

**THE STRATEGIC FINANCIAL EVALUATION OF
HUMAN RESOURCES DEVELOPMENT
PROGRAMS BY
SOUTH AFRICAN FIRMS**

by

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Summary

Human resources development plays an important role in the firm by improving productivity, and hence the competitive advantage of the firm. The strategic evaluation of human resources development programs is also important, in that such programs commit a firm's financial resources for a long period with uncertain results.

In this study, a method is developed to strategically evaluate human resources development programs. The evaluation method is based on the capital budgeting process. Capital budgeting techniques are a common methods of evaluating long term investments in firms.

This study is divided into two main sections. Firstly, a literature study of the subject of human resources development and capital budgeting

is undertaken. Based on this study, elements to include in the strategic financial evaluation method are established.

Secondly, an empirical study is conducted to determine whether South African firms can use the proposed method to financially evaluate human resources development programs. Using the proposed method as a basis, a questionnaire was determined and tested. The questionnaire was applied to a sample of South African companies, after which the results were reported. Descriptive statistics as well as advanced statistics indicated the following:

- South African firms do financially evaluate human resources development programs.
- South African firms can use the proposed method to financially evaluate human resources development programs.

In conclusion, recommendations on the strategic financial evaluation of human resources development programs by South African firms, are provided.

TABLE OF CONTENTS	PAGE
ACKNOWLEDGEMENTS	iii
DECLARATION	iv
TABLE OF CONTENTS	v - xi
LIST OF TABLES	xi - xiii
LIST OF DIAGRAMS	xiv
ANNEXURES	xv

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5. All other people who contributed towards making this dissertation possible.

A S DHLAMINI

DECLARATION

I declare that:

**“THE STRATEGIC FINANCIAL EVALUATION OF HUMAN
RESOURCES DEVELOPMENT PROGRAMS
BY SOUTH AFRICAN FIRMS”**

is my own work, that all the sources used or quoted have been indicated and acknowledged by means of complete references, and that this dissertation had not previously been submitted by me for a degree at any other university.

**A S DHLAMINI
JANUARY 1999**

TABLE OF CONTENTS

	Page
CHAPTER 1	
INTRODUCTION AND PURPOSE OF THE STUDY	
1.1 Introduction	1
1.2 The statement of the problem	4
1.3 The necessity for the study	6
1.4 The scope of the study	8
1.5 Research methodology	8
1.5.1 Primary Research	9
1.5.2 Secondary Research	10
1.6 Plan of the study	10
1.7 Definition of Concepts	12
1.8 Reference techniques	13
1.9 List of Acronyms	13

CHAPTER 2.

THE NATURE OF HUMAN RESOURCES DEVELOPMENT PROGRAMMES

2.1	Introduction	14
2.2	Human resources development programme	15
2.3	Assessing and identifying training and development needs	18
2.3.1	A definition of needs	18
2.3.2	The importance of needs analysis	21
2.3.3	Types of needs analysis	23
2.3.4	Methods of needs analysis	25
2.4	Training and development objectives	28
2.4.1	Definition	28
2.4.2	Reasons for writing objectives	29
2.4.3	Classification of objectives	30
2.5	Instructional programme design	31
2.5.1	Introduction	31
2.5.2	Selecting content	32
2.5.3	Sequencing content	33
2.5.4	Selecting instructional strategy	35

2.6	Programme evaluation	39
2.6.1	Introduction	39
2.6.2	The nature of evaluation	39
2.6.3	The purpose or role of evaluation	41
2.6.4	Approaches to evaluation	44
2.7	Conclusions	58

CHAPTER 3

THE NATURE OF CAPITAL BUDGETING

3.1	Introduction	60
3.2	Definition of capital budgeting	61
3.2.1	The concept - capital expenditure	62
3.2.2	The concept - capital budget	63
3.2.3	The concept - capital budgeting	64
3.3	The capital budgeting process	65
3.4	Cash flow analysis	67
3.4.1	Introduction	67
3.4.2	The initial investment	72
3.4.3	Net operating cash flows	73
3.4.4	Terminal cash flows	74

3.5 Capital budgeting techniques	75
3.5.1 Introduction	75
3.5.2 Payback period/method	76
3.5.3 Accounting rate of return (A.A.R.)	77
3.5.4 Net present value (N.P.V.)	78
3.5.5 Internal rate of return (I.R.R.)	79
3.5.6 Profitability index (P.I.)	80
3.5.7 Conclusions on capital budgeting techniques	81
3.6 Risk in capital budgeting	82
3.6.1 Introduction	82
3.6.2 Risk assessment techniques	83
3.6.3 Risk adjustment techniques	84
3.7 Conclusions	86

CHAPTER 4

THE FINANCIAL EVALUATION OF HUMAN RESOURCES DEVELOPMENT PROGRAMMES

4.1 Introduction	88
4.2 Financial evaluation techniques	89
4.2.1 Cost-effectiveness analysis	90
4.2.2 Cost-benefit analysis	91

4.2.3	The return on investment	91
4.3	Human resources development programme costs	93
4.3.1	Introduction	93
4.3.2	Cost in human resources development	93
4.3.3	Costing systems in human resources development	96
4.4	Benefits in human resources development programmes	106
4.4.1	Introduction	106
4.2.2	The nature of benefits	106
4.5	Proposed model on the financial evaluation of human resources development programmes	112
4.5.1	Introduction	112
4.5.2	Proposal generation	114
4.5.3	Review and analysis	115
4.5.4	Decision making	116
4.5.5	Implementation	117
4.5.6	Follow-up	117
4.5.7	The assumption underlying the proposed model	118
4.6	Conclusions	118

CHAPTER 5

EMPIRICAL INVESTIGATION

5.1	Introduction	120
5.2	Sample design	121
5.2.1	The definition of the population	121
5.2.2	The identification of the sampling frame	122
5.2.3	The size of the sample	124
5.2.4	Sampling procedure	125
5.3	Survey design	125
5.3.1	Introduction	125
5.3.2	Questionnaire design	126
5.3.3	Data collection procedure	129
5.3.4	Validity and reliability of measurement	130
5.4	Data analysis	134
5.4.1	Introduction	134
5.4.2	The inspection procedure	136
5.4.3	The editing process	138
5.4.4	The coding procedure	138
5.4.5	Transferring the data	139

5.4.6 Preliminary data analysis	139
5.4.7 The search for relationships	149
5.5 Conclusions	160
CHAPTER 6.	
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	
6.1 Summary	161
6.1.1 Introduction	161
6.1.2 Literature review	162
6.1.3 The empirical research	170
6.2 Conclusions	172
6.2.1 Chapter one	172
6.2.2 Chapter two	172
6.2.3 Chapter three	173
6.2.4 Chapter four	174
6.2.5 Chapter 5	175
6.3 Recommendations	177
6.4 Further research	179
6.5 Conclusion	179

<u>LIST OF TABLES</u>	Page
Table 2.1 Purposes of conducting HRD evaluation	43
Table 2.2 Measuring techniques appropriate to Hamblin's model	52
Table 2.3 The relationship between the terminology used in evaluation by different authors.	56
Table 3.1 Cash flow estimates for HRD programmes	71
Table 3.3 Comparative usage of capital budgeting techniques	82
Table 3.4 Risk adjustment methods used in a other countries	85
Table 4.1 Financial methods used to evaluate HRD programs	92
Table 4.2 Estimation of costs and benefits	95
Table 4.3 Kearsley's classification of training and development costs	97
Table 4.4 Phillip's classification of training and development costs	98
Table 4.5 A detailed Phillip's cost classification on account of process/functional categories	100
Table 4.6 Bramley's classification of training and development costs	101
Table 4.7 Fitz-enz's costs classification	102
Table 4.8 A summary of decision rules used in capital budgeting	117
Table 5.2 A summary of the content and format of the questionnaire	129
Table 5.3 The Cronbach's Alphas for Section A and B of the questionnaire	132
Table 5.4 The number of responses per type of business	137

Table 5.5	Indicates the responses for the different categories of Section C of the questionnaire	140
Table 5.6	Indicates the responses for the different categories of Section A of the questionnaire	141
Table 5.7	Responses for the different categories of Section B of the Questionnaire	143
Table 5.8	A summary of the descriptive statistics of the various categories of Section A and B of the questionnaire	146
Table 5.9	Indicates the different situations where different motivational techniques can be used.	152
Table 5.10	The results of the test to establish relationship between Section A and C of the questionnaire	154
Table 5.11	The relationship between the size of the firm (based on the number of employees) <u>and</u> the programme evaluation	157
Table 5.12	The relationship between the size of the firm (as indicated by annual turnover) <u>and</u> the programme evaluation	159

<u>LIST OF DIAGRAMS</u>	PAGE
Diagram 2.1	Illustration of the training needs gap 20
Diagram 2.2	Hamblin's evaluation levels 50
Diagram 3.1	The capital budgeting process 67
Diagram 4.1	The different phases in the life-cycle approach 104
Diagram 4.2	Thomas, Maxam and Jones benefits framework 108
Diagram 4.3	Kearsley's benefit analysis model 110
Diagram 4.4	The proposed model to strategically and financially evaluate human resources development programmes 113
Diagram 5.1	Section A of the questionnaire 142
Diagram 5.2	Proposal generation – Section B of the questionnaire 142
Diagram 5.3	Review and analysis: Section B of the questionnaire 143

ANNEXURES	PAGE
Bibliography	180
Annexures	188

1. ORIENTATION

1.1 INTRODUCTION

The world economy has during the past decades undergone rapid and radical transformation. As the 21st Century is rapidly approaching, firms around the world are experiencing changes at an unprecedented level and pace (Longenecker, Simonetti and LaHote, 1998:154). Brews (1988:33) provides an interesting analysis of the unprecedented technological advances that the present world economy is presently enjoying.

- In the field of manufacturing, there has been a move away from electro-mechanical manufacturing processes to computer-controlled manufacturing systems suited to high-quality, low-volume, low-priced manufacturing.
- In the field on information technology and information management, the revolution has been equally pervasive.
- In the service sector, there is a marked development of global markets, facilitated by the parallel appearance of a global communications network.

Today every firm in every country, small or large is affected by global competition (Kotler, Armstrong, Saunders and Wong, 1996:3). Firms the world over may develop and maintain a strategic fit between its goals and capabilities and the changing

global economy. The capabilities of firms may be improved by the development of human resources.

In this study, companies may be referred to as firms, businesses, organisations and enterprises.

The South African economy is not operating in isolation and is also affected by changes taking place within the world's economy. South African companies cannot ignore global markets and competition, for them to be successful. This is so, in view of the fact that the South African economy has become part of the global economy. Robbins (1996:26) is of the opinion, that for firms to succeed in today's economic environment, it would be necessary for them to successfully compete within the context of global competition.

The Monitor (UCT) study into the country's global competitiveness described the local industries as weak, parochial and in a mess (Lunche, 1995:36). The need for South African industry and firms to become globally competitive is uppermost, following the country's acceptance into world markets (Robertson, 1996:22).

In order for South African firms to be competitive, it may be necessary, that they commit their resources to human resources training and development so as to enhance their resources skills. The improved skills level will enable firms to be able to use the technology that is available in the global economy. According to Lindeque and Vester (1992:40), several of present-day winning nations, in terms of global competitiveness, such as Hong Kong,

Singapore, Taiwan, Korea and Germany, have invested heavily in their human resources. The skills base, particularly technical skills, and its continuous upgrading, enables these countries to maintain their competitive edge. Andrews and Crows (1993:23) stresses, that the World Competitiveness Report, reports that of the nine drivers identified as to 14 other industrializing countries, South Africa is rated the worst, as regards managing the development of human resources. Section 5.4.6 of this thesis indicates, that only one percent of firms spend more than twenty percent of their capital budget on human resources development.

Insight Managing Director Mathews (Efrat, 1996:15) states, that the solution to increasing our competitiveness, lies in uplifting the skills of the workforce. The South African Competitiveness Monitor (1996), which surveyed 46 countries, placed the country last in people-related issues such as skills and labour productivity (Efrat, 1996:15). It is further stated by Lindeque and Vester (1993:17), that in order to gain global economic competitiveness, South Africa needs to establish and enhance a competitive skills base, particularly technical skills. According to Eager (1996:18), South Africa spends less than one percent when compared to the five percent spent by its major partners. The National Training Board (Eager, 1996:18) argues, that a dramatic increase (four-to-five-fold) needs to be made in amounts spent on training.

To summarize, it may be necessary for South African firms to commit their scarce financial resources to skills enhancement in order for them to be competitive in global markets. The question

arises: how can South African firms evaluate the decision as to whether they have to commit financial resources to their skills upliftment of their human resources?

This thesis will attempt to find answers irrespective of methods that should be used to financially evaluate and select long-term investments into skills upliftment.

1.2 STATEMENT OF THE PROBLEM

In order for South African firms to be competitive, they have to make strategic plans that involve long-term planning. Investments in human resources development by firms, represent a long-term commitment of scarce financial resources. According to Gitman (1994:304), because long term investments are a sizeable outlay of financial resources that commit a firm to some course of action, procedures are needed to analyze and select them carefully. Human resources development programs are capital expenditures, that are expected to produce benefits over a period longer than one year. Gitman (1994:305) notes, that some capital expenditures do not result in the acquisition or transformation of tangible fixed assets shown on the firm's balance sheets; instead they involve a long-term commitment of funds, in expectation of future returns.

To analyze capital investment projects in which a tangible fixed asset is involved, firms mostly use the capital budgeting process. Few attempts have been made, especially by South African firms,

to use a capital budgeting process to evaluate projects that do not involve a fixed tangible asset, such as human resources development programs. Correia, Flynn, Ulana and Worlmal (1993:314) describe capital budgeting as a process which involves the analysis and evaluation of investment projects, which normally should produce benefits over a number of years. Further, Correia et al (1993:342) states, that it may be more difficult to apply capital budgeting techniques to projects such as staff development, due to the inherent difficulty in quantifying the future benefits of such projects. In chapter five of this thesis, it is indicated that firms may use capital budgeting techniques to evaluate human resources development programs.

In this study, a method will be developed that is based on the capital budgeting process in order to evaluate human resources development programs. Using the method as a guide, the existing strategies used by South African firms to financially evaluate their human resources development programs, will be determined. Once the existing strategies have been investigated, it may be established whether the model designed in this study, can be used by South African firms. Valuation in this study will be regarded as the process that leads to judgement about the worth of programs. Regarding the term "program", Lee and Sampson (1990:157) states, that a program is a set of operations, actions or activities designed to produce certain desired effects or outcomes.

The objectives of the study may be summarized as follows.

- To develop a method to be used in the financial evaluation of human resources development programs that are based on the capital budgeting process.
- To determine existing strategies used by South African firms to financially evaluate their investments in human resources development programs, using the proposed model as a guide.
- To indicate how South African firms can use the proposed method to financially evaluate their investment in human resources development programs.

1.3 THE NECESSITY FOR THE STUDY OR RESEARCH

The main reason for the study stems from the importance of human resources development in improving the productivity of a firm. Birkenbach and Hofmeyer (1990:19) argues, that firms need to undergo fundamental changes so as to develop their human resources more effectively in order to cope with turbulent changes surrounding them. According to Parsons and Jackson (1989:23) national productivity is becoming of paramount importance to both the wellbeing and survival of all South Africans. Crous (1989:3) is of the opinion, that if South Africa wants to become a winning nation, productivity and especially labour productivity, will have to improve at a higher rate than that of our trading partners. The low investment in human resources development is an important cause of low productivity in South Africa. Edstron (1997:12) also

supports the idea, that an increase in productivity through skills upgrading, is required if South Africa wishes to achieve a targeted growth of six percent and the creation of jobs by the year 2000.

Another most important reason for the study emanates from the fact, that human resources development programs commit a firm's financial resources for a long period, with uncertain results and, that such resources are relatively scarce. Wakeford (1997:1) points out, that the scarcity of resources implies, that investment projects have an opportunity cost and that choices have to be made, and if training is one form of investment, its profitability needs to be ascertained, relative to other investments. Archer (1997:7) furthermore notes, that training investments are inherently risky, because the monetary returns are highly uncertain at the time the firm has to decide whether to invest or not. In view of this, it is therefore, important that capital budgeting techniques be employed in evaluating investments in human resources development programs. The capital budgeting techniques are, as mentioned by Werner and Stoner (1995:372), used to qualify the investment of a large amount of the firm's resources and these have a major impact on the financing of the firm.

Finally, the process of setting-up and identifying the inputs to the method that will be developed in this study, will have value to management theory, in that it will provide a far greater understanding of the factors affecting a decision to commit financial resources to human resources development.

1.4 SCOPE OF THE STUDY

The South African company would be the form of enterprise to be used in this study. In South Africa there are two types of companies, namely private and public companies (Du Toit, 1990:97).

It was decided to concentrate on companies listed on the Johannesburg Stock Exchange, as information with regard to such companies is more readily available than that of other enterprises. Only those companies listed on the industrial sector, were selected, as they constitute more than fifty percent of companies and have a wide spread of different companies. Three listings of top companies are available in South Africa; two of these are based on net asset value (Financial Mail and Finance Week). One is based on performance (Business Times). The Financial Mail top companies constitute more than fifty percent from the industrial sector of the JSE. (Financial Mail, 1997). The Finance Week's top 200 companies also constitute more than fifty percent from the industrial sector of the JSE. (Finance Week, 1996:10).

1.5 RESEARCH METHODOLOGY

To obtain the required information for the study, in order to achieve the set objectives, use will be made of both primary and secondary research methods.

1.5.1 Primary research

A central part of research activity is, according to Churchill (1992:108), to develop an effective research plan or strategy. Chisnall (1992:23) and Churchill (1992:108) defines research design as a framework or plan for a study used as a guide in ensuring that the information obtained, is relevant to the research problem. Such a plan or strategy is detailed in chapter five.

To obtain the required information for the study a mail survey, using a questionnaire, was employed. The questionnaire consisted of three sections.

All the questions in the questionnaire were carefully phrased statements/questions to which respondents had to respond by means of a continuous Likert five-point scale. The respondents were asked to answer each question by crossing the response option which they perceived, best characterized their firm. The research instrument was subjected to testing in a pilot study in order to ascertain whether there were any ambiguities in the phrasing and format of the questions, and the time required to complete the questionnaire. A letter setting out the objectives of the study, together with a reply - paid envelope, accompanied each questionnaire. In addition to the pilot study, sections of the research instrument had been used/tested in previous research (refer Andrews & Butler, 1986; Bacon, 1977; Gitman & Forrester, 1977; Hertz, 1964; Merville & Tavis, 1973; Parry & Firer, 1990; Petry, 1975; Petty, Scott & Bird, 1975; Pike & Sharp, 1989; Reeve,

1981; Schall, Sundem & Geijsbeek, 1978) and Stanly & Block, 1983).

1.5.2 Secondary research

A literature study was done to define and describe concepts that will be used. For the theoretical basis of the study, an extensive number of literature references will be consulted. These include theses, research reports, journals and other publications on research methodology, as well as on financial, marketing and human resources management. The libraries of academic institutions and public libraries of city councils will be visited. The procedure suggested by Guy, Edglely, Arafat and Alten (quoted in Struwig, 1992:8) will be used to consider pitfalls when assessing the literature. The following criteria will be used, namely whether the literature –

- is too elementary,
- is too advanced or too technical. Such literature will be considered only at a later stage after more reading on the topic has been done, and
- treat an aspect of the topic to be covered or whether it contains information already found in other sources.

1.6 PLAN OF THE STUDY

As the aim of the study is to develop a method for program evaluation, the first section will concentrate on model formulation.

The second section will address the question of whether South African firms can use this method to financially evaluate their human resources development programs.

CHAPTER 1 will deal with the introduction to the study, the reasons for the study, the problem formulation, the research methodology used and problems encountered in the research.

CHAPTER 2 will concentrate on the nature of human resources development programs.

CHAPTER 3 will outline the theoretical aspects of capital budgeting in an attempt to clarify its application.

CHAPTER 4 will concentrate on the financial evaluation of human resources development programs. A model on how to financially evaluate such programs, incorporating capital budgeting, will be developed.

CHAPTER 5 will provide an overview of the empirical research methods used in the study in order to clarify data presentation and interpretation.

CHAPTER 6 will comprise a summary of the important aspects of the study, a summary of the conclusions reached, recommendations made, and suggestions proposed for future research.

1.7 TERMINOLOGY

- Training and development

A planned and systematic development of knowledge, skills and attitudes through learning experience.

- A program

It consists of a set of operations, actions or activities designed to produce certain desired effects or outcomes.

- Evaluation

The systematic process to determine the worth, value or meaning of something.

- A Model

A simplified representation of reality, which has the following benefits for the user, (Nadler, 1989:5).

- Explains various aspects of human behaviour and interaction
- Integrates what is known through research and observation
- Simplifies complex human processes
- Guides observation

- Investment

It is money spent for a return that will keep being realized in the future, without further expenditure.

1.8 REFERENCE TECHNIQUES

The Harvard method of reference is used throughout this study to indicate the sources consulted. A detailed list of sources consulted, is included at the end of this study.

1.9 LIST OF ACRONYMS

ANOVA	Analysis of variance
ARR	Accounting rate of return
CIRO	Context, Input, Reaction Outcome
HRD	Human resources development
IRR	Internal rate of return
MANOVA	Multivariate analysis of variance
DCF	Discounted cash flows
NPV	Net present value
SA	South Africa
SPSS	Statistical Package for Social Sciences
UK	United Kingdom
USA	United States of America

2. THE NATURE OF HUMAN RESOURCE DEVELOPMENT

2.1 INTRODUCTION

As a point of departure it is necessary in this thesis that the nature of human resources development programs be investigated before a method to evaluate such programs is developed. This is in view of the fact that the main objective of the study is to develop a method that could be used to financially evaluate such projects.

In chapter one it was indicated that a definition of a program used by Lee & Sampson (1990:157) will be used. The definition states that a program is a set of operations, actions or activities designed to produce certain desired effects or outcomes. The nature of operations, actions or activities with regards to human resources development will be explained and the desired effects or outcomes explained.

In chapter one it was also stated that evaluation could be regarded as the process that leads to judgement about the worth of a program. The concept valuation will be further elucidated in chapter four, which will concentrate on the financial evaluation of human resources development programs.

To clearly set out the content of this chapter, literature on human resources development was investigated. To explain the nature of

human resources development programs, the following will be explained;

- First, the explanation of the concept human resources development,
- Secondly, the concept needs assessment,
- Thirdly, training and development objectives,
- Fourthly, the design of training and development programs,
- Lastly, the evaluation of training and development programs.

In this study, the explanation of the concept human resources development, needs assessment, training and development objectives, the design of training and development programs were not empirically investigated. Aspects of the evaluation of human resources development was empirically investigated and the results will be outlined in section 2.6.

In order for evaluation to take place, it is necessary to explain the nature of the concept to be evaluated. The explanation of the concept needs assessment, training and development objectives, and the design of training and development programs serve, only to explain the nature of human resources development.

2.2 HUMAN RESOURCES DEVELOPMENT PROGRAMS

According to Gilley & Eggland (1989:3), the term 'human resources development' provides us with clues as to its meaning. To clearly explain the concept Gilley & Eggland (1989:3) broke it

into two components, that is, 'human resources ' and 'development'.

Today's firms consist mainly of three types of resources (Gilley & Eggland, 1989:3);

- physical resources, which are often referred to as, fixed corporate assets, and consist of machines, materials, facilities, equipment and parts of products.
- financial resources referred to as the liquid assets of an organization and consist of cash, stocks, bonds, investments and operating capital.
- human resources refer to the people employed by the firm.

Two questions should, according to Gilley & Eggland (1989:4), be asked when looking at the term development,

- What is meant by development of people? this refers to the advancement of knowledge, skills, and competencies, and also the improved behavior of people within the firm.
- What type of development that really occur within firms? it is the development that is directed at performance improvement in order that the organization can benefit; greater efficiency, more effective competitive practices, and greater profitability.

It is worth noting the difference between training and development in view of the fact that the two terms are sometimes used together or interchangeably in most literature on human resources development.

Armstrong (1989:489) and Buckley & Caple (1995:13) define training as the planned and systematic development of knowledge, skills and attitude through learning experience to achieve effective performance of a given tasks or job or a range of activities.

The department of employment glossary of training terms in United Kingdom(UK) (Bramley,1991:xiv), define training as the systematic development of attitude, knowledge, skills and behavior patterns required by an individual to perform adequately a given task or job.

Drawing also from the glossary, development is defined as the general enhancement and growth of an individual's skills and abilities though conscious and unconscious learning (Buckly & Caple, 1995:14).

According to Anthony, Perrewe & Kackmar (1993:324), the difference between training and development lies in the fact that training has a narrow focus in that it provide for skills for the current, job that will benefit the firms rather quickly. Development on the other hand has a broader scope and focuses on present or future job, and the benefits can only be measured in long term. (Anthony et al 1993:324) refer to the terms training and

development as the total structure of the on-the-job and off-the-job programs used by the in developing skills and knowledge needed for proficient performance of jobs and career advancement.

Marx (1986:143) define training and development 'as any attempt made to influence the knowledge, skills and attitude of employee in such a manner that their productivity will be increased and the enterprise will be enabled to further the achievement of its objectives'. Hyde & Shafritz (1985:4) on the other hand , note that training is part of a process of development that advances and maintains individuals within firms.

Based on above definitions, in this thesis human resources development will be defined as; **those planned operations, actions, or activities designed for the advancement of employees (human resources) in the organization to enable them to function more efficiently or effectively in their current and future jobs or tasks.**

In view of this the words training and development will be used interchangeably or together to refer to human resources development.

2.3. ASSESSING TRAINING AND DEVELOPMENT NEEDS.

2.3.1. A definition of needs

As firms are expected to spend a lot of money or invest very heavily in training and development, it is important that they

determine before hand if there is the need for training and development.

