is usually in the forefront of peoples' minds is the effect that using role-play may have on the atmosphere and conventions of the classroom. A second issue concerns the accuracy and relevance of what is learned and the degree to which the teacher or trainer must be in control of what is being learned. The third main area of disadvantages is that of resources. Role-play tends to use large amounts of time, space and sometimes people. In the first place, the prooess of warming-up and getting students accustomed to the idea of role-play can not be rushed.

In order to provide the right environment in the interplay between students and teachers, it is necessary to train the teachers so they can handle the special demands imposed on them while carrying out a role-play.

With proper training and development, teachers can acquire the required competence for the performance of role-play.

van Ments[11] suggests that the competence required can be broken down into three aspects:

[1] A thorough knowledge of the methodology
[2] Sensitivity to individual and group behavior
[3] Self-knowledge, maturity, balance.

To get the most out of the use of role-play, teachers should follow a procedure which ensures that each aspect is checked and used in the best way. The flow chart 1 (see appendice A) is indicated by van Ments[11] for using role-play which performs different functions at different times.

3.3.1 TYPES OF ROLE-PLAY

Role-play is a type of communication. Like other means of communication it can be used for messages, expressing or arousing emotion, negotiation and persuation, or a variety of other purposes. Different types of role-plays demand different approaches; the way in which role-play is introduced, the description of the role, the facilitation and post play analysis will all vary according to the type of role-play being used. A broad and important distinction may be made between those role-plays dealing with the practice of skills and techniques, and those dealing with changes in

understanding, feelings and attitudes. The essential point is that the conduct of the session must be adapted to the type of role-play used.

According to van Ments[11], the above two broad categories may be subdivided to produce a list of six functions which a role-play can fulfil. He suggests the types of role-play shown in table 2.1.(see appendice A).

3.4 LABORATORY TEACHING

Practical work is of utmost importance in the education of science and engineering. In practice most of this practical work is accomplished in laboratories.

In view that practical work is one of the most expensive components of an education program, it is particularly appropriate to consider ways of making practical work more effective and more efficient in the course it applies. Miller [2] suggests some strong reasons why laboratory classes are part of the curriculum in certain courses. He lists them as follow:

[1] to develop manipulative skills;
[2] to familiarize students with instruments and apparatus;
[3] to familiarize students with the design and construction of experimental equipment;
[4] to develop observational skills;
[5] to develop skills in gathering and interpreting data

The main principle underlying laboratory work is that students learn effectively through practical tasks. However, Brown and Atkins[13] suggest that the principle of learning through doing needs two qualifications. First, the tasks have to be perceived as relevant and meaningful by the students, otherwise interest may be minimal. Second, students (and lecturers too) have to receive constructive feedback on their performance, otherwise learning may be minimal. Practice alone is not perfect, but if feedback is provided, performance is greatly improved. These considerations are useful and therefore teachers should bear them in mind when preparing laboratory class.

The common practice in laboratory class is to divide the class into a pairs or small groups who will work on a particular experiment. Very often brief explanation and instruction are given to the whole class. Teachers should be able to create interest and to explain technical information. Brown and Atkins[13] set out the following list with the essential skills for laboratory teaching:

[1] explaining and presenting information
[2] questioning, listening and responding
[3] giving directions
[4] teaching demonstrators
[5] helping technicians
[6] preparing a laboratory course.

Concerning the laboratory teaching methods the essential principle underlying all laboratory teaching methods is that, as far as possible, students teach themselves and each other. The experiments, tasks, and guidelines are provided by the course organizers and the

students learn through their own efforts. Sometimes lecturers and demonstrators have to go over instructions or demonstrations a few times during the year. Very seldom will all the students get to absorb the procedures and verify their understanding. Many of the routine demonstrations and instructions can be done by the use of facilitating methods. The facilitating methods are advantageous because it permits every student to work at his own pace.

Written instructions are the most common facilitating method. They may be complemented with the use of a set of slides, a video recorder and/or audio cassette. Although the facilitating methods may save the time and energy of the demonstrator, it is wise to consider the cost factor when preparing facilitating material. For example a simple 10 minutes demonstration of first class quality may take 4 hours to video record; a complex one may take 20 hours. As it can be seen, it is not always feasible to, for example, video record.

In addition to the facilitating method, some other conventional methods of laboratory teaching are used. The following forms are worth mentioning: demonstration, exercises, enquiries, and projects. Everyone of these methods vary in the openness of the task and in time spent on the task. For instance demonstrations are designed to illustrate theoretical principles which are outlined in lectures. Whereas exercises are tightly structured experiments which are designed to yield well-known experimental results. Enquiries may be further subdivided into structured enquiries and open ended enquiries. Structured enquiries are lightly structured experiments which may require students to develop their own procedures and/or provide their own

interpretation of the results. The open-ended enquiries are suitable when students are required to identify a problem, formulate the problem clearly, develop experimental procedures, interpret results, and consider their implications. Finally, projects are based upon long experiments, field studies, or a series of experiments. The end product may include design plans, a model, or a computer. Topics may be chosen by students or suggested by the teacher.

It should be borne in mind that not every laboratory session need be an experiment. Instead alternative approaches can be used to fulfill the goals of the course.

Another issue of importance in laboratory teaching is the preparation of a laboratory course. In reality preparing a laboratory course has quite a few particularities in common with preparing for lecturing. Teachers must think about the course in the context of the overall program and they must consider constraints such as time available, equipment, materials, student numbers, and laboratory space. Within these constraints Brown and Atkins[13] suggest four major tasks:

[1] Establishing or rethinking the aims of the course.
[2] Choosing appropriate tasks for students.
[3] Designing appropriate tasks.
[4] Designing a laboratory manual.

Several other methods such as table top, in-class, case histories, hands on, field trip, field exercises, and unit exercises should be analyzed and their potentials

assessed to find out whether or not they can be used in the instruction program (see chart 2 in appendice A).

CHAPTER IV

TEACHING AND TRAINING AIDS

4.1 INTRODUCTION

Education is one field that is taking great advantage of today's technology to improve its effectiveness. Educators and school's administrators are most concerned in finding ways to increase productivity. This is necessary in order to get more work accomplished for a smaller investment of resources, in less time, and with a better quality result.

In education and training, technology is used to better the efficiency of the teaching/learning process, which will benefit the students and teachers. In this perspective, technology is applied to reduce training time, to increase student achievement, and to increase student/teacher satisfaction.

This chapter is intended to identify the usual outcome associated with different kinds of technology currently used in education. It will discuss three different media used in education and training; static media, dynamic media and interactive media. And since major technologies almost always have unforeseen side effects and implications, these will also be discussed in the context of training application.

Other issues dealing with the production of media as well as the use and choice of media will be analyzed along with a cost analysis assessment.

4.2 STATIC MEDIA : AUDIOVISUAL

Certain types of media, such as print, overhead transparencies, still pictures, slide/tape and microforms generally are used to depict or convey information without regard for its temporal attributes, and therefore they can be characterized as static. In reality the above mentioned media are the most common technology presently used in training and education. Furthermore, in many training applications, audiovisual media is one of the most cost-effective technologies possible because they are capable of presenting a wide variety of instruction with relatively low delivery and development costs.

Print has been one of the oldest technologies to be used in training. It is undoubtly the most pervasive and convenient media. Print is used in all kinds of training programs, in the form of technical manuals, students guides, workshop/seminar notes, article reprints, and textbooks.

Transparencies is another type of static media. The first wide use of transparencies can be traced to the period of World War II, and ever since it has expanded to all walks of life, especially for classroom instruction,(Kearsley[5]).

According to Kearsley[5], despite widespread use, however, transparencies are not always used effectively. He suggests the effective use of transparencies be divided into two major aspects: preparation and presentation.

Preparation:

[1] Present one major idea or concept on each

transparency.

[2] Use only a few key words/phrases. (Less than 6 words/line and 6 lines/sheet).

[3] Make sure letters and graphics are large and legible.

[4] Are your overheads interesting? (Use color, different typestyle, graphics).

Presentation:

[5] Start with an outline.

[6] Emphasize information by pointing.

[7] Control the pace by progressive disclosure.

[8] Turn projector off to make a verbal point.

[9] Use two projectors for increased effect.

[10] Obtain group involvement by writing on transparency.

The major benefits of using transparencies in training are twofold: planning and time savings in delivery. During the preparation of overheads instructors do some degree of planning. Therefore, some considerations are given to the structure, sequencing, and duration of a presentation in the process of making up transparencies. Although this does not guarantee an effective presentation, it certainly helps. Kearsley[5] suggests a time-saving figure of 20% to 40% over a conventional lecture.

