

**EDUCATIONAL TECHNOLOGY IN POST APARTHEID  
EDUCATION: EVALUATION OF ROLE AND POLICY**

**BY**

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✓

## DECLARATION

**I the undersigned hereby declare that the work contained in this thesis is that of my own original work which has not in its entirety nor in part been submitted previously at any university for a degree.**

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DATE

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## **ABSTRACT**

Educational Technology as a significant discipline within the educational landscape has been firmly accepted by many countries throughout the world. Most notably, countries such as the United Kingdom, United States of America, Australia, Hungary and Scotland are amongst the forerunners in implementing educational technology in their educational systems. The value and significance of educational technology is such that democracies throughout the world can ill afford to ignore.

This study is thus an attempt to investigate, assess and identify the role and policies of educational technology in post apartheid South Africa. The rationale behind this study is thus to examine and ascertain whether the Government of National Unity has gone far enough to affect major changes in the educational landscape with special reference to the assimilation and in co-operation of educational technology. Based on this rationale, the study investigates amongst others, the perception and understanding of educational technology amongst educationists in primary and secondary schools in Phoenix which is located approximately 25 km north of Durban in the province of KwaZulu Natal. This limitation of concentrating and restricting the study to Phoenix was unavoidable due to various mitigating circumstances amongst which were the factors of time, cost, human and financial resources and also the issue of security. However after all these concerns were analysed it was found that the majority of schools in the Phoenix area were ideally suited to the study as these schools were made up of a well balanced racial mix of pupils.

In investigating the understanding of “educational technology” amongst the various respondents, a number of correlations such as the influence of age, tertiary institution where the respondents graduated, qualification levels, the role of media centre and it’s staff , etc were made. Thus this study eventually strengthened the resolve in providing significant information on the previously uncharted territory of “educational technology” in South Africa. In fact this is one of the only known research studies that was undertaken on educational technology in KZN. The study also gleaned various other data to assess whether there exists any policy frameworks on educational technology within the educational landscape of South Africa.

In the final analysis various conclusions were drawn, and were subsequently followed by recommendations.

# TABLE OF CONTENTS

## CHAPTER ONE: INTRODUCTION

1. 1. INTRODUCTION .....	3
1. 2. PURPOSE OF THIS STUDY .....	4
1. 3. RATIONALE: .....	6
1. 4. KEY QUESTIONS TO BE ANSWERED IN THIS STUDY .....	13
1. 5. LIMITATIONS .....	14
BIBLIOGRAPHY.....	16

## CHAPTER TWO: THEORETICAL FRAMEWORK

2.1. INTRODUCTION:.....	20
2.2. WHAT IS TECHNOLOGY:.....	23
2.3.1. EDUCATIONAL TECHNOLOGY:.....	25
2.3.1.1. HISTORICAL DEVELOPMENT OF THE CONCEPT:.....	25
2.3.1.2. THE EMERGENCE OF EDUCATIONAL TECHNOLOGY INTO A MAJOR DISCIPLINE OF ITS OWN:.....	27
2.3.1.2.1. ELTON'S MODEL:.....	28
2.3.1.2.2. SEELS AND RICHEY'S MODEL:.....	30
2.3.1.2.2.1. DALES CONE OF EXPERIENCE:.....	31
2.3.1.2.3. THE RESEARCHER'S MODEL.....	33
2.3.2. TOWARDS A DEFINITION OF EDUCATIONAL TECHNOLOGY:.....	35
2.3.2.1. DEFINITIONS OF EDUCATIONAL TECHNOLOGY:.....	37
2.3.2.1.1. ASSOCIATION OF EDUCATIONAL COMMUNICATIONS AND TECHNOLOGY(1994).....	37
2.3.2.1.2. COUNCIL FOR EDUCATIONAL TECHNOLOGY FOR THE UNITED KINGDOM:(1984).....	37
2.3.2.1.3. ROWNTREE(1979).....	37
2.3.2.1.4. PERCIVAL AND ELLINGTON(1984).....	37
2.3.2.1.5. ROMISZOWSKI AND CRITICOS(1994).....	38

2.3.2.1.6. BROWN, LEWIS AND HARCLEROAD(1977).....	38
2.3.2.1.7. BRANCH(1994).....	38
2.3.2.1.8. THE RESEARCHERS DEFINITION(1997).....	38
<b>2.4. SYSTEMS APPROACH:.....</b>	<b>40</b>
2.4.1. WHAT IS A SYSTEM?.....	40
2.4.2. THE SYSTEMS APPROACH AND EDUCATIONAL TECHNOLOGY:.....	41
2.4.3. SYSTEMS ANALYSIS:.....	43
2.4.4. ADVANTAGES OF THE “SYSTEMS APPROACH”.....	44
<b>2.5. TECHNOLOGY OF EDUCATION AND TECHNOLOGY IN EDUCATION... 45</b>	
2.5.1. WHAT IS THE DIFFERENCE?.....	45
2.5.2. TECHNOLOGY IN EDUCATION:.....	47
2.5.3. TECHNOLOGY OF EDUCATION:.....	48
<b>2.6. THE MAJOR DOMAINS OF EDUCATIONAL TECHNOLOGY:..... 49</b>	
2.6.1. DESIGN:.....	49
2.6.1.1. PROBLEM DRIVEN APPROACH:.....	50
2.6.1.2. SOLUTION DRIVEN APPROACH:.....	51
2.6.2. DEVELOPMENT:.....	53
2.6.2.1. STAFF DEVELOPMENT:.....	54
2.6.2.2. MATERIALS DEVELOPMENT:.....	55
2.6.3. UTILIZATION:.....	57
2.6.4. MANAGEMENT:.....	59
2.6.4.1. STEPS IN THE OPERATION OF AN EMIS:.....	61
2.6.4.1.1. NEEDS IDENTIFICATION:.....	62
2.6.4.1.2. DATA COLLECTION:.....	62
2.6.4.1.3. DATA PROCESSING AND ANALYSIS:.....	63
2.6.4.1.4. INFORMATION PROVISION:.....	63
2.6.4.1.5. INFORMATION UTILIZATION:.....	63
2.6.5. EVALUATION AND ASSESSMENT: IS THERE A DIFFERENCE?.....	64
2.6.5.1. WHAT IS EVALUATION?.....	64
2.6.5.2. ASSESSMENT:.....	67
2.6.5.2.1. CRITERION REFERENCED TESTS:.....	68
2.6.5.2.2. NORM REFERENCED TESTS:.....	68
2.6.5.2.3. CONTINUOUS ASSESSMENT:.....	69
<b>BIBLIOGRAPHY..... 70</b>	

<b>CHAPTER THREE: METHODOLOGY</b>
-----------------------------------

3.1. INTRODUCTION:.....	80
3.2. THE RESEARCH METHOD:.....	81

3.3. WHY THE SURVEY METHOD?.....	81
3.4. RESEARCH INSTRUMENT:.....	83
3.5. SAMPLE AREA:.....	83
3.5.1. BRIEF HISTORY OF PHOENIX.....	84
3.5.2. WHY PHOENIX?.....	85
3.6. DEFINING THE SAMPLE:.....	86
3.6.1. TARGET POPULATION: .....	86
3.6.2. TOTAL NUMBER OF PRIMARY AND SECONDARY SCHOOLS IN PHOENIX: .....	87
3.6.3. SAMPLE SIZE OF SCHOOLS AND RESPONDENTS:.....	87
3.7. SAMPLE METHOD:.....	87
3.8. ANALYSIS OF DATA:.....	88
3.9. THE PILOT STUDY:.....	89
BIBLIOGRAPHY:.....	91

## **CHAPTER FOUR: PRESENTATION AND ANALYSIS OF DATA**

4. INTRODUCTION.....	96
4.1. UNDERSTANDING OF THE CONCEPT “TECHNOLOGY” .....	97
4.1.1. WHAT IS “TECHNOLOGY?” .....	97
4.1.2. RELATIONSHIP BETWEEN AGE GROUP AND THE PERCEPTION OF THE CONCEPT “TECHNOLOGY” .....	99
4.1.3. RELATIONSHIP BETWEEN POST LEVEL AND THE UNDERSTANDING OF THE CONCEPT “TECHNOLOGY” .....	100
4.2. UNDERSTANDING OF THE CONCEPT “EDUCATIONAL TECHNOLOGY”.....	103
4.2.1. DID YOU COME ACROSS THE CONCEPT “EDUCATIONAL TECHNOLOGY?” .....	103
4.2.2. WHERE DID YOU FIRST COME ACROSS THE CONCEPT ‘EDUCATIONAL TECHNOLOGY?’ .....	106
4.2.3. WHO IS THE PERSON IN - CHARGE OF THE MEDIA CENTRE?.....	109
4.2.4. “SUPPORT AND QUALIFICATION” OF MEDIA CENTRE STAFF.....	110
4.2.5. THE RELATIONSHIP BETWEEN “DID YOU COME ACROSS THE CONCEPT “EDUCATIONAL TECHNOLOGY” AND “WHO IS IN - CHARGE OF THE MEDIA CENTRE?” .....	112



4.2.6. PERCEPTION OF THE CONCEPT “EDUCATIONAL TECHNOLOGY” .....	114
4.2.7. RELATIONSHIP BETWEEN SCHOOL TYPE (PRIMARY/ SECONDARY) AND THE UNDERSTANDING OF THE CONCEPT “EDUCATIONAL TECHNOLOGY” .....	115
4.2.8. RELATIONSHIP BETWEEN THE LEVEL OF QUALIFICATION AND THE UNDERSTANDING OF THE CONCEPT “EDUCATIONAL TECHNOLOGY” .....	116
4.2.9. RELATIONSHIP BETWEEN AGE AND THE UNDERSTANDING OF THE CONCEPT “EDUCATIONAL TECHNOLOGY” .....	118
4.2.10. RELATIONSHIP BETWEEN TERTIARY INSTITUTION WHERE THE RESPONDENT GRADUATED AND THE UNDERSTANDING OF CONCEPT “EDUCATIONAL TECHNOLOGY” .....	120
4.2.11. IS THERE A DIFFERENCE BETWEEN “TECHNOLOGY OF EDUCATION AND TECHNOLOGY IN EDUCATION?” .....	123
4.2.12. WHAT IS THE DIFFERENCE BETWEEN “TECHNOLOGY OF EDUCATION AND TECHNOLOGY IN EDUCATION?” .....	124
4.2.13. WOULD YOU LIKE TO KNOW MORE ABOUT “EDUCATIONAL TECHNOLOGY” .....	126
4.2.14. WHY WOULD YOU LIKE TO KNOW MORE ABOUT “EDUCATIONAL TECHNOLOGY” ? .....	127
4.2.15. WHICH OF THE FOLLOWING WOULD YOU WELCOME THE MOST IN ORDER TO INCREASE YOUR UNDERSTANDING OF THE CONCEPT “EDUCATIONAL TECHNOLOGY” .....	130
<b>4.3. EXISTING STRUCTURES AND POLICIES OF “EDUCATIONAL TECHNOLOGY” IN KWAZULU NATAL.....</b>	<b>132</b>
4.3.1. DOES YOUR PROVINCE HAVE A DIRECTORATE OF “EDUCATIONAL TECHNOLOGY” .....	132
4.3.2. ARE YOU AWARE OF THE EXISTENCE OF SUBJECT ADVISORS IN “EDUCATIONAL TECHNOLOGY” IN YOUR PROVINCE?.....	134
4.3.3. REASONS FOR THE NON EXISTENCE OF SUBJECT ADVISORS AND A DIRECTORATE FOR “EDUCATIONAL TECHNOLOGY” .....	135
4.3.4. WHAT MAJOR CHANGES WOULD YOU LIKE TO SEE AS REGARDS “EDUCATIONAL TECHNOLOGY” IN THE PROVINCE KZN AND ITS’ SECONDARY SCHOOLS?.....	137
4.3.5. ARE YOU AWARE OF THE “TECHNOLOGY ENHANCE LEARNING INVESTIGATION THAT WAS CARRIED OUT BY THE NATIONAL MINISTRY OF EDUCATION IN 1996?.....	140
<b>4.4. EDUCATIONAL TECHNOLOGY: THE USE OF MEDIA CENTRES BY EDUCATORS IN KZN SCHOOLS.....</b>	<b>142</b>
4.4.1. HOW OFTEN DO YOU VISIT THE MEDIA CENTRE AT YOUR SCHOOL?.....	142