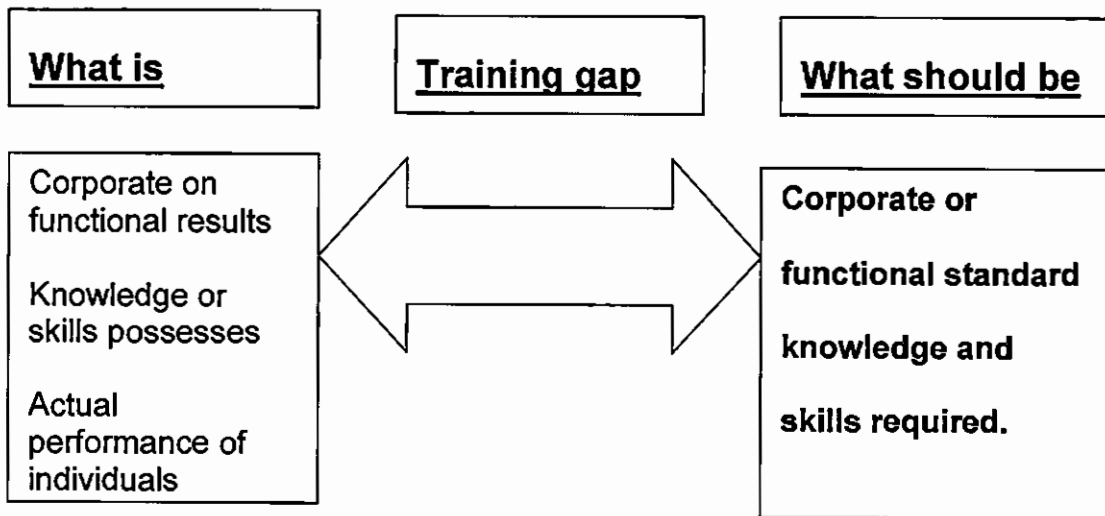
Anthony (1993:332) points out that, in order for a firm to ensure that its training and development programs meet its human resources needs in terms of skills required, it should systematically determine its needs for training and development.

Joubert (1995:6) define a training need as 'a discrepancy or gap between the actual and required performance of an employee that can be rectified by training and needs assessment as 'the formal process for identifying needs and placing them in order of priority.'

Training needs analysis aim to define the gap between what is happening and what should happen (Armstrong, 1988:497) or diagrammatically illustrated as:

Diagram 2.1 - Training needs analysis to follow p. 20

DIAGRAM 2.1: TRAINING NEEDS ANALYSIS



Source: Armstrong (1988:497) and adapted

The gap (mentioned above) may consist of the difference between;

- how the firm or function within the firm is performing and how it should perform.
- what employees know and may do and what they should know and do.
- what employees actually do and what they should do.

A further definition of a training need in the context of human resources development is, as suggested by Gilley & Egglund (1989:197) to think of a need as a gap between the current set of circumstances and some changed or desired set of circumstances. The circumstances can be described in terms of proficiency (knowledge, skills, attitudes, performance or situations). Truelove (1995:5) notes that a training gap can be said to exist if the

performance deficiency is as a result of a lack of knowledge or skill.

The definitions by Joubert (1995:6), Armstrong (1988:497), Gilley & Eggland (1989:197) and Roscoe (1995:51) all emphasize that;

- a need is a gap that exists between the current performance of employees and the expected performance.
- the gap exists as a result of a lack of knowledge, skills and competencies to perform tasks.

Before any attempt could be made to conduct a needs analysis, the importance of such an analysis, the importance of such an analysis must first be explained.

It can therefore be concluded that training and development need occur as a result of lack of skills required to perform a job.

2.3.2. The importance of needs analysis.

Michalak and Yager (Gilley & Eggland,1989:198) suggest the following four major reasons why it is important to conduct a needs analysis;

- to identify problem areas in the organization: management must know what the problems are, so that the most appropriate training is directed at solving those problems.

- to obtain management commitment: the way to obtain such commitment is to make sure that the proposed training directly affects what happens in that managers department or organization.
- to develop data for evaluation: needs analysis make it easy to evaluate and measure the effective ness of the training program when it is completed.
- To determine the cost and benefit of training: if management do a through needs analysis ,they are able to put a cost factor on the training needs. A detailed discussion of cost and benefit of training and development will be made in chapter four of this study.

The major argument as advanced by Schneier, Guthrie & Olian (1994:66) for conducting a training needs analysis are;

- it promotes a process view of training, in that training is viewed as a process grounded in the broader context of a general human resources management system.
- it provides a database to support and enhance other human resources management functions like recruitment, selection and compensation. In other words it also helps develop an integrated human resources management system.

- It provides a bottom line, empirical measure for human resources management operations. It provides data that can be used in the justification of funds allocated to human resources management programs.

As there are different types of needs analysis, it is important that the human resources development manager must indicate the type of needs analysis that the firm will conduct. The next section explains the different types of needs analysis.

2.3.3 Types of needs analysis

Authors such as Bramley (1991:9) , Tracy (1984:60) , Van Dyk , Nel , Loedoff & Haasbroek (1997:253) and Wexley & Latham(1985:22) have identified the following types of needs analysis ;

- Organisation needs analysis:

The focus of such analysis is the total organization and thus look at organisational objectives, the pool of skills presently available, indices of effectiveness and the organisational climate, (Bramley, 1991:9). The primary purpose of organisational analysis according to Wexley & Latham (1985:22), is to determine where in the organisation's training should be conducted. Van Dyk et al (1997:253) further point out that "such needs are considered difficult to assess as they have to be derived from organization development activities where aspects such as goals, objectives and priorities are determine".

- Group needs analysis:

This needs analysis is directed to specific job levels or categories of employees (Van Dyk et al,1997:254). This analysis enables the trainer to identify requirements with respect to interventions like team building, management training, small group problem solving and role classification (Tracy , 1984:61).

- Individual needs analysis

The focus of such needs analysis is on how a particular employee is performing the various tasks allocated to him (Bramley , 1991:9) . Van Dyk et al (1997:254) consider such needs analysis to be more specific because the background knowledge, aptitude, personality, experience, skills of individual employee is considered.

- Job needs analysis :

It involves collecting data about a particular job a group of jobs (Bramley, 1991:9) or to determine the content of training (Van Dyk,1997:254). Further, the analysis will determine the standard that are required and knowledge, skills and attitudes expected in order to achieve those standards. (Bramley,1991:9).

A somewhat different explanation of needs analysis is offered by Kenny & Reid (Buckley & Caple,1995:71). They suggested three approaches are in essence more or less the same as the others mentioned above.

- Comprehensive analysis:

This is where all aspects of the job are looked at to produce a detailed record of every task and sub – task that make up the job, together with the knowledge, skills and attitudes which are required to perform tasks effectively.

- Key–task analysis:

This is concern with the identification and investigation of key or primary tasks within a job, especially managerial tasks. It is also used in those jobs that change in emphasis or content and resulting in the need to identify skills and knowledge relevant to those tasks, and also standards of performing those tasks.

- Problem – centered analysis:

The focus is not on the whole or all of the critical tasks but on those aspects of current performance that are below accepted standards.

A decision has to be made about the method or techniques that will be used to conduct needs analysis. The different methods of needs analysis available are explained below.

2.3.4. Methods of needs analysis

According to Gilley & Eggland (1989:200), a considerable number of ways, strategies and techniques can be used to establish training needs. Van Dyk et al (1997:257) note that the method used will depend on the proposed course , the amount and type of

information required and the ability of the designer of the training program. A brief discussion of the more common methods used for conducting a needs analysis, follows;

- Interviews:

Interviews involve asking people questions to find out their perceptions of problems and their ideas about solutions (Gilley & Eggland, 1989:200). Interviews are very popular and versatile and the most common information gathering methods (Van Dyk, 1997:260) and could in some cases be the only technique used to determine the dimensions of training problems (Gilley & Eggland, 1989:200).

- Surveys and questionnaires:

According to Tracy (1984:63) surveys are used to assess attitudes, determine the climate of the organization; assess critical incidents like events or situations, which have a significant impact on operations, results or consequences. Surveys and questionnaires can reach many people in a short period of time at low costs, and without fear of embarrassment or retribution (Gilley & Eggland, 1989:203 and Van Dyk et al, 1997:259).

- Group techniques for needs analysis:

They involve interviews done in groups in that it permits synthesis of several points of view, promotes general understanding, build support for needed training and can in themselves serve as a form of training (Gilley & Eggland, 1989:205). A number of such techniques are available;

- Delphi techniques

The technique involves a group that is formed of experts and non-experts who do not have physical contact with each other. Each member provide input and receive the combined feedback of others member's inputs. The process is repeated until members reach a consensus on the problem (Le Roux, Venter, Van Vuren, Jacobs, Labuschagne, Kritzinger, Ferreira, De Beers, & Hubner, 1996:333).

- Nominal group techniques

This technique was originally developed by Andre Delbecque and Andrew Van de Ven in 1968 as method for generating ideas in situations where the participants do not fully understand or agree upon the nature of the problem or how to solve the problem (Scotts & Deadrick , 1985:51). It is a useful technique for obtaining maximum input from each member of a group while limiting unnecessary personal conflict from within (Van Dyk et al , 1997:265). Further, Scotts & Deadrick (1985:51) point out that such a special purpose technique is appropriate for elements of a problem situation , identifying elements of a solution and establishing priorities.

- Brainstorming techniques

They are a method of getting a number of ideas from a group within a short period of time (Van Dyk et al,1997:266).

Brainstorming sessions are used to repress those sensors in our unconscious which tell us that ideas are unworthy and hence create a climate in which ridiculous and frivolous behavior is the norm (Le Roux et al, 1996:325).

- Critical incident techniques:

It is a procedure developed by Flanagan in 1954 for collecting information about incidents, which have proved critical to the effective performance of a job. It is useful when constraints on training time force the trainer to concentrate on critical or vital aspects of job performance .It is also important when studying tasks that are not performed frequently or those tasks which cannot be observed directly because of certain restraints (Buckley & Caple, 1995:89).

After the training needs have been assessed, the first step, in the development of instructional programs is the formulation of training and development objectives.

2.4. TRAINING AND DEVELOPMENT OBJECTIVES

2.4.1. Definition

According to Van Dyk et al, (1997:286) , after the needs have been assessed, identified, verified and placed in some form of priority, the first step in the development of instructional systems is to formulate training objectives in performance term.

Joubert (1996:39) defines a training objective "as a statement of desired results/performance that should be achieved at the end of instruction. It must indicate exact and specific standards, required knowledge, skills or attitude and direction".

Briggs (1991:80) differentiate between goals and objectives by stating that goals are general statements what a learner should be able to do after the instruction is over , while an objective is a specific statement of actions learner should be able to take in a real world situation according to real world standards.

2.4.2. Reasons for writing objectives.

Camp, Blanchard & Huszozo (1986:101) identify the following reasons for specifying objectives: (also quoted in Van Dyk 1997:287; and Joubert, 1996:40)

- it limits the task , and removes all ambiguity and difficulties of interpretation .
- it ensures that measurement is possible , as the trainer is able to specify the criteria to be used in evaluating the effectiveness of the program.
- It allows the trainer to fully understand precisely what is required in order to achieve overall training goals.
- It explains the relationship between the learning process and the behavioral capabilities that are being developed.

Laird (1985:102) mentioned the following as reasons for writing objectives, based on the work of Robert F Mager ;

- that trainers who know exactly what is expected of them are much more inclined to invest energy in pursuit of the goal.
- instructors can better control the stimuli they use on trainees and can respond better to learner's reactions.
- management will know what it is getting for its investment when it has statements of the outcomes.
- the superiors of the trainees have a tool for motivating learning and for communicating expectations.
- the training and development department can more honestly evaluate its own achievement.
- can serve as validation of performance standards or as a way to get standards set where none have existed previously.

With the reasons for writing objectives determined the next step will be the classifications of objectives.

2.4.3. Classification of objectives.

Joubert (1996:44) classify objectives into two broad categories;

- **Primary/Terminal objectives**

Terminal objectives are broad objectives that must be achieved at the end of the training and development program (Van Dyk et al, 1997:288). They are of major importance in instructional systems in that they give meaning, clarity and unity to all learning objectives in training program (Joubert, 1996:44).

- **Derived/Enabling/Intermediate objectives**

This objectives are the subordinate elements of the terminal objectives (Van Dyk et al, 1997:288). They deal with certain fundamental understanding, concepts, principles or elements of skill that are often needed to support the attainment of the primary objective (Joubert,1996:44). According to Ribbler (1985:112), enabling objectives are related to and derived from actual program objectives. Further, that they are not tested at the end of the training program because they enable the trainee to perform the tasks defined by the training program objectives.

2.5. INSTRUCTIONAL PROGRAM DESIGN.

2.5.1. Introduction

As was explained in section 2.1 a number of models were considered for the purpose of designing human resources development programs. These models included those developed by Bramley (1991:6); Gustfson & Tillman (1991:10); Knick &

Gustafson (1986:23); Nadler (1989:112) and Rimoszowski (1981:20).

Once training and development needs have been identified and the objectives formulated, the next logical step is instructional design process.

This process involves selecting content, sequencing content and the development of training and development strategies.

2.5.2. Selecting program content.

The term "content", according to Joubert (1996:49) refers to the specific subjects, topics, principles, theories, skills and attitudes that will form the core of the training program. Tracy (1984:224) defines content as the subject matter, teaching points and learning activities that will enable the trainee to perform tasks associated with a particular job at which the terminal objectives of a training system are directed.

Nadler (1989:134) provides a model to be used in organizing and prioritizing program content. According to this model, all the content relate to objectives and can be organized under one of four categories:

- Essential;

In this category only those aspects that are essential for the curriculum must be included, if the learning experience is to meet the stated objectives.

- Helpful;

In this category the content that supplements the essential is included only if conditions and time allows.

- Peripheral;

This category contains those items that may have an effect on how well the trainee performs the task. It is difficult to differentiate peripheral content from helpful content.

- Unrelated;

Although as a rule it is not necessary to include in the curriculum, unrelated content normally arises from outside the usual design process. Higher authority may feel that if the content was good for somebody in another organization, then it must also be included in program content.

2.5.3 Sequencing content

According to Van Dyk et al (1997:315), proper sequencing of instructional objectives and teaching points is important, as this can have a major impact on the efficiency and effectiveness of learning. Sequencing means, the placing of content in a specific order to facilitate learning (Joubert, 1996:53) or in what order the content should be presented to the trainee (Nadler, 1989:137). Nadler (1989:137), Joubert (1996:53) and Van Dyk et al (1997:316) provide a number of approaches to sequencing program content;

- General to specific;

In this approach the trainee is first exposed to the overview, and then the content is presented that moves towards the specific.

- Specific to the general;

This approach is based on the works of Skinner. The trainee is lead through a series of specific learning experiences to the end results or the general.

- Concrete to abstract;

The trainee starts with content that is solid or observable beyond dispute to content that is more complex and abstract.

- Spaced learning;

In this approach the content is split into various components (modules). The trainee in this approach returns to the job at stated times and then returns again to the learning situation, instead of a continuous learning situation.

- Known to the unknown;

In this approach the trainee begins with materials that is known or familiar to new material.

With the content determine and sequenced the next step will be the converting of materials into training strategies.

2.5.4. Selecting instructional strategies.

Tracy (1984:244) defines an instructional strategy "as a combination of teaching methods and techniques design to accomplish an instructional job and instructional methods as the basic approach to instruction".

Van Dyk et al (1997:321) discuss a number of common instructional strategies available from which an instructor can choose from;

- **The lecture**

Buckley & Caple (1995:189) describe a lecture as a talk or presentation which is usually supported by visual aids in which information about practices, policies are describe and explained to an audience. Further, that in a lecture there is little or no participation by the trainees until they are invited to ask questions at the end of the lecture.

A suggestion by Tracy (1984:248), which reinforces the description stated above, is that the most important use of a lecture are;

- to orientate students with respect to rules, policies, procedures and learning resources .
- to introduce a subject and present on overview of its scope and its importance.

- to give direction on procedures for subsequent learning activities.
- to present basic material as background for the subject .
- to set the stage for discussion, demonstration or performance.

- **The conference**

The conference is a method widely used to support a lecture are, and it is a specific discussions about a predetermine topic conducted according to a specific plan (Van Dyk et al ,1997:322).

- **The case study method**

This method is an in- depth group study of a simulated real life or fictitious situation. It gives the learner the opportunity to apply the knowledge and principles previously learned to test the ability to assess a real – life situation, and the opportunity to develop independent thinking and exchange ideas (Van Dyk ,1997:323).

- **The incident method**

This method was develop by Pigor and Pigor in 1961 and represents a modification of the case study method. It is based on the provision of limited information to the learner about an organization, which is in the form of a short description of managerial situation and an incident, which has occurred (Van Dyk et al,1997:323)

- **Computer based training**

Gery (1987:6) cited in Dickelman (1994:127) define computer based training as “an interactive learning experience between a learner and computer in which the computer provides the majority of the stimulus, the learner must respond, and the computer analyses the responses and provide feedback to the learner.”

According to Tracy (1984:272) computer based training is divided into;

- computer assisted instruction, wherein the student's studies are completely personalized and depend on the particular needs and progress of the students.
- computer managed instruction, which involves the use of the computer to manage training programs to test students and their progress , to maintain inventories and records in respect of training facilities and to carry out resources allocation.

- **Structured on the job training**

On the job training methods involves the following (Stoner , Freeman & Gilbert (1995:391);

- job rotation in which employee's work on a series of jobs over a period of time to learn a variety of skills.
- internship in which job training is combined with related classroom instruction.

- Apprenticeship in which employees are trained under the guidance of a highly skilled co- worker.

- **Off the job training.**

According to Stoner et al (1995:392) , off the job training takes place outside the workplace and attempts to simulate actual working condition. Further , that this type of training includes vestibule training in which employees train on actual equipment and in realistic job settings but in a place different from the one in which they will be working.

- **Simulation**

A group of trainees engage in an exercise to analyze a case or simulate some actual performance. It is applied in techniques such as war games , business simulation , team building exercises and case problems (Van Dyk et al, 1997:332) . Lierman (1993:251) define simulation as a model of any process or activity that represents the controls , methods , and consequences of human operator action.

As the purpose of the study is to develop a method that will be used to evaluate human resources development programs, the nature of HRD program evaluation must be explained.

2.6. PROGRAM EVALUATION

2.6.1. Introduction

After determining the specific training and development needs, designing specific performance objectives that the training is to accomplish, designing a training program by specifying the content and a training strategy, the next logical step is to evaluate the training effort. The first part of this section will explore just what evaluation means, particularly as applied to training and development. The second part discusses the role and reasons for evaluation. The last part a review of the various approaches to evaluation will be presented.

2.6.2 The nature of evaluation

According to Nadler (1989:40), evaluation is a process and not a single activity and that there are many models used to design it. It must be pointed out that in section 1.2. it was stated that evaluation can be regarded as a process that leads to judgement about the worth of a program.

Phillips(1987:40) defines evaluation "as a systematic process to determine the worth, value or meaning of something". A more detailed definition of evaluation, which is based on the U.K.'s Manpower Service Commission is offered by Critten (1994:157) and is "the assessment of the total value of a training system, training course or program in social as well as financial terms.

Evaluation differs from validation in that it attempts to measure the overall cost – benefit of the course or program and not just the achievement of its laid down objective ”.

From this definition, two most important conclusions are drawn by Critten (1994:161);

- that the assessment of total value implies an assessment of a training program's financial value.

A distinction is made between validation and evaluation. “Validation is about measuring whether a course has delivered what it promised in terms of its published objectives. Evaluation is in making judgement about the effect of putting those objectives into practice”.

Buckley & Caple (1995:210) also distinguished between validation and evaluation and goes on to describe two discrete parts of the validation process, that are intimately linked;

- The first part is internal validation which has to do with whether a training activity has achieved its objectives, in other words, “did the trainees learn what they were taught?”
- The second part is external validation which aims to discover whether trainees have applied what they have learned to in training to the job and whether they are able to perform to the level expected after training.

- Evaluation on the other hand is seen as “the process of attempting to assess the total value of training that is the cost benefit, and general outcomes which benefit the organization as well as the value of the improved performance of those who have undertaken training”.

For the purpose of this study evaluation is defined **as the systematic process of determining the worth or total value in financial terms of the human resources development programs.**

Before any attempt can be made to evaluate human resources development programs, it is necessary to explain the purpose or role of evaluation.

2.6.3 The purpose or role of evaluation

Phillips (1987:33) presents the following as reasons for undertaking evaluation;

- to determine whether program is accomplishing its objectives. The program objectives should be measurable, specific and challenging.
- to determine the cost – benefits of an human resources development program. This aspect of evaluation compares the cost of a program to its usefulness or value. Further, this aspect of evaluation will be discussed in detailed in chapter four of this study.

- to decide who should participate in future programs: A follow-up evaluation that determine the benefits of the program and communicating such benefits to prospective participant and enable them to decide on their involvement to the program.
- to reinforce major points made to the participants.
- to identify which participants benefited the most or least from the program.
- to gather data to assist in marketing future programs.

Two most important roles or purposes of evaluation were first proposed by Scriven in 1967 (Critten, 1994:158), and these are;

- Formative evaluation which is concerned with gathering data or information that will improve the program (Critten, 1994:158) or information that can be used for the development of new course, the revision of existing ones, or to eliminate inappropriate or inefficient training (Shell, 1989:165).
- Summative evaluation, which is arriving at a judgement about the programs value from an analysis of its total effect (Critten, 1994:158). This form of evaluation has to do with monitoring of training with regard to job performance and financial benefits and costs involved (Shell, 1989:165).

In this study, it was established that South African firms conduct human resources development evaluation for all the purposes mentioned above. The table below summarizes such findings:

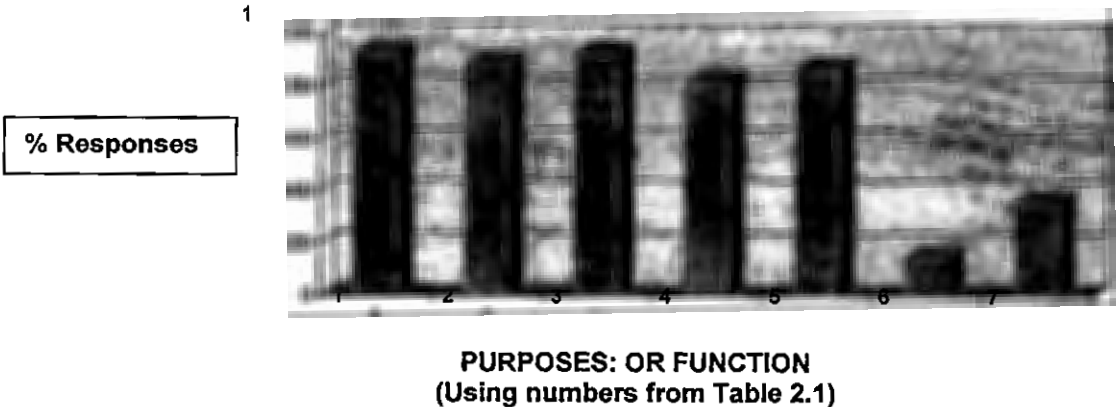
TABLE 2.1: PURPOSES OF CONDUCTING A H.R.D. EVALUATION

NO	PURPOSE OR FUNCTION OF EVALUATION	PERCENTAGE
(1)	Cost benefit analysis	93%
(2)	Cost effectiveness-analysis	89%
(3)	Improve the training and development program	93%
(4)	Provide feedback to program planners	82%
(5)	Gain knowledge of employee skills level	87%
(6)	Provide information for performance appraisal	15%
(7)	Placement of employees	36%

SOURCE: Own research

To indicate the relative responses to the different statements, the strongly agree plus the agree percentage responses are combined. A more clearer picture of the results can be presented graphically as indicated below:

Diagram 2.1: H.R.D Evaluation



SOURCE: OWN RESEARCH

As can be observed from the above table 2.1 and diagram 2.1 , firms conduct formative evaluation to improve the program, provide feedback to program planners and gain knowledge of employee skills level .Very little of human resources development evaluation is used for performance appraisal and the placement of employees.

The results also indicate that firms do conduct a summative evaluation by doing a cost-benefits analysis and the cost effectiveness analysis. This kind of evaluation looks at the total effect of the HRD program of the firm.

2.6.4 Approaches to evaluation

In the literature, a number of approaches to evaluation are mentioned. Two of the most popular approaches will be discussed in this thesis , although no empirical research was conducted to determine which approach is used by firms. One approach concerns itself with the different levels of evaluation and the other look at the concepts of costing, cost–effectiveness and cost – benefit analysis as it applies to human resources development.

- **Costing**

These methods are based on the costing of human resources development programs and to use such costs to compare this programs. The costs are also compared to the benefits of the human resources development programs to determine their financial value. The costs and benefits determined are also used

to calculate the return on investment of human resources development programs. Cost-effectiveness and cost-benefit methods are financial evaluation methods commonly used by most firms to evaluate their training and development efforts. Such methods will be discussed in detail in chapter four of this, wherein the different cost benefit methods will be combined to develop a strategic financial evaluation model to be used in evaluation of training and development methods.

- **Different levels of evaluation**

Phillips (1987:36) noted that the question of what to will depend on the type of resources program, the organization and the purposes of evaluation. The following section presents the most popular evaluation models in chronological order;

- * **The Kirkpatrick approach**

The most well – known and widely used framework for classifying areas of evaluation was developed by Donald Kirkpatrick in 1959 , and his model developed a way to assist in determining what data are to be collected (Phillips, 1987:36) . Kirkpatrick's model outlined four categories of measures of the effectiveness of training outcomes, and three assumptions are made (Alliger & Janak, 1994:219);

- The first assumption is that the steps in the model are arranged in ascending value of information provided.

- The second assumption is that these levels are positively intercorrelated.
- The third assumption is that the levels of evaluation are causally linked .

The four steps or levels represent a sequence of ways to evaluate programs and as you move from one level to the other, evaluation become difficult and time consuming (Kirkpatrick,1994:21)

The four levels are (Kirkpatrick, 1994:21);

- Reaction.

Evaluation in this levels measure how those who participate in the program react to it.

- Learning.

This can be defined as the extent to which participants in the training program change attitudes , improve knowledge , and or increased skill as a result of the program.

- Behavior.

This can be defined as the extent to which change in behavior has occurred because the participants attended the training program.

- Results.

This can be defined as the final results that occurred because the participants attended the program. Results can be increased production, improved quality, decreased costs, and reduced accidents, increased profits and return on investment.

- * The CIRO approach.

This general approach to classifying types of evaluation was developed by Peter Warr, Michael Bird and Neil Rackham in 1970 and has four categories of evaluation (Critten, 1994: 179, and Phillips, 1987: 39);

- Context evaluation .