Sometimes instructors fail to recognize that transparencies represent a visual medium, and this poses an obstacle to the effective use of it. A good example of it is the instructor who prepares a presentation mainly as a written text and then photocopies it to make transparencies.

The third item, still pictures, is regarded as one of the most valuable tools for the attainment of visual literacy in education and training. Various abstractions can be best understood by studying still pictures. Moreover still pictures permit students to recognize objects and call them by name. It goes without saying the powerfulness of still pictures in teaching is reflected in the ancient Chinese adage: ***pictures speak louder than words.***

Brown[8], quoting some research work done on the effectiveness of still pictures as a teaching media, says that for still pictures:

[1] stimulate students interest

[2] help readers to understand and remember the content of accompanying verbal materials.

Another teaching aid classified under static media is the slide/tape. Despite the wide use of slide/tape in training applications, it isn't as popular as print or transparencies. However, one peculiarity of slide/tape is that it is suited for both group presentation and self-study use.

In self-study uses, slide/tape can provide the visual and audio information of an instructional presentation, hence, replacing the oontent of a classroom lecture or laboratory demonstration. In group uses, multi-image and sound effects can be used to increase the information and motivational aspects of an instructional presentation. Multi-images can involve the use of multiple projectors or multiple screens.

"Design and development procedures for slide/tape programs introduce a new step not normally included in the design of print or transparencies: scripting/story boarding. In order to properly coordinate visual and audio presentation, it is necessary to specify prior to production the exact content and sequencing of all information. This step increases the development costs of slide/tape relative to print and transparencies", (Kearsley[6]).

With the introduction of computer technology the production of slides has been greatly improved, either in quality or in cost. Special computer graphics software allow slides to be produced online. One major advantage, besides the rapidness of production, is the capability of making correction quickly and cheaply. This is possible since the slide images are stored electronically.

Finally, microforms are another valuable teaching material worth considering. They are reknowned for their information density. For individual uses they are often used with a viewer, however they can be projected like transparencies. Microfilm and microfiche are the most popular types of microform, with the latter being the most common.

4.3 DYNAMIC MEDIA: FILM AND VIDEO

Teaching and training aids that can present dynamic sequences of events are considered as dynamic. Of the most commonly used for instruction are film and video. "As compared to those static media described above, film and video has the potential to be more attention-getting, hence resulting in a higher degree of learner involvement

and stimulation",(Kearsley[5]).

Motions pictures provide some valuable contributions to learning. In fact they are very popular, and very powerful, if not the most powerful among the resources for teaching and learning. They also are unique in their capacity to communicate, to influence people, and to inform.

Brown[6] lists some unique contributions of motion pictures-film and video - to teaching and learning as follow:

[1] communicate through the most direct channels to the mind and the emotion: sight and hearing.

[2] bypass some intellectual barriers to learning. They reduce dependence upon words.

[3] break through barriers of time and space, taking a viewer into the past, present, and future - and into the world of imagination.

[4] slow happenings in real time and in time modified: events can be stretched or compressed for study by slow or time-elapsed motion.

Dynamic media teaching aids may be categorized in accordance to what it fulfills. According to Brown[6] it might be skill (psychomotor), attitudinal/appreciational, or informational, to name a few.

Skill motion pictures are intended to aid the development or improvement of some psychomotor ability or abilities, such as typing, carving, or electronic assembly. They often distinguish and examine the skills involved in specific tasks. Attitudinal/appreciational motion pictures aspire primarily to build or persuade

viewer mind-sets, pro or con, with respect to what is portrayed and addressed. Lastly, informational motion pictures are perhaps the most usual and most widely available type. Didactic informational film or video productions approach subjects logically, and analyze and present in order the main points to be shown and discussed.

The typical formats of motion pictures are film (16 mm) and video (tape). Everywhere, 16 mm film is the form which motion pictures are presented for purposes of education, training and public information. The chief advantages of 16 mm film are that it serves effectively for showing motion pictures to either medium or large groups, maintaining sharp, consistent images in color. The video tape format has grown steadily as a medium for showing motion pictures. The main reasons for its expansion relies on the facts that video tape is less expensive than film, it is much easier to produce and it is simple to use and handle. Mckeachie[8] summarizes some relevant principles that have emerged from the research on the use of film and video in teaching as follows:

[1] Students can learn from film/video and usually do learn at least as much as from a poor teacher (Vandermer, 1950).

[2] Repeating the film and video increases learning (Mctavish, 1949)

[3] Participation increases learning (Hovland, Lumsdaine, and Shefield, 1949).

In addition, Brown[8] points out several other generalizations borne out by research and practical experience made about the utilization of instructional motion pictures:

[1] Increased learning will result if students are told in advance what they are expected to learn from the film/video and that they will be checked to see what they have learned.

[2] It is important for the students to know in advance any special terminology or nomenclature they must learn in order to grasp the full meaning of the film/video they are about to see.

[3] Repetition is strongly recommended, especially if the motion picture deals with some complex skills.

[4] Note taking is not to be encouraged because it interferes with viewing and attention, and hence learning.

To summarize, in instruction and training, motion picture/film and video-suit a variety of purposes. They convey information, change or strengthen attitudes, help develop skills, arouse interest, raise problems, invoke moods, and emotionalize learning.

4.4 INTERACTIVE MEDIA: COMPUTERS

The introduction of computers in education and training gave a new dimension to the learner and teacher, since it granted the interactiveness in the interface of teaching and learning. "The use of computers in training introduces a very important instructional capability: interactivity. Interactivity derives from active responding and explicit feedback. With computer-based instruction (CBI), the student overtly responds to questions or problems, and feedback on the correctness of these responses can be provided" (Kearsley[5]).

Basically there are three major uses of computers in training: computer based instruction systems, simulators, and microcomputers. These three differ from each other in their purpose and applications, however some overlap may occur. The CBI system is best used when practice and drill on skills is intended. It is widely believed that individuals master skills by practicing appropriate exercises. Since students have different learning abilities the CBI system introduces the capability of assessing the different variables of instruction. Brown[8], lists some advantages of using computers in education and training:

[1] Problems can be presented at a pace at which a student can prosper and receive reinforcement on one before going to others.
[2] Problems can be presented in increasing degrees of difficulty to permit steady, successful student advancement.
[3] According to responses, a student can be given immediate correction or moved along to a new problem or further instruction.
[4] Both student and teacher can be given records of student performance to indicate progress or need for further instruction.

When an instructional objective is to demonstrate something, microcomputers with graphics and color can often be used to accomplish such an objective. Microcomputers can also be used for playing games, which is often the best way to introduce students to microcomputers.

The other wide use of computers in education and training is in simulators. Simulation permits students to participate in close-to-real-life incidents under safe and purposefully controlled conditions that require decisions.

Over the years, a substantial amount of evidence has amassed on how the use of computers can significantly enrich the efficiency or effectiveness of training. One consistent finding is that computerized instruction reduces the amount of training time required by 25 to 30 percent over conventional (classroom) instruction. It is recognized that this reduction is largely due to the individualized nature of CBI, (Kearsley[5]).

4.5 SELECTION AND USE OF MEDIA

The principles underlying the selection and use of media are various. Teachers should be aware of them in order not to fall in the trap of purchasing unwanted material. One of the forefront issues is to be sure that uses of media are consistent with instructional objectives.

In any consideration of using media, at least three issues need to be discussed. First is the idea that one wishes to get across. The material must clearly present the idea or set of ideas better than one can without it. Second, one must match media to his/her objectives. A beautiful film on the topic one is considering may be a waste of instructional time if it does not contribute to meeting the learning objectives one has established for the class. Finally, one must consider his/her audience:

the material must be appropriate to their needs and interests.

Along these lines Brown[6] outlines several other specific guidelines for media utilization:

[1] No one medium is best for all purposes.

[2] Media uses should be consistent with educational objectives.

[3] Media users must familiarize themselves with content of the media they choose.

[4] Media must be appropriate for the instructional format.

[5] Media must be appropriate for student capabilities and learning styles.

[6] Media are neither good nor bad simply because they are either concrete or abstract.

[7] Media should be chosen objectively rather than on the basis of personal preference.

[8] Physical conditions surrounding uses of the media significantly affect the results obtained.