4.4.2. REASONS FOR “SELDOM / NEVER” VISITING THE MEDIA CENTRE AT YOUR SCHOOL.....	143
4.4.3.1. IS YOUR SCHOOL MEDIA CENTRE FUNCTIONING AT ITS’ OPTIMUM LEVEL?.....	145
4.4.3.2. WHAT ARE POSSIBLE REASONS FOR YOUR SCHOOLS’ MEDIA CENTRE NOT FUNCTIONING AT ITS’ OPTIMUM LEVEL?.....	146
4.5. EDUCATIONAL TECHNOLOGY AND THE LEVEL OF COMPUTER LITERACY AMONGST EDUCATORS IN KZN SCHOOLS.....	149
4.5.1. ARE YOU COMPUTER LITERATE?.....	149
4.5.2. DO YOU HAVE ACCESS TO COMPUTERS AT YOUR SCHOOL?....	150
BIBLIOGRAPHY.....	154

## CHAPTER FIVE: CONCLUSION

5. INTRODUCTION.....	158
5.1. UNDERSTANDING OF THE CONCEPT, “EDUCATIONAL TECHNOLOGY”.....	161
5.1.1. THERE EXISTS A STRONG RELATIONSHIP BETWEEN TERTIARY INSTSITUTIONS WHERE THE RESPONDENTS GRADUATED AND THE UNDERSTANDING OF THE CONCEPT, ‘EDUCATIONAL TECHNOLOGY.....	163
5.1.2. THERE IS A STRONG RELATIONSHIP BETWEEN AGE LEVEL AND THE UNDERSTANDING OF THE CONCEPT, “EDUCATIONAL TECHNOLOGY”.....	165
5.1.3. RESOURCE/MEDIA CENTRES WITHIN PRIMARY AND SECONDARY SCHOOLS DO NOT PROMOTE AND DEVELOP EDUCATIONAL TECHNOLOGY.....	166
5.2. EDUCATIONAL TECHNOLOGY DOES NOT EXIST WITHIN THE SOUTH AFRICAN EDUCATIONAL SYSTEM AND THUS THERE IS NO POLICY IN PLACE TO SHAPE EDUCATIONAL TECHNOLOGY. 167	
5.2.1. THERE EXISTS NO DIRECTORATE OF EDUCATIONAL TECHNOLOGY IN KZN.....	168
5.2.2. THERE EXISTS NO SUBJECT ADVISORS FOR EDUCATIONAL TECHNOLOGY IN KZN.....	169
5.2.3. REASONS FOR THE NON - EXISTENCE OF SUBJECT ADVISORS AND A DIRECTORATE FOR EDUCATIONAL TECHNOLOGY IN KZN.....	169
5.3. THE MAJORITY OF EDUCATORS IN KZN REQUEST MAJOR CHANGES AS REGARDS EDUCATIONAL TECHNOLOGY.....	169

<b>5.4. MAJORITY OF THE EDUCATORS REQUESTED INSET PROGRAMMES FOR IMPROVING THEIR UNDERSTANDING OF THE CONCEPT, “EDUCATIONAL TECHNOLOGY”</b> .....	<b>171</b>
<b>5.5. RECOMMENDATIONS</b> .....	<b>171</b>
<b>5.5.1. ESTABLISHMENT OF EDUCATIONAL TECHNOLOGY INSTITUTE IN SOUTH AFRICA</b> .....	<b>171</b>
<b>5.5.2. INSET PROGRAMMES</b> .....	<b>173</b>
<b>5.5.3. THE DEVELOPMENT/ESTABLISHMENT AND PROMOTION OF RESOURCE/MEDIA CENTRES IN KZN SCHOOLS</b> .....	<b>174</b>
<b>5.5.4. DEVELOPMENT OF A POLICY FRAMEWORK ON EDUCATIONAL TECHNOLOGY IN SOUTH AFRICA</b> .....	<b>175</b>
<b>BIBLIOGRAPHY:</b> .....	<b>177</b>
<b>APPENDICES:</b> .....	<b>188</b>

## LIST OF FIGURES

<b>FIGURE 1 :</b>	<b>ELTON'S MODEL ILLUSTRATING THE VARIOUS INFLUENCES ON THE DEVELOPMENT OF EDUCATIONAL TECHNOLOGY .....</b>	<b>28</b>
<b>FIGURE 2. :</b>	<b>SEELS AND RICHEY'S MODEL ILLUSTRATING THE INFLUENCES ON THE DEVELOPMENT OF EDUCATIONAL TECHNOLOGY.....</b>	<b>30</b>
<b>FIGURE 3. :</b>	<b>DALE'S CONE OF EXPERIENCE.....</b>	<b>31</b>
<b>FIGURE 4. :</b>	<b>THE RESEARCHER'S MODEL ILLUSTRATING THE VARIOUS INFLUENCES ON EDUCATIONAL TECHNOLOGY.....</b>	
<b>FIGURE 5. :</b>	<b>A SIMPLE EDUCATIONAL SYSTEM .....</b>	<b>42</b>
<b>FIGURE 6. :</b>	<b>MODEL ILLUSTRATING THE SIX STEPS INVOLVED IN SYSTEMS ANALYSIS .....</b>	<b>43</b>
<b>FIGURE 7. :</b>	<b>THE FUNCTIONAL DIFFERENCE BETWEEN TECHNOLOGY OF EDUCATION AND TECHNOLOGY IN EDUCATION .....</b>	<b>46</b>
<b>FIGURE 8. :</b>	<b>THE FIVE STEPS INVOLVED IN OPERATING AN EMIS .....</b>	
<b>FIGURE 9. :</b>	<b>PERCEPTION OF THE CONCEPT "TECHNOLOGY".....</b>	<b>97</b>
<b>FIGURE 10.:</b>	<b>RELATIONSHIP BETWEEN AGE GROUP AND THE UNDERSTANDING OF THE CONCEPT, "EDUCATIONAL TECHNOLOGY".....</b>	<b>99</b>
<b>FIGURE 11.:</b>	<b>FAMILIARITY WITH THE CONCEPT " EDUCATIONAL TECHNOLOGY".....</b>	<b>103</b>
<b>FIGURE 12.:</b>	<b>FIRST INTRODUCTION TO THE CONCEPT "EDUCATIONAL TECHNOLOGY".....</b>	<b>106</b>
<b>FIGURE 13.:</b>	<b>THE MANAGEMENT OF MEDIA CENTRES.....</b>	<b>109</b>
<b>FIGURE 14.:</b>	<b>THE LEVEL OF QUALIFICATION AND TYPE OF SUPPORT OFFERED BY MEDIA CENTRE PERSONNEL.....</b>	<b>110</b>
<b>FIGURE 14.:</b>	<b>RELATIONSHIP BETWEEN THE FAMILIARITY WITH THE CONCEPT, "EDUCATIONAL TECHNOLOGY" AND THE PERSON IN CHARGE OF THE MEDIA CENTRE.....</b>	<b>112</b>
<b>FIGURE 15.:</b>	<b>PERCEPTION OF THE CONCEPT "EDUCATIONAL TECHNOLOGY".....</b>	<b>114</b>
<b>FIGURE 16.:</b>	<b>RELATIONSHIP BETWEEN THE TYPE OF SCHOOL AND THE UNDERSTANDING OF THE CONCEPT, "EDUCATIONAL TECHNOLOGY".....</b>	<b>115</b>

<b>FIGURE 17. :</b>	<b>RELATIONSHIP BETWEEN LEVEL OF QUALIFICATION AND THE UNDERSTANDING OF THE CONCEPT, “EDUCATIONAL TECHNOLOGY”</b> .....	<b>116</b>
<b>FIGURE 18. :</b>	<b>RELATIONSHIP BETWEEN AGE AND THE UNDERSTANDING OF THE CONCEPT, ‘EDUCATIONAL TECHNOLOGY’</b> .....	<b>118</b>
<b>FIGURE 19. :</b>	<b>RELATIONSHIP BETWEEN TERTIARY INSTITUTION AND THE UNDERSTANDING OF THE CONCEPT, “EDUCATIONAL TECHNOLOGY”</b> .....	<b>120</b>
<b>FIGURE 20. :</b>	<b>IS THERE A DIFFERENCE BETWEEN TECHNOLOGY OF EDUCATION AND TECHNOLOGY IN EDUCATION?</b> .....	<b>123</b>
<b>FIGURE 21. :</b>	<b>WOULD YOU LIKE MORE INFORMATION ON THE CONCEPT,“EDUCATIONAL TECHNOLOGY”? </b> .....	<b>126</b>
<b>FIGURE 22. :</b>	<b>WHY WOULD YOU PREFER MORE INFORMATION ON THE CONCEPT, “EDUCATIONAL TECHNOLOGY”</b> .....	<b>127</b>
<b>FIGURE 23. :</b>	<b>PREFERENCE FOR INCREASING THE KNOWLEDGE OF THE CONCEPT, “EDUCATIONAL TECHNOLOGY”</b> .....	<b>130</b>
<b>FIGURE 24. :</b>	<b>EXISTENCE OF A PROVINCIAL DIRECTORATE FOR EDUCATIONAL TECHNOLOGY”</b> .....	<b>132</b>
<b>FIGURE 25. :</b>	<b>EXISTENCE OF SUBJECT ADVISORS FOR EDUCATIONAL TECHNOLOGY</b> .....	<b>134</b>
<b>FIGURE 26. :</b>	<b>REASONS FOR THE NON-EXISTENCE OF SUBJECT ADVISORS AND A DIRECTORATE FOR EDUCATIONAL TECHNOLOGY</b> .....	<b>135</b>
<b>FIGURE 27. :</b>	<b>TYPES OF MAJOR CHANGES THAT ARE BEING AWAITED AS REGARDS EDUCATIONAL TECHNOLOGY IN KZN</b> .....	<b>137</b>
<b>FIGURE 28. :</b>	<b>AWARENESS OF TELL</b> .....	<b>140</b>
<b>FIGURE 29. :</b>	<b>FREQUENCY OF VISITS TO THE SCHOOL MEDIA CENTRE</b> .....	<b>142</b>
<b>FIGURE 30. :</b>	<b>REASONS FOR “NEVER/SELDOM” VISITS TO THE MEDIA CENTRE</b> .....	<b>143</b>
<b>FIGURE 31. :</b>	<b>THE LEVEL OF FUNCTIONING OF THE MEDIA CENTRE</b> .....	<b>145</b>
<b>FIGURE 32. :</b>	<b>REASONS FOR THE SCHOOL MEDIA CENTRE NOT FUNCTIONING AT ITS OPTIMUM LEVEL</b> .....	<b>146</b>
<b>FIGURE 33. :</b>	<b>LEVEL OF COMPUTER LITERACY</b> .....	<b>149</b>
<b>FIGURE 34. :</b>	<b>ACCESS TO COMPUTERS AT SCHOOL</b> .....	