This involve obtaining and using information about the present operational situation (or context) to establish if there is a need for training and to determine training objectives.

- Input evaluation.

Consists of obtaining and using information about possible training resources. It also involves analyzing the resources available and determining how they can be used so that there is a maximum change of achieving the desired objectives.

- Reaction evaluation

This involves obtaining and using information about the participant's reaction to improve the human resources development process.

- Outcome evaluation.

This involves obtaining and using information about the results or outcomes of human resources development to improve future programs.

- * The Parker approach.

This approach of evaluation was developed by Treadway Parker in 1975, and has divided the information on evaluation into four groups (Phillips , 1987:37);

- Job performance.

This evaluates the extent to which an human resources development program has contributed to an individual improved job performance.

- Group performance.

This determines the impact of the program on a group within which the participant functions , or the effect of the program on the organization as a whole.

- Participant satisfaction.

This measures the satisfaction of the participants on the content of the program, methods of training, and their attitude towards what has been learned.

- Participant knowledge gained.

This evaluation determines what facts , techniques or skills were learned by the participants.

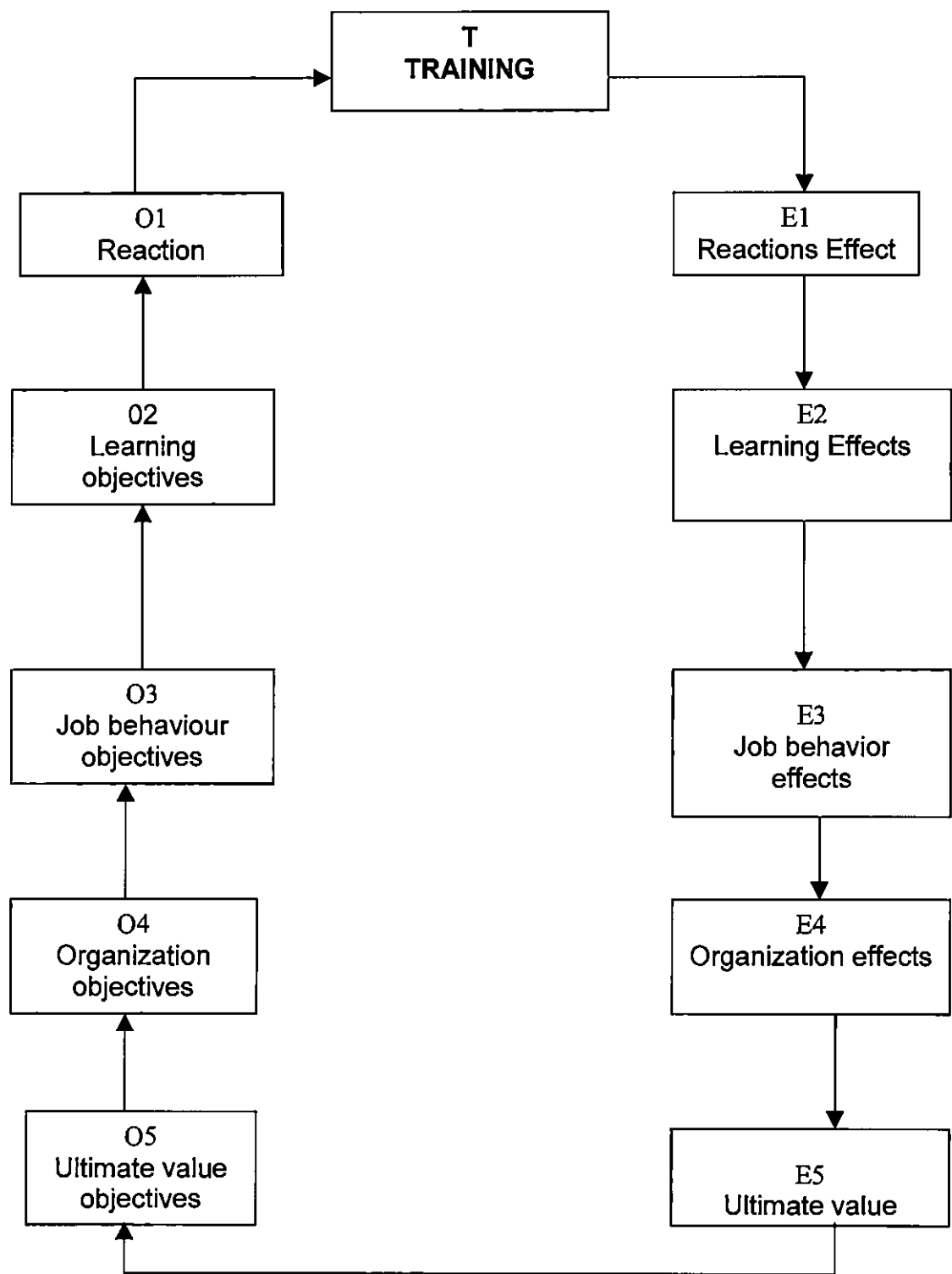
- * Hamblin's approach.

Hamblin in 1974 put together the models proposed by Kirkpatrick (refer above) and the CIRO approach to develop a 'cause and effect chain' linking five levels of training effects(Critten,1994:179);

The chain is: that training leads to reaction, reaction leads to learning, learning leads to changes in the organization, changes in organization leads to achievement of ultimate goals (Critten, 1994:179).

Diagram 2.2 illustrates Hamblin's model or approach on pg. 50

DIAGRAM 2.2: HAMBLIN'S APPROACH TO EVALUATION



Source: Hamblin (1974:15) and adapted

Hamblin (1974:15) explained the different levels of the model as follows;

- Level 1: Reaction.

The first effect of a training is the highly complex reaction of the trainee to the training and reaction is shifting over time. Since reaction are the first effect of training, reaction effects (E1) have been entered in the diagram at first level of evaluation. Reaction objectives have also been entered at first level of objective setting (O1). There is now a sequence of activities O1 – T – E1. First reaction objectives are set, then there is training, then evaluation reaction effects.

- Level 2 : Learning

Training is provided so that people learn i.e. acquire the ability to behave in a particular way. Learning effects (E2) is entered on the diagram as the second level of evaluation. First, learning objectives (O1) must be determine to give the criteria by which learning can be evaluated.

- Level 3: Job behavior.

Job behavior effect (E3) is evaluation to find out whether trainees have applied their learning on the job. To evaluate at this level, job behavior objective (O3) must first be set.



- Levels 4 and 5: Organization; Ultimate value

This has to do with studying the effects of behavioral changes on the firm, and to discover whether training has been worthwhile in terms of the ultimate criteria by which the firm evaluates its activities. Level 5 can also be labeled as the cost – efficiency level wherein the question asked, is: “Are the financial benefits resulting from training, greater than the financial costs of training?”.

Critten (1994:180) proposes techniques that are appropriate to each level of the Hamblin model. In this study no detailed explanation of the techniques is given. The table below will illustrate such techniques.

TABLE 2.2: MEASURING TECHNIQUES APPROPRIATE TO EACH LEVEL OF HAMBLIN'S MODEL

LEVEL	TECHNIQUES
1. Reaction	1. Reaction scale following each training session 2. Reaction notebooks, observer records 3. End-of-course reaction forms 4. Post-course questionnaire interview 5. Repertory grid 6. Attitude questionnaire 7. Semantic differential scale
2. Learning	8. Objective tests 9. Written essay/oral exam 10. Multiple choice tests 11. Learning portfolios
3. Job behaviour	12. Activity sampling 13. Observer diaries 14. Interview/questionnaires 15. Appraisal/self-appraisal 16. Critical incidents
4. Organization	17. Indices of productivity/labour turnover 18. Organization culture 19. Work flow studies
5. Ultimate value	20. Cost benefit analysis 21. Human resources accounting

SOURCE: Critten (1994:180) and adapted

In chapter 4 this study only the ultimate value level of the model will be discussed.

* The Bell System approach

A different approach to evaluation was developed by Stephanie Jackson and Mary Jo Kulp at the AT & T and Bell System unit in 1979 (Phillips,1987:38). The levels of evaluation are the following.

- Reaction outcomes

This measures the trainee's opinion of the training program as a whole or a specific component, such as content, material, methods, or activities.

- Capability outcomes

This has to do with what trainees are expected to know, think, do, or produce by the end of the program.

- Application outcomes

This has to do with what the trainees know, think, do, or produce in the real - world settings.

- Worth outcomes

This measures the extent to which the firm has benefited from the training program in terms of money, time, effort or resources invested. It shows the value of the program in relation to its costs.

* Van der Walt approach

According to Van der Walt (1989:3), training can be evaluated on the following five levels.

- Before training: that is, evaluation of inputs.
- The training process: that is, have knowledge, skills and attitudes of trainees improved?
- The result of training in the work situation: that is, are the trainees performing their jobs better?
- The impact of the training on the organizations operations.
- Social and cultural values.

Van der Walt (1989:3) places more emphasis on the third level of evaluation, by designing a performance matrix to measure validation (Van Dyk, et al, and 1997:465).

Validation, as explained in section 2.6.2, is about measuring whether the human resources development program has achieved its objectives. It does not look at making judgements about the total effect of the program on the firm.

According to Van der Walt (1988:4), the performance matrix is an aid to identifying performance gaps(refer section 2.2) and thus also in the determination of training needs. The matrix has the following components.

- Key performance criteria which are aimed at the objectives of the job.

- The periodic monitoring of performance.
- An eleven-point performance scale.
- The present (average) performance of a trained and experienced worker.
- The expected future performance (optimum performance) which is aimed at.
- The lowest acceptable performance.
- The performance value which can be expressed in terms of each individual performance criteria or in terms of the total of all the performance criteria.
- The financial value of each key performance criteria, spread over the eleven performance levels.

If the performance matrix is used properly, the following benefits can be obtained (Van der Walt, 1988:7).

- It becomes possible to make a prediction of the economic benefits of performance change, because measurable results are being measured.
- The change in performance can be expressed in financial value and a cost-benefit analysis could be conducted.
- It becomes possible to determine the financial benefits of a program before implementation. This makes it easy for decision-making regarding the implementation of a new program.

• **Conclusions on the levels of evaluation**

The relationship between the terminology used by the different authors, is summarized in the following table.

TABLE 2.3: A COMPARISON OF TERMINOLOGY USED BY DIFFERENT AUTHORS

	Kirkpatrick	Warr, Bird & Rackham 1970	Parker 1978	Hamblin 1974	Jackson & Kulp 1979	Van der Walt 1979
1	Reaction	Context	Job Performance	Reaction	Reaction Outcomes	Input
2	Learning	Input	Group Performance	Learning	Capability Outcomes	Process
3	Behaviour	Reaction	Participants' Satisfaction	Job behaviour	Application Outcomes	Result in Work Situation
4	Results	Outcome	Participants Knowledge gained	Organization	Worth Outcomes	Impact on Firm
5				Ultimate Value		Social cultural Values

SOURCE: OWN RESEARCH

Overall, the common thread among the different evaluation approaches presented above, is that the value of information increased from the first level to the last level. An analysis of the

different levels proposed by the different authors above, indicates the following.

- Level 1

A measurement of the reaction of the participants to the training program. The exception is the Parker approach, which measures job performance, as a result of a training program. The Van der Walt approach looks at the evaluation of all inputs to a training program.

- Level 2

Measure the increased skills level as a result of the training program.

- Level 3

Measure the change in behavior brought about by the training program.

- Level 4

Measure the ultimate value in financial terms of the firm brought about the training and development.

The difficulty of assessment increases as one moves from the first to the last level. In chapter 4, on the financial evaluation of human resources programs, the emphasis will be on the last levels (level 4 and level 5) of the above approaches.

2.7. Conclusions

In this chapter the concept “human resources development” was explained as being those planned operations, actions, or activities designed for the advancement of human resources in firms, in order to enable such resources to be more efficient job performances. The difference between training and development is, that training is concerned with a particular job or task, whereas development is concerned with the general enhancement of skills.

Human resources development needs are defined as a gap that exists between the current performance of employees and the expected performance.

The importance of the types and methods of training needs analysis are discussed. After the needs have been assessed, identified, verified and placed in order of priority, the next step in the development of instructional systems, is to formulate training objectives in performance terms.

Training objectives are defined as a statement of desired results/ performance that should be achieved at the end of the instruction. The reason for the writing of training and development needs and classification of objectives, has been discussed.

The instructional program design is investigated, by first scrutinizing content selection, then content sequencing, and lastly, the selection of an instructional strategy.

The nature of evaluation is investigated by first defining evaluation. The difference between evaluation and validity is explained. The purpose or role of evaluating the different levels of evaluation, is presented in chronological order of development.

The empirical results indicated that South African firms do conduct a human resources development evaluation.

3. THE NATURE OF CAPITAL BUDGETING

3.1 INTRODUCTION

One of the objectives of this study, is to develop a method that is to be used in the financial evaluation of human resources development programs – a method based on the capital budgeting process. Before such a method can be developed, it is important that clarity be obtained irrespective of all the concepts that will be used in this method.

In chapter two, the concept of human resources development was explained and clarity of what is meant by the concept “program” was obtained. It is indicated, that human resources development entails a needs analysis, the setting of objectives, program planning, instructional design and program evaluation. It is also stated, that evaluation is to determine if the program accomplishes its assigned objectives and to determine the strengths and weaknesses of the program; also, that programs should be evaluated in order to establish a database that could be used to demonstrate the productivity and effectiveness of the human resources development department.

The financial evaluation of programs will be discussed in the next chapter. In this chapter, a clear understanding of the concept “capital budgeting” will be obtained, in order to establish elements, which will be included in the method to be designed later.

In this chapter, only aspects of cash estimation, the different capital budgeting, techniques used by firms, and risk in capital budgeting were empirically investigated and the results are reported on in section 3.4.1, 3.5.7 and 3.6.3. A more detailed analysis of results is given in chapter five. The following procedure will be used to explain capital budgeting.

- First, the concepts “capital expenditure, “capital budget” and “capital budgeting” will be defined.
- Secondly, the capital budgeting process will be explained.
- Thirdly, the determination of cash flows will be explained.
- Finally, an analysis of the different evaluation techniques used in capital budgeting, will be discussed.

3.2 THE DEFINITION OF CAPITAL BUDGETING

According to Horngren, Foster & Datar (1997:781), capital budgeting is a decision making tool that focuses on programs whose effects span over multiple time periods. Further, that capital budgeting decisions are not based on current accounting period’s income statement as they ignore the future implication of investigating in a project.

Human resources development programs are long term projects whose effects well span over a number of accounting periods. In making decision with regards to such programs, it is therefore necessary to use the capital budgeting process.

To facilitate an exposition of capital budgeting, it is more advisable to break it down into its major components.

3.2.1 Explanation of the concept capital expenditures or capital outlay

Gitman (1994:304), and Moyer, McGuigans & Kretlow (1992:368) differentiate between capital and current expenditures, where capital expenditures are those outlays of funds by a firm that are expected to produce benefits over a period greater than a year, whereas current expenditures are outlays resulting in benefits within a year. However, according to Levy & Sarnat (1990:18), there is no significant conceptual difference between the two expenditures, as all of the firm's expenditures are made in the expectation of producing future benefits. Further, Levy & Sarnat (1990:18) points out, that in the case of capital expenditures, a significant period of time elapses between an outlay and benefits, hence resulting in the problem of evaluation and comparing costs, and benefits becoming more difficult. Hence the conclusion is drawn that many firms apply formal capital budgeting procedures only to those projects in which one year elapses between the initial outlay and receipt of benefits.

Gitman (1994:305) identifies the expansion to the level of operations, the replacements or renewal of absolute or worn-out assets, as motivation for firms towards making capital expenditures. But, some capital expenditures do not result in the acquisition of tangible fixed assets shown on the balance sheet. Instead, they involve a long-

term commitment of funds by firms in expectation of future results. Human resources development projects are examples, because such projects involving long-term commitment funding.

According to Moyer et al (1992:368), investment in employee training is classified as capital expenditures and evaluated by using the framework of capital budgeting models. Bierman & Smidt (1984:4) refer to such decisions that involve large sums of funds and results in a major departure from what the firm has been doing in the past, as strategic investment decisions.

3.2.2 An explanation of the concept capital budget

A number of authors define this concept differently. According to Pinches (1994:240), a capital budget contains estimates of cash flows for long-term projects. Weiner & Stoner (1995:372) defines a capital budget as a financial plan reflecting a firm's intended outlays for long-term assets. Whereas Hartl (1986:198) states, that it is a schedule of all capital assets proposals found to be acceptable. Neveu (1985:275) describes it as a set of investment alternatives that a set of returns associated with each alternative occurring over a period of time.

From the above definition of a capital budget, it may be concluded, that a capital budget is a plan detailing a firm's set of long-term investment projects and containing estimates of cash flows of such projects.

In this study ninety nine percent of the companies investigated, indicated that the percentage expenditure for human resources development to the total capital expenditure, was less than twenty percent. This represents a sizeable amount spent on training and development. It can, therefore, be concluded, that it is necessary to properly evaluate the expenditure in respect of the human resources development.

3.2.3 An explanation of the concept capital budgeting

In analyzing different definitions by different authors, such as Brigham & Gapenski (1990:261); Chambers & Lacey (1994:166); Gitman (1994:304); Hartl (1986:198); Jones (1992:324); Moyer et al, (1992:368); Neveu (1985:276); Pringle & Harris (1987:299); Ross, Westerfeld & Jordan (1993:219); Werner & Stones (1995:372); Weston & Brigham (1981:394); and Brigham & Copeland (1992:299), a definition of capital budgeting is proposed. That is, capital budgeting is the process of analyzing, evaluating, planning and selecting long-term investment projects' whose returns are expected to extend beyond one year, to be included in the capital budget. Such a definition of capital budgeting incorporates all the aspects mentioned above, with regard to the concepts "capital expenditure" and "capital budget".

Finally, Weston & Brigham (1981:394) further points out, that capital budgeting is essentially the application of the classical proposition from economic theory of the firm, which state, that firms should

operate at the point where marginal revenue is just equal to marginal costs, and marginal revenue is taken to be the percentage rate of return from the project.

3.3 THE CAPITAL BUDGETING PROCESS

In section 3.2 it was resolved that capital budgeting is a process, which will obviously have different steps. In the literature (compare – Gitman, 1994:306; Levy & Sarnat, 1990:19; and Moyer et al (1992:372), various steps of the capital budgeting process are proposed.

Proposal generation. According to Gitman (1994:372) and Moyer et al (1992:372), capital expenditure proposals are made at all levels of the firm and Levy & Sarnat (1990:20) alternatively states, that such proposals are made by the conjunction with research and planning units. The head of department of human resources development will also make proposals for human resources development projects, and such proposals require large outlays of funds. Levy & Sarnat (1990:20) further points out, that optimal methods for identifying and generating investment proposals, differ from industry to industry and even from firm to firm.

Review and analysis. Gitman (1994:372) states, that investment proposals are reviewed in order to assess their appropriateness, taking into account the firms' overall objectives and plans, and more importantly, to evaluate their economic validity.

From the beginning of the proposal, the expected cost and benefits generated by the project are estimated (Levy & Sarnat, 1990:21) and then converted into a series of relevant cash flows to which various capital budgeting techniques are applied so as to measure the project's merit (Gitman, 1994:306). The capital budgeting process is as mentioned by Moyer et al (1992:374), and concerned primarily with the estimation of the cash flows associated with a project, not only its contributions to accounting profits. In view of this, relevant cash flow estimation and capital budgeting techniques will subsequently be discussed in detail.

Decision-making. After the relevant cash flows of a project have been estimated and the various capital budgeting techniques applied to such cash flows, a decision is made as to whether the project is economically viable or not. Management must satisfy itself as to whether acceptance of a project will result in an increase in the value of the firm. Gitman's (1994:304) accept–reject approach, which is the evaluation of capital proposals to determine whether they meet the firm's minimum acceptance standards, is used.

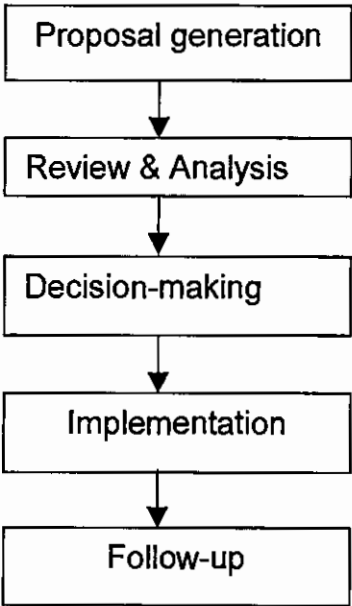
Implementation. Gitman (1992:306) states, that once a proposal has been approved and the funding allocated, the implementation begins. In the case of human resources development, stages mentioned in chapter two begin.

Follow-up. This, according to Gitman (1994:306), involves monitoring results during the operating phase of the project by

comparing actual income in terms of costs and benefits, with those expected. If there are any deviations, action may be taken to correct them.

In summary, the capital budgeting process can be indicated by the following model.

DIAGRAM 3.1: CAPITAL BUDGETING PROCESS



Source: Own research

3.4 CASH FLOW ANALYSIS

3.4.1 Introduction

It was noted in section 3.3, that the capital budgeting process is concerned primarily with the estimation of cash flows associated with a project. Gitman (1992:308) classifies such cash flows into two patterns, such as conventional cash flow patterns, which consist of an initial outflow, followed by a series of inflows, and also non-conventional cash flow patterns, wherein an initial outflow is not followed by a series of inflows. According to Correia, Flynn, Uliana &

Wormald (1989:271), the use of cash flows in evaluating investment projects, avoids accounting issues such as determining when income is earned rather than received and when costs become an expense. Five basic principles of cash flow estimation are applied to specific problems of project evaluation (Moyer et al, 1992:375).

Cash flows should be measured on an incremental basis.

Levy & Sarnat (1990:104) mentions, that projects should be evaluated by considering incremental cash flows which are cash inflows and outflows induced by the investment project decision in question. Ross et al (1993:256), defines an incremental cash flow as one consisting of any and all changes in the firm's future cash flows, that are a direct consequence of undertaking the project. Furthermore, that the stand-alone principle is applied, which states that once incremental cash flow from undertaking a project is determined, the project is viewed as a "mini-firm" with its own future revenue and costs. Finally, Ross et al (1993:258) explains, that in evaluating a proposed investment interest paid or any other financing costs, such as dividend or principal repaid, must not be included in the analysis and only cash flows from the project should be included. Werner & Stoner (1995:378) writes as follows irrespective of projects cash flows.

"The technique for evaluating capital budgeting projects, test each potential investment against the firm's cost of capital. Since the role of the cost of capital is to bring the firm's financing cash flows into the decision, we exclude financing cash flows from the description of the

investment project itself. Otherwise we will be double-counting in incorporating the financing flows cash flows twice.”

Cash flows should be measured on an after tax basis

In view of the fact that the initial investment made on a project, requires an expenditure of after-tax cash, the returns from the project should also be measured on an after-tax cash flow basis.

Sunk costs should not be considered when evaluating a project

All the indirect effects of a project should be included in the cash flow calculations. An increase in working capital, that results from the acceptance of a project, should be included in the net investment. Brigham & Gapenski (1990:301) and Ross et al (1993:257), define “sunk cost” as a cost that has already been paid or the business has such a liability to pay and cannot be changed. Sunk costs should not be included in a capital budgeting project (Brigham & Gapenski, 1990:301), as such costs are not incremental cash flows (Levy & Sarnat, 1990:109).

The value of resources used in a project, should be measured in terms of their opportunities

Brigham & Gapenski (1990:301) points out, that all relevant opportunity costs must be included in a correct capital budgeting decision. Opportunity costs are defined by Ross et al (1993:257) as those most valuable alternatives that are given up, if a particular project is undertaken. In other words, the opportunity costs of

resources are the cash flows those resources could generate, if they are not used in the project under consideration (Moyer et al, 1992:376).

Hartl (1986:204) notes, that in the business world, cash flow estimates that can be dependent upon with a 100%, are none, and that the uncertainty of future cash flows is the major cause of business risk, and hence management should try as best as it can to estimate them properly. Hartl (1986:205) further discusses a number of techniques that are used to estimate cash flow and these techniques should not be considered substitutes for each other, but rather as complements.

- Historical data. Valid historical data on a particular asset, is used to approximate the future. Mathematical everlasting techniques are used on the historical data.
- Survey. Surveys that are properly conducted, are used in the production of future cash flows. Care should be taken in using them, as such surveys are susceptible to bias.
- Engineering estimates. This is when technological aspects of many assets can be evaluated by experts so as to provide estimates.
- Subjective probabilities. Employees' feelings based on experience and training, and training as used to make estimates.

In this study a combination of these estimation techniques will be employed in order to determine cash flow estimates. Cash flows are the cost and benefits associated with training and development (refer section 4.3).

The empirical results indicate, that the companies investigated in this study do make estimates of future cash flows of the human resources development. It is noted, that such estimates are incremental cash flows that are measured on an after-tax basis. The table below indicates the results obtained.

TABLE 3.1: CASH FLOW ESTIMATES FOR H R D PROGRAMMES

QUESTION ASKED	PERCENTAGE RESPONSES
1. Estimates of future costs data made in your company	88%
2. Estimates of future training benefits are made in your company	56%
3. In estimating future training cash flows, your company only considers incremental cash flows that have measured on an after-tax basis.	75%

SOURCE: Own research

Gitman (1994:310) categorizes cash flows into three basic components; that is, the initial investment, operating cash flows, and terminal cash flows. It is furthermore stated, that all projects have the initial investment and operating cash inflows, but that some lack terminal cash flows. These components are discussed below.

3.4.2 Initial investment

Gitman (1994:311) and Jones (1992:332) describe the initial investment or net initial cash outflow as the relevant cash outflow at time-zero, to implement a proposed long-term investment. Several well-known components are incorporated in an analysis of the initial investment (Jones, 1992:332) and a decision has to be made as to which component is associated with a proposed investment (Gitman, 1994:31).

The most common components of initial investment, are the following - although not all initial investments include all of these components (Gitman, 1994:314); (Jones, 1992:333) and (Moyer et al, 1992:376).