In regard to media selection criteria, care must be exercised as Fuhrmann[4] suggests:

> *"Media decisions should be made not for a gross entity of learning as large as a topic, but rather for groups of objectives that collectively make up the topic. Within a given topic, carefully designed combinations of media, where each performs a particular function, based on its attributes, and reinforces the learning effects of the others, may be required to achieve the kind of instruction for groups or individuals that is most effective."*

Brown[8] suggests the following guidelines for selection criteria:

[1] Purpose: For what specific instructional or informational objective will the item be used?

[2] Content: Is the content significant? accurate? up to date?

[3] Cost: Is the item worth the cost?

[4] Circumstance of use: Is the item appropriate to the environment and the audience?

As it can be seen, the proper selection and use of various media very often require the participation of teachers, school officials, professional specialists of several types and last not but least the students (see chart 3 in appendice A).

CHAPTER V

THINKING IN TEACHING

5.1 INTRODUCTION

Educational institutions exist for many purposes, including the preservation, organization, and transmission to new generations of old knowledge, the discovery of new knowledge, and the development of wisdom in the use of knowledge.

Additionally, educational systems as we know must follow the technological development the world is experiencing now. The ability to reason seems to be the component of education that goes hand in hand with such development.

As Grant states, "If higher order thinking is not promoted in the course of learning to read, compose, and calculate, a student may never have an opportunity to move beyond the literal interpretation of information." [25]

This chapter is aimed at analyzing the concept of thinking in education and the role of teachers in the actual process of teaching thinking. Further, it will emphasize the benefits derived from the practicing of critical thinking.

5.2 TEACHING CRITICAL THINKING

Several research studies on teaching have revealed, among others things, the efficacy of instructional teacher behavior, the importance of well-organized classrooms, and

the complex relationship between time and learning. However, little attention has been given to the content of teaching, i.e. the knowledge teachers teach students and how they communicate it effectively.

Very often teachers are engaged in making decisions to fulfill the needs of a particular group within situations that are complicated, changeable, unstable, peculiar and contain value conflicts. Grant suggests that effective teaching be based on successful translation and adaptation curricula into instructional activities suitable to diverse groups of students in particular contexts. [25]

For teachers to be able to teach critical thinking the mastering of knowledge on the subject matter is a crucial one. Additionally, pedagogical, knowledge as well as knowledge of the ways to transform and apply appropriate rules and subject matter in organizing particular classrooms for learning is also important.

The characterization of critical thinking has been a difficult one because of the lack of a common definition. Despite the variety over definitions, Grant outlines one well-established definition of critical thinking as:

* the ability to identify and formulate problems as well as the ability to propose and evaluate ways to solve them
* the ability to recognize and use inductive and deductive reasoning and to recognize fallacies in reasoning;
* the ability to draw reasonable conclusion from information found in various sources (written, spoken, tables, graphs), and to defend one's conclusions rationally; and,
* the ability to distinguish between fact and opinion."[25]

The pursuit of teaching critical thinking in school is justified if we take into consideration the rich-information world we live in. This is strongly reflected in the shaping of the concept of literacy, which has changed from the ability to sign one's name to the ability to function in society to the ability to reason.

The teaching of critical thinking is beneficial for teachers and students for many reasons. One of which is the breaking of the barrier between the classroom and the real world in the context of problem solving. Recognizing that the kind of tasks found frequently in life are of ill-structured nature, which are absent in classroom, students often do not get the opportunity to link the real world with academic work. Thus, teaching students to solve ill-structured problems would provide them with a greater transfer of learning since they must think in order to process given information into an output capable of generating new knowledge.

One striking question that comes to mind is what exactly means to teach students to think. To address this issue the analysis of thinking, or creative use of knowledge needs consideration. According to Evans it is useful to recognize several approximate and non-exclusive categories of "thinking". These includes:

Organization and correlation of ideas. This category of thinking involves the recognition of common factors among a variety of ideas. Consider, as an example, the correlation of electrostatic phenomena with gravitational phenomena, and the recognition of the basic common principles of the inverse-square law, of action-at-a-distance, and of field concepts. Recognition of the

similarities and the differences between apparently unrelated facts or principles is one kind of organizational thinking. Likewise, the important process of generalizing from limited data to a broad hypothesis could be included here.

Elaborative thinking describes the process of bringing many sources and types of information to bear on a new problem or situation. It includes some cases of reasoning by analogy and of carrying knowledge in one field over into a second field; it connects mobility of attack.

Critical thinking involves reflections on the consequences to be expected if a proposed action is taken. It includes evaluation of experiments, mathematical derivations, or political theories, often by comparison with a standard.[28]

In a word, teaching to think helps the student acquire the ability to apply his knowledge to new situations, i.e. to think.

5.3 AN APPROACH TO TEACHING THINKING

Two approaches have been advocated to teaching thinking. Most current psychological research places thinking directly within a context of subject matter. McPeck (1981) "affirms that thinking is always thinking about something. Proposing to teach critical thinking in the abstract, in isolation from specific fields or problem areas, is muddled nonsense; thinking of any kind is always 'thinking' about X."[25]

However, de Bono argues for direct teaching of thinking

as a separate skill. de Bono proposes his approach of teaching thinking in a set of sessions labeled as The CoRT approach. The acronym is derived from The Cognitive Research Trust. The CoRT approach crystallizes different aspects of thinking into definite tools.

5.3.1 THINKING IN ACTION

The de Bono Thinking Kit is a course made up of six segments that permits the teaching of thinking as a skill like any other skill, such as swimming, cooking.

According to the author the course covers many aspects of thinking. It is divided as follows:[27]

[1] CREATIVITY, DESIGN AND INNOVATION
[2] IMPROVEMENT, REVIEW AND PRODUCTIVITY
[3] PEOPLE, COMMUNICATION AND NEGOTIATION
[4] DECISION, CHOICE AND EVALUATION
[5] ACTION, PLANNING AND IMPLEMENTATION
[6] PROBLEMS, CRISES AND OPPORTUNITIES.

It is beyond the objective of this project to discuss in detail the contents of the above course. However, further consideration of this fascinating subject is strongly suggested. It must be said as well that the successful teaching of thinking as a skill depends largely on the teacher. The best material can only provide a framework from within which he can work. To further the discussion on the subject the bibliography lists some relevant material on the subject.

5.4 TEACHER'S ROLE IN THE EDUCATION PROCESS

"Students learn more when opportunities for learning increase, when they are actively engaged in activities, and when they are successful in solving problems presented."[25]

As pointed out before, specification of objectives, selection of learning activities, organization of learning activities, and specification of evaluation procedures would make teaching go smoothly. However, teachers, in the course of teaching, should reflect on their procedures to find out if anything is going wrong, and thus respond to it. At this point it is worth sacrificing the lesson framework as set forth and take corrective action.

According to Grant, a teacher's responsibility, is to create a work setting that promotes and supports learning. He goes on further by quoting Doyle (1986,p.424) "The key to a teacher's success in management appears to be his or her (a) understanding of the likely configuration of events in the classroom, and (b) skill in monitoring and guiding activities in light of this information." [25]

Therefore, teachers should be concerned with creating an environment which will capture the students attention and interest in the subject matter, as well as monitor and pace activities in order to maintain interest throughout the course.

Bearing in mind that good teachers are made not born, and that learning and teaching are parts of one general unit process, the teacher's role in teaching should include counseling as a part of the educational process.

No instructor can consider his job properly done merely by meeting his classes. He should be able to provide guidance and leadership to his students. This can best be accomplished through counseling sessions. Although it is time-consuming for both instructors and students, the benefits derived from it pay off the effort spent.

Counseling includes all the contact between the teacher and the student in and out of classroom. Teachers as counselors should listen to students and refrain from passing moral judgments. As Evans suggests "the teacher understands that for many questions there are no answers, and for many wrong there is no one person to blame. As a rule he does not give advice directly. He realizes that the formulation of the problem will make it objective enough for the student either to make a constructive attack on it or a sensible defense against it."[28]

If only teachers could keep in mind that their constant aim is to help the students understand themselves and thus be able to solve their own problems, educational institutions would become a better place.

CHAPTER VI

COMPUTERS IN EDUCATION

6.1 INTRODUCTION

"The computer is the most powerful new learning device since the invention of the printing press and textbook. The computer has the potential to solve most of our current educational problems. Within twenty years the computer will be the major delivery system for education at all levels and in practically all subjects areas, replacing books and lectures."[7]

Undoubtedly, in our modern information age teachers and school administrators cannot ignore the potentials of computers in education. The ability to handle the computer has become as important as the ability to read and write. This chapter on computers in Education addresses the issues relating to the use of computers either in education or in school. It is also intended to bring a sense of awareness to the CFN staff with regard to the application of computers in education.