## **LIST OF TABLES**

<b>TABLE 1. :</b>	<b>TOTAL NUMBER OF PRIMARY AND SECONDARY SCHOOLS IN PHOENIX.....</b>	<b>87</b>
<b>TABLE 2. :</b>	<b>SAMPLE SIZE OF SCHOOLS AND RESPONDENTS.....</b>	<b>87</b>
<b>TABLE 3. :</b>	<b>RELATIONSHIP BETWEEN POST LEVEL AND THE PERCEPTION OF THE CONCEPT, “TECHNOLOGY”.....</b>	<b>100</b>
<b>TABLE 4. :</b>	<b>FIRST INTRODUCTION TO THE CONCEPT, “EDUCATIONAL TECHNOLOGY”.....</b>	<b>107</b>
<b>TABLE 5. :</b>	<b>DIFFERENCE BETWEEN TECHNOLOGY OF EDUCATION AND TECHNOLOGY IN EDUCATION.....</b>	<b>124</b>

**CHAPTER ONE:  
INTRODUCTION**

<b>TABLE OF CONTENTS:</b>
---------------------------

1. 1. INTRODUCTION ..... 3

1. 2. PURPOSE OF THIS STUDY ..... 4

1. 3. RATIONALE: ..... 6

1. 4. KEY QUESTIONS TO BE ANSWERED IN THIS STUDY ..... 13

1. 5. LIMITATIONS ..... 14

BIBLIOGRAPHY.....16



**1. 1. INTRODUCTION:**

The emergence of Educational Technology as a fundamental discipline in its own right has been long and ardent. Educational Technology as a concept grew out of an acceptance that education as a discipline is based on contributions and inputs from a wide variety of subjects. There is universal agreement that indeed three major contributors to the field of Educational Technology can be identified. However, there are two opposing views as to the identification of the three key contributors to the development of Educational Technology as a major discipline. Elton(1977) identifies the Audiovisual Communications movement coupled with Individualised Learning and later Group Learning as the three broad lines along which Educational Technology has evolved. Opposing this stance, Seels and Richey(1994) argue that Media Education, Psychology of Instruction and the Systematic Approach to education were in the main the three chief contributors to the development of the concept “Educational Technology”. The view taken by Elton(1977) seems to be immersed in a positivistic discourse as to the origination and development of the concept “Educational Technology”, while the argument put forward by Seels and Richey(1994) is based more on a post modernistic explanation. These two opposing views shall be explored in greater depth in chapter two of this study.

What is of significance and consequence at this juncture is that there are universal agreement and consensus that Educational Technology is indeed a key discipline which consists of a number of subsystems and when this subsystem function together as a supra system, it in fact enhances the quality of teaching and learning significantly.

Countries such as the United Kingdom and the United States have been regarded as the forerunners in the field of Educational Technology and their educational systems have become role models that many other nations have begun to identify with. Scotland, Australia and more recently Hungary has begun to whole heartedly adopt, apply and restructure their educational systems based on the principles of Educational Technology.

It is not being implied in this study that the USA and UK have developed the most sophisticated educational system via Educational Technology. However, it must be stressed that these two countries have indeed achieved great success in the field of education due to the application of the principles of Educational Technology.

### **1. 2. PURPOSE OF THIS STUDY:**

The Government of National Unity (GNU) has inherited an educational system that can best be described as being highly fragmented, disjointed based on the provision of schooling along racial lines. The seventeen departments of education operated on a centrally allocated budget that was in turn unequal from a technical, human, physical and financial resource point of view. There is, therefore widespread agreement and concern that South Africa's entire educational system is in need of a major renewal if not overhauling. This is also compounded by a restlessness and impatience amongst the masses who for far too long had to endure apartheid education. The marginalisation in terms of access and equality of educational opportunity has to be addressed as soon as possible.

Thus far the GNU has initiated a successful single ministry of education. However, this is not enough. Ways and means have to be thought of and found in order to solve the many problems facing education in South Africa. Zenor(1995) supports the view that when problems emerge in any educational system then Educational Technology must be used as one important part of the solution. He quotes examples of countries such as Hungary and Australia that identified problems in their educational systems and thus used Educational Technology successfully as their major solution.

Based on the above premises, the primary intent of this study is inter alia to:

- \* investigate how educationists in Kwazulu Natal(KZN) understand the concept “Educational Technology”
- \* Identify, examine and assess policies and proposals in the Post Apartheid era that provide a framework for the application of Educational Technology
- \* evaluate the present role of Educational Technology in KZN
- \* determine the attitudes of educators towards engaging in workshops, INSET and PRESET programmes in so far as sustaining and promoting the principles and goals of Educational Technology with the express purpose of developing a provincial Educational Technology Unit in KZN.
- \* assess and determine the extent to which the Technology Enhanced Learning Investigation (TELI) has influenced educationist’s perception of the concept “Educational Technology”

**1. 3. RATIONALE:**

Educational Technology which is now a familiar feature on the educational landscapes of many countries has yet to be developed and adopted in South Africa. To a large extent Educational Technology has been ignored. Its' value and significance in promoting and sustaining a well balanced educational system cannot be overstated, yet South Africa lags far behind. Compounded with the problems and legacies of apartheid education one would find many solutions to our educational problems by developing Educational Technology. The exact nature and principles implicit in Educational Technology have been in the main submerged by incorrect perceptions amongst educators, policy-makers and as such the power of educational technology has been foregone. However it would be beneficial to reorientate misguided perceptions that may exist amongst many of our educators, decision-makers and policy-makers in KZN.

What is "Educational Technology?" Presently Educational Technology is perceived as the simplistic application of teaching tools such as teaching machines, electronic gadgets, microcomputers, etc in the classroom. This approach confuses Educational Technology with "tools technology" (Rowntree 1982). Thus it is imperative that we begin by decontextualising the concept "Educational Technology" before it is exclusively attached to teaching machines and gadgets. Educational Technology must be seen in the context of being as wide as education itself : it is concerned with the design, evaluation of curricula and learning experiences and with the problems of implementing and renovating them.

Essentially, it is a rational problem solving approach to education, a way of thinking sceptically and systematically about learning and teaching (Rowntree 1982). More definitions of Educational Technology shall be analysed in chapter two. However from this definition it becomes very clear that Educational Technology is an all embracing approach that attempts to answer the problems in education by carefully adopting a rational and systematic stance. It also becomes apparent that Educational Technology is made up of a number of systems that depend on each other for smooth functioning. Further, the definition implies very succinctly that the thrust of Educational Technology is to enhance the value and quality of teaching and learning; to evaluate teaching practices and methods with the express aim of improving teaching and learning; and also to encourage the design and production of materials and resources to increase the level and ease with which teaching and learning can be pursued in the educational setting.

Thus Educational Technology seems to be most appropriate within the South African educational scenario seeing that our country is a relatively new democracy and as such was characteristic of apartheid education with all its evils of unequal funding, resource distribution, inequitable staffing, etc. Another significant factor is the teaching methods and strategies that have inherently characterised South African education - this has particular reference to Christian National Education (CNE) which was the cornerstone of apartheid education. CNE was a form of direct subservience that was propagated by the state to indoctrinate the disadvantaged masses by providing them with an education that was fashioned along European ideals and goals.

This was contrary to an education provision that was ideal to the aspirations of the black masses of South Africa.

Teaching strategies and methods were too traditional in the sense that they were highly characteristic of rote learning, memorization and teacher talk. Essentially teaching and learning placed great emphasis on teacher centred instruction where the teacher was the dominant force in the classroom which subsequently stifled pupils individualism as regards thought processes and articulation in the classroom. There was no room and scope for teacher-pupil or pupil-pupil interaction. Instructional delivery was rigidly hierarchical and this suited the state where it satisfied the principles of racism and apartheid. Pupils were unable to question the suitability and aptness of the curricula as they were centrally designed and implemented by National Government.

In this regard the GNU released the White Paper I in Education and Training in 1995 which states that “the curriculum, teaching methods and textbooks at all levels and in all programmes of education and training, should encourage independent and critical thought, the capacity to question, enquire, reason, weigh evidence and form judgements, achieve understanding, recognise the provisional and incomplete nature of most human knowledge, and communicate clearly” (p 22)

From the fairly brief discussion above, there can be no doubt whatsoever that in Educational Technology lies many solutions and challenges to the problems facing educators in South Africa.

The sooner we react in assimilating the principles of Educational Technology the sooner our educational system can succeed in becoming more effective and meaningful.

The role, value, significance and promotion of Educational Technology together with the application of technologies to the classroom curriculum can be used to improve our schools by accommodating different learning styles and speeds amongst students in classrooms by allowing the teacher to assume the role of a “knowledge facilitator” rather than a “knowledge provider” (Richmond, 1986: 26). The application of Educational Technology also allows for better collaboration between schools, business and the community. It is therefore important to decontextualise the concept “Educational Technology” as consisting of a number of sub-systems whereby each of these sub-systems have an equally important role to play in allowing the effective and meaningful functioning of the educational system.

Keeping in mind the dire need to re-establish and sustain a culture of teaching and learning in South Africa, the GNU ought to develop a steadfast view in the quest of addressing critical issues of equality, quality, access and opportunity of education for the masses in South Africa. Educational Technology being as wide as education itself provides and implies many solutions that educators can pursue in so far as enhancing teaching and learning.

More recently in the public minds of South Africans “ when somebody talks about getting Educational Technology into schools, the only thing that comes to mind is media and computers or more media and computers”. This perception has to be negated by structured and coherent workshops and Inservice Education and Training (INSET) programmes. Provincial departments of education have to take accountability and responsibility for the promotion of Educational Technology. However it must be stressed that national policies must be in place so as to guide and provide a framework that can be adhered to by the provinces located in South Africa. It is thus hoped that this study will be able to provide valuable data as to the perception of Educational Technology that exists amongst educators in KZN.

A fundamental difference between “Technology in Education and Technology of Education” also needs special reference in terms of clarification. There seems to be widespread tentativeness, uneasiness and at times confusion as to the meaning and implications of the above two concepts that are inherent in Educational Technology. This research will provide a meaningful discourse as to the concise meaning of the two concepts and thereby promote valuable guidance so that educators can assimilate these two concepts in relation to Educational Technology. The distinction that exists between “Technology in Education and Technology of Education” are fundamental in explaining Educational Technology as a discipline in its own right. There is increasing evidence that educators in South Africa are placing more and more emphasis on Technology in Education at the expense of Technology of Education.



Although both aspects are an integral part of Educational Technology, each however, must not be seen as being more functional than the other.

This study also hopes to provide an in depth analysis of the concept “Technology” from a post modernistic view. The positivistic stance of the concept “Technology” has led many to believe that the word technology is solely concerned with engineering, machines, tools, etc. However this study will argue a rather different view as to the meaning of the concept “Technology”. Because technology is perceived as being solely concerned with machines and gadgets, so too has “Educational Technology” become submerged with the perception of it being solely about teaching machines. This perception is rather narrow and outdated and thus an attempt at re-orientation is called for amongst educators in South Africa. Here again it is hoped that this study will be able to provide valuable data in highlighting the precise meaning of Educational Technology and how it can be efficiently practised in schools with a well formulated policy framework.

Presently in South Africa there seems to be little effort in initiating a combined approach at bringing together all the sub-systems of education to make policies and proposals from a single forum. This is due in part from the legacies of apartheid which was based on “divide and rule” along racial segregation. However in the new dispensation the National Ministry of Education must make attempts at drawing together all the disciplines that have a stake in education to come together so that a united policy could be drawn up.