- Installed costs, which include the cost of new assets plus installation cost (Gitman, 1994:314). Those costs are typically the largest part of the initial investment and they provide the basis for tax and depreciation.
- Change in networking capital initially required as a result of the new investment (Meyer et al, 1992:376). According to Gitman (1994:31), the acquisition of new machinery by a firm to expand its level of operation, results in an increased level of cash, inventory, accounts receivable and accounts payable. Furthermore, the differences between the changes in current assets and the changes in current liabilities, would be the change in net money capital. Finally (Jones, 1992:333), states that use is made of net working capital, because part of any

change in current assets, is offset by a change in those current liabilities that automatically change when revenue expands.

- The net proceeds from the sale of old or existing assets when the investment is a replacement decision (Meyer et al, 1992:376) such sale proceeds of old assets have varying tax implications (Jones, 1992:333). The tax depends upon the relationship between its sale price, initial purchase price, and book value. (Gitman, 1994:315; Brigham & Gapenski, 1990:302) note, that tax can have a major impact on cash flows and can make or break a project, and therefore, it is critical that they be dealt with correctly in capital budgeting decisions. In terms of **Section 8(4)(a) of the Income Tax Act 58.1962 as amended**, if the selling prices of an asset is greater than the assets tax value, the differences represents a recoupment which must be added to taxable income in the year the asset is sold. If the selling price is below the asset tax value, and the disposal is in the ordinary course of trading, then the difference between the selling price and the tax value is deducted from a company's taxable income.

3.4.3 Net operating cash flows

Correia et al (1989:273) notes, that the purpose of investing in projects, is the generation of future cash flows. According to Meyer et al (1994:377), after the initial investment has been made, capital projects are expected to generate after-tax cash flow streams.

Furthermore, that the process of estimating incremental cash flows of a project, is an important part of the capital budgeting process. The terms "incremental cash flow", and "after-tax" were explained in section 3.4.1. To reiterate, benefits from a project must be measured in after-tax, since the firm will not have used any of these benefits before satisfying tax obligations.

Benefits from a project should be measured on a cash flow basis and not as accounting profits. The basic calculation, according to Gitman (1994:320), requires adding non-cash charges deducted as expenses on the firm's income statement, back to net profit after-taxes.

During the life of a project, the after-tax net operating cash flows may be defined as the changes in operating earnings after taxes, plus the changes in depreciation (a non-cash item), minus the changes in non-working capital required to support the project (Moyer et al, 1992:377). As again noted in section 3.4.1, interest charges associated with a particular project and resulting from a debt obligation, should not be deducted or considered in the estimation of cash flows.

3.4.4 Terminal cash flow

Gitman (1994:325) describes terminal cash flow, as that after-tax cash flow resulting from the termination and liquidation of a project at the end of its economic life. Furthermore, consideration of these cash flows provides closure to the capital budgeting analysis, allowing the firm to return to its initial position in terms of the expenditures being considered. Correia et al (1989:275) states, that

cash flows at the end of a project consist of proceeds on sale of the asset, which will result in a tax recoupment, if the selling price is higher than the asset's tax value and if it is sold below the tax value, the firm qualifies for the scraping allowance; return of working capital and this reflects the reversion of the firm to its original status of any networking capital investment reflected as part of the initial investment.

As was noted in section 3.3. after budgeted costs and benefits are converted into cash flows, various capital budgeting techniques are applied to evaluate a project. Such capital budgeting techniques are discussed below.

3.5 CAPITAL BUDGETING TECHNIQUES

3.5.1 Introduction

As was noted in section 3.3, expected costs and benefits generated by the project, are estimated and then converted into a series of relevant cash flows, to which various capital budgeting techniques are applied to evaluate a project. Various techniques, according to Gitman (1994:342), are available to evaluate prospects for selection and they integrate time-value procedures, risk and return considerations, and valuation concepts. The most popular capital budgeting techniques will be discussed. Secondly, it will be those techniques that use discounted cash flow methods and incorporate the time-value of money, and thirdly, those that do not. Ross et al (1993:221) describes discounted cash flow valuation as the process of valuing an investment project by discounting its future cash flows.

3.5.2 Payback period/method

Authors such as Correia et al (1989:267); Gitman (1994:342); Hartl (1986:239); Jones (1992:354); Chambers and Lacey (1994:177); Pringle & Harris (1987:302); Ross et al (1993:224); Levy & Sarnat (1990:164) and Weston & Copeland (1992:306), define the payback period/method as a method or approach of analyzing investment projects so as to determine or measure the time it takes to recover the initial investment from cash flow generated by the project. Bierman and Smidt (1984:35); Moyer et al (1992:416) & Jones (1992:354) define it as the length of time required for the cumulative cash inflows from a project to be equal to the net initial investment or cash outflow. It is also, as mentioned by Naveu (1985:284) & Ross et al (1993:227), the time required for a project to break-even in an accounting sense and not in an economic sense.

The decision criterion to make accept-reject decisions, is that if the payback period is less than the acceptable payback period, the project is accepted, but if it is greater than the maximum acceptable period, the project is rejected (Gitman, 1994:343).

Because of its ease of calculation, the payback period is popular among small firms and also appealing, for the fact that it considers cash flows rather than accounting profits (Gitman, 1994:344). The problem of the payback formula is, that it does not take into account the time-value of money, and it only concentrates on the receipts within the payback period and ignores receipts later in the year. (Levy & Sarnat, 1990:165).

3.5.3 Accounting rate of return

The ARR is the second oldest evaluation technique which looks at a project's contribution to net income, rather than at its cash flow (Brigham & Gapenski, 1990:265). The accounting rate of return uses accounting based return on investment (Pringle & Harris, 1987:304). This rate of return is calculated by dividing a project's annual net profit after deducting depreciation, by either the total or the average initial investment (Levy & Sarnot, 1990:166). The average investment is the arithmetic average of the beginning and ending investment values (Weston & Copeland, 1992:308). As is true with the payback period approach, the accounting rate of return does not take the time-value of money into account (Weston & Copeland, 1992:308) or does not make provision for discounting future cash flows (Levy & Sarnat, 1990:167).

Pringle & Harris (1987:304) furthermore explains, that the other problems associated with accounting based return on investment measures, are -

- that there are many ways return can be measured – accounting profits, cash flow, before tax and after-tax,
- investment can be measured by initial outlay, book value, average book value,
- return on investment calculated with value of the above measures, would yield different results, and

- even when a particular measure is chosen, the quantities will be affected by accounting conventions, such as a choice of depreciation method.

Finally, Chambers & Lacey (1994:179) contends, that the logic underlying the use of the accounting rate of return, is that the objective of firms is to produce high profits on investments, and they will, therefore, invest projects (assets) that produce high-average profits.

3.5.4 Net present value (NPV)

The net present value is defined by Chambers & Lucey (1994:168), as capital budgeting models that compare the present value of the project benefits with the present value of the projects costs and the difference between benefits and costs, is the net present value. Gitman (1994:345) notes, that the net present value (NPV) is calculated by subtracting the initial investment from the present value of the cash inflows discounted at a rate equal to the firms' cost of capital. Ross et al (1993:320) offers a somewhat different explanation, by pointing out, that the net present value is a measure of how much value is created or added today by undertaking an investment, or the net present value of uninvestment, is the difference between an investment's market value and its costs.

The cost of capital used in discounting the cash inflows reinforced the above, is defined by Gitman (1994:400) as the rate of return that a firm must earn on its project investment to maintain its market value

or it can be thought of, as the rate of return required by the market suppliers of capital, to attract their funds to the firm.

The decision rule when the net present values are used, is that a project should be accepted if the net present value is greater than zero, because the firm will earn a return greater than its costs of capital (Gitman, 1994:346). If the project has a positive net present value, then its benefits are greater than the costs, such a positive value will increase the value of the firm (Pringle & Harris, 1987:307). Finally, one of the advantages of the net present value, is the way it incorporates the time value of money (Chambers & Lacey, 1994:168).

3.5.5 Internal Rate of Return method (IRR)

With the internal rate of return, which is closely related, and the most important alternative to the net present value, or single rate of return is found that summarizes the merits of a project (Ross et al, 1994:233). The procedure is to use present-value concepts, but to avoid the arbitrary choice of rate of interest, by finding a rate of discount that will make the present value of the cash proceeds from an investment, equal to the present value of the cash outlays required by the investment (Bierman & Smidt, 1984:31). The rate is internal, in that it depends only on the cash flows of the investment under consideration and not on rates offered elsewhere (Ross et al, 1993:232). The internal rate of return is the actual rate of return that a project earns when profits and the time-value of money are taken into account (Neveu, 1985:290). Moyer et al (1992:414) states, that the internal rate of return technique, like the net present value

technique, taken into account, puts both the magnitude and the timing of cash flows over the entire life of a project in measuring the projects desirability.

The decision rule, according to Gitman (1994:347) and Jones (1992:362), is to compare the internal rate of return with a required rate of return or cost of capital, and if the IRR is greater than the cost of capital, the project is accepted, but if it is less, the project is rejected.

In projects with nonconventional cash flows, the possibility exists, that more than one discount rate equates the net present value to zero. But if some nonconventional project and discount rate could be found but it is a laborious task to check. If cash flows are nonconventional, it is better to use the net present value approach (Jones, 1992:364). Nonconventional cash flows are described by Gitman (1994:308) as the pattern of cash flows, in which an initial outflow is not followed by a series of inflows.

3.5.6 Profitability index

The profitability index is a third discounted cash flow technique used in capital budgeting, in addition to the net present value and the internal rate of return (Pringle & Harris, 1987:31). It is sometimes called the benefit/cost ratio (Brigham & Gapenski, 1990:270). Jones (1992:364) defines profitability index as the present value of the future cash inflows for a project divided by its initial investment.

According to Meyer et al (1992:415), a project whose profitability index is greater than or equal to one, is acceptable, whereas a project with an index less than one, is unacceptable. Chambers & Lacey (1994:170) states, that an index whose value is greater than one, defines a project whose benefits exceed costs, and an index less than one, defines a project whose cost exceeds benefits and an index equal one, implies costs are equal to benefits.

3.5.7. Discussions in respect of the capital budgeting techniques

The choice of a particular technique, depends on the costs and benefits of that technique. It would be quite reasonable for a decision-maker to select a very simple technique, if the costs of using the more complex alternative exceed their benefits.

There has been a number of articles during the last decade with regard to company practice in the use of the capital budgeting techniques (refer section 5.4).

The capital budgeting techniques discussed above, are used around the world. Horngren, Foster & Dater (1998) reports on the studies conducted around the world by a number of researchers on the use of capital budgeting techniques. The findings, which will incorporate the findings of this study are shown below.

Table 3.3: comparative usage of capital budgeting techniques on pg. 82

TABLE 3.3: THE COMPARATIVE USAGE OF CAPITAL BUDGETING TECHNIQUES

METHOD	COUNTRY									
	USA	AUS- TRALIA	CANADA	IRE- LAND	JAPAN	SCOT- LAND	SOUTH KOREA	U K	POLAND	S A
PAYBACK	59%	61%	50%	84%	52%	78%	75%	76%	48%	83%
I R R	52%	37%	62%	84%	4%	58%	75%	36%	8%	85%
N P V	28%	45%	41%	84%	6%	48%	60%	38%	23%	78%
A A R	13%	24%	17%	24%	36%	31%	68%	28%	11%	18%
OTHER	44%	7%	8%	-	5%	-	-	7%	13%	13%

SOURCE: Horngren, Foster & Datar, (1997:794) and adapted

The percentages above, indicate how frequent a particular capital budgeting technique is used. The percentages exceeds 100, because companies use more than one capital budgeting technique.

The last column indicates the usage by South African companies surveyed in this study. Research shows that South African companies do not differ significantly from other firms around the world.

3.6 RISK IN CAPITAL BUDGETING

3.6.1 Introduction

Risk that is brought about by uncertainty (Hartl, 1986:92), is defined as the chance of financial loss and the term refers to the variability of returns associated with a given investment (Gitman, 1994:214).

Brigham & Gapenski (1990:341) identifies three types of project risk.

- Start-alone risk, which looks at risk of a project in isolation, without regard to other investments.
- Within-firm risk, also called corporate risk, which looks at the risk of a project with the context of the firm's other projects.
- Market risk, which looks at a project's risk within the context of the firm's shareholder-diversification in the general stock market.

Risk, which is of concern in the human resources development program, is stand-alone and within-firm risk.

According to Parry & Firer (1990:52), there are several quantitative techniques which have considerable potential in assisting decision-makers to deal with the uncertainty (risk) surrounding capital budgeting decisions. In this section, risk assessment and risk adjustment techniques will be discussed.

3.6.2 Risk assessment techniques

Parry & Firer (1990:52) identifies four formal methods that are used in assessing risk of a capital budgeting proposal.

- Sensitivity analysis which is used to determine the impact of input variables to the success of the project. The variables are flexed by a given amount, and this impact on the net present value and the internal rate of return, determined.

- Scenario analysis provides a range of likely values of variables, in addition to measuring the sensibility of changes in key variables. Usually worst and best case values are used to produce estimates of the worst and best possible outcomes. Assigning probabilities to these outcomes, as well as to the expected outcomes, allows for the calculation of an expected NPV and its associated standard deviation.
- Monte Carlo simulation, which is the more vigorous method of assessing a project's stand-alone risks, ties together sensitivities and input variable probability distribution that requires the use of a computer.
- Decision processes are generally used in projects that require capital outlays of several years and provides estimates of expected NPV and the one-commitment standard deviation”.

3.6.3 Risk adjustment techniques

Three methods of risk-adjustments are discussed by Parry & Firer (1990:53).

- The maximum payback period is shortened, if a project is assessed to have a high risk, unacceptable to the firm.
- The handle rate for the project is adjusted by a suitable premium or discount so as to allow for risk that is not acceptable to the firm. This technique is known as risk-

adjusted discount rate and involves changing the handle rate if the IRR is used or the discount rate in the NPV or profitability index is used.

- The estimated cash flows are adjusted to allow for the changing levels of risk over the life of the project cash flow. One is project life adjustment and involves the transaction of cash flows by reducing the project life and hence the apparent return: the second is the certainty equivalent approach which invests first reducing part expected cash flow to its certainty – equivalent and then discounts for times using the risk-free rate.

A survey of how companies around the world adjust for risk when evaluating capital investments, is reported by Horngren et al (1997:841). The table below indicates the survey results and incorporates results obtained in this study.

TABLE 3.4: RISK ADJUSTMENT METHODS USED IN A NUMBER OF COUNTRIES

METHOD	COUNTRIES						S A
	USA	AUSTRALIA	CANADA	U K	TAIWAN	POLAND	
1. Perform sensitivity analysis	29%	57%	59%	63%	-	10%	52%
2. Increase the required rate of return	18%	-	31%	42%	61%	13%	53%
3. Shorten payback period	17%	-	24%	34%	72%	25%	71%
4. Estimate probability distribution of future cash flows	12%	11%	18%	15%	-	13%	45%
5. Compare optimistic & pessimistic forecasts	-	63%	-	-	-	-	-
6. Make subjective non-quantitative assessment	54%	37%	29%	22%	69%	4%	-

SOURCE: Horngren et al (1997:841) and adapted

The table above indicates, that the specific methods used, vary among countries. South African companies do make use of these methods to adjust for risk in the same manner as in other countries.

3.7 CONCLUSION

In this chapter, the exposition on the concept capital budgeting is broken down into three components.

First, the difference between current and capital expenditure is explained. It is also pointed out, that investment in human resources development is classified as a capital expenditure.

Secondly, the concept "capital budget" is explained as a plan detailing a firm's set of long-term investment projects and contains estimates of the cash flow of such projects.

Lastly, the concept "capital budgeting" is explained by noting, that it is a process of analyzing, evaluating, planning and selecting of long-term projects for inclusion in the capital budget of a firm.

Cash flows used in the capital budgeting, are classified into conventional and unconventional cash flow patterns. Different methods of estimating cash flows are discussed.

The techniques which are used in the selection and evaluation of capital projects, are explained. The decision rules with regards to the

application or use of these techniques for making decisions, are indicated.

The concept risk and the risk adjustment techniques are explained . It was also noted that South African firms do make use of the risk adjustment methods to assess and adjust for risk in the evaluation of capital projects.

4. FINANCIAL EVALUATION OF HUMAN RESOURCES DEVELOPMENT PROGRAM

4.1 INTRODUCTION

The objective of this study is to develop a method that is to be used in the financial evaluation of a human resources development program that is based on the capital budgeting process. The term "financial" indicates a use of funds that are normally scarce. Concepts that will be used in the development of such a method have been clarified in the previous chapters.

Human resources development entails a need analysis, the setting of objectives, instructional design and program evaluation. A program is a set of operations, actions or activities designed to produce certain desired effects or outcomes. Capital budgeting is the process of analysing, evaluating, planning and selecting long-term investment projects whose returns are expected to extend beyond one year. Lastly, evaluation is the process of assessing the total value of the human resources development program for the organization.

In chapter 2 different levels of evaluation by authors such as Kirkpatrick (1994:21), Phillips (1987:36) and by Parkor, Erickson and Kulp, Warr, Bird and Noel Rackham, and Hamblin are presented. The last levels of some of these approaches are worth noting (refer section 2.6.4.3)

- Kirkpatrick approach's "results" level – evaluation of this level relates results of the program to organizational improvement. Results include cost savings.
- The Bell System approach's "worth outcomes" level – this level shows the value in relation to costs. This indicates the extent to which an organization benefits from human resources development in terms of money, time or resources used.

Overall, the common thread in these approaches is an emphasis on costs and benefits from a human resources development program, in terms of money or financial resources used. A comparison of costs and benefits will determine the financial value for the organizations – of a human resources development program.

In this chapter the concepts cost, cost effectiveness, cost/benefits analysis", as they pertain to human resources development, will be explained. The financial concept of return on investment as used in human resources, is also described. Lastly the method to financially evaluate a human resources development program, is developed, also indicating conditions under which such a method will work in a firm.

4.2 FINANCIAL EVALUATION TECHNIQUES

Several methods are used to financially evaluate investments in human resources development programs. Three of the most

common methods, cost-effectiveness, cost-benefit and return on investment will be discussed.

4.2.1 Cost-effectiveness analysis

According to Bramley (1991:79), cost-effectiveness analysis is used to cost programmes and to use these costs as a basis for comparing them. Cost-effectiveness is a comparison of the cost of a method of training to achieve a particular objective with other methods (Critton, 1994:162), or how to reduce costs of the current training program (Kearsley, 1993:161).

Carpenter & Haggart (1970:2) states in their article on cost-effectiveness analysis for educational planning, that cost-effectiveness techniques may be used not only for comparing programs but also to -

- help assess the relative worth of several innovative programs with the same training outcome,
- determine whether a single program is becoming more or less effective as time passes, so that steps may be taken to improve it, if necessary, and
- help assess the relative worth of the same program for different trainees from different backgrounds or in different training settings.

4.2.2 Cost-benefits analysis

According to Kearsley (1993:162) the focus of cost-benefit analysis is an attempt to weigh the costs of training activity with the outcomes (benefits) achieved. Outcomes can be end-of-training achievement, improved job performance, reduced turnover, increased sales, or some other measure of organizational benefits: these are to be discussed later. Bramley (1991:80) also states that a cost benefit analysis's intention or purpose, is to establish whether the benefits from training are more valuable to the organization than the cost, and wherever possible, benefits are translated into monetary terms.

Critten (1994:164) draws the conclusion, that cost-benefit analysis is the real key to financial value and that it implies some form of "payback" over and above the original costs of training, and that it answers the basic question of the heart of evaluation. Are the expenses incurred in training worth it?

4.2.3 The return on investment

Phillips (1987:191) states, that the expression "return on investment" originates from the finance and accounting field, is fairly common, and conveys an adequate meaning of financial evaluation of a human resources development program. Furthermore, Phillips (1987:192) states, that "return on investment" may be calculated, prior to a human resource development program so as to estimate the potential cost-effectiveness, or after a program has been conducted, to measure the results achieved. The method of calculation is the same. However, the estimated return before a program is usually

calculated for a proposal to implement the program. The data, after its calculation, are more subjective and usually less reliable than data after the program has been completed. Because of this factor, management may require a higher return on investment for a human resources development program in the proposal stage.

The return on investment is calculated by dividing earnings (income) by total assets (Correia, Flynn, Uliance & Wormals, 1989:155). For a human resources development program evaluation, the return on an investment may be stated as follows (Phillips, 1987:191).

$$\text{Return} = \frac{\text{Net program benefits (or savings)}}{\text{Program costs (or program)}}$$

In this study it is indicated that the firms investigated, do conduct a cost-effectiveness and cost-benefit analysis. The table below summarizes these results.

TABLE 4.1: FINANCIAL METHODS USED TO EVALUATE HUMAN RESOURCES DEVELOPMENT PROGRAMS

METHOD	PERCENTAGE RESPONSE
1. Cost-benefit analysis	93%
2. Cost-effectiveness analysis	89%
3. Return on investment	(not investigated)

SOURCE: Own research

From the above table, it can be deduced, that firms can use financially based methods to evaluate human resources development programs.

4.3 HUMAN RESOURCES DEVELOPMENT PROGRAM COSTS

4.3.1 Introduction

A common thread running through the different financial evaluation techniques discussed above, is the concept “cost and benefit”. This section explores in detail the definition of cost, the rationale for determining costs, specific methods to deal with costs in human resources development, and the estimation of costs. The concept benefit will then be discussed in the next section.

4.3.2 The concept “cost” in human resources development

Thomas, Mexham & Jones (1969:235), in the study of cost benefit analysis of Industrial training in UK, defined training costs “... as the total monetary sacrifices (the sum of all increases in expenditure and decreasing in receipts) incurred by the firm (and/or the individual and society) as a result of the training activity”. Throughout literature on training, money spent on training and development has been defined as a monetary cost (Cullen, Sawzin, Sisson & Swangon, 1985:217).

In view of that fact that cost represents money that is invested in human resources development (and as indicated before, that this money happens to be scarce), must be designed to classify and allocate such costs to human resources development. In other words, a costing system that is tailored to the needs of the human resources development, must be designed.

Phillips (1987:108) is of the opinion, that the following are some reasons for having a human resources development costing systems, other than for the purpose of evaluation.

- To determine the overall expenditure for human resources development – an effective system of cost data collection will enable the firm to calculate the total human resources development expenditure as compared to that of other programs.
- To determine the relative cost of each individual human resources development program – monitoring costs of programs, enables management to know if some programs are carrying other programs which are costing more, with little results. It enables evaluation of the relative importance of programs to be determine and to see if their costs are increasing out of proportion.
- To predict future program costs – historical costs data from previous programs, help to develop standardized data that can be used in estimating the costs of proposed programs.
- To calculate benefits versus cash for a specific program – the most important reason for collecting costs, is to prepare data to use benefit-costs evaluation techniques. These will be indicated in the study.

- To improve the efficiency of the human resources development department; this will indicate whether or not the department is functioning properly.
- To evaluate alternatives to a proposed human resources development program – this will enable alternatives for training to be evaluated, to see if training is cost effective.

This study indicates, that firms have a system of human resources development cost classification. Estimates of future costs and benefits are also conducted . The table below summarizes the responses obtained.

TABLE 4.2: ESTIMATION OF COST AND BENEFITS

QUESTION ASKED	RESPONSE
1. A system of human resources development costs classification exists in your company	94
2. Estimates of future training costs data are made in your company	88
3. Estimates of future training benefits are made in your company.	56

COURSE: Own research

It can be concluded, that if firms have a system of cost classification and do make estimates of costs and benefits, a method to evaluate programs that incorporate these costs and benefits, can be used by them.

Different methods of dealing with costs in the context of human resources development financial evaluation techniques, are

discussed in sections 4.2.1, 4.2.2 and 4.2.3. Such methods will be presented in the following sections in chronological order.

4.3.3 Costing systems in human resources development

According to Phillips (1987:112), there are two basic ways of classifying human resources development costs.

- The description of the expenditure; this is called an "expense account classification".
- Categorising in the human resources development process or function.

Different approaches to classifying cost by different authors, are subsequently presented in chronological order.

- **Kearsley's Resource Requirement Model (1981, 1982)**

According to Kearsley & Crompton (1991:52) and Kearsley (1992:11), this model provides a simple framework for the analysis of training costs associated with various approaches to training. Van Dyk, et al (1997:443) states, that such a model allows the systematic identification of costs on the basis of various aspects of the training cycle and accounting to four main categories of resources.

Kearsley (1982:12) illustrates the accumulation of costs by means of the following matrix.

Table 4.3: KEARSLEY'S MODEL

	PERSONNEL	EQUIPMENT	FACILITIES	MATERIALS
ANALYSIS				
DESIGN				
DEVELOPMENT				
IMPLEMENTATION				
EVALUATION				

Source: Kearsley (1982:12) and adapted

Kearsley (1982:12) provides the following method of using the matrix in analysing costs.

- “By filling in the cells applicable to a certain training setting, the total costs applicable are determined by adding up all of the rows and columns.
- In order to compare two training approaches or techniques, the total costs of each are summed across all aspects and resources categories and then compared.
- Using this model in this way, it is possible to decide if a new training approach or technique could provide costs savings over an existing method.

The sum of all the costs through all of the different stages of the training cycle, represents total costs. This model is used for comparing the costs of two or more approaches to training (Van Dyk et al, 1997:444).

Finally, van Dyk et al (1997:444) provides a method of calculating cost savings between two approaches.

$$\text{Total cost saving} = \text{Total cost (approach A) less Total cost (approach B).}$$

- evaluation

- **Phillips Approach (1987)**

Phillips (1987:113) classifies costs into four process/functional categories.

Table 4.4: PHILLIPS METHOD OF COSTS CLASSIFICATION

<u>Column A</u> Support costs Operation costs	<u>Column B</u> Classroom costs Administrative costs Participant compensation and facility costs
<u>Column C</u> Administrative costs Program development costs Classroom costs Participant costs	<u>Column D</u> Analysis costs Development costs Delivery costs Evaluation costs

Source: Phillips (1987:114) and adapted

- In column A, support costs include all administrative, overhead, development, analysis, or any other expenditures not directly related to conducting the training program. Operating costs include all expenses involved in conducting the human resources development program. In this column, no details are provided to analyze the cost on a functional basis.