6.2 COMPUTER LITERACY

In the highly technological society we live in it is obvious that a goal of every school program is to prepare students to cope with the demands posed on them by the society. It is estimated that 75 percent of all jobs today will involve computers in some way (Langhorne[18]).

Computer literacy has been conceptualized by Langhorne[18], as having three components: "knowledge about

computers, knowledge of computer applications, and knowledge about social issues pertaining to computers". In explaining his concept he suggests knowledge about computers to include basic instruction in the operation of a computer and how it works. For example students must know what the components of a system are, how to switch the computer on and off, and how to have a program running from a menu. These skills can be taught as students are required to use the computer to achieve various instructional goals.

With regard to knowledge of computer applications it refers to software and hardware designed to perform some specific job. Word processing is the most popular application of computer in schools today. The use of database and spreadsheet software are of essential importance in our information-rich world, since it is helpful in managing and manipulating information. Another software of great interest is graphics as well as CAD(Computer Aided Design). Again the skills in using such kinds of software are gained when students use them in a variety of subject areas.

Finally, the third component of computer literacy is an understanding of the social issues related to computer. When a school embraces itself in promoting the use of computers it is of paramount importance to establish some ethical aspects of utilizing the computer. This should conform to copyright regulations and of ensuring individual privacy. In addition, issues pertaining to the need for the students to be prepared for frequent job retraining during their lifetime, the impact of computer technology as we move from the industrial age to the information age must be addressed.

Langhorne[18] suggest the following approach for computer literacy as depicted in figure 6.1.

6.3 PLANNING FOR USE OF COMPUTER

In order for computers to have an impact on teaching and learning there must be a curriculum-related educational need for bringing them into schools.

Considering maritime industry activities a plan for computer-curriculum integration should reflect perspective on classroom organization and on educational needs and problems. Collins[7] outlines the following plan:

[1] Students use word processing software in language classes and in writing reports.
[2] Students use simulation software to develop inquiry skills in a series of science lessons.
[3] Students use computers for data capturing and analysis in a series of science lessons.
[4] Students use database management software to support the collection, organization, classification, and retrieval of information in a series of social studies lessons.
[5] Students use graphing software to develop skills in the display and interpretation of data in a series of science, engineering and social studies lessons.
[6] Students use a "real-world" information database to locate and evaluate information in senior year social studies and science lessons.
[7] Students use plotting software to develop skills in interpreting functional relationships and in

finding the roots of equations in a series of mathematics and engineering lessons.

[8] Students use the randomization capabilities of the computer in a series of probability and statistics lessons.

[9] Students use spreadsheet software to develop problem-solving strategies in a series of mathematics lessons.

In addition, the plan should incorporate some amount of programming to develop problem-solving strategies in a series of engineering lessons.

Teachers should reflect from time to time when, within the curricula, they can use computers to make a valuable contribution to teaching. A continuous assessment of computer usage should be done in order to check whether or not the plan is working. The general idea behind the plan is that teachers can make occasional use of classroom computers with minimal disruption of their routine and with definite benefits to their curriculum-related needs.

From the onset the relationship of the computer to curricula and educational needs should be clearly defined. In this regard the computer should be utilized as a tool to address educational needs relative to curriculum objectives and goals in various subjects.

The plan should be realistic concerning the resources available. A budget should be allocated to update existing facilities. It must not be forgotten that the introduction of computers into teaching should not require allocation of extra time, but it should be consistent with whole-class instruction organization.

6.4 THE COMPUTER AS A TOOL IN THE SCHOOL

Computers may not be regarded merely as an educational tool for students. They are beneficial when utilized by teachers, administrators, library media specialists, and counselors to assist with the many record-keeping and paperwork responsibilities associated with operating today's school. Such applications often provide more efficient and more versatile methods of accomplishing day-to-day tasks, and can result in improved education for students.

For school personnel to learn to use the various applications of computers each school should provide a place where, for example, teachers can work with computers to preview software, prepare materials, and plan lessons which involve computers.

One area of importance for teachers, as far as the application of computers is concerned, is word processing. Teacher proficiency at word processing will enable them to write course syllabi and prepare classroom materials, as well as prepare and store lesson plans. This is advantageous in the sense that correction and revision are easily done. Moreover, they can prepare attractive worksheets using the graphics programs and fancy font styles available.

Another aspect where the use of computers is advantageous for teachers is the record-keeping. Computerized record-keeping offers several advantages over computing grades from traditional grade books. The computer is able to calculate average, means, and standard

of deviation much more rapidly than can be done by hand.

The computer has had a profound effect on the way administrative functions are performed. One area of interest is the financial services. Budgeting, records, ordering and receiving of materials, inventories, and payroll are some of the services that can be performed by computer.

Computers can be used for scheduling of students into classes, making timetables, maintaining students' records and grade reporting.

Finally, one department of a school where the computer has great impact is the library. Since computers are particularly good at routine repetitive tasks, record-keeping is greatly supported. The computer has the potential to greatly reduce the time spent on routines such as filling circulation and catalog card, typing overdue notices, and preparing statistical reports. The major advantage of having a computerized library media center is that it saves a tremendous amount of time which in turn can be spent on working with students and teachers.

In a word, it can be said that microcomputer technology enables us to perform many of the routine duties associated with operating the school in a more efficient manner. Even more importantly, it improves our ability to manage and use all the information available to us within the school setting. To conclude, computer skills are essential for teachers and administrators.

CHAPTER VII

MARINE AND MARITIME CAREERS

7.1 INTRODUCTION

Cape Verde, being an archipelagic state, composed of ten islands and five islets, with a land area of 4033 square kilometers and with an overall area of approximately 52000 square kilometers, suggests that the pursuing of maritime related careers would enrich, if not guarantee the success of its development program. The strategic geographical position of Cape Verde makes it unique, in that it lies on the important shipping route of the Atlantic Ocean linking Europe to South America and North America with West and Southern Africa; hence developing careers in the maritime field is most important.

In order to be competitive in areas of maritime industry a nation should, at least, be able to provide the fundamentals and basic needs called upon by maritime activities. This chapter on Marine and Maritime Careers is aimed at identifying and analyzing the various career opportunities in this area which in turn might be worth considering, either in the near future or in the long run for the Development Policy of Cape Verde.

7.2 MARITIME ADMINISTRATION

A nation committed to developing its shipping industry as well as its maritime industry must have a sound maritime administration from the onset. This sector of

maritime industry deals mainly with legal and legislative matters. In some instances it has certain law enforcement powers in order to facilitate the implementation of its policy.

The offices within a maritime administration are numerous, but three are worth considering. One is that of protection of ports and harbours, and to patroling the coast and territorial waters. The coast guard is one sector of maritime administration that may have law enforcement powers owing to the nature of its functions.

Another activity of Maritime Administration is the handling of inspection of ships and licensing of seagoing personnel. These matters are dealt with by the Marine Inspection office. This office is primarily concerned with the promotion of safety and setting of standards.

Additionally, the Maritime Administration is concerned with making inquiries into marine casualties. This is dealt with by the Marine Investigation office. The function of this sector of Maritime Administration is of paramount importance since it provides means of improving standards and ways of reducing further accidents in the practice of maritime activities.

From the foregoing, opportunities in Maritime Administration careers are numerous, some of which are inspectors, surveyors, legislators, examiners, and so on.

7.3 MARITIME TRANSPORTATION

Historically, world trade has been almost entirely dependent upon shipping, ports and associated facilities and this situation is not likely to change within the foreseeable future. In fact the changes that have occurred are due to the increase in commercial and environmental pressures which are frequently, if not always, on a collision course. Cape Verde does not escape this reality, and its port authority must be able to cope with this situation.

Opportunities in maritime transportation may be divided into two separate areas, oceangoing opportunities and portside opportunities. Considering the temporary boom in the Capeverdean fleet and the recent construction of some maritime infrastructure, career development in all fields of maritime transportation is imperative.

7.3.1 OCEANGOING OPPORTUNITIES

Traditionally, oceangoing opportunities are those involved with the crewing of vessels, whether a barge, a towboat, a supertanker, or a container ship. The crew of a ship is divided into officers and ratings, and further down into departments according to the type of ship. Most frequently there are three departments aboard all ships, deck department, engine department and catering department.

The deck department comprises the captain or master,

chief deck officer, deck officers and able seamen. The functions of deck department personnel vary considerably from ship to ship. However, in any ship the master is the person responsible for the ship's operation and the safety of the crew, passengers, and cargo. He is assisted by the chief deck officer whose job includes assigning duties to deck crew and in managing personnel. The deck officers occupy other operational duties of the vessel.