This is an important ingredient in the recipe for educational success. To achieve this kind of unity, Educational Technology must be adopted as soon as possible. The reason for this is very clear, in that, in Educational Technology, a systematic approach is of utmost importance and as such it brings together all the sub-systems that allows for the smooth and efficient functioning of the educational system as a whole. To foster a collaborative working relationship between all the disciplines that constitute the educational system, a National Institute should be developed so to co-ordinate the promotion of Educational Technology in South Africa.

There exists also a myth amongst educators that Educational Technology implies a great deal of cost in so far its implementation is concerned. The application of Educational Technology in the educational system of South Africa will not necessarily involve great amount of costs. Moja(1987) argues that to restore the culture of learning in South Africa, educators need not look towards the acquisition of new technologies and media but rather they should look at and investigate ways and strategies of making use of existing infrastructures more efficiently and systematically. Educational Technology can provide valuable solutions to the problem of costs. Educational Technology is a way of thinking sceptically about problems in education and as such it does not solely demand the use of extravagant and costly teaching machines and technology to enhance teaching and learning. Clark (1984) after undertaking numerous longitudinal studies concluded that media does not enhance classroom teaching alone but he identified the human

component, ie. the teacher as being the most important entity in the instructional episode. Thus the increased acquisition of technology related hardware and software in schools will not necessarily guarantee educational success. However teaching and learning strategies and methods have to be devised, taking into account the utilization of the various resources at hand in the classroom. There are indeed various other components in the educational system to consider, such as, management strategies, evaluation mechanisms and the like. The adoption of Educational Technology is thus the key towards unlocking the doors of educational success in South Africa.

#### **1. 4. KEY QUESTIONS TO BE ANSWERED IN THIS STUDY:**

In the final analysis there are two key questions that this study attempts to answer viz,

- \* How do educators in KZN understand the concept “Educational Technology”?
- \* What is the status of “Educational Technology in KZN schools?

In providing answers to the two questions above, the researcher will bring to light the present perceptions that exists amongst educators in KZN as concerns Educational Technology. In pursuing these questions, valuable data can be obtained as to the willingness of educators towards engaging in workshops, seminars and INSET programmes so as to further their knowledge of Educational Technology.

The research will also provide valuable input in terms of analysing the present status of Educational Technology in KZN. The analysis will also highlight the practice and policy of Educational Technology in the province of KZN. Finally it is hoped that by providing answers to these questions significant recommendations will be made as to the adoption of the principles of Educational Technology.

#### **1. 5. LIMITATIONS:**

This study is not without any limitations, and as such two shortcomings have been identified by the researcher. The first limitation is that this research's findings are based on the studies undertaken in the province of KZN and not in South Africa as a whole. However, keeping in mind that there now exists a single National Ministry of Education, it is hoped that the generalisations and findings of KZN will be applicable to all other provinces as the National Ministry is entrusted with legislations for all provinces. Also due to financial constraints and the researcher being employed on a full time basis whilst undertaking this research, it was impractical to undertake research on a national level in all nine provinces. However the researcher hopes to conduct a national study in the near future with the proviso of financial support.

The second limitation of this study is that the research findings are based on Educational Technology in schools located in a predominantly "Indian" area of Phoenix. The researcher having noted this constraint felt that, of all the areas in KZN, Phoenix is probably the one area where a large proportion of the schools have a mixed racial composition of pupils.

In schools such as Foresthaven Secondary and Sastri Park Secondary, the Indian to Black pupil ratio is approximately 50:50. Thus race, class and location have not been compromised when carrying out and undertaking this research.

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**CHAPTER TWO**  
**THEORETICAL FRAMEWORK**

<b>TABLE OF CONTENTS</b>
--------------------------

2.1. INTRODUCTION:.....	20
2.2. WHAT IS TECHNOLOGY:.....	23
2.3.1. EDUCATIONAL TECHNOLOGY:.....	25
2.3.1.1. HISTORICAL DEVELOPMENT OF THE CONCEPT:.....	25
2.3.1.2. THE EMERGENCE OF EDUCATIONAL TECHNOLOGY INTO A MAJOR DISCIPLINE OF ITS OWN:.....	27
2.3.1.2.1. ELTONS' MODEL:.....	28
2.3.1.2.2. SEELS AND RICHEY'S MODEL:.....	30
2.3.1.2.2.1. DALES CONE OF EXPERIENCE:.....	31
2.3.2. TOWARDS A DEFINITION OF EDUCATIONAL TECHNOLOGY:.....	35
2.3.2.1. DEFINITIONS OF EDUCATIONAL TECHNOLOGY:.....	37
2.3.2.1.1. ASSOCIATION OF EDUCATIONAL COMMUNICATIONS AND TECHNOLOGY(1994).....	37
2.3.2.1.2. COUNCIL FOR EDUCATIONAL TECHNOLOGY FOR THE UNITED KINGDOM:(1984).....	37
2.3.2.1.3. ROWNTREE(1979).....	37
2.3.2.1.4. PERCIVAL AND ELLINGTON(1984).....	37
2.3.2.1.5. ROMISZOWSKI AND CRITICOS(1994).....	38
2.3.2.1.6. BROWN, LEWIS AND HARCLEROAD(1977).....	38
2.3.2.1.7. BRANCH(1994).....	38
2.3.2.1.8. THE RESEARCHERS DEFINITION(1997).....	38
2.4. SYSTEMS APPROACH:.....	40
2.4.1. WHAT IS A SYSTEM?.....	40
2.4.2. THE SYSTEMS APPROACH AND EDUCATIONAL TECHNOLOGY:.....	41
2.4.3. SYSTEMS ANALYSIS:.....	43
2.4.4. ADVANTAGES OF THE "SYSTEMS APPROACH".....	44



<b>2.5. TECHNOLOGY OF EDUCATION AND TECHNOLOGY IN EDUCATION..</b>	<b>45</b>
<b>2.5.1. WHAT IS THE DIFFERENCE?.....</b>	<b>45</b>
<b>2.5.2. TECHNOLOGY IN EDUCATION:.....</b>	<b>47</b>
<b>2.5.3. TECHNOLOGY OF EDUCATION:.....</b>	<b>48</b>
<b>2.6. THE MAJOR DOMAINS OF EDUCATIONAL TECHNOLOGY:.....</b>	<b>49</b>
<b>2.6.1. DESIGN:.....</b>	<b>49</b>
<b>2.6.1.1. PROBLEM DRIVEN APPROACH:.....</b>	<b>50</b>
<b>2.6.1.2. SOLUTION DRIVEN APPROACH:.....</b>	<b>51</b>
<b>2.6.2. DEVELOPMENT:.....</b>	<b>53</b>
<b>2.6.2.1. STAFF DEVELOPMENT:.....</b>	<b>54</b>
<b>2.6.2.2. MATERIALS DEVELOPMENT:.....</b>	<b>55</b>
<b>2.6.3. UTILIZATION:.....</b>	<b>57</b>
<b>2.6.4. MANAGEMENT:.....</b>	<b>59</b>
<b>2.6.4.1. STEPS IN THE OPERATION OF AN EMIS:.....</b>	<b>61</b>
<b>2.6.4.1.1. NEEDS IDENTIFICATION:.....</b>	<b>62</b>
<b>2.6.4.1.2. DATA COLLECTION:.....</b>	<b>62</b>
<b>2.6.4.1.3. DATA PROCESSING AND ANALYSIS:.....</b>	<b>63</b>
<b>2.6.4.1.4. INFORMATION PROVISION:.....</b>	<b>63</b>
<b>2.6.4.1.5. INFORMATION UTILIZATION:.....</b>	<b>63</b>
<b>2.6.5. EVALUATION AND ASSESSMENT:</b>	
<b>IS THERE A DIFFERENCE?.....</b>	<b>64</b>
<b>2.6.5.1. WHAT IS EVALUATION?.....</b>	<b>64</b>
<b>2.6.5.2. ASSESSMENT:.....</b>	<b>67</b>
<b>2.6.5.2.1. CRITERION REFERENCED TESTS:.....</b>	<b>68</b>
<b>2.6.5.2.2. NORM REFERENCED TESTS:.....</b>	<b>68</b>
<b>2.6.5.2.3. CONTINUOUS ASSESSMENT:.....</b>	<b>69</b>
<b>BIBLIOGRAPHY.....</b>	<b>70</b>

**2. 1. INTRODUCTION:**

The power of educational technology as a significant contributor towards the enhancement of educational management, curriculum and materials development, educational administration , evaluation and teaching and learning has been largely recognised by numerous countries throughout the world. Examples of such countries that come to mind immediately are the United States of America (USA) and Britian (UK). These countries are also identified by many scholars as the pioneers in the field of educational technology because of their untiring endeavours to promote and sustain educational technology. Many of the paradigms and models of educational technology have been developed in these two countries and as such they have become leaders in the field of educational technology. However many other countries such as Scotland, Australia, Germany have also developed and adopted educational technology because of the value and significance that it carries in the educational landscape. Very recently Hungary, too, has developed a well balanced policy and framework that incoperates educational technology and they has also ventured to the extent of creating and building one of the state of the art educational technology unit. The reason for commenting on Hungary is that South Africa and Hungary share similar circumstances in so far as the achievement of democracy is concerned. Hungary like South Africa achieved democracy in the early 1990s and similar to South Africa the road to democracy was a long and turbulent one. Thus the experiences that Hungary shared will be easily identifiable to South Africans and from time to time the researcher will draw from the Hungarian experience with special reference as to how the Hungarian

Authorities were able to develop and establish an Institute of Educational Technology (OOK).

It is unfortunate that South Africa, to a large extent has yet to recognise the value and significance of a well balanced educational technology framework. This is evident from the non-existence of clear policies that should have been in place especially at a school level. Many tertiary institutions have also not recognised educational technology as a major force to be reckoned with. Here again there is no evidence of educational technology units that exist in most South African universities. The University of Durban Westville has a division of Educational Technology, however in terms of policy making and information dissemination it falls far short mainly because of the apathy of the University Structures in promoting and making use of it. Therefore all in all, it would be logical to conclude that the South African educational authorities whether at central government, regional or provincial level have as yet not developed educational technology per se. The shortcomings are overwhelming in the support for the establishment of an educational technology institute that can begin to develop and shape policy around the incorporation of educational technology in South Africa.

Developments in education since 1995 have resulted in the Technology Enhanced Learning Investigation (TELI) and Technology 2005 Project. Although both these initiatives are very encouraging, they fall far short of tangible solutions that South Africa's educational system requires.

These projects and proposals have been developed piecemeal and as such it lacks a systematic vision whereby a coherent logical framework could result. In effect these two projects mentioned above have developed to a large extent in isolation to each other where in fact logic would require that they should have been part and parcel of a complete system. Each of these projects should have formed subsystems to the supra system of South Africa's educational ideals and goals.

Owing to these kinds of developments and processes on part of government, it becomes imperative that our educational system be fashioned along the principles of educational technology which insists on a systematic approach towards rationally solving educational problems. Educational technology stresses the need for an holistic approach to teaching and learning and thus no education system can in fact ignore the power and impact of educational technology.

This research study was initiated partly because of the confusions and misconceptions outlined above. However in addition to these problems, this research study also undertakes to seek in-depth clarity on basic assumptions of educational technology with special reference to the definition of educational technology and how educationists perceive it in South Africa. As a point of departure it becomes of paramount importance to begin with an analysis of the concept "Technology" which has taken a rather elusive framework in terms of its assimilation and implementation in the educational sphere of South Africa.