- In column B, more detail is given, but information on program development costs which are a useful item, are not provided.
- In column C development costs are given, but there are no evaluation costs which are becoming a more significant part of the total human resources development process.
- In column D costs are broken down into several categories.
 - Analysis costs, which are associated with the initial problem identification, needs analysis, development of objectives, selection of participation, preparation of program proposal. Examples are salaries, materials, special equipment and consulting fees.
 - Development costs, which are directly related to the development of the program. Since those costs are normally large, they have to be spread over the life of a continuing program.
 - Delivery costs, which are associated with the delivery of program.
 - Evaluation costs, which could be evaluation material and time to administer the evaluation instruments, analyze results, and report those results.

Phillips (1987:118) furthermore provides a more detailed table in the classification process so as to define the kinds of costs in the account

classification system which apply to the process/functional categories.

Table 4.5: PHILLIPS DETAILED METHOD OF COST CLASSIFICATION

	Analysis	Development	Delivery	Evaluation
Salaries & benefits – HRD personnel	X	X	X	X
Salaries & benefits – other firm personnel		X	X	
Salaries & benefits – Participation			X	X
Meals, travels & incidental expenses – HRD personnel	X	X	X	X
Meals, travel and accommodation – participants			X	
Office supplies & expenses	X	X		X
Program materials & supplies		X	X	
Printing and reproduction	X	X	X	X
Outside services	X	X	X	X
Equipment expense allocation	X	X	X	X
Equipment – rental		X	X	
Equipment – maintenance			X	
Registration fees	X			
Facilities expenses allocation			X	
Facilities rental			X	
General overhead allocations	X	X	X	X
Other miscellaneous expenses	X	X	X	X

Source: Phillips (1987:118) as adapted

Finally, a significant reason for classifying costs, is to predict the cost for future programs, and also to compare ongoing costs with the budget or with projected costs.

• **Bramley’s Approach - (1991)**

Bramley’s work on Evaluating Training Effectiveness, provides a simple matrix for costing training events, where he divides costs into personnel and equipment and allocates them according to three stages in a training programme (Critten, 1994:162).

Table 4.6: BRAMLEY’S APPROACH OF COST CLASSIFICATION

	PERSONNEL	FACILITIES	EQUIPMENT
DESIGN	1(a)	1(b)	1(c)
DELIVERY	2(a)	2(b)	2(c)
EVALUATION	3(a)	3(b)	3(c)

Source: Bramley (1991:78) as adapted

- 1. The cost of designing a training program, includes things like -
 - 1(a) costs of preliminary analysis of training needs, development of objectives, course development, programming, training aids production, consultants’ advice,
 - 1(b) offices, telephones, and
 - 1(c) production of workbooks, slides, tapes, tests printing and reproduction.
- 2. Delivery cost is actually running the events and includes -
 - 2(a) some proportion of annual salaries of trainers, clerical/admin staff, costs of consultants and outside lecturers, travel cost,
 - 2(b) cost of the conference centre or up-keep of classrooms, buildings, offices, accommodation and food, office supplies, and

2(c) equipment for delivering training.

3. Evaluation would include -

3(a) design of questionnaires, follow-up, interviews, travel, accommodation, analysis of data and preparing reports,

3(b) offices and telephone, and

3(c) tests, questionnaires, postage.

Finally, for financial evaluation purposes, the costs mentioned above, are used in cost-effectiveness comparisons, and in cost-benefit analysis.

• **Jac Fitz-enz Approach 1994**

Fitz-enz (1994:210) developed a cost classification system that is more or less similar to that of Kearsley, Phillips and Bramley, the identified and classifies eighteen costs variables, these are slotted into the various stages of the training program, thereby creating a matrix of cost inputs and training stages.

Table 4.7: FITZ-ENZ APPROACH OF CLASSIFYING COSTS

Phase	A.People	B.Equipment	C.Motorial	Facilities	Mice	Total
Diagnosis						
Design & Development						
Delivery						
Evaluation						
Total	Total	Total	Total	Total	Total	Total

Source: Fitz-enz (1994:211) as adapted

Different types of cost analyses can be performed by using this cost-accounting system (Fitz-enz, 1994:212)

- Project future program costs by using historical cost data
- Run trend analysis – by using a base of historical and data
- Run trend analysis – by using a base of historical data, opportunities to cut costs can be looked at.
- Manage line-term cost—a review of costs from program to program and within programs, can be done by using the given line-term costs by stage and input.
- Plan budget, using the current data base of costs.

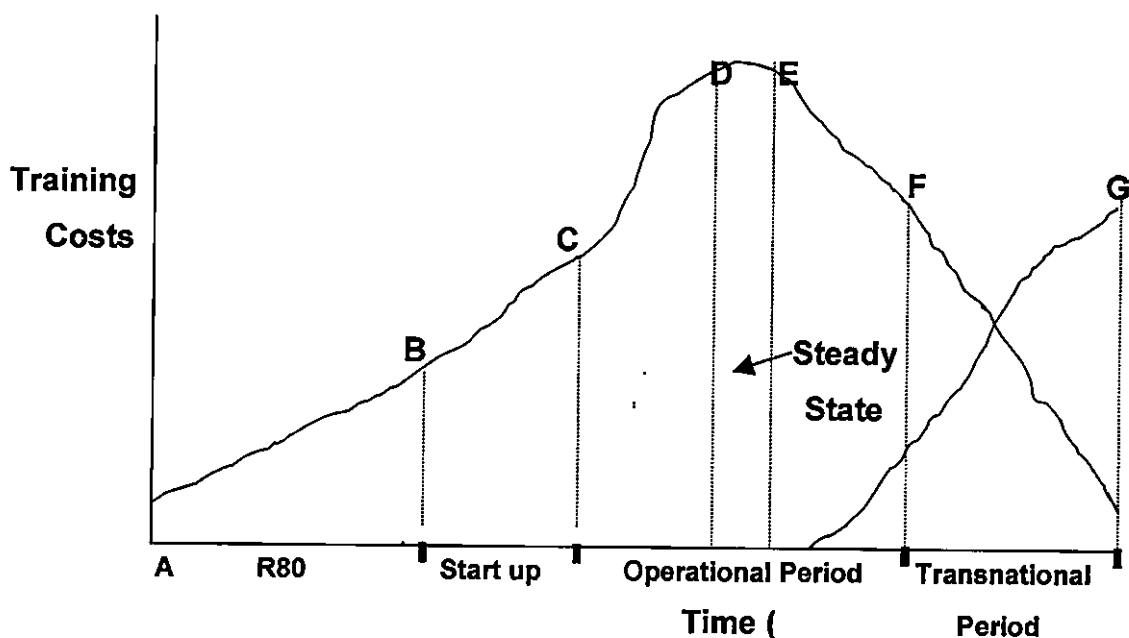
The costs identified above, are used to make up this other half of the costs benefit analysis equation. The other half will consist of benefits accruing from the program.

- **The Life Cycle Approach**

According to Kearsley (1982:37), the resource requires input approach, providing a way of comparing the costs of two or more different training approaches at a given point in time and does not take into account the entire life cycle of the training system. Kearsley (1982:37) maintains, that the life cycle model is a model that allows comparison of the relative costs of two or more training approach as

to be made over some selected period of time. Furthermore, the Life Cycle Model could be used to compute **absolute costs**, but they are often used for comparison purposes.

Diagram 4.1 Specific activities and phases in this model



Source: Kearsley (1982:32) as adapted

The following can be deduced from this diagram (Van Dyk, 1997:445).

- During event A, a new training approach is studied and tested.
- During event B, a decision is taken to implement the new approach. Kearsley (1998:39) notes, that such a decision should be based on evidence that the approach will meet

desired training objectives and generate a favorable cost/benefit analysis.

- Costs involved in the implementation rise sharply, as investments are made in the necessary resources (i.e. instructors, equipment, acquisition facilities or the development of new materials).
- The operational phase of the training system is represented by segments C and F. The quantity of resources needed during this phase, remains constant or even declines. Kearsley (1982:40) notes, that once the operational phase has been reached, the adopted training approach becomes the baseline to which new or alternative approaches are now compared.
- The interval D-E represents a state.
- During event F-, the decision is made to replace the current approach to training by a new one.
- The period between F and G, is the transitional phase wherein this old approach is phased out and its costs decline drastically. The start-up cost of the new proposed approach rises steeply.
- In view of the fact that the transitional phase may be the most cost-intensive in a training program, it is important to develop ways of implementation that will restrict these costs to a minimum.

A formula (Van Dyk, 1997:446) can be used to calculate costs in the life cycle approach, irrespective of the time period used, and is -

$$\text{Total life cycle costs} = \text{Total start-up costs} + \text{total transitional costs} + \text{total steady state costs}$$

4.3 BENEFITS OF HUMAN RESOURCES DEVELOPMENT PROGRAMS

4.4.1 INTRODUCTION

In the previous section, different models have been discussed on how to compute or deal with human resources development costs. In order to use the financial evaluation techniques discussed in section 4.2 (i.e. the cost benefit models and the return on investment), it is important that benefits of human resources development programs be determined. In this section a definition of what is meant by "benefits" will be given, and in more detail, the nature of a human resources development program benefits discussed.

4.4.2 The nature of benefits

Gilley & England (1989:272) notes, that once the costs of the training program have been estimated, the benefits or savings must also be determined and the easy method is, to estimate savings potential and/or increased revenue.

There are numerous potential benefits that could be gained by an organization from a well-planned and effectively conducted human resources development program. (Buckley & Caple, 1995:16). This includes -

- improved employee work performance and productivity;
- shorter learning time, which could lead to less costly training, and to employees being "on-line" quickly;

- decrease in wastage time;
- fewer accidents;
- less absenteeism; and
- lower labour turnover and greater customer or client satisfaction.

Since all or most of these benefits result from a training program, evaluation should account for the contribution from each one.

Oatey (1970:9) suggests that, since the ultimate objective of training is increased profitability (benefit), it must be evaluated directly in terms of total profit.

Benefits, like costs (in the cost-effectiveness and cost-benefit models), can be used to evaluate two or more different human resources development programs. Two models that provide a way of comparing the benefits of two or more training programs, are presented below.

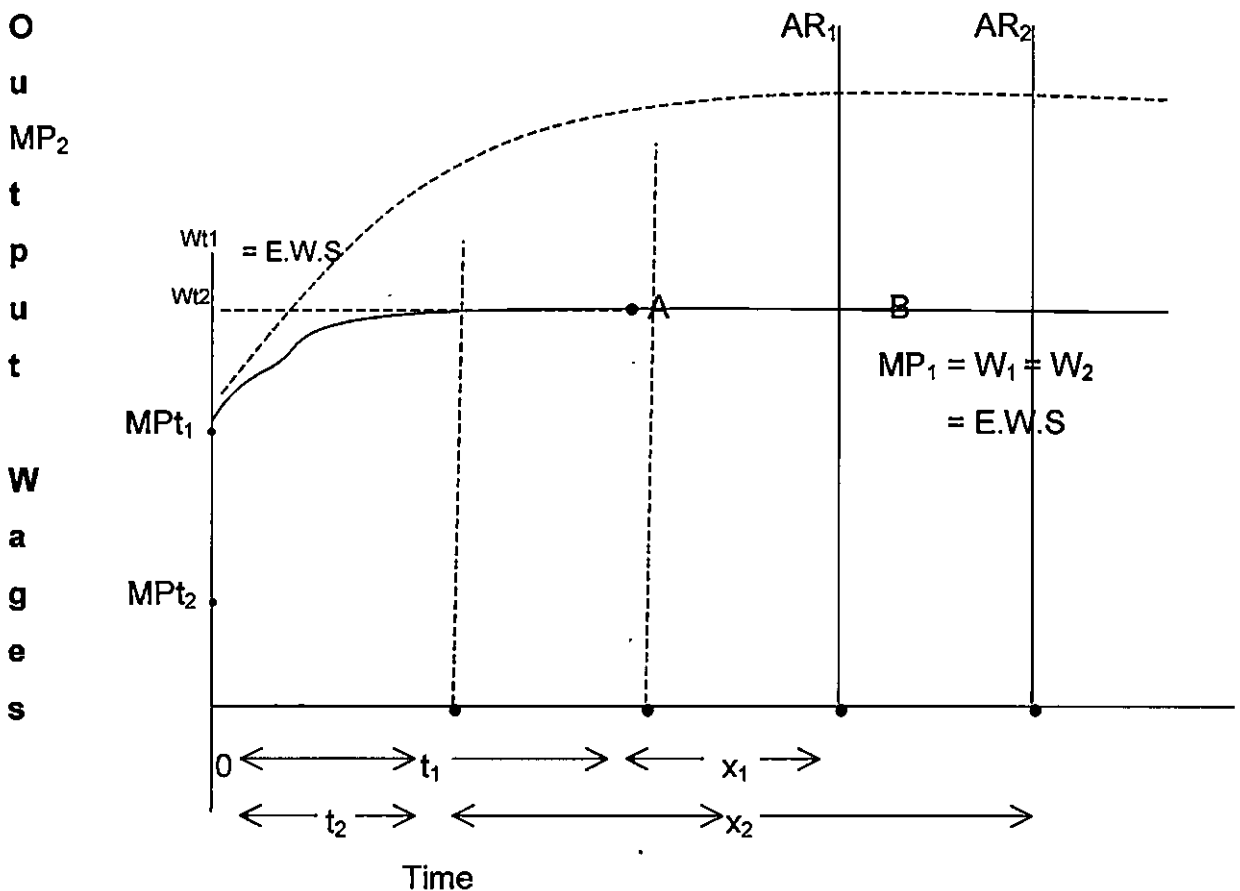
- The Thomas, Maxham and Jones Framework

According to Thomas, Maxham & Jones (1969:242), all training programs produce a result in terms of efficiency of labour, and the benefits of a training program will simply be the change it produces in results.

This is illustrated by means of a diagram which does not show any training costs, save for the costs associated with wages and output during the training period (Thomas, Maxham & Jones, 1969:242).

Two training programs T_1 and T_2 , are compared and all the other costs (other than wages and output) are termed K_1 for T_1 and K_2 for T_2 .

Diagram 4.2



Source: Thomas, Maxham & Jones (1969:242) as adapted

In the first program (T_1), the trainees produce a marginal product of MP_{t1} and are paid wages of W_{t1} , during the training period (t_1). After training, the workers produced of MP_1 and are paid a wage w_1 . The

average retention times (AR), resulted in the work period after training, and up to the point of leaving the firm, bring (X_1).

The second program (T_2) results in a different situation. The trainees produce MP_{t2} and are paid W_{t2} during training t_2 , after which they produce MP_2 and are paid W_2 for a period of X_2 .

The results of the T_2 program, after the training period, are as follows:

1. Value of output = $MP_1 \times X_1$
2. Wages paid = $W_1 \times X_1$

The results of T_2 after the training period is:

1. Value of output = $MP_2 \times X_2$
2. Wages paid = $W_2 \times X_2$

The benefits to the firm of the introduction of the new program (T_2) is the increased output (arising from higher performance levels, shorter training periods, and longer retention time) net of any increase in the wage paid.

The benefits are the changed results and are indicated by the following

$$\begin{aligned} \text{Equation: Benefits} &= [(MP_2 \times X_2) - (MP_1 \times X_1)] \\ &\quad \text{less} \\ &\quad [(W_2 \times X_2) - (W_1 \times X_1)] \end{aligned}$$

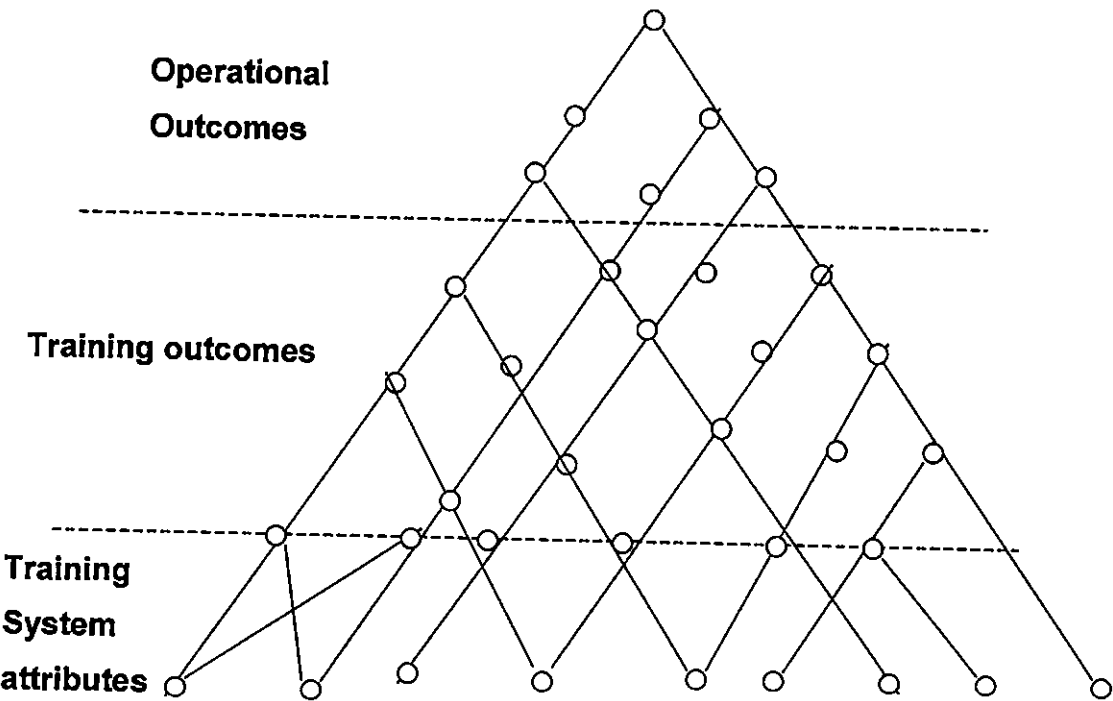
The change in the marginal product of trainers, from MP_{t1} , to MP_{t2} , reduces the training time, as well as lengthens the time-stream of benefits. The benefits to the firm are shown by areas A + B. The

training period is reduced from t_1 to t_2 and the cost of wages, minus trainee output, changes from $t_1(W_{t1} - MP_{t1})$ to $t_2(W_{t2} - MP_{t2})$.

- Kearsley Benefit analysis model

According to Kearsley (1982:58), the benefits analysis model is based on a network of causal relationships between a training system's attributes and benefits. Put differently, the benefit analysis must causally link the attributes of a training program to the major goals of the program and ultimately to those of the firm. This model is illustrated by the following diagram.

Diagram 4.3: Kearsley model



Source: Kearsley (1982:59) as adapted

From the diagram, a number of training system attributes (like media capability, testing capability, student capacity) **result** in certain training outcomes (like student completion time, retention, attitude changes, motivation etc.).

The training outcomes in turn, will lead to operational outcomes (like production time, equipment failure rates, sales volume, customer instruction.

When the operational outcomes are positive, they are benefits. For each training system, a unique set of relationship will occur between training system attributes and training/operational outcomes (Kearsley, 1982:17).

To conclude, it can be pointed out, that both the benefits models discussed above, can be employed to financially evaluate human resources development programs or, they can be very useful tools in justifying human resources development expenditure.

All of the models discussed above, be they cost-based or benefits-based, can be used by firms to financially evaluate human resources development programs. As was pointed out in chapter one, firms commit large sums of money/funds to human resources development programs, in anticipation of benefits that will accrue over a long period. It is, therefore, necessary that a model be designed that will be long-term based or strategically based in order to evaluate such programs.

4.5 PROPOSED METHOD TO STRATEGICALLY EVALUATE A HUMAN RESOURCES DEVELOPMENT PROGRAM

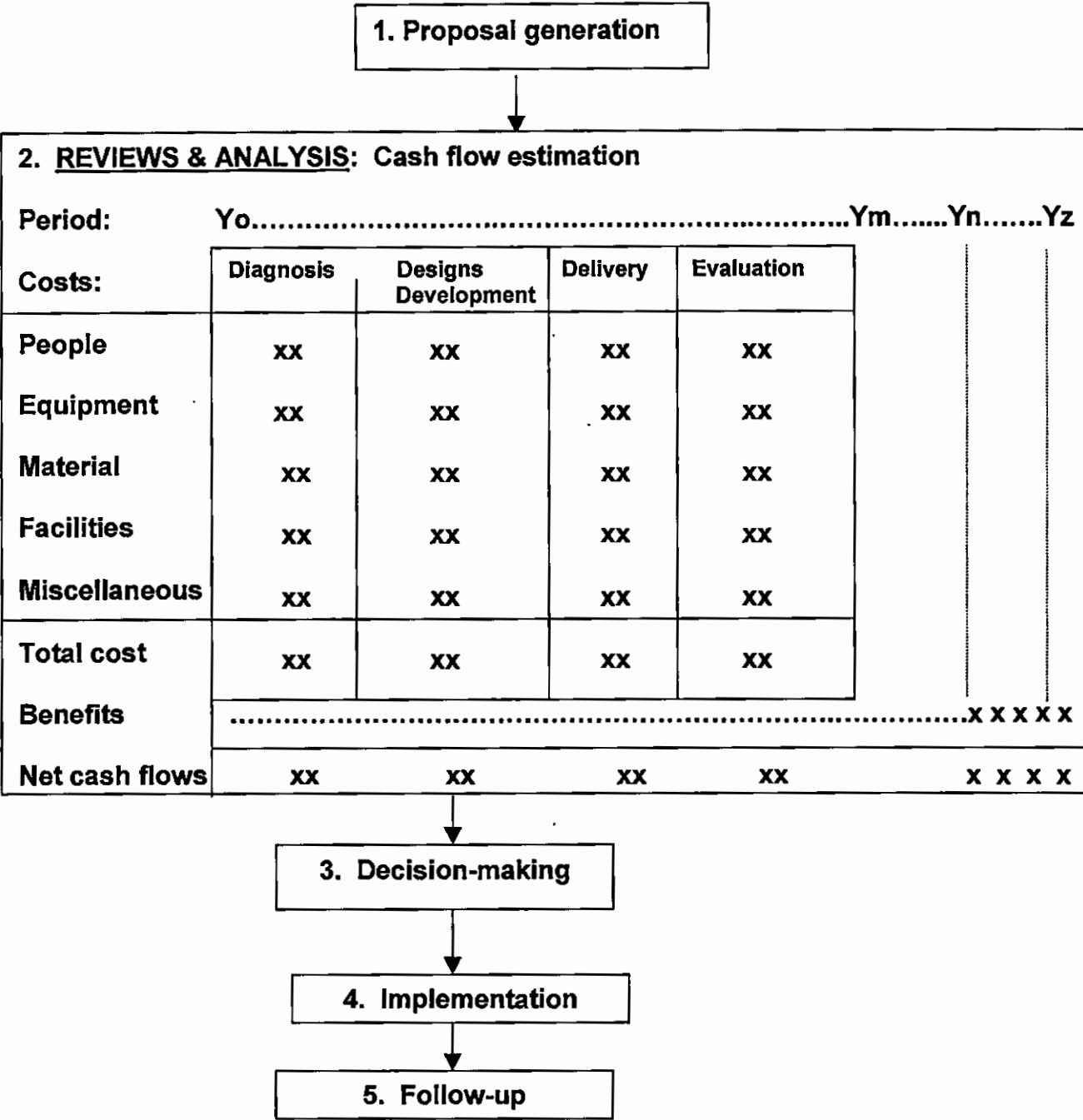
4.5.1 Introduction

The various models of financial evaluation of human resources development programs that look at the cost effectiveness, the comparison between the cost and benefits and return on investment, follow more or less the same pattern in the categorization and description of costs and benefits. Most of the models presented above, treat costs and benefits for a given point in time; only the life cycle approach proposed by Kearsley (section 4.3), takes into account the entire life cycle of the training and development program.

The various models discussed above, will be incorporated into the strategic capital budgeting method discussed in section 3.3. The method resulting from such a combination, will be used to strategically evaluate the human resources development program. The assumptions underlying such a method, will be presented below. An illustration of such a method, is given diagram 4.4.

Diagram 4.4 to follow on pg. 113

Diagram 4.4: PROPOSED METHOD TO EVALUATE AN HRD PROGRAMME



Source: Own research

In analyzing diagram 4.2, a strategic method to financially evaluate human resources development programs, is established. It is established, that the method to financially evaluate such a program,

includes the various steps in the capital budgeting process: proposal generation, review analysis, decision-making, implementation and follow-up. The method also incorporates the different approaches to comparing costs and benefits in the financial evaluation of human resources development programs. The proposed steps in the proposed method, will be discussed in the following paragraphs.

4.5.2 Proposals generation

The first step in this method, is the preparation of a proposal to undertake a human resources development program. The formal program is based on the gap that exists between the current performance of employees and expected performance, and such a gap exists, as a result of a lack of knowledge, skills and competitiveness, to perform risks. In view of the fact that huge sums of source funds are to be committed to such programs, it is necessary that the proposed investment be considered in relation to the company's overall strategic plan. The culture of the company needs to be, that valid human resources development pervades the entire organization. The investment in human resources development must be regarded by top management as being an important investment in research of new product development or capital equipment. The commitment of top management to training and development, should be communicated to all managers and employees. The responsibilities of each manager and employee and the implementation schedule of the program, should be spelt out.

4.5.3 Review

The next step is to review the program to evaluate its economic or financial validity. **Estimates** are required of cash flow data, along with the discount rate to be used in the method. A decision is made of the data estimation process. The human resources development costs classified by the description of the expenditure and by the categories in the human resources development process or function, represent cash outflows in the method. The benefits associated with human resources development, represent cash inflows. In the estimation of such cash flows, only incremental cash flows are considered and are measured on an after-tax basis. Any of the cash flow estimation techniques discussed in section 3.4.1, can be used. The estimated cash flows can be adjusted to allow for different levels of risk over the life of the program. The two methods of adjusting for risk as discussed in section 3.6.3 can be employed, and that is either that the project life is adjusted or reduced, and hence transacting the cash flow or use of the certainty equivalent approach, which involves reducing cash flow to its certainty equivalent and then discounting such cash flows by using the risk-free rate.

In diagram 4.4 the different costs associated with human resources development, are indicated. The different costs are categorised in terms of resource and in terms of the different stages in the training process. The assumption is, that such costs are evenly spread throughout the training process (indicated by Period Y_0 to Y_m). The period Y_m to Y_n indicates a transition period which is at the end of

training, but before any benefits from training could be realised. Period Y_0 to Y_n represents cash outflows.