The ratings of deck department, able seamen, consist the mainstays of the deck force on all oceangoing vessels. Their job is to handle all gear and deck equipment. In addition, they must steer the vessel according to the direct orders of ship's officers. Consequently, they must understand steering commands, elementary construction and parts of the ship, nautical terms, fog and distress signals, running lights, etc. In short, they must be well trained.

With regard to the engine department, the chief engineer is the person in charge. He supervises the engine department and its personnel and has responsibility for the safe and efficient operation of the engines and mechanical equipment. Serving under the chief engineer, the first assistant engineer supervises the engine room personnel. The maintenance of equipment and machinery falls under his direction. In addition, there are the second and third assistant engineers, who take care of other operational aspects of the department.

The ratings of engine department include oilers, wipers, electricians, and several other specialties. Again the type of vessel would determine the kinds of rating to be had on board. The duties of engine

department ratings are those related to cleaning, helping repair engine room equipment, servicing electrical motors and generators, and so on.

Finally, the catering department consists of the chief steward, chief cook, and messman. The chief steward functions include ordering of supplies, planning menus, and supervising meals. Additionally he heads the department and supervises the personnel. The chief cook assists the chief steward in his various tasks, and he is responsible for preparing the meals. Very often he is helped by the messman whose duties are to serve the meal, clean mess rooms, do the dishes, and in general keep the living quarters in good order.

Career development in those areas described above would certainly enrich the maritime community as well as promote safety and thus be compatible with commercial and environmental requirements. Besides, it must be realized that oceangoing careers are the starting point of other maritime related careers.

7.3.2 PORTSIDE OPPORTUNITIES

Thousands of tons of cargo move yearly through the ports in Cape Verde. Port and harbour facilities provide employment for stevedores, shipchandlers, cargo surveyors, and marine insurance underwriters, to name a few. Opportunities in this area of operation of maritime industry is a sensible one in view that it requires previous experience in the field. A potential source of input comes from previous seagoing careers.

Portside opportunities offer a wide range of choices, starting with stevedores and running up to port managers and harbour masters. In many countries, portside activities fall under the jurisdiction of a port authority whose functions include some or all of the following:

[1] Conservancy and provision of navigational aids.
[2] Provision of berth infrastructure.
[3] Provision of berth superstructure.
[4] Laying of moorings.
[5] Licensing of provision of works and structures by other bodies within the port.
[6] Cargo handling, warehousing, etc.
[7] Licensing of other bodies to undertake cargo handling, warehousing, etc.
[8] Licensing of moorings laid by others.
[9] Towage.
[10] Making of bylaws to regulate the activities of port users and other persons within the port.
[11] Provision of police service and security services.[24]

The prominent figure in the port authority is the harbour master. Whether in a small port or a large port it has become increasingly necessary for harbour masters to add to the professional skills they acquired as master mariners. Some general knowledge of harbour engineering will need to be acquired, together with a grasp of finance and accounting procedures.

The ultimate aim in developing careers in portside activities is that of building up a sensible, logical framework within which shipping can operate with minimum hindrance and maximum security, and still be compatible

with commercial and environmental pressures.

7.4 SHIP REPAIR

One way to take advantage of the strategic geographical position of Cape Verde is to be able to provide various services that the shipping industry requires. Ship repair activity is one which is worth considering owing to its potentials in the economic and social life of a nation. The development of this industry therefore has high career potentials.

In this area there is a spectrum of activities ranging from sheet metal workers to naval architects and marine engineers. Certainly ship repair yards vary in size, complexity of work to be performed, technology used, and so on. However for it to be efficient it must have properly trained staff and workers. The list below gives some opportunities available for a ship repair yard:

- Naval Architects
- Marine Engineers
- Production Engineers
- Safety Inspectors
- Machinist
- Drafters
- Electricians
- Welders
- Truckers
- Crane Operators
- Pipefitters
- Sand blasters
- X-Ray technicians

The tasks and roles of those jobs will depend greatly on the responsibilities of each one of them. Frequently the input source of ship repair personnel comes from a seagoing background. Here again, considering such persons because of their previous knowledge in the field may be advantageous for the yard.

The reason behind career development in the ship repair industry is the earning of reputation and consequently being able to gain the market from local competitors.

7.5 FISHING

Fishing plays an important role on life in Cape Verde since its direct product, fish, is one of the staple foods in the daily diet of the population. Furthermore, it is one of the few natural resources available and is the most practiced activity. It is known that more than 23000 families (roughly 30% of the population) are involved directly in fishing.

Despite being developed to some extent, further development or improvement of fishing is in need in order to optimize production and preserve its practice for years to come.

Recently fishing has become more a science than an art. Boats use technical equipment to locate schools of fish. Fishermen know far more than their ancestors did about fish behaviour, and catching strategies have improved ever since. Much of this technological innovation is a result of work done by fisheries scientists.

Fishing, being an extensive area for career development, is divided here into its main components and each one of them analyzed with regard to its potentials and its contribution to fishing in an overall perspective.

7.5.1 EDUCATION

Occupations in education may be characterized into two perspective. One has to do with a teaching career at the college level and the other is the education of the general public about the oceans, or marine educators. The latter gets involved in several activities; the preparation of publications for the media being the most important. Additionally they work with fishing information, oceanography, and coastal zone management, giving advice to fishermen, and keeping up with problems and trends in the industry. In general the work of marine educators is one of creating a good public awareness as well as boosting up the morale among fishsermen.

7.5.2 ADMINISTRATION AND MANAGEMENT

Administration and management are two occupations in the fishing career which are of extreme importance. The administration is concerned with the setting of standards and regulations, hence promoting safety and instilling confidence among fishermen. Additionally the administration is involved in planning programs, coordination of various activities and the execution and implementation of policies.

With regard to management, its importance lies in the work of maintaining and developing fish populations for recreational or commercial purposes. Persons working in this capacity pay close attention to the fish kills, monitor water pollution, estimate seasonal catches, reclaim fishing grounds, work with conservation groups, and inform the public about the general state of fishing.

The responsibilities of fishing administrators and managers have increased in importance lately due to the problem of over fishing that may damage the ecology of a region. In addition, the environmental campaign has made fishing practice stricter and stricter with regard to the method used.

A sound career development in fishing should not ignore the role that fishing administrators and managers play in the fishing industry.

7.5.3 SEAGOING FISHING CAREER

Fishing has been one of the oldest careers at sea, and it has been for quite a while a family affair, thus very often tradition overrules technical practice. However, with the increasing concern over safety and environmental issues, the pursuit of a seagoing fishing career has taken a different dimension. To ensure safe practice of fishing, including both safeguarding against unnecessary loss of human life and property and the protecting of the environment, proper training must be provided to fishermen. The training should include matters related to safe navigational practice, seamanship, basic meteorology, electronic equipment, fishing gear and methods, fish handling on board, and safety measures, including stability.

Career opportunities in the field of seagoing fishing activity include skipper, motorman, and fisherman. In order to cope with the technological development of fishing vessels, adequate specialization of the crew should be considered from time to time so that turnover of investments can be maximized.

7.6 OCEANOGRAPHY AND THE MARINE SCIENCES

"Before addressing technology for development and utilization of the oceans to provide basic needs, it is necessary to understand and characterize the oceans- their bounds, their resources and their dynamic process. Having such data and information enables users and researchers to intelligently and efficiently pursue their objectives in a systematic manner."[18]

The seas should not be regarded merely as a means of transportation or source of food. A lot more could be taken from the sea that might enrich the life of a nation. Although oceanography careers are difficult ones it should not be overlooked or left aside, it must be challenged.

Oceanography involves the utilization of many sciences applied to the study of the oceans. It attempts to explain the process taking place in the ocean through the principles of other disciplines, such as biology, chemistry, geology, meteorology, physics and mathematics. "Basically, oceanographers are professionally trained persons who use the sea as their laboratory for scientific study. As with all other professionals, each has a special interest within his or her chosen field."[18]

To name a few of the typical oceanography and marine science careers we have:

Atmospheric Oceanographers
Biological Oceanographers
Chemical Oceanographers
Geological Oceanographers

Oceanographic Engineers

Career development in the area of oceanography and marine sciences is worth considering due to its contribution to shipping and the maritime industry in general.

7.7 MISCELLANEOUS MARINE AND MARITIME CAREERS

Opportunities in marine and maritime careers are numerous and an attempt to include them all here would make this project too lengthy. However, hereunder are some related maritime careers that are considered important.