## 2. 2. WHAT IS TECHNOLOGY?

There are two views that are purported towards tracing the historical derivation of the word “Technology”. The first view is that of Byrum(1984) who argues that the word “Technology” is derived from a Greek word called “Techne”. He further indicates that the Greeks used the word “Techne” to refer “to the knowledge required to get the job done”.

Hunt (1992) on the other hand argues that the word “Technology” owes its derivation to the Greek word “Technologia” which meant a systematic treatment of methods and processes.

These two views are quite similar in its treatment of “Technology” as regards its meanings. Thus to provide connotative meanings as will be explained below seems to be ill timed and ill-advised. Therefore let us analyse some of the meanings that scholars and educationists both in South Africa and around the world have come to attach to the concept “Technology”.

Selby(1993) after conducting numerous studies in the United States found that many educationists regard technology as machines, gadgetry, equipment and the like. Puk(1993) also found that scholars in Britain have come to perceive technology as an engineering process implicitly perceiving technology as machines and tools. Ely and Donald (1993) have also observed that numerous scholars use the term technology to mean “Hardware” ie. devices that deliver information and serve as tools to accomplish a task. Naughton (1991) who is a British educational researcher also found that people conceive the concept “Technology” as

being attached solely to machines. Naughton(1991) goes on to add that the equation of technology to machines and gadgets are totally invalid because if the human element is not part of the conceptualisation of “Technology” then there is no technology to talk of.

The quest for logically well balanced views on the concept “Technology” can be found in the following. According to Roger(1983) the concept “Technology” must be seen as a design for instrumental action that reduces the uncertainty in a cause-effect relationship involved in achieving a desired outcome. He goes further to argue that technology must be seen as having two components. Firstly the hardware component which are usually tools and machines, and secondly the software component which usually refers to information. However the latter component seems to be unclear and as such it would be more appropriate to add a third component viz. the underware component which refers to strategies and methods that are used to plan, design, evaluate and implement the software and hardware components.

Saettler(1991) also provides a definition wherein he argues that modern technology must be seen as systematised practical knowledge. Here again it would be foolish to categorise technology into modern and ancient. One needs to understand and perceive technology as technology. In this regard it is worthwhile noting Braudel’s (1979) view, who argues that everything is technology: not only man’s most strenuous endeavours but also his patience and monotonous efforts to make a mark on the external world.

Thus if we are to consider Saettler's (1991) viewpoint, then we will have to forego important inventions such as the printing press, picture books, etc because all these are ancient. Therefore the argument is that technology is technology however ancient or modern it may be. In effect it is a way of life and is lived (Hunt 1992). Hunt (1992) adds further that "technology" is woven throughout the very fabric of our culture and society: it is an agent for social, economic and political change.

In concluding the analysis of the concept, "Technology" it emerges very clearly that technology is not to be confused and solely attached to our understanding of tools, machines and gadgets. Technology must be seen as lived and experienced. It must be seen as "action made effective" (Seels and Richey 1994, p.16). Another important consideration is that "Technology" must not be seen only as a process that brings rapid changes but more importantly technology must also be seen as a process that can result in slow improvements because at the end, technology will always result in bearing the fruits of accumulated knowledge. (Saettler 1991)

## **2. 3. 1. EDUCATIONAL TECHNOLOGY:**

### **2. 3. 1. 1. HISTORICAL DEVELOPMENT OF THE CONCEPT:**

Many researchers ( Seels and Richey 1994; Ely 1979; Saettler 1989; Elton, 1977) are of the opinion that educational technology is predominantly a post World War II concept. It is for this reason that the historical development of educational technology is being focussed from the middle 1940s.

If we are to consider the principles of educational technology very carefully then the views asserted by the above researchers proves to be incorrect. Educational technology must be seen as a concept that existed as long as mankind. Educational technology, however, might be semantically developed after the 1940s but in terms of its application and implementation, one needs to justify its existence as far back as education itself. As shall be discussed later, educational technology must not be confused with tools technology and the development/innovations that came with advancements in engineering. Educational technology is much more than that. It is a way of thinking rationally and sceptically about education problems and how it could be solved thereby enhancing teaching and learning. Thus one needs to consider advancements made and brought about by, for example : the printing press, the introduction of the picture book (Comenius 16th century), etc. All these inventions and introductions did in fact promote and sustain educational technology. However rudimentary developments were, one still needs to give it credit from the point of educational technologists.

Seels and Richey (1994) must be singled out as being rather biased and prejudiced whereby they refer extensively to the use of media by the United States Military as being one of the key support factor and foundation for the emergence of educational technology. These kinds of historical perspectives merely serve to cast doubt and adds to the confusion surrounding the development of educational technology. One needs to be open minded and consider imaginatively that educational technology is not about machines alone, it is a systematic approach that

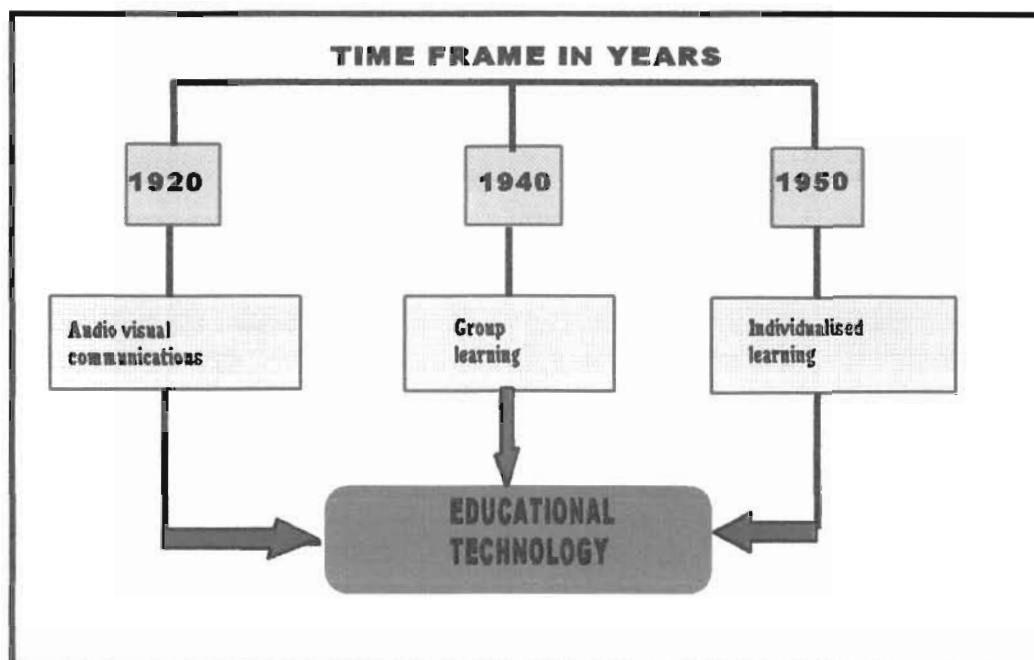


takes cognisance of ways of knowing and thinking as well. If we are thus to assume it as a post World war II concept, then we explicitly are propagating that man was incapable of thinking, planning, strategising and applying knowledge and skills prior to World War II.

Based on the above premises we need to understand the context of the historical development of education as being a discipline that evolved over a number of centuries and to this day is still evolving ie. Educational Technology is dynamic and will be continuously influenced by man as long as he strives to introduce and maintain new technology and innovations over time.

### **2. 3. 1. 2. THE EMERGENCE OF EDUCATIONAL TECHNOLOGY INTO A MAJOR DISCIPLINE OF ITS OWN:**

The emergence of educational technology into a major field in its own right has been precipitated by influences from a number of other disciplines and field of studies. Amongst others, the researcher has considered inputs from Elton (1977) and Seels and Richey (1994) who have provided valuable contributions towards the analysis of the development of educational technology emerging into a significant discipline.

**2. 3. 1. 2. 1. ELTON'S MODEL (1977)**

**Figure 1. : Elton's Model illustrating the various influences on the development of Educational Technology.**

Three decades could be identified as the key periods which provided the impetus for the development of educational technology. Elton (1977) goes on to identify, the 1920s, whereby major inputs from the audiovisual communications movement began to lay the basis for the development of educational technology.

Secondly he adds that "Group Learning" which began to take root in the 1940s due to the growth in the development of various machines and media.

As regards machines and media, Elton(1977) singles out the Closed circuit television, Overhead Projector, Television and Motion Picture as key machines that laid the basis for instruction to large audiences. Finally Elton argues that the 1950s saw the emergence of the introduction of Individualised Learning whereby significant inputs were made from psychology.

Elton's Model (1977) seems to be rather simple and sketchy. He gives a very simplistic overview of the emergence of educational technology. He conveniently ignores the structure of societies that began to cope with emerging technologies precipitated by engineering. He also loses sight of the increasing demands made by individuals and masses from various societies in terms of transformation in the educational landscape. Thus in essence Elton(1977) does not consider important and significant inputs that emerged from the fields of : Sociology, Philosophy, Engineering, etc. All these disciplines indeed lent support to the emergence of educational technology into a discipline in its own right.

### 2. 3. 1. 2. 2. SEELS AND RICHEY'S MODEL (1994)

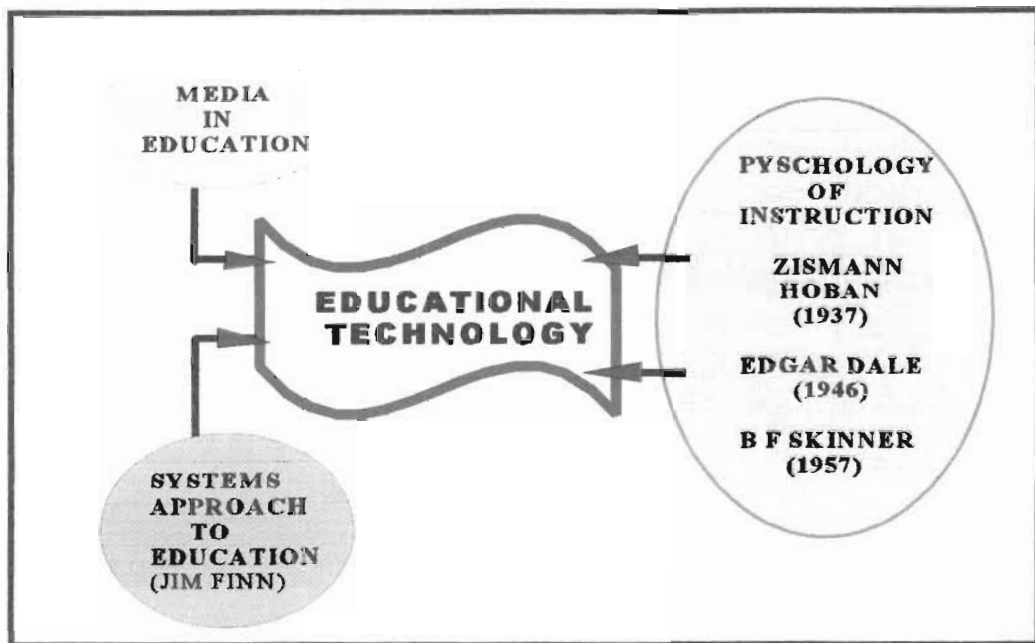
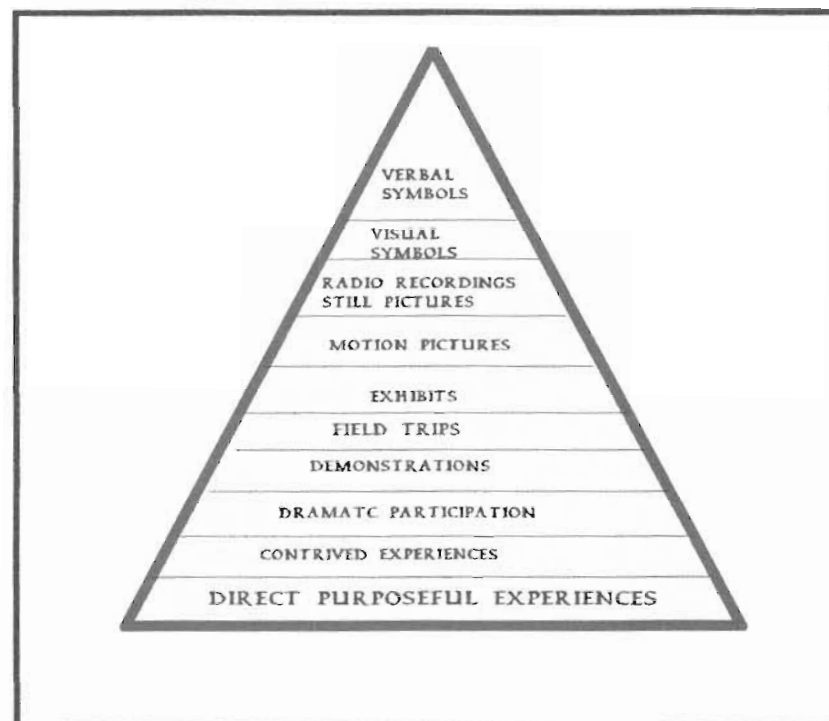