Period Y_n to Y_z represents a period where benefits from training are realized. At period Y_z , the shelf-life of the skills acquired through training, comes to an end, and at this point there will be a need for restraint.

The net cash flows are the difference between outflows (costs of training) and cash inflows (benefits).

4.5.4 Decision-making

The net cash flows estimated in section 4.7.5, are used in decision-making. The various capital budgeting techniques (refer section 3.5) are applied to these net cash flows so as to establish whether the program is economically viable. The decision rules of the various techniques are employed. If the program is found, to be financially sound in that it will add value to the fork, it is then accepted. In summary, decision rules are indicated in the following table.

Table 4.8 of summary of decision rules in capital budgeting on page 117

Table 4.8: SUMMARY OF DECISION RULES IN CAPITAL BUDGETING

TECHNIQUE	DECISION RULE
1. Payback period	Accept: If project payback period is less than the acceptable (predetermined) payback period.
2. Accounting rate of return	Accept: If there is a positive difference between the project's annual net profit and the average initial investment.
3. Net present value	Accept: If the net present value of cash flows is greater than zero.
4. Internal rate of return	Accept: If the internal rate of return is greater than the cost of capital.
5. Profitability	Accept: If the index is greater than one.

SOURCE: Own research

4.5.5 Implementation

If the project/program is found to be economically viable, in that it will add value to the firm in the long-run, it is then determined how it will be implemented.

4.5.6 Follow-up

At this stage, management has to present with a control system for the program. Such a system will monitor results during the operational phase of the program. The results are compared to the expected or projected results. If there is a deviation, what actions are going to be taken to correct such deviations?

4.5.7 Assumptions underlying the method

The assumptions are that -

- the human resources development programs are based on the learning principles (theory),
- the mechanics (methods) of needs analysis programs, objectives setting, program content segmenting, and evaluation with regard to other levels, have been used and are known,
- the cost of capital/rate of return used to discount cash flows, has been determined,
- financing for the program is available and hence no rationalization, and
- the firm should have a separate human resources development department, assisted by the financial department.

4.6 CONCLUSION

The concept cost, cost-effectiveness, cost-benefit analysis and return on investment as financial tools to evaluate a human resources development program are discussed and elaborated on.

Human resources development costs are defined as the monetary sacrifices incurred by the firm as a result of a training program. The reasons for having human resources development costing systems, are given.

The two basic methods of classifying human resources development costs, is by the description of expenditure and by the categories in the human resources development process.

Different cost classification approaches development by Kearsley, Phillips, Bramley and Fitz-enz, are discussed.

The potential benefits of human resources development program are identified. Two models by Thomas, Maxham & Jones and Kearsley provide a way of comparing two or more programs by using the program benefits, are presented.

The method for the strategic financial evaluation of human resources development programs, is developed.

The empirical results indicate that the firms investigated have a system of human resources development costs classification and do make estimates of future costs and benefits to be included in the evaluation method.

5. DATA ANALYSIS

5.1 INTRODUCTION

In chapter four the concept cost, cost effectiveness and cost-benefit analysis, as they pertain to human resources development programs, are explained. The financial concept of return on investment is also explained and the method to be used to financially evaluate human resources development program is developed. The assumption underlying such a method and conditions under which a model will work in an organisation are stated.

In this chapter the result of the empirical research is analyzed. A central part of research activity is, according to Churchill (1992:102), to develop an effective research strategy or plan. Churchill (1992:108) and Chisnall (1992:23) defines research design as a framework or plan for a study that is used as a guide in ensuring that the information obtained, is relevant to the research problem. Struwig (1991:157) notes, that a properly planned research project, designed according to empirical requirements, should ensure that the purpose and objectives of a study are achieved.

This chapter will discuss the samples design, which specifies the survey population, the sample frame, the sample size, and the sampling procedure used in this study. The empirical research design will outline the questionnaire design. The data collection procedure and the validity and reliability of measures used, will also be discussed.

5.2 SAMPLE DESIGN

Since sample design is an integral part of the total research design, great care should be taken at every stage in the development of suitable samples (Chisnal, 1992:90) and Churchill (1992:456) suggest the following six-step procedure for drawing a sample.

- The first step involves defining the population
- The second step constitutes the identification the sampling frame is
- In the third step a sampling procedure is selected
- The fourth step involves determining the sample size
- The fifth step entails selecting of the sample elements
- The final step is the collection of data from the designated elements.

The above steps are discussed in the following paragraphs.

5.2.1 Definition of the population

The population is a collection of elements or units about which the researcher wishes to make an inference (Churchill, 1992:456) or it is the aggregate of elements from which the sample is drawn (Kress, 1988:174; Nel, Rädcl & Loubser, 1988:291).

Madden & Firtle (1987:267) stipulates three important points with regard to the definition of the target population.

- Firstly, the target population must be consistent with the objectives of the study. In other words, it must be possible to achieve the objectives by using the selected target population.
- Secondly, any other qualities that the respondents must have in order to be included in the sample, must be clearly specified.
- Lastly, all decisions rules for inclusion or exclusion of respondents, must be clearly explained.

In this study the target population is chosen from South African companies. In South Africa, companies with a share capital, are the most common and a distinction is made between public and private companies (Marx, Reynders & Van Rooyen, 1993:113). The Standard Industrial Classification in South Africa classifies companies according to the activities they perform (Nel et al, 1990:278).

As information regarding companies listed on the Johannesburg Stock Exchange (JSE) is more readily available than that of other business enterprises, it was decided to limit the study to JSE-listed companies.

5.2.2 Identification of the sampling frame

Churchill (1992:456), Cooper & Emory (1995:204) and Kress (1988:174) define a sampling frame as the listing of the elements or units from which the actual sample will be drawn. Kothari (1995:69)

states, that such a list should be comprehensive, correct, reliable, appropriate and representative of the selected population.

Nel et al (1988:267) suggests several requirements that a reliable sampling frame should meet, but points out, that nearly every sampling frame has inherent weaknesses; These requirements are the following.

- The sampling frame must represent all the elements and all strata of the population.
- The sampling frame must be up to date
- The entry in the sampling frame must be complete and correct in every detail.
- There may be no duplication of entries.
- The sampling frame must be accessible and the information must be arranged in such a manner, that a sample can be drawn from it.
- Ideally, the sampling frame should contain additional information that facilitates stratification.

A sampling frame used in this study, is the JSE Handbook 1998, which is a complete investor's guide to the Johannesburg Stock Exchange and the Bond Exchange of South Africa. This handbook meets all the requirements suggested by Nel et al (1990:267) above, and is obtainable from the JSE. It contains all the information about the different companies listed on the Johannesburg Stock Exchange. The nature of their businesses, addresses, telephone numbers of

their head officers and names of directors are all indicated in the handbook.

5.2.3 Size of sample

A sample size refers to the number of items to be selected from the population to make up a sample (Kothari, 1995:69).

Determining the sample size, is generally quite difficult (Dillion et al, 1990:317) and is a complex matter (Churchill, 1992:512). Researchers do not agree on the guidelines to be used for determining the number of elements to be included in a study (Cates, 1985:62).

According to Frankel and Wallen (1990:79), researchers should try to obtain as large a sample as is practically manageable. Furthermore, Kerlinger (1986:119) notes, that large samples are advocated in order to allow the principle of random chance to work and to eliminate the problem of selecting deviant samples associated with small samples. Sommer & Sommer (1986:201) are also of the opinion, that large samples provide more reliable and representative data than do small samples.

Considering all of the above, it was decided that all businesses in the industrial sector listed at the Johannesburg Stock Exchange, be used in this study (refer section 1.4).

5.2.4 Sampling procedure

It was indicated in section 5.2.3 that all of elements or companies in the industrial sector will be included in the sample.

In selecting an appropriate sampling procedure, it is important that researchers must keep in mind two causes of incorrect inferences; (Kothari, 1995:70). These are as follows:

- Systematic bias which results from errors in sampling procedure and cannot be reduced or eliminated by increasing the sample size.
- Sampling errors, which are variations in the sampling estimates around the true population parameters.

To avoid such errors from occurring in this study all the elements of JSE-listed companies in the industrial sector are included. This represents a stratified sample and the number of elements in each stratum for this research, is presented in Annexure B.

5.3 SURVEY DESIGN

5.3.1 Introduction

Nel et al (1990:142) indicates, that there are no fixed guidelines as to which method for collecting information, a researcher could use. Furthermore, that the researcher must collect information, as accurately and unambiguously as possible, and at a reasonable cost.

Considering the size of the sample, costs and the time factor, the technique for collecting primary data in this research is the mail survey. According to Bryman & Cramer (1990:13), a survey usually entails the collection of data on a number of variables at a single juncture. A questionnaire will be used as an instrument for collecting data.

The design of the questionnaire, the data collection procedure and the variability and validity of measures are discussed in the following sections.

5.3.2 Questionnaire design

Parasuraman (1991:363) defines a questionnaire as "... a set of questions designed to generate the data necessary for accomplishing a research project's objectives". Designing a questionnaire, is still an art and not a science (Churchill, 1992:328), as there are no rules to be followed so as to ensure a perfect questionnaire (Parasuraman, 1991:364).

In evaluating questions (content) for inclusion in the questionnaire, the following three questions are considered (Weiers, 1988:261).

- Is the question really necessary in view of the objectives of the research study?
- Will the respondent be willing and able to provide the information required?
- Does the question adequately cover the content area for which it is responsible?

After the issues relating to the content have been analyzed, the next issue relates to the response format; that is, the type of questions to use (Kinnear & Taylor, 1991:344).

Kinnear & Taylor (1991:344) describes three types of questions, ranging from structured to unstructured response format.

- Open-ended questions which require the respondents to provide their own answers to the questions.
- Multiple-choice questions, which require the respondents to choose an answer from a list provided in the questionnaire
- Dichotomous questions which are an extreme form of the multiple choice question and which allows the respondent only one of two responses, such as either "yes" or "no".

In this study, a structured response format consisting of closed-ended questions, is used. It was decided to use the four-point Likert Scale as a measurement technique. With this scale, the respondent is asked to respond to each statement by choosing one of five choices (Cooper & Emory, 1995:179).

The appearance and layout of the questionnaire are important as mail surveys, and the questionnaire should not create the impression of being too long, but it should have enough space to record the information required (Nel et al;1990:246).

The questionnaire in this study, is divided into three sections.

- Section A contains questions that relate a number of functions that may be linked to the evaluation of training and development programs.
- Section B contains questions that relate to the different stages of the proposed model to financially evaluate human resources development programs.
- Section C contains closed-ended questions establishing the general information about companies of the respondents.

The statements in Section A and B consist of both positive and negative statements (a copy is in Appendix A).

A summary of the content and format of the questionnaire used, is given in Table 5.2.

Table 5.2 content and format of the questionnaire on page 129

Table 5.2: Content and format of the questionnaire

SECTION	CONCEPT EMPHASISED	NUMBER OF QUESTIONS
A	• Evaluation functions	8
B	• Proposal generation	5
	• Review and analysis	11
	• Decision-making	5
Total A & B		29
C	• Existence of human resources development department	1
	• People employed	1
	• % HRD expenditure to total capital budget	1
	• Annual turnover	1
	• Sector involved in	1
Total		5
Grand Total		34

Source: Own research

After the questionnaire had been designed, it was pre-tested by giving it to a number of academics for evaluation. After the results of the evaluation of the different academics had been processed and analyzed, the questionnaire was refined and ready for use in the actual collection of data.

5.3.3 Data collection procedure

As indicated in section 5.3.1, the survey technique best suited for this study, is the mail survey. According to Cooper & Emory (1995:282),

mail survey costs less and the respondent can take more time to collect facts, talk with others, or consider replies at length.

Cooper & Emory (1995:282) further states that the major weakness of mail survey is a non-response and suggests the following practical ways of improving the response.

- The questionnaire length is to kept short, in order to obtain a higher response.
- Return envelopes with a stamp must be included to simplify questionnaire return.
- A cover letter should be included as the most logical vehicle to persuade the respondent to respond.
- A promise of anonymity must be made and confidentiality of results ensured.
- A follow-up letter should be sent to all respondents so as to ensure that they have received the questionnaire.

5.3.4 Validity and reliability of measures used

Walizer & Wiener (1978:402) reports, that for a study to be meaningful, it is necessary to use reliable and valid measures of the variables being studied. The measures in this case, would indicate questions in the questionnaire.

Kinnear & Taylor (1991:232) refers to reliability as the extent to which the measurement process is free from random error and that it is concerned with consistency, accuracy and predictability of the

research findings. Two types of reliability are mentioned by Brymer & Cramer (1990:70), namely internal reliability and external reliability. External reliability is the most common and refers to the degree of consistency of a measure over time.

Frude (1993:94) indicates that four commonly used strategies to assess reliability are available.

- The test-retest method involves administering the same test twice to the same group of cases and then correlating the first test of scores with the second set.
- The alternate is methods involving the creation of two forms of tests which are closely parallel in terms of length, style and content, giving both test and correlate scores.
- The split-half method involving the creating of two alternate forms by splitting the test into two halves and correlating the scores from the two halves.
- Internal consistency methods which compare each item of the measure to every other item. The most widely-used measure of internal, consistency is the alpha coefficient. Cronbach's "alpha" is an estimate of the correlation to be expected between scores obtained on our scale (the observed score) and a true score (that which would be obtained from a perfect measure of the scale variable).

It this study the internal consistency method is employed by calculating Cronbach’s alpha, to test the internal reliability of sections A and B of the questionnaire. Table 5.3 indicates such alphas.

Table 5.3: Cronbach’s Alphas for Section A and B of the questionnaire

QUESTION	ALPHA	QUESTION	ALPHA
A1	0.791	B8	0.905
A2	0.842	B9	0.923
A3	0.800	B10	0.789
A4	0.701	B11	0.841
A5	0.846	B12	0.823
A6	0.823	B13	0.817
A7	0.801	B14	0.822
A8	0.811	B15	0.815
B1	0.822	B16	0.819
B2	0.817	B17	0.925
B3	0.841	B18	0.910
B4	0.701	B19	0.817
B5	0.804	B20	0.822
B6	0.811	B21	0.800
B7	0.892		

Source: Own research

The value of the alpha depends on the number of items that make up the scale and the correlation between them (Frude, 1993:196). The overall value of the alpha for Section A is 0.832 and that of B is 0.821. Brymer & Cramer (1990:71) suggests the Cronbach’s alpha greater than 0,8 to indicate internal reliability.

To measure external reliability, would mean using the test-retest method discussed above. This could be very costly as far as this study is concerned.

One other criteria for evaluating a measuring tool (questionnaire) other than reliability, is validity. Validity refers to the extent to which a test measure the researcher actually wishes to measure (Cooper & Emory, 1995:148). Validity is a broader and more difficult issue than reliability (Kinnear & Taylor, 1991:232).

Kinnear & Taylor (1991:234) identifies four major ways of estimating the validity of measurements.

- Construct validity, which involves understanding the theoretical rationale underlying the obtained measurements.
- Content validity, which involves a subjective judgement by an expert as to the appropriateness of the measurement. Cooper & Emory (1995:149) describe "content validity of the measuring instrument" as " ... the extent to which it provides adequate coverage of the topic under study".
- Concurrent validity involves correlating two different measurements of the same phenomenon which has been administered at the same point in time.

- Predictive validity involves the ability of a measured phenomenon at one point in time to predict another phenomenon at a future point in time.

To ensure construct validity, the researcher is encouraged to deduce hypotheses from a theory that is relevant to the concept (Brymer & Cramer, 1991:72). To ensure construct validity in this study, a number of secondary sources were consulted to incorporate the theory in the measures used.

5.4 DATA ANALYSIS

5.4.1 Introduction

Having collected the data from primary or secondary sources, the researcher proceeds towards drawing/conclusion by logical inference (Luck & Rubin, 1987:373). The data collected from surveys, are frequently a collection of numbers, and a simple inspection will ordinarily communicate very little to the understanding of the researcher (Ferguson & Takane, 1989:16).

The measurement or assignment of numbers to observations or responses, has the following advantages (Churchill, 1992:407).

- Quantified responses from a large sample can be summarized more efficiently than are non-quantifiable responses.
- Quantified responses can be manipulated by using a number of mathematical techniques.

Chisnall (1992:329) states the following analytical techniques as being useful for data analysis, and indicates that their applicability depends on the number of variables.

- Univariate techniques, which involve the analysis of a single variable. According to Kinnear & Taylor (1991:545), it is often important in studies to do a univariate analysis on some variables in order to gain useful information.
- Bi-variate techniques, which measure an association between two variables.
- Multi-variate techniques which analyses raltionships between more than two variables.

The second question to consider, after having looked at the number of variables, is whether we are interested in the description of the sample or making inferences about the population from which the sample was drawn (Kinnear & Taylor, 1991:344).

- Description statistics provide summary measures of the data contained in all the elements of the sample.
- Inferential statistics allow the researcher to make judgements about the whole population, based on the results generated by samples.

The third question to consider, is the scale level at which the variable or variables have been measured. Quantified responses fall into one of the following four levels of measurement (Churchill, 1992:408).

- Nominal scale responses which are no more than labels used to identify different categories of responses.
- Ordinal scales which are a set of numbers in which magnitude of the number represents no more than rank ordering. These scales are more powerful than nominal, because of the property of rank order.
- Interval scale, which is a set of numbers in which the differences (not ratios) between numbers can be meaningfully interpreted and which have all the properties of an ordinal scale.
- Ratio scales, which are a set of numbers in which the ratios between the numbers can be meaningfully interpreted.

According to Churchill (1992:608), the search for meaning from responses can take many forms. The inspection procedure, editing and the transferring of data into a computer, are the preliminary steps. The preliminary data analysis and the search for relationships then follow. The following section will discuss all of the above.

5.4.2 The inspection procedure

After the questionnaire had been received, it was inspected in order to determine its usefulness. A completed questionnaire with more than four questions not answered, was regarded as not usable. A

complete summary of the returned questionnaires, is given in table 5.4.

Table 5.4: Number of returned questionnaires (Response)

Business involved in	Number sent	Number received	Percentage
1. Beverage, Hotels & Leisure	33	18	54
2. Building & Construction	22	10	45
3. Chemicals, Oil & Plastics	11	4	36
4. Clothing, Footwear & Textiles	23	8	35
5. Development Stage	4	0	0
6. Electronics & Electrical	46	15	33
7. Engineering	28	12	43
8. Food	34	11	32
9. Furniture, Household and Allied	6	3	50
10. Industrial Holdings	48	18	38
11. Media	21	3	14
12. Motor	11	4	36
13. Packaging & Printing	16	10	62
14. Paper	1	0	0
15. Pharmaceutical & Medical	15	9	60
16. Steel and Allied	4	2	50
17. Stores	50	11	22
18. Transport	8	4	50
19. Other	-	4	-
TOTAL	381	146	38

Source: Own research

The response rate of this study was 38%, if only the usable questionnaires are used in calculating the response rate.

Non-response bias was taken into account. The failure to obtain information from some element of the population, can influence the final results.

5.4.3 The editing process

The editing of all questionnaires received, was done by the researcher in order to ensure consistency. Besides consistency, legibility and completeness were checked. Parasuraman (1991:101) describes editing "... as the process of examining the responses and taking the necessary corrective action to ensure that they are of high quality".

5.4.4 The coding procedure

Coding involves the assignment of numbers to answers, so that responses can be grouped into a limited number of classes or categories (Cooper & Emory, 1995:381).

The editing of questionnaires was easy, as the Likert Scale of measurement, as well as closed-ended questions, were used in the questionnaire. Open-ended questions requiring the respondent to state the nature of business of the company, were set. Questions that had not been answered or which were ambiguous, were disregarded and coded 0. A questionnaire with more than four "0's," was not used.

5.4.5 Transferring data

The data were transferred onto the database created in the Quatro P10 computer program, which is a spread-sheet program. Because of the complex nature of the statistical procedures or techniques used to analyze data, the Statistical Package for Social Science (SPSS-PC was used to compute the values required in the study.

According to Frude (1993:100), the SPSS package offers the following advantages.

- It enables data from surveys and experiments to be analyzed fully and flexibly.
- It has facilities for extensive manipulation and transformation of data.
- It includes a wide range of procedures for both simple and highly complex statistical analysis.

5.4.6 Preliminary data analysis

In this study, the data obtained were collected by means of a questionnaire divided into three sections (see Appendix A). Section C of the questionnaire requests general information regarding the respondents' company, so as to facilitate comparisons and the establishment of relationships between Section A and B. The frequency distribution of the responses indicating the different categories, is given in Table 5.5.

Table 5.5: Response irrespective of the different categories of Section C of the questionnaire

Category	Number of Responses	Percentage
EXISTENCE OF HRD DEPARTMENT:		
(a) Yes	91	62
(b) No	55	38
Total	146	100
NUMBER OF EMPLOYEES:		
(a) 0 – 999	43	29
(b) 1 000 – above	103	71
Total	146	100
% OF HRD EXPENDITURE TO TOTAL CAPITAL BUDGET:		
(a) 10 – 20	145	99
(b) 21 – 30	2	1
(c) 31 – 40	0	0
(d) 41 – 50	0	0
(e) 51 and above	0	0
Total	146	100
TURNOVER:		
(a) 0 – 9 999 999	49	34
(b) Above R10 million	97	66
Total	146	100

Source: Own research

The frequency distribution of the responses to Section A of the questionnaire, is given in Table 5.6. This section of the questionnaire

contains questions that determine the functions of the evaluation of training and development programs.

Table 5.6: Response for the different categories of Section A of the questionnaire

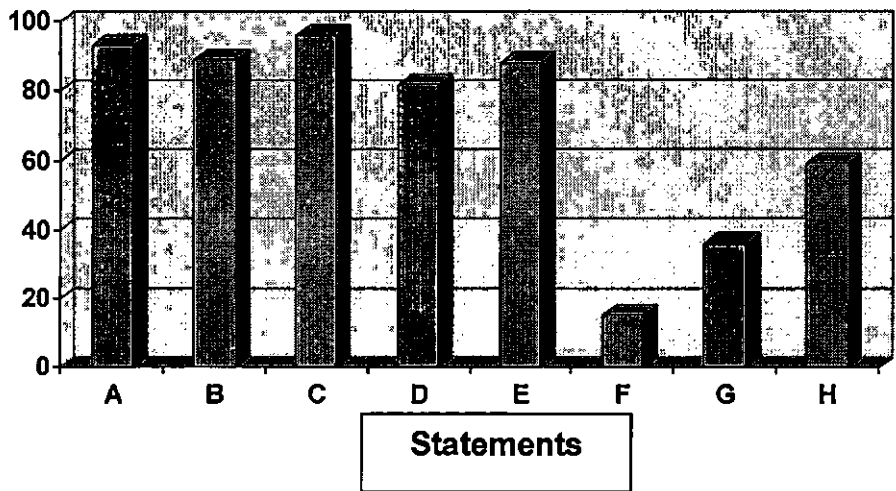
Number and percentage

Categories	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
a) Cost benefit analysis	89 61%	46 32%	10 7%	1 0%	0
b) Cost-effectiveness analysis	43 29%	88 60%	15 11%	0 0%	0 0%
c) Improve the training & development program	78 53%	63 43%	4 3%	1 1%	0
d) Provide feedback to program planners management	66 45%	54 37%	6 4%	13 9%	7 5%
e) Gain knowledge of employee skills level	40 28%	86 59%	5 3%	10 7%	5 3%
f) Provide information for performance appraisal	10 7%	11 8%	100 68%	25 17%	0 0
g) Placement of employees	47 32%	6 4%	88 61%	5 3%	0 0%
h) Provide feedback to program participants	16 11%	70 48%	59 41%	0 0%	1 0%

Source: Own research

To indicate the relative response to the different statements of section A, the “strongly agree” plus the “agree” responses of the Likert Scale are combined. The graph below indicates the results.

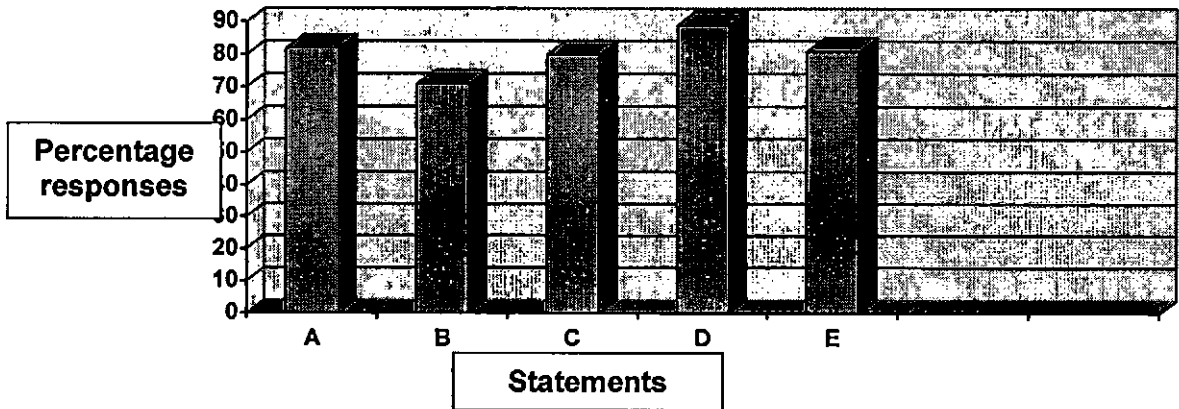
Diagram 5.1: Section A of questionnaire



Source: Own research

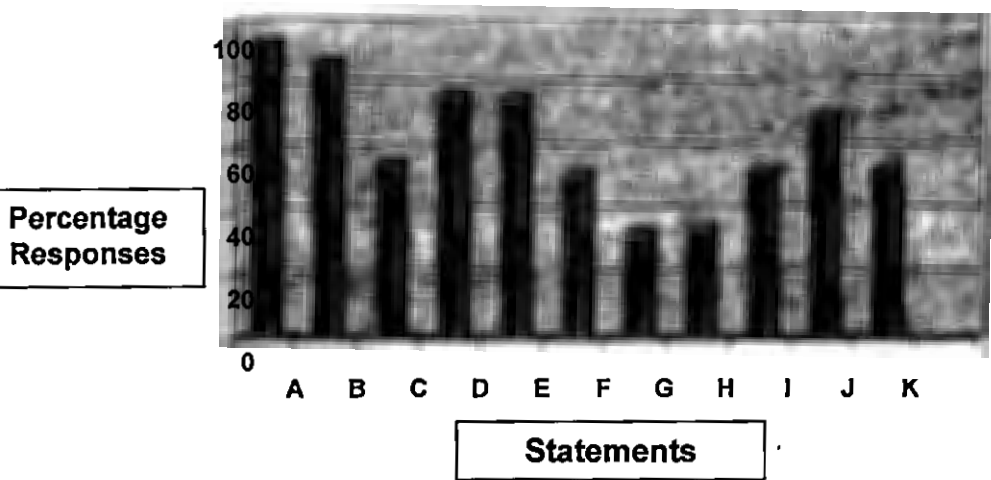
To indicate the relative response to the different statements of section B, the “strongly agree” plus the “agree” responses of the Likert Scale are combined. The graph below indicate the results.