7.7.1 PILOT

Pilots take ships safely through ports and harbours. By law and by custom, ships must take aboard a harbour pilot as they prepare to enter a port to guide the ship to its berth. At a prearranged location, harbour pilots meet and go aboard ships. Pilots then also guide the vessels out of port.

Many years of experience aboard ships or towboats are necessary in order to become a pilot. As with other maritime personnel, pilots must have a license. One other requirement of importance is the ability of pilots to have command over English since it is the international nautical language. This aspect should not be overlooked because good communication is to be maintained at all times.

Recognizing that safety is vital for every port and that pilotage enhances it, career development in this field of maritime industry is of paramount importance.

7.7.2 ADMIRALTY LAW

Very often commercial trade takes place beyond the national borders of a country, and it is regulated by internationally agreed procedures. Therefore today's legal-minded society does not escape the marine and maritime community. An admiralty law career offers interesting, valuable, and profitable employment.

To safeguard Capeverdean maritime interests, admiralty lawyers must be prepared to respond to the legal questions arising from the practice of maritime activities, both in national context and international context. They must know the international maritime laws, as well as international conventions that their countries have adopted.

Admiralty law is one specialty in the study of law, hence lawyers in admiralty law must have a previous education in law. Their training should include courses dealing with the following subjects:

Admiralty	Marine Insurance
Coastal Law	Marine Pollution
International Law	Water Law
International Convention	Ocean Law.[19]

Career development in admiralty law is the backbone of any maritime development policy since litigation is

inevitable in this area of activity.

7.7.3 MARINE ARCHAEOLOGY

Historical facts indicate the existence of a number of sunken ships and treasures around the territorial waters of Cape Verde. This is mainly due to the practice of acts of piracy that took place during the last three centuries when shipments of wealth were being brought from Africa and the Far East to Europe.

For many years marine archaeology remained on the dark side mainly because of a lack of expertise to develop it; things have since changed. Recently, the development of scuba equipment, undersea vehicles, and systematic procedures for rescuing artifacts from the sea and reconstructing them ashore have contributed to advancing the academic discipline of archaeology.

In order not to be caught by surprise some thought ought to be given to career development in the area of marine archaeology, not only as a source of income but as well as for its contribution to our understanding of the past.

7.7.4 COMMERCIAL DIVING

For many years scuba diving has had the status of a hobby. Most of the time people dive to explore the underwater beauty, however the technological development has contributed to making scuba diving a profession.

Keeping in mind the development program that Cape Verde is undergoing in relation to the building of maritime infrastructures, commercial diving opportunities offer great potentials. Specific jobs in this industry vary greatly in terms of skills and work situations. The following is a sample list:

Anchor and cable inspection	Salvage
Pier construction and inspection	Search and recovery
Flowline installation and inspection	Wreck removal
Harbour and deck construction	Underwater painting
Pipeline installation and inspection	Dredging
Underwater photography and television	Cable laying
Marine environmental control work	Navigational aid.

Many of these jobs require additional skills as well as good diving ability. "Diving can be exploited to further another career. If you have the ability to weld, or take photographs and combine it with diving, your career can prove interesting and finanoially rewarding."[18]

7.7.5 MARINA FACILITIES

Considering the strategic geographical location of Cape Verde in the crossing of the Atlantic the development of marina facilities seems to be beneficial for the archipelago.

In 1978, during the winter months in the northern hemisphere, more than seventy sailing yachts called at Sao Vicente. In subsequent years well over a hundred yachts have been calling at Porto Grande in Sao Vicente every year. Yet very little effort has been made to take advantage of this potential.

The development of marina facilities should include the promotion of nautical sports, creation of a school to train for sailing boats, motor racing and wind surfing, and provision of services for the maintenance of such crafts. Additionally, it should include the construction of jetties to berth the sailing yachts.

Taking into account that the commercial and industrial sectors are important activities around marinas, its development would certainly have a profound impact on the socio-economic life of the area.

To summarize, shipping and maritime industries are complex and their success depends greatly on the combined efforts of all their components. These components do not stand alone, and they are only effective and consistent when taken together.

CHAPTER VIII

CONCLUSION AND RECOMMENDATIONS

8.1 CONCLUSION

As stated earlier, the creation of CFN was a good step in the right direction, and additional steps to guarantee its successful operation must be seriously considered. The problems facing CFN are presented hereunder, and subsequently addressed in the recommendation part of this project.

CFN has had a mixed management in the last six years, and poor contact between them has prevailed ever since. The ability to make decisions has been greatly impaired due to this situation.

There has been no consensus on how to run the three departments with regard to the school calendar. In the radio the electronics department there are courses that run on a yearly basis, whereas in the other departments, courses are semester based.

The teaching staff of CFN are either former ship officers or recent graduates from colleges with no pedagogical knowledge. In many instances they end up with a high teaching work load.

The administrative work of CFN with regard to issues of admission, registration, record keeping, financial and social affairs has not lived up to its promises. In fact,

most of the administrative functions of the school are performed by the teaching staff or assisted by them.

Despite having a considerable number of students, a student association at CFN is non-existent. In addition, at least one hundred students have graduated from CFN in the past six years and an alumni association is also non-existent.

Coordination of departmental work has been given very little attention, mainly because of the lack of dialogue among teachers as well as with the department heads. Interrelated courses are taught separately without any regard to the whole instructional context. This situation is most prevalent when part-time teachers are contracted.

Grading policy has been a controversy at CFN. There are no uniform criteria for evaluations among the departments. As a result of this situation a few students have been unfairly mistreated.

Computer facilities at this moment are non-existent. This is attributed primarily to the fact that very little knowledge about computer use in education is known. Furthermore, computer literacy among the teaching staff is lacking.

It seems that students see very little relationship between the classroom work and real-life situations. Very rarely teachers approach the concept of reasoning when teaching new material. This is reflected when students wonder why they are studying such courses.

Despite having material resources as well as human resources, CFN very rarely exploits these resources fully. It seems that there is an enormous inertia to overcome when it comes to promotion of extra-curricular activities.

There is no contact between the CFN and the ministry of education even though the source of this segment of education is greatly dependant on the high schools which are run by the ministry of education.

In concluding, I wish to stress that despite the problems CFN faces, it is an institution of great importance to the life of Cape Verde. I strongly believe that the success of CFN is dependent on the national staff for its contribution, and upon hard work and team effort at various level. With this kind of attitude in mind many problems may be solved regardless of constraints in financial areas or of any other areas.

8.2 RECOMMENDATIONS

The following are hereby recommended for possible improvements at CFN based upon the findings contained in this project.

1 School year activities should be planned well in advance, two to three months before the opening of the school year. The school year should start in the first week of September so it can be in tune with other educational institutes.

2 CFN should operate under a quarter system. Quarters may be of eleven or twelve weeks plus one additional week allocated for exams. Classes should be held in three quarters within a year. This system would greatly optimize the use of teaching staff and facilities, and thus lower costs to some extent.

3 A calendar should be designed and proposed for the whole school, i.e. including all departments. The calendar should specify the weeks of classes, exams, vacations and any holidays that might occur during a quarter. All efforts should be made to follow the calendar strictly.

4 Curricula of all departmental courses should be designed, by writing the curriculum aim, specifying the objective of every course being taught, defining the evaluation criteria to be used and discussing their purpose. Procedures should be uniform for the whole school, i.e. including all three departments.

5 Scheduling for teachers should include time for weekly meetings within departments, and monthly within the school. These meetings are to give teachers opportunities to reflect on their progress and seek to find out if anything is going wrong, taking corrective action when appropriate. Frequent teacher contact among themselves is strongly recommended.

6 Teachers should be aware of the teaching techniques and methods available so that they can best use them. The following is list of some good attributes a teacher should

master:

[1] make a careful plan of what is expected to be accomplished.

[2] prepare adequate notes and master them so that an occasional glance is all that is needed.

[3] collect all teaching aids which are intended to be used. Make sure that demonstration experiment will work, that models used are in good shape, and that enough copies of any graphs or other material to distribute are available.

[4] no subject and no individual lecture can cover everything pertinent to the topic. Make a considered selection of the most important or the most stimulating material, allowing time for questions and discussion by the students as well as for necessary repetition and summary.

[5] plan provocative questions and illustrative problems and situations in order to arouse student's interest, his oral discussion, and his critical evaluation of the material.

[6] review frequently the standings, needs, difficulties, and special abilities of individual students.