FIGURE 2. : Seels and Richey's Model illustrating the influences on on the development of Educational Technology

Seels and Richey's model appears to be more logical and systematic. They do not provide time frames within which educational technology emerged thereby noting that educational technology was long in existence and thus only terminology has changed as regards it's principles and nature. The above model also identifies persons who played prominent roles in the development of educational technology as a significant discipline. Hoban and Zismann (1937) wrote extensively on the use of media in the United States Military training and they therefore argued that general education institutions began to borrow experiences and expertise from the successful use of media in the United States Army.

Seels and Richey go onto identify the significant role played by Edgar Dale (1946). Dale (1946) wrote extensively from research conducted on the role of media in enhancing cognitive skills such as experiences as related to concrete and abstract symbols.

### 2. 3. 1. 2. 2. 1. DALE'S CONE OF EXPERIENCE:



**FIGURE 3. : Dales Cone of Experience (Adapted from Edgar Dale : 1946)**

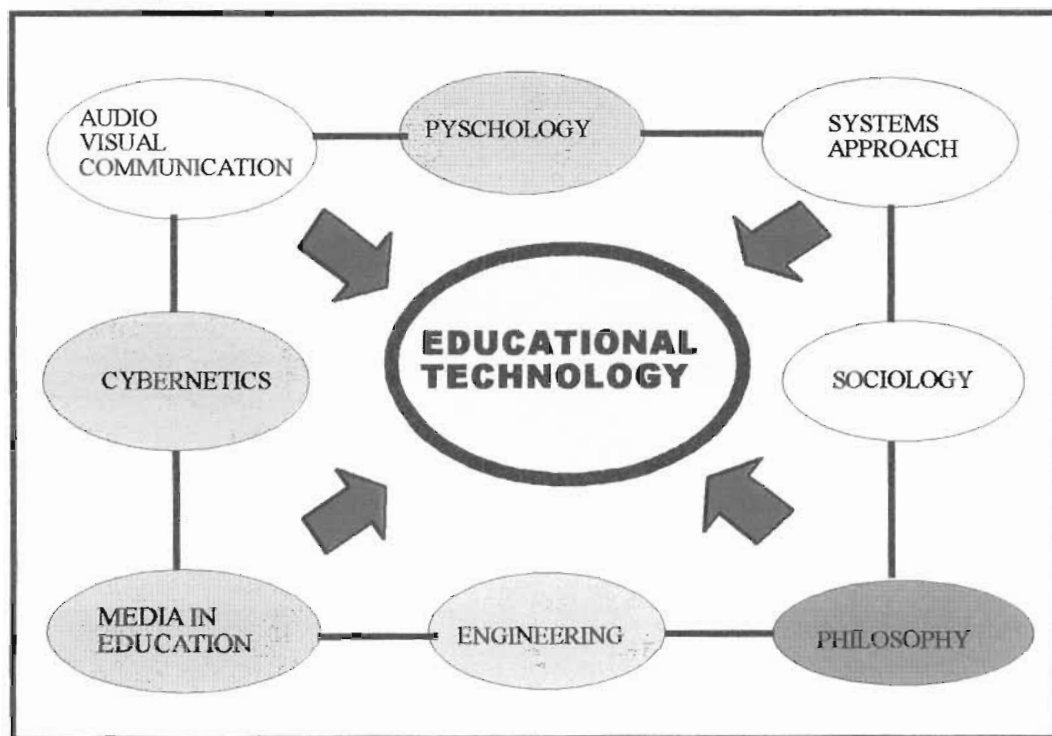
Figure 3. illustrates Dales (1946) view where he argued that all experiences are based on a continuum that extends from concrete to abstract.

However, an experience not always proceeds from the concrete to the abstract. In some instances it is possible that one's experience will move from the abstract to the concrete especially when there is context stripping. In the final analysis Dale (1946) concluded that in most of the cases abstract symbols and ideas were more easily understood and retained by the learner if they were built on concrete experiences.

In this regard Reigeluth (1987) also agreed that Dale's Cone of Experience was the "first attempt to build a rationale that involved both learning theory and audio-visual communication" (p.21).

There is widespread acceptance ( Mager 1962; Glaser 1960; Lumsdaine 1964) that Skinner's (1954) research and practice of teaching machines and programmed learning in teaching and learning legitimised and popularised the discipline, " Educational Technology". This was the first instance where professionals began to accept educational technology because of the strong influence and support it attracted from psychologists. There was now a psychological basis for educational technology.

### 2. 3. 1. 2. 3. THE RESEARCHER'S MODEL



**FIGURE 4. : The researcher's Model illustrating the various influences on the development of Educational Technology**

The emergence of educational technology as a significant discipline in its own right has been evolutionary. There is no single cause or sets of attributes that have led to its emergence as a discipline to be reckoned with. It must be stressed that educational technology will continue to evolve as man exists. Technology whether through engineering or sheer thought processes of human beings will continue to expose educational technology to a more vibrant discipline. In Figure 4. above, a number of attributes/disciplines have been outlined as a mere preamble to

illustrates some of the influences of educational technology. This is by no means an exhaustive list of influences. As mentioned earlier there will be numerous other influences as educationists begin to develop thought processes either through evaluation or feedback. However this model goes beyond Elton(1977) and Seels and Richey(1984) in terms of illustrating how wide and vast the influences were that contributed to the emergence of educational technology into a significant discipline. Also, of importance is the contribution of cybernetics which both Elton and Seels and Richey seem to marginalise. The advent of cybernetics have indeed added one of the greatest attributes to the emergence of educational technology into a major discipline. There is up to now continuous developments in cybernetics and all these developments have added quality and improvements to educational technology in some way or another. However, the information superhighway that has emerged can be singled out as one of the major contributions towards the latter half of this century. In terms of the information superhighway, the Internet and E-Mail stands out as most significant.

The work of Habermas, Paulo Freire, Gramsci, etc have also contributed in terms of sociological underpinnings of educational technology. The introduction and acceptance of “Peoples Education” has given new direction to the provision and functioning of education especially in countries who were under the spell of colonialism and apartheid. The work of the above researchers and scholars have led educationists to redefine the type, quality and meaning of the curriculum and education in general that needs to be implemented.



Philosophy also contributed to educational technology emerging into a strong and significant discipline. The work of Habermas during the Enlightenment also gave a new orientation to education. Positivism was seen to be dying because everything was tested against scientific facts at the expense of original thinking and individualistic thought processes.

Post modernism and Constructivism fashioned along the lines of the French philosopher, Michael Foucault also began to give impetus to Educational Technology. Constructivism together with post modernism was based on educational theory that identified learning as being pupil centred rather than teacher centred. In essence the pupil constructs his or her own knowledge with the teacher as facilitator. The advent of the super-information highway as reduced the world to a global village where all countries and it's citizens can communicate and share information with the mere touch of controls and buttons. The electronic transfer and access of information is such that it can be done within minutes and thus ideas, goals and aims can be achieved with the minimum of ease.

### **2. 3. 2. TOWARDS A DEFINITION OF EDUCATIONAL TECHNOLOGY:**

As yet there exists no universally accepted definition of educational technology. This must be seen against the background of educational technology being an evolutionary discipline. Also compounding the lack of a universal definition is the fact that different countries experience different circumstances in terms of human, physical, technical and financial resources.

The educational settings and educational landscapes also differ markedly in various countries and as such each country has adopted and adapted it's own definition in respect of educational technology. One glaring example lies in conceptualising educational technology as regards it's terminology. The United States and Canada for example refer to educational technology as Instructional Technology while countries such as the United Kingdom, Australia and Hungary prefer to use the term Educational Technology. Although countries opt for different terminology, the common thread in most educational landscapes of the world lies in the belief that indeed educational technology is an all embracing discipline that is most significant in which educational structuring and manifestation are fashioned. It must also be understood that countries are situated in different political, economic and social backgrounds and more importantly these backgrounds determine and shape the level of commitment and willingness to assimilate and adopt educational technology to its hilt.

What emerges strongly from various research studies is the fact that a number of the following definitions have been incorporated and adopted by most countries as a basis for their definitions of educational technology. Although not in it's entirety there is overwhelming evidence in support of countries adopting and adapting the following definitions. This is by no means an exhaustive list of definitions.

**2. 3. 2. 1. DEFINITIONS OF EDUCATIONAL TECHNOLOGY:****2. 3. 2. 1. 1. ASSOCIATION FOR EDUCATIONAL COMMUNICATIONS AND TECHNOLOGY (AECT) : 1994**

AECT define educational technology as the theory and practice; of design, development, utilization, management and evaluation; of processes and resources; and or learning.

**2. 3. 2. 1. 2. COUNCIL FOR EDUCATIONAL TECHNOLOGY FOR THE UNITED KINGDOM (CET) : 1984**

CET define educational technology as the development, application and evaluation of systems, techniques and aids to improve the processes of human learning .

**2. 3. 2. 1. 3. Rowntree (1982)**

“Educational technology is as wide as education itself: it is concerned with the design and evaluation of curricula and learning experiences and with the problems of implementing and renovating them. Essentially, it is a rational problem solving approach to education, a way of thinking critically and systematically about teaching and learning” (p. 31)

**2. 3. 2. 1. 4. PERCIVAL AND ELLINGTON (1984)**

“The principal role of educational technology is to help improve the overall efficiency of the teaching learning process” (p. 11)

**2.3.2.1.5. ROMISZOWSKI AND CRITICOS (1994)**

**Educational technology is defined as a discipline committed to advancing educational efficiency by systematic design, development and evaluation of educational systems.**

**2.3.2.1.6. BRANCH (1994)**

**Branch (1994) argues that educational technology is the systematic approach to assessing the total process of learning, design, utilization and evaluation of instructional strategies and the management thereof.**

**2.3.2.1.7. BROWN, LEWIS AND HARCLEROAD (1977)**

**“ Educational technology is a systematic way of designing, carrying out and evaluating the total process of learning and teaching in terms of specific objectives, based upon research in human learning and communication, and employing a combination of human and non-human resources to bring about more effective instruction” (p.131)**

**2.3.2.1.8. THE RESEARCHER’S DEFINITION (1997)**

**Educational technology is a systematic approach that involves the implementation of technology in education and technology of education via the processes of design, utilization, development, evaluation and management. Educational technology in the main is therefore process driven which inherently enhances the teaching learning process through systems orientation and rational problem solving which must lead to affectivity and efficiency in the teaching learning situation.**

All of the eight definitions above, show very little differences in terms of the meaning of educational technology. Although different terminology are used in the definitions with reference to semantics, nevertheless the principles and meanings are the same. In fact we could sum up by implying that the definitions show more similarities than differences.