Diagram 5.2: Proposal generation – Section B of questionnaire



Source: Own research

Diagram 5.3: Review and analysis: Section B of the questionnaire



Source: Own research

The frequency distribution of the responses to Section B of the questionnaire, is given in Table 5.7. This section contains questions that are intended to determine if the model developed in section 4.5 can be applied by the respondents, companies, and are based on the mode itself.

Table 5.7: Responses irrespective of the different categories of Section B of the questionnaire

Number and percentage

Categories	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
Proposal generation					
(a)	21 14%	99 68%	4 3%	17 12%	5 3%
(b)	28 19%	76 52%	15 10%	21 14%	6 4%
(c)	61 42%	56 38%	10 7%	15 10%	4 3%
(d)	81 55%	49 34%	11 8%	3 2%	2 1%
(e)	68 47%	50 34%	12 8%	5 3%	1 0%

Review & analysis					
(a)	30 21%	107 73%	2 1%	2 1%	5 4%
(b)	16 11%	112 77%	7 5%	7 5%	6 4%
(c)	37 25%	45 31%	10 7%	30 21%	24 16%
(d)	9 6%	101 69%	16 11%	9 6%	11 8%
(e)	22 15%	90 62%	5 3%	19 13%	10 7%
(f)	3 2%	73 50%	40 27%	20 14%	10 7%
(g)	12 8%	38 26%	50 34%	30 21%	16 11%
(h)	14 10%	51 35%	51 35%	10 7%	20 14%
(i)	37 26%	40 27%	43 29%	11 8%	15 10%
(j)	23 16%	80 55%	30 20%	20 1%	11 7%
(k)	2 1%	76 53%	60 41%	1 0%	5 5%
Decision-making:					
(a)	69 47%	55 38%	5 3%	8 5%	9 7%
(b)	52 36%	61 42%	0 0%	20 14%	13 9%
(c)	5 3%	4 10%	98 67%	10 7%	19 13%
(d)	14 10%	3 8%	90 62%	19 13%	10 7%
(e)	50 34%	72 49%	3 2%	10 7%	11 8%

Source: Own research

Parasuraman (1991:625) quite rightly states that "... before analyzing a data set by using sophisticated techniques, a researcher should get a feeling for what the data are like". Furthermore that, the purpose, of

the preliminary data analysis is to reveal features of the basic composition of data that have been collected.

Dillon et al (1990:458) points out, that descriptive statistical techniques are a means of inspecting data before testing the hypothesis. Descriptive statistics, according to Kinnear & Taylor (1991:544), provides a researcher with summary measures for the data in their samples. Preliminary data analysis or descriptive statistics, involves examining the central tendency (the most likely response to a question) and the dispersion or variability. The measures of shape, skewness and kurtosis respectively, describe departures from the symmetry of a distribution and its relative flatness or peaking. (Cooper & Emory, 1995:398).

In this study the following descriptive statistics are calculated for all categories of Section A and B.

- Measures of central tendency, i.e. the mean, mode and median.
- Measures of dispersion i.e. standard deviation.
- Measures of shape of the distribution, i.e. skewness and kurtosis.

A summary of the results obtained in this study, is provided in Table 5.8.

Table 5.8: A Summary of statistics irrespective of the various categories of Section A and B

	SECTION A	SECTION B		
STATISTIC	Evaluation Functions	Proposal Generation	Review analysis	Decision-making
1. Mean	25.357	17,461	33,571	18,00
2. Mode	28,000	20,000	37,000	21,00
3. Median	27,000	18,000	35,000	19,00
4. Standard deviation	3,451	2,134	1,217	2,645
5. Skewness	- 0,218	- 0,122	- 0,241	-0,196
6. Kurtosis	- 0,197	- 0,139	- 0,184	0,142

Source: Own research

Certain deductions can be made with regard to the four categories of Section A and B of the questionnaire.

Category A: Evaluate functions

This category of section A contains 8 questions, with a maximum score of 5 and a minimum score of 1. The maximum score that can be obtained for this category is 40, which would indicate a positive reaction to questions, on the functions of evaluation. A score of 8 would indicate a negative reaction, whereas a score of 24 would indicate a neutral position.

As can be seen from table 5.8, the responses are negatively skewed and the distribution has a low peak. The median 27, which indicates that the respondent on average are positive in their responses to question on the function of evaluation. This is an indication that South African companies do on average make an evaluation of their

human resources development programs for most of the reasons indicated by statements in section A of the questionnaire. Cost-benefit analysis and cost-effectiveness analysis, which are financial evaluation measures have the highest percentage of respondents strongly agreeing (61%) and agreeing (60%) – see Table 5.6. It can be concluded from this, that these companies do use some form of financial evaluation on their human resources development programs.

Category B: Section B, Proposal generation

Five questions were used in this category to indicate proper conditions for proposal generation with regards to human resources development programs. The maximum score is 25, indicating a “strongly agree” response. The minimum score of 5 will indicate a negative response and a score of 15 a neutral position.

The results in table 5.8 show a distribution that is negatively skewed and a high-peak kurtosis. The mode is 20, which indicates that there is a positive response on average to the statements of this category. It could be concluded from this, that South African companies do consider their investment proposals in human resources development in relation to their strategic plan. The culture of most of these companies is such, that HRD is valued in all levels in the organization. There is also open communication with regards to the intentions of any investment in human resources development.

Category C: Review and analysis

Eleven questions are set in this category, to indicate conditions that must exist for a capital budgeting based model of evaluating human resources development, to work. The maximum score is 55, indicating a “strongly agree” positive on the part of respondents. The minimum is a score of 11, indicating a negative overall response, and a score of 33 indicates neutrality.

The distribution is negatively skewed and has a low peak. The median is 35 and the mode is 37, indicating an overall positive response to the questions. It could, therefore, be said that South African companies do a human resources cost classification system, and that future estimates are made of training costs and benefits. Incremental cash flows are considered and riskiness of projects assessed, using either of the techniques mentioned in questions f, g, h of this category. Risk adjustment is done using either of the methods mentioned in questions i, j, k of this category of section B of the questionnaire.

Category D: Decision-making

In this category, five questions are set to identify methods used by South African companies to make capital budgeting decisions. The maximum score in this category, is 25, indicating a “strongly agree” position. The minimum score is 5, indicating a negative position. A score of 15 indicates neutrality.

The distribution in this category is negatively skewed and has a high-peak kurtosis. The mode is 21, indicating that on average, the respondents strongly agree with most of the questions in this category. It may be concluded, that South African companies do make use of the different capital budgeting techniques to evaluate capital projects, and can, therefore use these techniques to evaluate human resources development projects. The payback period, the internal rate of return and the net present value are the most used techniques with (49%+ 34), (47%+ 38), and (36%+ 42) respectively. This results correspond very closely with those of a study conducted by Parry & Frier (1990:55). They used a similar sample of industrial companies listed on the Johannesburg Stock Exchange.

In conclusion, the descriptive statistics used to summarize the data, indicate the following.

5.4.7 The Search for Relationship

- **Introduction**

The statistical techniques used in section 5.4.6, mainly portray or describe the data. To make conclusions as to whether South African companies can use the proposed model to financially evaluate human resources development projects or programmes, it is important that techniques to establish relationship be employed.

In section 5.4.1 it is indicated, that a number of statistical techniques exist that can be used to analyse data. The applicability of such techniques depends on -

- the number of variables, i.e. univariate, bivariate and multivariate techniques, and
- the scale level at which the variable or variables have been measured i.e. nominal, ordinal, interval and ratio scale. "... which can take on quantitatively different values even in decimal points, are called continuous variables." (Kothari, 1993:44).

Multivariate techniques are employed in this study in the analysis of data. The different questions in the questionnaire can be referred to as variables. Table 5.2 indicates that there are 34 questions (variables), in total with Section A having 8, Section B 29 and Section C 5 questions.

Kothari (1995:368) describes multivariate analysis techniques as a collection of methods that simultaneously analyse more than two variables on a sample of observations. Furthermore, that such techniques are largely empirical and possess the ability to analyse complex data or to represent a collection of data in simplified way.

Multivariate procedures are divided into two main categories (Kinnear & Taylor, 1991:606).

- Interdependence methods, where no variable or variables are designated as being predicted by others. The interrelationship among all the variables taken together, are considered.

- Dependence methods, where one or more variables are designated as being predicted by (dependent on) a set of independent variables. Kothari (1995:372) describes dependent variables as resultant or criterion variables, and independent variables as explanatory or criterion variables.

To enable a proper investigation as to whether South African firms can use the proposed model of financial evaluation of a human resources development program, it was decided that the dependence methods be used to investigate the relationship among or between the different variables (measures or questions in the questionnaire).

The selection of the proper dependence method to use, will depend on (Kinnear & Taylor, 1991:624; and Weiers, 1984:457).

- The number of variables that have been designated as dependent.
- The scale levels of the dependent and independent variables.

The table below presents situations in which each technique is appropriate.

Table 5.9 Situations using dependence methods on pg. 152

Table 5.9: Situations using dependence methods

A. One dependent variable		
Technique	Scale level of despondent variable	Scale level of independent variables
1. Multiple regression	Interval	Interval
2. Analysis of variance covariance	Interval	Nominal
3. Dummy variable multiple regression	Interval	Nominal
4. Automatic interaction detector	Interval	Nominal
5. Discriminant analysis	Nominal	Interval
6. Dummy-variable discriminant	Nominal	Nominal
7. Conjoint	Nominal	Nominal
B. More than one dependent variable		
Technique	Scale level of despondent variable	Scale level of independent variables
8. Canonical correlation	Interval	Interval
9. Multi-variate analysis of variance	Interval	Nominal

Source: Kinnear & Taylor (1991:626) as adapted

To establish relationships, the variables (questions) in section C of the questionnaire, will be designated as independent variables. Section C variables establish the various backgrounds of the respondent companies and are mostly interally-sealed variables. The variable in Section A and B, will be designated as dependent

variables and are mostly nominally-scaled variables. Variables in Section A and B are measured by using a Likert Scale.

In studying Table 5.9 above, it can be concluded, that the analysis of variance (ANOVA) and the multivariate analysis of variance (MANOVA) can be used in establishing relationships. The primary purpose, according to Parasuraman (1991:736) of ANOVA), is to ascertain the relative importance of independent variables in explaining variations in the dependent variable. MANOVA which is straight forward extension of ANOVA is used to test the effects of the independent variables on a series of dependent variables (Kinnear & Taylor, 1991:637).

Struwig (1994:209) proposes two steps that can be followed in multivariate analysis.

- The first step involves establishing whether there is any difference between the dependent variables (Section A and B of the questionnaire) based on the independent variables (Section C of the questionnaire) as based. The MANOVA procedure, which uses the Wilk's Lambada F. multivariate test of significance, is used. This test is based on the hypothesis, that there are no differences between the two types of variables.
- The second step is executed if there is difference between the variables in step one. This involves determining which

variables differ from the other. The univariate analysis of variance using the F-test, is used to establish in which category dependent variables the difference occur.

- Value (P) of the Wilks lambda F-test must be $P < 0,05$ to indicate a significant difference and a $P < 0,01$ to indicate a highly significant difference.

In the following section the relationships between variables are discussed.

- **The relationship between the existence of separate HRD departments in a firm, the number of employees, percentage of HRD expenditure to total capital budget, turnover and the functions of HRD evaluation**

The results of the tests are summarized in Table 5.10 below.

Table 5.10: Results of Test to establish relationship between Section A and Section C

Categories of C	Wilks' Lumbla F-Test (P values)
1. Existence of a human resources development (HRD) department	0,023
2. The number of employees	0.067
3. Percentage of HRD expenditures to total capital budget	0,071
4. Turnover	0.082

Source: Own research

In analyzing the p-value of the categories above, only the category: Existence of Human Resources Development (HRD) Department shows a difference with a P-value - 0,023 which is below 0,05. All the other categories are greater than 0,05.

It is indicated in Section 4.7, that one of the assumptions of the proposed method on the financial evaluation of a human resources development program, is that there exists a separate well-developed human resources development department. If such a department does not exist, it will be difficult to implement the proposed method. This difference in the relationship could be ascribed to the fact, that about 38% of the company indicated that they do not have a separate HRD department, and can, therefore, not provide positive answers to questions in Section A of the questionnaire.

Sixty one percent (61%) of the respondents indicate that they use a cost benefit analysis and 60% indicate, that they agree as to the use of cost-effectiveness analysis. It can be concluded from this, that both these financial evaluation techniques are used by a majority of the respondents' companies. These results contradict those obtained by Brandenburg (1982:17) in the USA, who conclude that cost analysis of training is a secondary evaluative function. Brandenburg's results also indicated that the major functions of evaluation, are basically an internal support role to the training process.

South African Companies do make use of financial evaluation techniques in their evaluation of human resources development programmes.

- **The relationship between the size of the firm based on the number of employees and the program evaluation (i.e. Section B of the questionnaire)**

For the purpose of this study it could be indicated that those companies employing more than 1 000 people are large firms, and those less than a 1 000 are small firm.

From the responses received (see table 5,5) it can be observed that a majority of firm (71%) of responded are large firms. Hence these companies will have a major influence on the overall results.

The Wilk's lambada F-test of significance's P value = 0,022 which indicate that there is a significant difference in the manner in which small and large companies answer Section B of the questionnaire. The P value is greater than 0,01 but less than 0,05.

The next step is to conduct a univariate analysis of variances using the univariate F-test to establish in which category of Section B the difference occurs.

The result of the univariate test are given in table 5.11 below:

Table 5.11

Test			Dependent variables (Section B of questionnaire)	P value
Univariate significance	F-test	of	Proposal generation	0,201
			Review and analysis	0,062
			Decision making	0,035

Own research

In analysing the P-values of the univariate F-test of significance, the difference only occurs in the category “Decision making” as it has a $P < 0,05$ but $P > 0,01$. This category contains questions that have to do with the different capital budgeting techniques. The responded companies differ in the manner in which they use these techniques for decision making. It could not, from these study be establish as to whether this has to do with whether some of this companies are small or large.

The responded companies do not differ in the manner in which they answer questions in categories “proposal generation”, and review and analysis.

- **The relationship between the presenting of HRD expenditure to total capital budget and the program evaluation (Section B of the questionnaire)**

It was indicated that the majority of respondent companies (99%) have an expenditure of between 10% to 20% of their human resources development as a percentage of the total capital budget.

The Wilk's Lambda F-test of significance i.e. P value = 0,065, which indicate that there is no significant difference in manner in which companies in the different categories of expenditure answer questions in section B.

As a result of the above it can be pointed out that there is no need to conduct a univariable F-test of significance.

- **The relationship between the size of a company (as indicated by annual turnover) and the program evaluation (Section B of questionnaire)**

For the purpose of this study it could be stated that companies with a turnover above R10 million are large companies.

As indicated in Table 5.5, 66% of respondents have an annual turnover R10 million, and are larger companies.

The Wilik's Lambda F-test of significance P-Value = 0,020, which indicate that there is a significant difference between the size of firm and the manner in which they answer questions in Section B of the questionnaire. The P value is greater than 0,01.

The next step is to conduct a univariable analysis of variance to establish in which category of Section B the difference occurs. This is indicated in Table 5.12 below:

Table 5.12

Test	Dependent variable	P Value
Univariate F-Test of signifiante	Proposal generation	0,300
	Review and anlaysis	0,074
	Decision-making	0,042

Source: Own research

In analysing the P values above, the differences occurs in the category "Decision making" and it is $P = 0,035 > 0,01$. This is the same as in the case where the number of employees are to indicate the size of the company.

The company "Decision Making: contains questions that deals with the use of the different capital budgeting techniques used to evaluate investments in human resources development programs.

An analysis of Table 5.7 indicate that the Internal rate of return is the most popular method used. It is followed by the payback period and then the net present value then the accounting rate of return and lastly the profitability index.

These results tallies with the study conducted in the:

- United States by Gitman & Forrester (1977:68); Schall, Sunden & Gerysbeek (1978:282) and Stanley & Block (1983:65) wherein

they found that the internal rate of return is the most used followed by the net present value.

- In the United Kingdom Pikes Sharp (1989:139) also indicated more or less the same results.
- In South Africa, over the years Reeve (1981:17); Andrews & Butler (1986:15) and Parry & Firer (1990:55) found more or less similar results.

5.5 Conclusion

The chapter outlined the research procedures used to obtain the necessary information for the thesis. A six step procedure for drawing a sample was used. The editing coding and transfer of data was also explained.

The preliminary data analysis was conducted. The descriptive analysis consist of frequency distribution of the responses to all section of the questionnaire, the measures of central tendency, the measures of dispersion and the measures of shape of the distribution.

The response rate for the thesis was 38%. It was concluded from the empirical result that South African companies do financially evaluate their human resources development program.

The final conclusion is that South African firms can use the strategic financial evaluation method proposed in this thesis, to evaluate their human resources development programs.

6. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 SUMMARY

6.1.1 Introduction

In section 1.3 I it is pointed out, that one of the reasons for the study stems from the importance of human resources development in improving productivity of a firm. For South Africa to be a winning nation ,labour productivity will have to be improved. The cause of low productivity in South Africa, has been the inadequate investment in human resources development.

Another most important reason for the study, stems from the fact that human resources development programs commit a firm's scarce financial resources for a long period, with uncertain results. Because human resources development programs are a form of long-term investment, its profitability relative to other investments, needs to be ascertained. The capital budgeting process can be employed to evaluate such programs.

In order to achieve the objectives of this study as set out in section 1.2, the study has been conducted in two parts. In the first part, the relevant literature on the nature of human resources development programs, capital budgeting and program evaluation, was reviewed. In the second part it is determined by means of an empirical study on whether South African firms can use the proposed method to

financially evaluate their investments in a human resources development program.

Chapter six seeks to summarize the most salient points discussed in earlier chapters; certain conclusions are highlighted; and recommendations are made. The process of summarizing will inevitably entail some repetitions, but is nevertheless necessary so as to serve as an introduction and overview to readers before their reading the whole text.

6.1.2 Literature review

The review of literature is conducted by means of secondary research in order to highlight important aspects of the study, and hence to shape the research on which the empirical investigation is based. In assessing the literature, the procedure suggested in Section 1.5.1, is adopted in the review.

In chapter one the following aspects of the study are addressed: the background introduction, the reasons for the study, the scope of the study research methodology and problems encountered in the study. An outline of the study is also provided in this chapter.

In chapter two, which serves as a point of departure, the nature of human resources development programs is investigated. Human resources are, comprised by the people who are employed by the firm. Development is the general enhancement and growth of an individual's skills and abilities through conscious learning. A program

is a set of operations, actions or activities designed to produce certain desired effects or outcomes.

A definition of human resources development programs proposed is the following. These are those planned operations, actions or activities designed for the advancement of knowledge, skills, competencies and behaviour of employees in the firm so as to enable them to function more efficiently or effectively in their current and future jobs or tasks.

In section 2.3.1 human resources development needs are defined as a gap that exists (as a result of lack of skills, knowledge and competencies) between the current performance of employees and the expected performance.

The importance, types and methods of needs analysis are discussed. After the needs have been assessed, identified, verified and placed in order of priority, the next step in the development of instructional systems is, to formulate training objectives performance terms.

Training objectives are defined as a statement of desired results/performance that should be achieved at the end of instruction. The reasons for writing training and development needs and classification of objectives, are discussed.

In section 2.5 instructional program design is investigated, by first looking at content selection, then content sequencing and then lastly,

the selection of an instructional strategy. Content refers to the specific subjects, topics, principles, theories, skills and attitudes that will form the core of the training program. Instructional strategies considered, are the lecture, the conference, incident method, computer-based training, structured on-the-job training, off-the-job training, and simulation.

In section 2.6 the nature of evaluation is investigated, by first defining evaluation as "...the assessment of the total value of a training system or program in social as well as in financial terms". The difference between evaluation and validity is explained by pointing out, that validity concerns itself with whether a training activity has achieved its objectives and whether trainees are able to apply what they have learned. Evaluation, on the other hand, is the process of attempting to assess the total value of a human resources development program.

The purpose or role of evaluation and the different levels of evaluation as proposed by Kirkpatrick, the CIRO approach, by Parker, and by Hamblin, the Bell system and the Van der Walt system, are presented in chronological order of their development.

The relationship between the terminology used in the different approaches to evaluation, are summarized in Table 2.2 (Refer to page 62).

In chapter three the exposition on the concept "capital budgeting" is broken down into its major components.

- Firstly, the difference between current and capital expenditure is explained, by pointing out that capital expenditures are those outlays of funds that are expected to produce benefits over a period greater than a year. Investments in human resources development programs are classified as capital expenditures.
- Secondly, the concept “capital budget” is explained as a plan detailing a firm’s set of long-term investment projects and contains estimates of the cash flow of such projects.
- Lastly, the concept “capital budgeting” is explained, by noting that it is a process of analysing, evaluating, planning and selecting of long-term investment projects for inclusion in the capital budget of a firm.

In section 3.3 the capital budgeting process is stated as consisting of the following steps.

- Proposal generation, which has to do with the generation and identification of investment proposals.
- Review and analysis, which has to do with the assessment of investment proposals for their appropriateness. The expected costs and benefits of the projects are estimated.
- Decision-making, which has to do with the application of various capital budgeting techniques to cash flows in order to make decisions about projects.

- Implementing, which has to do with the allocation of funds and the implementation of the chosen project.
- Follow-up, which has to do with the monitoring of results during the operations phase of the project.

In section 3.4 cash flows used in capital budgeting, are classified into two patterns, that is, conventional and non-conventional cash flow patterns. The basic principles of cash flow estimation are specified.

To estimate cash flows, historical data, surveys, engineering estimates and subjective probabilities are used. The basic components of cash flows are the following.

- Initial investment, which is the net initial relevant cash outflow at time zero, to implement a proposed long-term investment.
- Net operating cash flows, which are the after-tax cash flows streams generated by the project.
- Terminal cash flow, which is after-tax cash flow resulting from termination and liquidation of a project.

Section 3.5 considers capital-budgeting techniques which are used in the selection and evaluation of capital projects. The most popular of these, are the payback period method, the accounting rate of return. The decision rules with regard to the application or use of these techniques for decision-making are indicated.

Section 3.6 considers risks which are generated by the variability of returns associated with a given investment. Risk assessment techniques are the sensitivity analysis, scenario analysis, monte carlo simulation and decision trees. After the risk has been assessed, it must be incorporated into the project. The risk adjustment techniques are the maximum payback period, the hurdle rate adjustment and the adjustment of the estimated cash flows.

In chapter four, the concepts cost, cost-effectiveness, cost-benefit analysis and return on investment as financial tools to evaluate human resources development program, are discussed and elaborated on.

Cost-effectiveness involves a comparison of the cost of one method of training to achieve a particular objective, with other methods. The focus of cost-benefit analysis, is to weigh the costs of a training program with the outcome or benefits achieved.

The return on investment is calculated by dividing earning or income by total assets or, in the case of human resources development, net program benefits or savings, divided by program costs. The return on investment can be calculated prior to the program implementation.

In section 4.3 human resources development program costs are discussed. Cost are defined as the monetary sacrifices incurred by the firm as a result of the training program. A number of reasons for having a human resources development costing system are given.

The two basic ways of classifying human resources development costs are the following. The first is by the description of the expenditure, and the other is the categories in the human resources development process or function. The different cost classification approaches have been developed over the past years.

Kearsley's Resource Requirement Model (1981) allows for the systematic identification of costs on the basis of various aspects of the training cycle and according to four main categories of resources (personnel, equipment, facilities and materials).

The Phillips approach (1987) is based on the Kearsley model. The Phillips model of classification is used for the purpose of predicting cost for future programs.

Bramley's approach (1991) provides a simple matrix for costing training events, by dividing them into personnel, facilities and equipment, and according to stages of training.

Fitz-enz (1994) developed a cost classification system that is similar to that of Kearsley and Bramley.

Kearsley also provided the life cycle approach that allows comparison of the relative costs of two or more training programs to be made over some selected period of time.

In section 4.4 the benefits of a human resources development program are described. Potential benefits that can be gained by a firm from a well-planned and effectively conducted human resources development program, are identified.

Two models that provide a way of comparing two or more programs by using the program benefit, are presented.

The Thomas, Maxham & Jones Framework indicates that all training and development programs produce a result in terms of efficiency of labour, and the benefits of a program will simply be the change it produces in results.

The Kearsley Benefit Analysis Model is based on a network of causal relationships between a training system's attributes and benefits, as the major goals of the program.

In section 4.5 the proposed method irrespective of the strategic financial evaluation of human resources development programs is developed. This method is based on the concepts of capital budgeting discussed in chapter 3 and the different costs and benefit classification methods discussed in chapter four.

The different steps of the method are based on section 3.3.

- Proposal generation
- Review and analysis

- Decision making
- Implementation
- Follow-up

The different assumptions underlying the method, and the conditions under which the method will work, are stated.

6.1.3 The empirical research

In chapter five the research procedure used to obtain the necessary information for the study, is outlined. The South African company, as a form of enterprise/firm, was used to represent South African firms.

A six-step procedure for drawing a sample, was employed (refer to section 5.2). The target population in this study consist of Johannesburg Stock Exchange companies in the industrial sector. No statistical formula was used to determine the size of the sample, as all such companies were included for better representability. Companies listed in the industrial sector of the Johannesburg Stock Exchange, comprise about 381 in total (refer to section 5.2.4).

The technique used for the collection of data ,was by means of a mail survey using a questionnaire (refer, section 5.3.2). A response rate of 38% was achieved in this survey.