7 Teachers should exercise care in preparation of an examination to make sure that it measures what it is supposed to measure, or in a word, that the test is appropriate. It must also be reliable in its measurement of a subject.

8 Grading policy should be uniform and invariable when used among instructors, among courses or among departments. The grading system should be clearly defined

and uniformly understood by all concerned.

9 The teaching staff should not be allocated more than two different course per quarter and no more than four courses a year. It must be realized that quality overrides quantity.

10 Provisions should be arranged to carry out frequent inventory (twice a year) on teaching and training aids. Evaluate their condition, maintain them, and recommend proper action where applicable.

11 Teaching staff should be informed of the availability of teaching and training aids in the school. After selecting proper aids to be used during the course of the school year, these items should be thoroughly checked and the right mode of operation ensured.

12 In order to make CFN versatile and enhance its dynamic role in the development of the maritime industry, its function should be expanded. This expansion should include offering courses, such as port safety, marine safety, fishing, diving, environmental protection, maritime English and so on.

13 Officials responsible for fishing should work together with CFN staff to mutually assist each other as an attempt to improve standards and share knowledge and information. This approach would certainly enrich fishing practices.

14 CFN should involve itself in the promotion of seminars and workshops to serve the local maritime

community. This may be done together with other maritime offices interested in the venture. Additionally CFN should offer certain courses for existing ship officers and ratings in order to upgrade their license documentation. These courses may include the following:

[1] Tanker operations
[2] Inert Gas systems
[3] Crude Oil Washing systems
[4] Chemical product carrier operations
[5] LNG and LPG carrier operations

15 The engine department curriculum needs revision with respect to teaching pneumatic and hydraulics control as applied to maintenance and operation of automated equipment. The curriculum of the refrigeration plant course needs revision as well, especially when it comes to maintenance and operation of such installations.

16 Teaching of the English language should be upgraded. One way of doing it is by increasing the working load of English teaching as well as extending it through later years of education. In addition, effort should be devoted to the extensive use of the language laboratory. The English teaching staff might be increased to achieve this goal.

17 Continuous teacher training should be arranged at all levels. The training might be done locally in some cases. One aspect of training that is badly in need is computer literacy. A phase in to a computerized system should be worked out within one year due to its relevance to today's education process.

18 In regards to utilization of computers in education, the CFN management should consider purchasing the following computer hardware for the initial phase of introduction of computers to education:

6 microcomputers
- 4 80286 machines VGA color monitor
- 2 80386 machines VGA color monitor

2 printers
- 1 standard size paper
- 1 wide size paper

2 internal modems

The microcomputers should be IBM compatible and have two size floppy drives (3.5" and 5.25"), and hard drives of 40 Mb with RAM not less than 1 Mb. Additionally some software packages should be bought. This would include spreadsheet, data base, word processing, and design packages (autocad, medusa, lumina). A computer specialist should be hired to handle both the hardware and software aspects of its operation. Continuous assessment of the initial phase is to be done in order to advise further expansion.

19 The library at CFN should be expanded so it can fulfill the demands of literature in the maritime field. A budget should be allocated for such expansion. Competent staff should be hired to have a properly run library. Computerization of the library should be considered for its efficient operation. Yearly inventory of the library is to be done. Operational procedures should be posted to inform users of basic rules to be observed. Effort should be made to teach students how to use reference materials in the library.

20 It is strongly recommended that the relationship between teacher and students be given some attention with the aim of bridging the gap that often exists between them. The schedules of teachers and students should include some time where they meet regularly on a personal basis. Teachers should direct their attention and their planning at individual students, not to the class as an impersonal body of people. It is the individual student who counts.

21 Provisions should be made for teachers at CFN to have contact with the maritime administration to closely follow their activities and assist in carrying out some of its functions. To mention a few, marine inspection, marine casualty inquiry, licensing and training of its staff.

22 The ministry responsible for CFN should consider making efforts to make CFN a regional maritime institute serving Portuguese speaking countries in Africa. Keeping in mind the role that MINCONMAR (Ministerial Conference of West and Central African States in Maritime Transport) played in the regionalization of the Regional Maritime Academy in Acra and in Abidjan it seems appropriate to deal with this matter by the forum of which Cape Verde is a member.

23 Considering that the archipelago of Cape Verde is one of four in the east Atlantic, and due to its similarity and proximity with the Azores, Madeira and Canaries, CFN, through the competent government office, should seek opportunities to have regular contacts in all aspects of maritime activities with the above mentioned archipelagos. This eventual interchange would definitely enhance the

role that CFN plays on the overall maritime policy of the country. At first, contacts should take place in the form of mutual visits to assess potential areas of cooperation.

24 The teaching staff of CFN should get involved in the production of technical work concerning maritime matters. Such production may be published in the local media, through newspapers or radio talks.

25 CFN should engage itself in rendering services to the maritime community as a means of supplementing its budget.

26 The CFN management should help students create an association within the school in order to promote social activities. The school budget should include expenses related to sports and social activities. Additionally, the CFN management should consider the possibility of creating an alumni association which might turn out to be of great help to CFN in years to come.

27 The administrative management of CFN should be given top priority before it gets to late. The concern includes topics such as record keeping, registration procedures, and admission policy. A statistical inventory should be carried out to gather information to permit a forecast of activities relating to student population, drop-out rate, failure rate, and so on.

28 Very often the teachers of CFN go abroad in pursuit of technical expertise in various areas. However, very little attention has been given on how to communicate this expertise to the rest of the teaching staff. It seems

that if a teacher, after returning home, were required to give a debriefing of his stay abroad it would certainly enrich the content knowledge of the remaining staff. This debriefing could be done in a round-table discussion with the presentation of a written report.

29 The CFN management should pay attention to the problem of motivation and incentive. It is unfortunate that very often people have a tendency to consider motivation and incentive from the material point of view. Despite the potential of material reward for one's accomplishment it should be remembered that respect and recognition for one's accomplishment may be the strongest reward. I feel that this problem is directly related to the high attrition rate of teachers.

30 Regular contact between CFN and the ministry of education is strongly encouraged. Any relevant information related to education should be shared between those two institutions at their respective level of operation. Furthermore CFN should propose that the ministry of education include some marine science courses in the high-school curriculum.

31 CFN should lead a campaign to promote the practice of nautical sports. One possibility of doing this may be by working together with existing local nautical club and the municipal authority. In the early stages this promotion should start in Sao Vicente. As an initial step CFN should include in its curricula nautical sports programs.

APPENDIX A

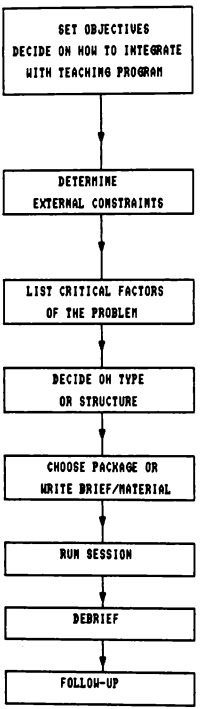
TABLE A - BASIC FEATURES OF CAPE VERDE ISLANDS

	Islands and Islets	Population (1990)		Altitude Maximum (m)	Area Approximated (Km^2)
		Number	Density (inhabitants/Km^2)		
W	Santo Antão	45030	57.8	1979	779
I	S. Vicente	62710	276.3	725	227
N	Santa Luzia	-	-	395	35
D	Branco	-	-	327	3
W	Raso	-	-	164	7
A	S. Nicolau	12630	36.8	1304	343
R	Sal	8150	37.7	406	216
D	Boavista	3110	5.0	387	620
L	Maio	4560	17.0	436	269
E	Santiago	199310	201.1	1392	991
E	Fogo	34580	72.7	2829	476
W	Brava	6610	103.3	976	64
A	Grande	-	-	95	2
R	Luís Carneiro e Sapado	-	-	32	0.22
D	Cima	-	-	77	1.15
TOTAL		**376,690**	**94.1**	**2829**	**4033**