Some of the following threads are common to most if not all of the eight definitions, ie: **Educational Technology.....**

- \* **involves a systems approach**
- \* **includes both : Technology of education  
Technology in education**
- \* **can enhance teaching and learning**
- \* **has a number of domains amongst others : evaluation,  
management, utilization, design, development**

At this juncture it would be most appropriate to invoke discussion and analysis of all the attributes/threads implicit in the definitions of educational technology. This will definitely enhance our understanding of educational technology as mentioned earlier that there exists no universally accepted definition of the field: Educational Technology.

## **2. 4. SYSTEMS APPROACH:**

The concept “Systems Approach” emerged in the early 1950s as a label for what was becoming a more analytical approach to management and problem solving (Reynolds 1992). Reynolds (1992) goes onto add that the concept “systems approach” has been bandied around within two contexts, namely that of a technical and non technical context. He adds further that cybernetics as a discipline introduced the concept “systems approach” during discussions and descriptions of computer based systems. However the non-technical usage of the concept “systems approach” was becoming familiar amongst other fields who identified it as a valuable and significant approach in so far as problem solving evaluation, management, course design and administration is concerned. This in Reynold’s (1992) view was how the “Systems approach” came into fruition within the discipline: educational technology.

### **2. 4. 1. WHAT IS A SYSTEM?**

A systems is a “regularly interacting independent group of items forming a unified whole” (Webster’s Dictionary). Sampath, et al.(1984) define a system as a methodically arranged set of ideas, principles, methods or procedures while Angyal(1941) believes that a system comprises a number of parts which are arranged, organised and interrelated in some way that distinguishes them from a simple collection of objects. This belief of Angyal(1941) is fundamental in that a system must be seen within a framework which in turn is made of a number of subsystems.

These subsystems must be thought of as having commensurate importance in terms of it’s functioning and existence within the systems. Thus if one subsystems fails then the entire system will malfunction.

In this way the system must be seen as having a combination of subsystems that are not independent of each other but in relation to each other. All the subsystems must be looked at equally in terms of its roles and functions.

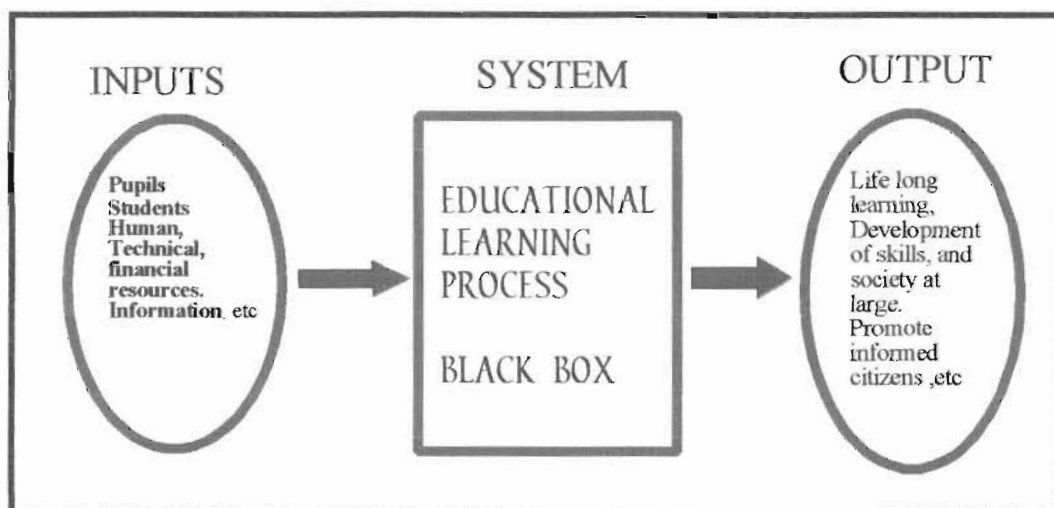
#### **2. 4. 2. THE SYSTEMS APPROACH AND EDUCATIONAL TECHNOLOGY:**

There is overwhelming evidence (from all the definitions of educational technology as discussed earlier on in this chapter) that the systems approach undoubtedly occupies a central position in thinking and discussing educational technology. In educational technology, the systems approach demands a rational problem solving process of analysing the educational process thereby making it more effective and efficient. The systems approach therefore makes reference to the process taken as a whole that incorporates all facets of education, namely pupils, teachers, curriculum content and materials development, course design, media in education, instructional episodes, instructional strategies/methods, resources(human, physical, technical, financial), policy planning and implementation, administration and management, feedback and evaluation. These facets being mentioned here are by no means an exhaustive list.

Percival and Ellington(1984) therefore argue that the systems approach attempts to provide an in depth framework which requires the identification of all the parts, attributes (Cleary et al, 1984), subsystems (Rowntree 1977) of the educational system and in so doing aims at evaluating the functioning of the various parts with continuous feedback.

The reason for continuous feedback and evaluation is for the promotion and development of the optimum functioning of the system. They also state that the systems approach operates in a similar fashion to that of a “Black box”. The black box assimilates all the functions and workings of the various parts/attributes and subsystems.

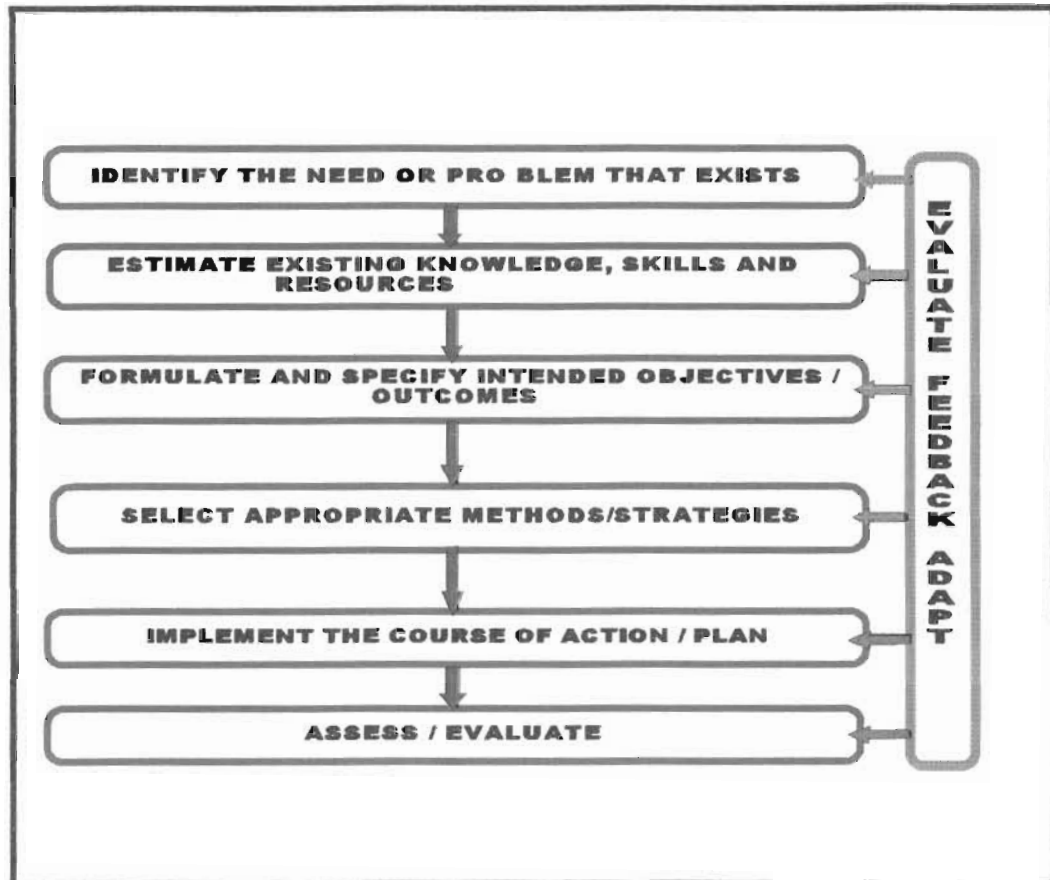
The following sketch (Figure: 5) illustrates a simple “EDUCATIONAL SYSTEM”. However, it must be stressed that the sketch is included merely to give a simplistic overview of how Educational Technology uses the systems approach as a basic premise. There are numerous subsystems to consider in any educational system and thus the following sketch does not provide an exhaustive illustration of the various subsystems.



**FIGURE: 5. : A simple educational system : ( Adapted from Percival and Ellington : 1984)**



### 2. 4. 3. SYSTEMS ANALYSIS:



**FIGURE: 6. : Model illustrating the six steps involved in systems analysis. ( Adapted from Hodge (1970) ; Freyson (1989) and Percival and Ellington (1984)**

In considering a systems approach to educational technology, it is important to understand that any given system relies relentlessly on the application of a systems analysis, ie an analysis which must be iterative (Freyson 1989), cyclical (Reynolds 1992). By engaging a systems analysis, it becomes possible to make adjustments to decisions on the basis of evaluation and feedback which are the cornerstones of systems analysis.

Thus in effect systems analysis must be applicable to all the components/elements (Freyson 1989), and subsystems (Rowntree 1977). Figure: 6. illustrates a typical systems analysis that could be applied to any component, element or subsystem of a system. This sketch is highly simplistic merely providing a basic understanding of how a systems analysis could be initiated in terms of analysing subsystems, components or elements of a system. The systems analysis could also be applied to the general educational systems as a whole.

#### **2. 4. 4. ADVANTAGES OF THE “SYSTEMS APPROACH” :**

The systems approach identifies that the educational landscape is made of a number of subsystems, components and elements. As a result of such a stance, the systems approach attempts at providing a holistic approach to education. It also stresses that each component, element or subsystems functions in a mutual relationship as an integrated whole. The following is a list of advantages, however there could be many more which you could add to this list:

##### **The systems approach.....**

- \* provides a conceptual framework on which plans could be built for implementing change for/in education
- \* recognises the complexity of the educational landscape and thus promotes the study and understanding of all the related subsystems, elements and components so that a better perception of the functional relationships could be assimilated

- \* promotes and demands continuous feedback and evaluation because of its iterative and cyclical nature. This allows for adaptation thereby enhancing efficiency and effectiveness of the entire educational systems.
- \* denounces and repudiates rigidity especially in terms of “plan of action” and thus allows for action research which will only result in the best quality of education for all citizens.
- \* helps to assess the resource needs, facilities, etc in relation to quantity, time, cost, appropriateness, etc ; ie. it provides for overall evaluation and analysis of educational provisioning, administration, management, evaluation (Freyson 1989).
- \* allows for an orderly introduction of subsystems and it’s components that is required for systems success in terms of educational outcomes (Reynolds 1992).