The evaluation and analysis of the findings resulting from the mail survey, was done in the following sequence:

- **The editing, coding and transfer of data**

The editing was done irrespective of all questionnaires in order to ensure consistency. Coding involved the assignment of numbers to answers so that responses could be grouped into a limited number of categories. The data were transferred onto the database, created in the QuatroPro spreadsheet program. The SPSS (PC) program was used to compute values required.

- **Preliminary data analysis**

In section 5.4.6 the results of a descriptive analysis of the data is described. The descriptive analysis consists of a frequency distribution of the responses irrespective of all sections of the questionnaire, the measures of central tendency, the measures of dispersion or variability and the measures of the shape of the distribution.

- **The search for relationships**

In section 5.4.7 the dependence multivariate techniques are used to explore possible relationships between the variables. The dependence methods are where one or more variables are designated as being predicted by (dependent on) a set of independent variables (criterion variables). The techniques includes Anova and Manova, and to evaluate relationship, the F-test was used to test for significance.

6.2 CONCLUSIONS

A number of conclusions are arrived at in chapters one to five. The objective in this chapter, is to list the most important conclusions arrived, and conclusions for each chapter are listed under a chapter heading.

6.2.1 Chapter one

The following conclusions can be drawn from chapter one.

- In order for South African firms to be globally competitive, it is necessary that they commit resources to human resources development.
- South Africa is rated worst in terms of its development of human resources.
- An investment in human resources development will result in an improvement in productivity.
- A model should be developed that could be used by South African firms to financially evaluate their investment in human resources development.

6.2.2 Chapter two

In chapter 2 the following conclusions are made.

- The difference between training and development lies in the fact, that training has a narrow focus, in that it provides for skills

improvement for current jobs that will benefit the firm rather quickly. Development has a broader focus on present or future jobs, and the benefits can be measured only in the long-term.

- Any training and development system commences with the identification and assessment of needs. '
- In the design of an instructional program, training and development objectives must be set.
- Different instructional strategies exist, from which a trainer could choose, such as the lecture, the conference, case study method, the incident method, computer-based training, on-the-job training, off-the-job training, and simulation. (refer section 2.5.4)
- A common thread running through the different approaches to human resources development program evaluation is, that they all have different levels of evaluation.

6.2.3 Chapter three

In chapter three the following conclusions are arrived at.

- The capital budgeting process consists of a number of steps that must be executed.
- Incremental cash flows are considered in the evaluation of a capital project, and the estimate of such cash flows is based on a number of principles.
- Different capital budgeting techniques that use incremental cash flows in the evaluation of projects, exist. (refer section 3.5)

- Risk in capital projects exist as a result of the variability of returns and the long-term nature of capital projects.
- Risk assessment and adjustment techniques exists that could be incorporated in the evaluation of projects (refer section 3.6).

6.2.4 Chapter four

The following conclusions could be drawn from discussion in chapter four.

- Cost-effectiveness analysis, cost-benefit analysis, and return on investment, are methods that are used to financially evaluate human resources development programs.
- Financial evaluation techniques are based on the determination of costs and benefits.
- Different approaches to deal with human resources development program costs have been developed over the past years (refer section 4.3).
- Two approaches exist, that use benefits to evaluate programs (refer section 4.4).
- The method developed to strategically and financially evaluate human resources development programs is based on the capital budgeting process.

6.2.5 Chapter five

The following conclusions are arrived at.

- **Conclusions pertaining to descriptive analysis**
- The measures (questions used in the questionnaire) are initially reliable, with a Cronbach's alpha above 0,8.

- Response rate in this study is 38%.
- Respondent companies do make use of some form of financial evaluation of their human resources development programs (see Table 5.8).
- Respondent companies do consider their investment proposals in relation to their strategic plan. The culture of such respondent firms is, that human resources development is valued by all.
- Respondent companies do assess the riskness of the project and then make risk adjustments irrespective of their evaluation of projects.
- Respondent companies do make use of capital budgeting techniques in their evaluation of projects.
- **Conclusions irrespective of the search for relationships**
 - There is no significant differences irrespective of the size of a company (as measured by the number of employees, turnover and the percentage of HRD expenditure total capital budget) and the functions of human resources development evaluation. Companies that have separate human resources development departments differ in the manner in which they evaluate human resources departments (see Table 5.10).
 - There is a difference between small and large companies (as measured by their turnover and number of employees) in the manner in which they use capital budgeting techniques, and the risk assessment and adjustment technique. It can be

concluded, that large companies have reached that level of sophistication and have the resources to use such techniques.

- **Evaluation of objectives**

In section 1.2, three objectives for this study were stated. The aim of this section, is to evaluate those objectives in order to assess whether they have been achieved. The following comments can be made irrespective of those objectives.

- A method to be used to financially evaluate human resources development programs based on the capital budgeting process is developed in section 4.5.
- It was determined, that South African firms do make use of a form of financial evaluation of human resources development programs. Section A of the questionnaire contains questions that relate to function of evaluation. The majority of the respondents indicate, that they do make use of cost-effectiveness analysis and cost-benefit analysis (section 5.4.6).
- It was established, that South African firms can use the proposed method to financially evaluate the human resources development program, as they indicate that they have all satisfied the conditions of such methods stated in section 4.5.7.

From the above, it can be concluded, that objectives set for this study have been achieved.

6.3 RECOMMENDATIONS

In view of the findings in this study, the following recommendations are made. Among others, it is recommended that -

- The South African firms must increase their investment in human resources development so as to be in line with its trading partners, such as the U.S.A, the UK and Japan.
- Firms should establish a separate human resources department. As firms are operating in a dynamic and competitive environment, there has to be an emergence of the human resources development department from a position of obscurity within the hierarchical structure of the firm, to a role that is more active and integrated.
- The estimated return on investment of human resources development is to be reflected in the financial statements of the firm as an indicator of its commitment to training and development.
- Firms should decrease their learning cycles or develop faster knowledge transfer cycles, as the speed of knowledge development is increasing dramatically.

- Furthermore, although this study has revealed that the South African firms do financially evaluate their human resources development programs, there still is room for improving their evaluation process. There must be commitment from top management towards ensuring that the financial evaluation of such programs will be at the centre of their strategic planning.
- South African firms should benchmark with regard to skills development, from successful firms in Japan and the U.S.A. According to de Villiers (1995:90), benchmarking is very popular in the U.S.A and increasing in popularity elsewhere in the world. It provides a practical management tool that could help business enterprise to improve should they embrace this.
- Courses at technikons and universities in training management should include a more detailed study of the financial evaluation of a human resources development program.
- Companies should continuously undertake program evaluation so as to establish a database that could be used to demonstrate the effectiveness of their human resources development departments.

6.4 FURTHER RESEARCH PROPOSAL

The following research topics are proposed

- This study was restricted to the industrial sector of the Johannesburg Stock Exchange, which represents big businesses in the formal sector of the economy. A similar study involving small businesses in the formal sector, is proposed.
- A comprehensive study on the economic viability of alternatives to formal training, like formal learning from experience, should be undertaken. As Critten (1994:162) has indicated, there is a growing evidence of the value of informal or incidental learning at the workplace; more account will need to be taken of the costs involved in informal learning in any evaluation carried out.
- Research on the impact of an increased investment in human resources development on the staff turnover of a firm must be undertaken.

6.5 CONCLUSION

In this chapter, the scope of the study is summarized, and conclusions drawn in the previous chapters, are listed for the convenience of the reader, major conclusions are made, and recommendations are put forward.

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ANNEXURE A

QUESTIONNAIRE

DEPARTMENT OF BUSINESS MANAGEMENT

QUESTIONNAIRE

The **objectives** of the survey are -

1. to determine methods used by South African companies to financially evaluate human resources development programs; and
2. to develop a model that can be used by South African companies to financially evaluate their human resources development programs.

All answers will be treated as strictly confidential and the questionnaire will not be analysed individually.

SECTION A: EVALUATION FUNCTIONS

Listed below are a number of functions that may be linked to the evaluation of training and development programs. Answer all questions by marking with a cross in the relevant block each function as it relates to your company.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
a) Cost-benefit analysis	5	4	3	2	1
b) Cost-effectiveness analysis	5	4	3	2	1
c) Improve the training and development program	5	4	3	2	1
d) Provide feedback to program planners or management	5	4	3	2	1
e) Gain knowledge of employee skills levels	5	4	3	2	1
f) Provide information for performance appraisal	5	4	3	2	1

g) Placement of employees into units where they most benefit company goals

5	4	3	2	1
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h) Provide feedback to program participants

SECTION B: PROGRAM EVALUATION

Answer all the questions by crossing the block of your choice.

Proposal generation:

a) Proposed investments in the human resources development program in your company are considered in relation to company's overall strategic plan.

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
5	4	3	2	1

b) The culture in your company is one that values human resources development, and such culture pervades the entire company.

5	4	3	2	1
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c) Top management in your company regarding investment in human resources development as being as important as investment in research, new product development or capital equipment.

5	4	3	2	1
---	---	---	---	---

d) In your company the commitment of management to human resources development is communicated to all employees.

5	4	3	2	1
---	---	---	---	---

e) The responsibility of each manager and employee to the implementation of the program, is properly spelt out.

5	4	3	2	1
---	---	---	---	---

Review and analysis

- a) A system of human resources development costs classification exists in your company.
- b) Estimates of future training costs data are made in your company.
- c) Estimates of future training benefit are made in your company.
- d) In estimating future training cash flows, your company considers only incremental cash flows and measure them on an after-tax basis.

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
5	4	3	2	1
5	4	3	2	1
5	4	3	2	1
5	4	3	2	1

- e) Your company generally uses the same financial analysis systems to evaluate both human resources development proposals and traditional investment projects.
- f) Your company uses "sensitivity" analysis systems to evaluate both human resources development proposals and traditional investment projects.
- g) Your company uses "Monte Carlo simulation" to assess the program risk.
- h) Your company uses "scenario analysis" to assess program risk.
- i) Your company uses **Risk adjusted discount rate** to adjust program risk.

5	4	3	2	1
5	4	3	2	1
5	4	3	2	1
5	4	3	2	1
5	4	3	2	1

- j) Your company uses the **Maximum payback period** as a method to adjust for risk.
- k) Your company use **Certainty Equivalents** to adjust for program risk.

5	4	3	2	1
5	4	3	2	1

Decision making

Listed below, are a number of capital budgeting methods commonly used to evaluate program. Answer all questions by marking with a cross in the relevant block each method as it relates to your company.

- a) Internal rate of return
- b) Net present value
- c) Profitability index
- d) Accounting rate of return
- e) Payback period/method

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
5	4	3	2	1
5	4	3	2	1
5	4	3	2	1
5	4	3	2	1
5	4	3	2	1

SECTION C: GENERAL

Answer all questions by marking with a cross in the relevant block.

1. Your company has a **separate** human resources development department:

- (a) Yes

1

- (b) No

2

2. How many people are employed full-time in your company?

- (a) 0 – 999

1
- (b) 100 and above

2

3. What is the percentage of human resources development expenditure to the total capital budget?

- (a) 10% - 20%

1
- (b) 21% - 30%

2
- (c) 31% - 40%

3
- (d) 41% - 50%

4
- (e) 51% and above

5

4. What is the annual turnover of your company?

- (a) R0 – R9 999 999

1
- (c) Above R10 million

2

5. In which sector is your business?

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ssified Index

al — Beverage, Hotels & Leisure
 Amalgamated Beverage Industries Ltd
 Avis Holdings Ltd
 Beverage and Consumer Industry Holdings Ltd
 City Lodge Hotels Ltd
 Cullinan Hotel and Leisure Group
 Dalys Ltd
 Don Group Ltd
 Distillers Corporation Ltd
 Gallagher Estate Holdings Ltd
 Interleisure Ltd
 Karos Hotels Ltd
 Kersaf Investment Ltd
 Killimanjaro Investments Ltd
 King Food Holdings Ltd
 KVV Beleggings Beperk
 Leisureport Ltd
 Nandos Group Holdings Ltd
 Oakfields Thoroughbreds and Leisure Industries Ltd
 Opus Investments Ltd
 Robhold Ltd
 SA Breweries Ltd
 Stocks Hotels & Resorts Ltd
 Stellenbosch Farmers' Winery Group Ltd
 Sun International (South Africa) Ltd
 Spur Holdings Ltd
 Spur Steak Ranches Ltd
 Seregro International Ltd
 Steers Holdings Ltd
 Suncrush Ltd
 Tellow Holdings Ltd
 Tourism Investment Corporation Ltd
 Tenaxo Ltd

rial — Building & Construction

Alpha Ltd
 Buildmax Ltd
 Boumout Ltd
 Basil Road Holdings Ltd
 Centaur Ltd
 Ceramic Industries Ltd
 SM Goldstone Ltd
 Group Five Holdings Ltd
 Grinaker Construction Ltd
 Group Five Ltd
 IFA Ltd
 Maronte (Africa) Ltd
 Mazarin Holdings Ltd
 Monus Ltd
 Otis Elevator Company Ltd
 Portland Holdings Ltd
 Pretoria Portland Cement Company Ltd
 Shoredits Holdings Ltd
 Stocks & Stocks Holding Ltd
 Stocks & Stocks Ltd
 Wilson Bayly Holmes — Ocean Ltd
 York Timber Organisation

rial — Chemicals, Oils & Plastics

ABC Ltd
 Chemical Services Ltd
 Engen Ltd
 Envisure Holdings Ltd
 Francol Ltd
 Hoechst South Africa Ltd
 Ominia Holdings Ltd
 Polifin Ltd
 Sinterchem Ltd
 Sural Ltd
 Spanpand Ltd

rial — Clothing, Footwear & Textiles

Adams Knitwear Holdings Ltd
 African and Overseas Enterprises Ltd
 Asian Investment Corporation Ltd
 Allwear Ltd
 Burlington Industries Ltd
 Bolton Footwear Ltd
 Consolidated Frame Textiles Ltd
 Conshu Holdings Ltd
 Coastal Group Ltd
 Da Gama Textile Company Ltd
 Franco Group Holdings Ltd
 Glindis Holdings Ltd
 Gohl and Ingers Ltd
 Ninian and Lester Holdings Ltd
 Pals Holdings Ltd
 Pointer Fashion International Ltd
 Romintex Ltd
 Rex Transform Clothing Company Ltd

SA Bias Industries Ltd
 Seardel Investment Corporation Ltd
 Sterling Clothing Ltd
 Towles Edgar Jacobs Ltd
 Textile Mills (1947) Holding Ltd
 Tolaram 2000 Ltd
 Unispin Holdings Ltd

rial — Development Stage

Admiral Leisure World Ltd
 Managed Care SA Ltd
 M-Cell Ltd

Industrial — Electronics & Electrical

ADT Advanced Technical Systems Ltd
 AEC Anovco Investments Holdings Ltd
 ALT Allied Technologies Ltd
 AMA Amalgamated Appliance Holdings Ltd
 APG Autopage Holdings Ltd
 ATN Allied Electronics Corporation Ltd
 BIC Bico Cofca Ltd
 CNL Control Instruments Group Ltd
 DAE Daewoo Electronics SA Ltd
 DDT Dimension Data Holdings Ltd
 DEL Delta Electrical Industries Ltd
 DTC Datatec Ltd
 FCM Masterbridge Ltd
 FIN Fintech Ltd
 FMT Femco Technology Holdings Ltd
 GNK Grinaker Holdings Ltd
 GRX IBM South Africa Group Ltd
 IBM Jasco Electronics Holdings Ltd
 ISC Log-Tek Holdings Ltd
 LGT Mast Holdings Ltd
 MAT MCX Holdings Ltd
 MCX Multisource Holdings Ltd
 MEL Mustek Ltd
 MST Nu-World Holdings Ltd
 NWL Omega Holdings Ltd
 OMA Power Technologies Ltd
 POW Persotel Holdings Ltd
 PRL Plessey Corporation Ltd
 PSY Q-Data Ltd
 QDT Reunert Ltd
 RLO Searec Ltd
 SET Softline Ltd
 SFT Spescom Electronics Ltd
 SPK Siltek Ltd
 STT Stantron Group Holdings Ltd
 STM Telematrix plc
 USK Usko Ltd
 VLT Voltex Holdings Ltd
 VNT Venturon Corporation Ltd

Industrial — Engineering

AFX African Oxygen Ltd
 ALR Fraser Alexander Ltd
 BEL Bell Equipment Ltd
 BIV Berzack-illman Investment Corporation Ltd
 BTO Bateman Project Holdings Ltd
 BTR Bateman Industrial Corporation Ltd
 BZK Berzack Brothers (Holdings) Ltd
 CHU Chubb Holdings Ltd
 CLY Clyde Industrial Corporation Ltd
 CMT Cementation Company (Africa) Ltd
 CTY City Investment Holdings Ltd
 ELB Edward L. Bateman Ltd
 FRX Fralex Ltd
 HAG Haggie Ltd
 HDC Hudaco Industries Ltd
 HWN Howden Africa Holdings Ltd
 INM Immins Ltd
 NEH NEI Africa Holdings Ltd
 NEI Northern Engineering Industries Africa Ltd
 SCG Scherrighuisen Holdings Ltd
 SCN Scharrig Mining Ltd
 SHR Scharrig Industrial Holdings Ltd
 SNR Sondor Industries Ltd
 SPI Spicer-Mitchell Holdings Ltd
 TPN TPN Investments Ltd
 UHS Unihold Ltd
 WNB Winbel Ltd
 WNH Winhold Ltd

Industrial — Food

AMT Armato Corporation Ltd
 BON Bonitta (Pty) Ltd
 BRJ Breaner Mills Ltd
 CAS Cadbury Schweppes (South Africa) Ltd
 CHL Chillers Group Ltd
 CKS Crookes Brothers Ltd
 COI Choice Holdings Ltd
 CSF CC Smith Foods Ltd
 DLF Dol Monte Royal Foods Ltd
 FDC Foodcorp Ltd
 FSF First Food SA Holdings Ltd
 HLH Hunt Leuchards and Hepburn Holdings Ltd
 HNC Hunter Ltd
 ICS ICS Holdings Ltd
 ILV Illovo Sugar Ltd
 IRV Irvin and Johnson Ltd
 KOS Kolosus Holdings Ltd
 LGB Langeberg Holdings Ltd
 LSU Lonrho Sugar Corporation Ltd
 MDM Macadams Bakery Supplies Ltd
 NCX National Chick Ltd
 NFH Namibian Fishing Industries Ltd
 NMS Namibian Sea Products Ltd
 NRK Northern Bakeries Ltd
 NTR Natal Ocean Trawling Ltd
 OCF Oceana Fishing Group Ltd
 OTK OTK Holdings Ltd
 PML Premier Group Ltd
 RBW Rainbow Chicken Ltd
 SHV Sea Harvest Corporation Ltd
 SOV Sovereign Food Investments Ltd
 TIC Tiger Oats Ltd
 TNT Tongaat-Hulett Group Ltd
 WBH WB Holdings Ltd

Industrial — Furniture, Household & Allied

AFC Associated Furniture Companies Ltd
 AMR Amalgamated Retail Ltd
 CNK Pat Cornick Ltd
 ELH Ellerman Holdings Ltd
 IDC ID Group Ltd
 PON Protea Furnishers Ltd

Industrial — Industrial Holding

AMI Anglo American Industrial Corporation Ltd
 AVI Anglovaal Industries Ltd
 BAR Barlow Ltd
 BDN BTR Dunlop Ltd
 BLT Bolton Industrial Holdings Ltd
 BVT Bidvest Group Ltd
 CFX Consolidated Afex Corporation Société Anonyme
 CCS CG Smith Ltd
 CHR Charter plc
 CUL Cullinan Holdings Ltd
 DLG Del Monte Royal Corporation Ltd
 DLH Del Monte Royal Holdings Ltd
 DLV Dorbyl Ltd
 EUR Eureka Industrial Ltd
 FWR Forward Group Ltd
 GFR Griffin Shipping Holdings Ltd
 GNR Genarod Unicorn Group Ltd
 IPL Imperial Holdings Ltd
 IVH Island View Holdings Ltd
 JNC Johnnies Industrial Corporation Ltd
 KJR Kairos Industrial Holdings Ltd
 KLN Klipfontein Ltd
 LBS Liblife Strategic Investments Ltd
 LNC Lenco Holdings Ltd
 LNM Lion Match Company Ltd
 LON Lonrho plc
 LVT Lenco Investment Holdings Ltd
 MAC MacPhail Holdings Ltd
 MIN Micor Industrial Corporation Ltd
 MLB Malbak Ltd
 MTE Montague Société Anonyme
 MTK Metkor Group Ltd
 MUR Murray and Roberts Holdings Ltd
 MZG Metje and Ziegler Ltd
 NAI New Africa Investment Ltd
 NCS Nictus Beperk
 OZZ OZZ Ltd
 PZZ Plate Glass and Shatterproof Industries Ltd
 RAH Real Africa Holdings Ltd
 RAI Real Africa Investments Ltd
 RCH Richemont Securities AG
 RMB Rembrandt Beherend Beleggings Beperk
 RMT Rembrandt Group Ltd
 SBV Sabvest Ltd
 SFR Sefmarine & Reanias Holdings Ltd
 STR Strand Group Holdings Ltd
 TCH Technihire Ltd (1988)
 TEG Tegiese Beleggings Korporasie Beperk
 TIB Tegiese & Industriële Beleggings Beperk
 TOC Toco Holdings Ltd
 TUN T & N Holdings Ltd
 USV United Service Technologies Ltd
 UTI Utico Holdings Ltd

Industrial — Media

ABC Abacus Technology Holdings Ltd
 CXN Caxton Ltd
 CTP CTP Holdings Ltd
 EDC Education Investment Corporation
 MNE Electronic Media Network Ltd
 IDW Independent Newspapers Holdings Ltd
 MTH MTH Holdings Ltd
 NPN Nasionale Pers Beperk
 OMC Omni Media Corporation Ltd
 PEN Penrose Holdings Ltd
 PRB Perskor Beleggings Beperk
 PRK Perskor Groep Beperk
 PRI Primedia Ltd
 PBH Publico Holdings Ltd
 PBC Publico Ltd
 SSA Sasani Ltd
 TME Times Media Ltd

Industrial — Motor

ATQ Autoquip Group Ltd
 CMH Combined Motor Holdings Ltd
 GTA Gentyre Industries Ltd
 MTA Metals Investments Ltd
 POT Brian Porter Holdings Ltd
 SPG Super Group Ltd
 THL Tiger Wheels Holdings Ltd
 TIW Tiger Wheels Ltd
 TOY Toyota SA Ltd
 VCR Vauxtrucar Ltd
 VLT Vauxauto Ltd
 WES Wesco Investments Ltd

Industrial — Packaging & Printing

ALX Alex White Holdings Ltd
 ARE Aries Packaging Ltd
 BCF Bowler Mearns Ltd
 CAN Canadian Overseas Packaging Industries Ltd
 CONSOL Ltd
 COSMA Cosma Brothers Ltd
 GDL Gundle Ltd
 HRL Harwill Investments Ltd
 KOH Kohler Ltd

Industrial — Paper

SAP Sappi Ltd

Industrial — Pharmaceutical & Medical

ADC Adcock-Ingram Ltd
 ALN Alliance Pharmaceuticals Ltd
 AUK Auckland Investments Ltd
 CLC Clinic Holdings Ltd
 CRS Carson Holdings Ltd
 GOC General Optical Company Ltd
 MDC Medi-Clinic Corporation Ltd
 MDH Medhold Ltd
 MDX Medex Ltd
 MMD Macmed Health Care Ltd
 NTC Network Healthcare Holdings Ltd
 PSM President Medical Investments Ltd
 SDG SA Druggists Ltd

Industrial — Steel & Allied

CMI Consolidated Metallurgical Industries Ltd
 COM Chromecorp Holdings Ltd
 HVL Highveld Steel and Vanadium Corporation Ltd
 ISC Iscor Ltd

Industrial — Stores

ACM Acrem Holdings Ltd
 AKJ Arthur Kaolan Jewellery Holdings Ltd
 ALC Amlic Ltd
 ARM Aroma Liquor Holdings Ltd
 BRM Bearing Man Ltd
 CHT Charon Holdings Ltd
 CNG CNA Galle Ltd
 CPD Corpego Ltd
 CSB Cashbuild Ltd
 DCL Dover Investment Holdings Ltd
 DLM Dina-Movie Ltd
 EDS Edgars Stores Ltd
 ESI Europe South African Investment Corporation Ltd
 FOS Foschini Ltd
 HCH Homeconco Holdings Ltd
 HOR Hilar Ltd
 HSW Housewares Group Ltd
 HVN Swires from Heaven Holdings Ltd
 IBI IB Bette Ltd
 ITE Italtile Ltd
 IVT Invicta Holdings Ltd
 LEF Lewis Froschini Investment Company Ltd
 LTR LA Retail Stores Ltd
 MAH Matheson and Ashby Holdings Ltd
 MAT Mast Holdings Ltd
 MCR McCarthy Group Ltd
 MCT McCarthy Retail Ltd
 MDS Midas Ltd
 MHL Mas Holdings Ltd
 MRG Markols Retail Group Ltd
 MSN Masheidi Consolidated Investment Holdings Ltd
 MTC Metro Cash & Carry Ltd
 MTO Mathomo Group Ltd
 NCL New Clicks Holdings Ltd
 ODV Oceana Investment Corporation plc
 PCF Pacific Asia Investments International
 PEG Pappo Ltd
 PEI Pop Ltd
 PEP Popkor Ltd
 PIK Pick 'n Pay Stores Ltd
 PWK Pick 'n Pay Holdings Ltd
 REG Redwoods Holdings Ltd
 SHP Shoprite Holdings Ltd
 SPY Speciality Stores Ltd
 SRT Smart Centre Holdings Ltd
 STC Storeco Ltd
 TLT Teltron Ltd
 WAL Waltons Stationery Company Ltd
 WLH Waltons Consolidated Investment Holding Ltd
 WLO Wooltru Ltd

Industrial — Transport

CRG Cargo Carriers Ltd
 LSR Laser Transport Holdings Ltd
 MOB Mobile Industries Ltd
 PTC Putco Ltd
 RDP Roadcorp Ltd
 TRE Trencor Ltd
 UTR Unitrans Ltd
 VTL Venters Leisure and Commercial Trailers Ltd