Porto Grande (S. Vicente)																
126	Ushuaia (Fuego)															
119	129	Palomito (Sal)														
132	136	18	Puerto de Leon (Sal)													
25	146	126	136	Puerto de Sal (S.ta Antão)												
130	25	149	158	153	Faros (Brava)											
154	69	99	101	165	80	Porto de Mos-t (Maio)										
8	128	121	132	21	131	160	Porto Rave (S.ta Antão)									
160	49	116	113	173	69	21	152	Praia (Santiago)								
58	92	76	92	70	106	105	61	117	Pregoiça (S. Nicolau)							
130	105	37	38	139	126	67	142	83	80	Sal-Rei (Boavista)						
130	18	144	151	147	10	72	133	61	101	121	S. Filipe (Fogo)					
22	107	103	114	35	113	132	25	138	37	112	112	Santa Luzia (S.ta Luzia)				
127	124	12	11	133	145	92	128	108	80	27	141	139	Santa Maria (Sal)			
24	133	143	152	23	133	131	24	169	75	150	135	40	92	Tarrafal (S.ta Antão)		
44	93	86	99	58	104	110	48	19	14	88	92	24	90	64	Tarrafal (S. Nicolau)	
128	36	98	106	140	59	38	132	35	83	73	52	105	94	138	86	Tarrafal (Santiago)

CHART NO. 1

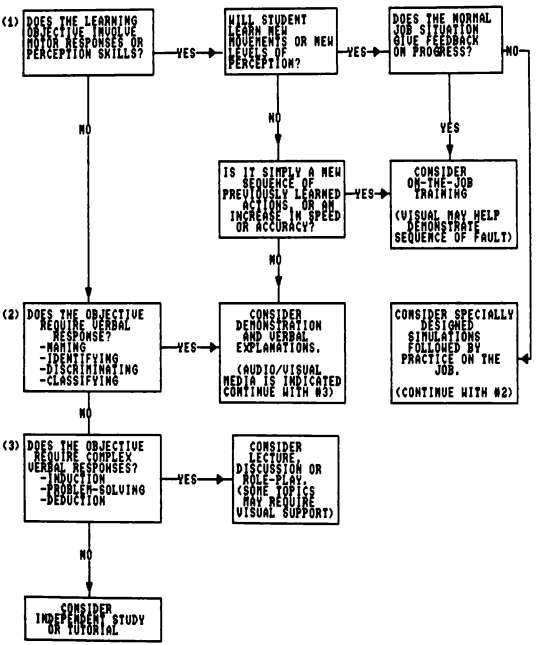
FLOW CHART FOR USING ROLE-PLAY



REFERENCE 11

CHART NO. 2

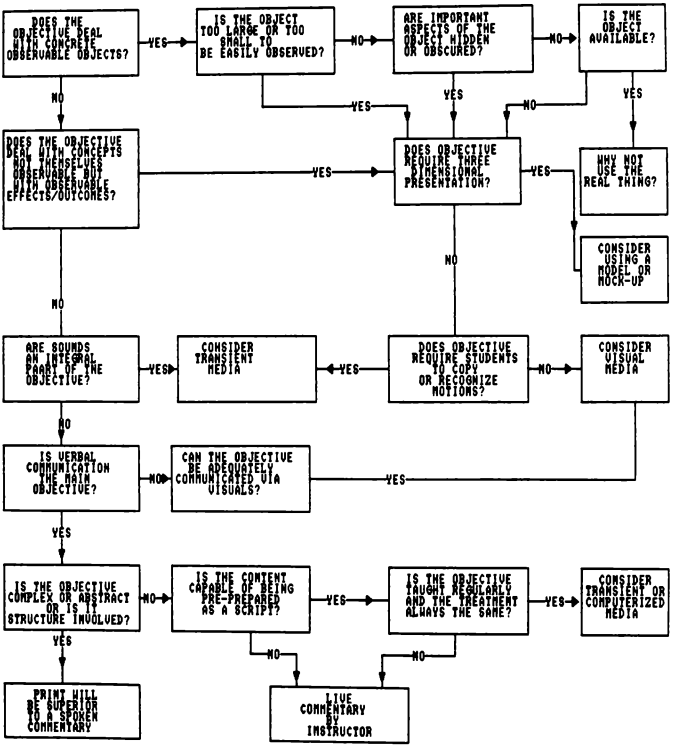
METHOD SELECTION ASSISTANCE CHART



REFERENCE 17

CHART NO. 3

SUPPORTING MEDIA SELECTION ASSISTANT CHART



REFERENCE 17

TABLE 2.1 TYPES OF ROLE-PLAY

FUNCTION / PROTAGONIST		STUDENT(S) PLAYING			TUTOR	OUTSIDERS
		SELF	OTHER STUDENT	OUTSIDE PEOPLE		
A	DESCRIBE To illustrate, demonstrate problem/ situation/ process	A1 Look, this is how I see the situation.	A2 Is this the situation you found yourself in?	A3 This is how that type of person behaves.	A4 Let me show you what the situation is.	A5 This is our situation.
B	DEMONSTRATE To demonstrate technique	B1 This is how I do it.	B2 This how you might do it.	B3 They use this method.	B4 Let me show you how to deal with this situation.	B5 This is how we would handle the situation.
C	PRACTISE To practise skill	C1 I'll try to improve the way I do this.	C2 I'll copy what you show me.	C3 We'll improve our technique by putting ourselves in this situation.	C4 You can practise on me.	C5 You can practise on us.
D	REFLECT To give feedback	D1 I take a look at myself from within.	D2 This is how you appeared to me.	D3 Now I understand the reasons for their behaviour.	D4 This is how you appear to others.	D5 This is how you appear to us.
E	SENSITIZE To increase awareness/ sensitivity of situation/ others	E1 Now I feel more consious of my feeling.	E2 Is this the effect I have on you?	E3 Now I understand what others must feel like.	E4 Lend me yours ears.	E5 Document-ary drama.
F	CREATE/ EXPRESS	My actions express my feelings.				

REFERENCE 11

REFERENCES

1 Derek Rowntree, Developing Course for Students
Harper Education Series
First published 1981 by McGraw-Hill Book Company (UK)

2 Allen H. Miller, Course Design for University Lecturers
Kogan Page, London Nichols Publishing Company, New York
First published in Great Britain in 1987 by Kogan Page

3 Robert L. Ebel/David A. Frisbie, Essentials of Educational Measurement
Prentice-Hall, INC., Englewoods Cliffs, New Jersey 07632
First published in 1965 by Prentice-Hall

4 Barbara Schneider Fuhrmann/Anthony F. Grasha
A Pratical Handbook for College Teachers
Little, Brown and Company

5 Greg Kearsley, Training and Technology- A Handbook for HRD Professionals
Addison-Wesley Publishing Company
First published in 1984

6 James W. Brown/ Richard B. Lewis/ Fred F. Harcleroad
Av Instruction Technology, Media, and Methods
McGraw-Hill Book Company
First published in 1985

7 Bettis Collins, Computers, Curriculum, and Whole-class Instruction. Issues and Ideas

8 Wilbert J. McKeachie, Teaching Tips. A Guidebook for the Beginning College Teacher
D.C. Heath and Company

9 Edward de Bono, Thinking in Action
The de Bono Thinking kit
BBC Education & Training

10 David Newble/ Robert Cannon
A Handbook for Teachers in Universities & Colleges
A guide to improving teaching methods
Kogan Page
First published in Great Britain in 1989

11 Morry van Ments, The Effective Use of Role-Play
A Handbook for Teachers and Trainers

12 Prepared by a Massachusetts Institute of Technology Faculty Committee under the chairmanship of Professor Robley D. Evans
You and Your Students

13 George Brown/Madeleine Atkins, Effective Teaching in Higher Education
Methuen London and New York
First published in 1987

14 Grace E. Grant, Teaching Critical Thinking
Praeger
First published in 1988

15 David Pratt, Curriculum Design and Development
Harcourt Brace Jovanovich, Publishers
First published in 1980

16 Mary Jo Langhorne/Jean O. Donham/ June F. Gross and Denise Rehmke, Teaching with Computers " A New Menu for the 90's
Kogan Page, London
First Published in Great Britain in 1989

17 Marine Safety School
USCG Reserve Training Center Yorktown, Virginia

18 Marine Technology Society Journal
Vol. 24 Number 1 March 1990

19 Wm. Ray Heitzmann, Opportunities Marine and Maritime Careers
VGM Career Horizons
First published in 1988

BIBLIOGRAPHY

1 Richard Lobban and Marilyn Halter, Historical Dictionary of the Republic of Cape Verde
Second Edition
The Scarecrow Press, Inc. Metuchen, N.J., & London
1988

2 George Brown, Lecturing and Explaining
First published in 1978
by Methuen & Co. Ltd.

3 Edward de Bono, Teaching Thinking
Published by Penguin group in 1978

4 **Elementos para Apreciação da Evolução Socio-Económica em Cabo Verde** -
Ministério do Plano e da Cooperação, Março 1989.

5 **Roteiro do Arquipélago de Cabo Verde.**