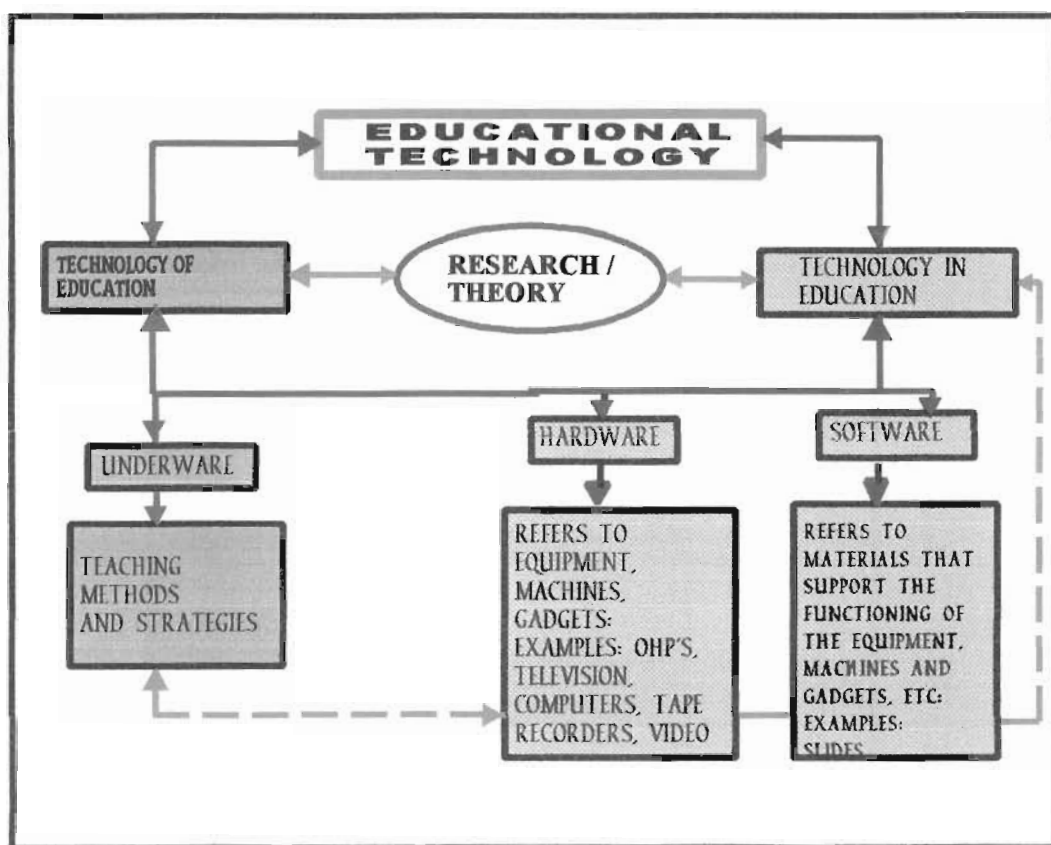
## **2.5. TECHNOLOGY IN EDUCATION AND TECHNOLOGY OF EDUCATION :**

### **2. 5. 1. WHAT IS THE DIFFERENCE ?**

“To most people, the term “Educational Technology” is, at best confusing, and at worst downright off-putting” ( Percival and Ellington 1984 : 9). Indeed there is much confusion as to the meaning of educational technology which has been compounded by the existence and use of various terminology by scholars in the field. To some, the concept, “Educational Technology” has been associated solely with technical equipment that is being used in the classroom while there are still others

who take the view that educational technology involves the clinical systematic analysis of the entire teaching- learning process (Percival and Ellington 1984; Rowntree 1977; Davies 1979). Because of the varying degrees of misconception this research study hopes to contextualise and provide a meaningful framework wherein it will locate the two concepts:

**Technology in Education and Technology of Education .**



**FIGURE: 7. : The functional difference between Technology of Education and Technology in Education: (Adapted from - Percival and Ellington : 1984 ; Donald :1990 )**

From the outset, it must be stressed that both these concepts are not the same. Each of these concepts are fundamental in understanding educational technology and further each of them are underpinned by different principles and theories. The sketch ( Figure: 7.) simply illustrates the contextual framework between Technology of education and Technology in education

Figure: 2.7., as mentioned earlier is an attempt merely to clarify the meanings of Technology in Education and Technology of Education. Both these concepts are different only as far the meanings are concerned. However, it must be emphasised that both Technology in Education and Technology of Education are parts of the whole educational system. Although they may be functionally different and separate, nevertheless they are very much dependent on each other. Both these processes are in turn dependent on the goals and objectives of the educational system at large. There is thus, a fairly thin boundary between the functioning of Technology in Education and Technology of Education.

### **2. 5. 2. TECHNOLOGY IN EDUCATION:**

Technology in education embraces every possible means by which information can be presented (Percival and Ellington 1984). It is concerned with all the machines, gadgets, tools that are used in the educational landscape to promote and enhance effectiveness and efficiency in the educational provisioning and educational setting. These teaching tools, machines and gadgets are all collectively referred to “**hardware**”. Examples of hardware will include: computers;

overhead projectors; slide projectors; episopes; chart makers; cd-copiers; thermal copiers; etc. An important point to consider is the misconception that many individuals hold in terms of hardware being applicable solely to the classroom teaching-learning situation. However, we need to also contextualise the use of hardware in the general administration and management of education itself. Thus the use of hardware in the National Ministry of Education or at the Provincial level of education is also of paramount concern. The level of hardware and software being used by managers and administrators will undoubtedly influence the type of hardware that is provided for at the school level. Thus technology in education must be seen and viewed from a systems approach, ie. holistically.

Technology in education also comprises the various materials that are used to support and in effect , allow for the functioning of the various equipment, tools, machines (hardware) mentioned earlier on. These materials are collectively known as “**software**”. Thus the software is as important as the hardware. The software is used in conjunction with the hardware. Examples of software will include: transparencies; slides; audio/video cassettes; charts, computer diskettes; films; filmstrips; etc

### **2. 5. 3. TECHNOLOGY OF EDUCATION:**

Molenda (1996) argues that Skinner (1954) coined the phrase “Technology of Education”. Skinner(1954) was the first scholar that gave educational technology a psychological basis through his numerous research studies on the behaviour of individuals.

Subsequently he introduced Programmed learning whereby he explained that individuals could be taught through a step by step process using teaching machines. This allowed for individuals to learn at their own pace depending on their ability levels. However, technology of education as a concept has grown rapidly and it now refers to learning theories as well as methodologies and techniques that are used in educational systems.

Thus “technology of education” will refer to the “underware” (Percival and Ellington 1984) whereby all the intangible aspects are taken into account. The intangible aspects are those aspects that are introduced after studying and analysing various learning theories, strategies and techniques that have been continuously evaluated and assessed. In the final analysis “Technology of education” involves changes and adaptations to the educational system after scientific research. These changes are not made because of the system but rather for “good educational reasons” (Donald 1990).

## **2. 6. THE FIVE MAJOR DOMAINS OF EDUCATIONAL TECHNOLOGY HAVE BEEN IDENTIFIED AS FOLLOWS:**

### **2. 6. 1. DESIGN:**

Design is the planning phase of educational technology (Branch 1994). Design must be used to interpret the reality of the educational system or it's parts, elements, components or subsystems. The design must be appropriate and take into account existing knowledge, skills and resources (human, technical, physical and financial). Branch (1994) also

argues that design must be able to “initiate natural or existing interrelationships” (p.15). He goes on to add that design if thought about carefully will be able to recommend organisation and recognition of information within educational contexts. The significance of time and its constraints must also be evaluated and taken cognisance of.

There are various approaches that could be adopted when contemplating design. However careful consideration must be given to the scope, purpose, goals, resources (technical, financial, human and physical) that are at the disposal of the individual who is entrusted with design. The design must also take into account its purpose in the entire education system.

Ely (1996) argues that there are two approaches to design that has been popularised due to its practicality, simplicity, effectiveness and efficiencies. The two approaches that Ely (1996) identifies are:

#### **2. 6. 1. 1. PROBLEM DRIVEN APPROACH:**

Simon (1969) has been largely accredited with this approach. According to Vischer-Voeman and Plomp (1996), the problem driven approach to design consists of two systematic steps which they identify as: problem analysis and sub - problem analysis. Vischer-Voeman and Plomp (1996) argue that in design, one has to firstly analyse the problem or need at hand and then proceed to decompose these problem/s or need/s into sub-problems. These steps must be carried out systematically until the underlying structures of the problem/need becomes viable in terms of solutions.



By following these two steps they go onto add that if the underlying structure\ become more clear and concise then solutions will become more co-herent and logical with the minimum of time. The identification and decomposition of major problems into sub-problems are the key to final solutions of the **“whole problem”** (p123).

Goel and Pirelli (1992) also concur with Vischer-Voeman and Plomp (1996) that any attempt at design must follow two steps, namely: there must be a thorough analysis of the major problem which must then be decomposed and contextualised. Finally the designer must be able to identify the relations and interconnections amongst the various components of the problem. Each of the decomposed problems must be solved separately whose sum will lead to the solution of the entire problem.

### **2. 6. 1. 2. SOLUTION DRIVEN APPROACH:**

This approach to design in the context of educational technology was initiated and promoted by Schon(1983). Schon (1983) also called this approach **“reflection in action approach”**(p23). The value of Scon’s work was underpinned by his criticism of designers who were heavily influenced by scientific knowledge.

He argued that designers in educational technology must be able to make increasing use of their own experiences in terms of initiating design. Designers need to strike a balance between scientific knowledge and knowledge gained through their own experiences or borrowed from others.

During the design process the designer must allow for “theories in use” (p24). Theories in use refer to theories and paradigms that emerge out of the application of design to a specific situation and context. Thus design cannot be a static process that is based largely on predisposed knowledge.

Schon(1983) concludes by stating that the designer must “converse with the situation” (p.23) whereby a continuous exploration, testing, redefinition and adoption of theories and solution must be carried out. Thus Schon(1983) adds that the solution driven approach to design is a way of “naming, framing and exploring solutions” (p23).

Both approaches analysed above, have merits in term of practicality and effectiveness, however Salisbury(1990); Sorayan (1993) and Zemke (1985) show preference to the solution driven approach to design in educational technology. Support for the solution driven approach stems from the fact that it seems to be simple, practical and allows for greater scope especially regarding the issue of originality and context. It also does not create room for predisposed knowledge that many other approaches demand as a pre requisite for design. The solution driven approach also encourages the development of one’s own theories when implementing design, thus there is no prescription which will allow for increased creativity and openness.

As indicated earlier, there are a host of approaches that could be followed when attempting design and thus the two approaches discussed above are mere examples which could be used as a basis for understanding design.

**2. 6. 2. DEVELOPMENT:**

Development is an essential domain of educational technology. The type, level and speed of development is integral to the effectiveness and efficiency of any system. Thus educational technology identifies development as being fundamental to the educational system. Every component, element, attribute or sub system must undergo development. Development is important to foster greater interactivity, interrelationships and adaptations that are brought about or initiated by continuous assessment and evaluation of each of the sub systems within the educational systems at large.

Thus development of every aspect of the educational system must be considered at all times. In terms of development we could identify the following: Curriculum development, Systems development, Staff development and Materials development. However for the purposes of this research, only the latter two shall be analysed and discussed, namely Staff development and Materials development. Both these components are extremely significant in promoting educational technology in South Africa given the shortage and lack of financial resources. Staff development has to begin in earnest so as to equip educationists with the necessary skills in terms of redefining and reshaping their teaching methods, practices and curricula designs. Materials development and resource development are also of extreme importance where educationists at the school level must be able to design, produce and implement resources with the least amount of cost and time while it must be most beneficial to the pupils in the classroom.

This must not be construed as if all the other forms of development are non essential. It must be realised that every component of the educational systems must be developed in accordance or in tandem with the goals, objectives and outcomes of the educational system as a whole.

### **2. 6. 2. 1. STAFF DEVELOPMENT:**

The essence of educational change consists of learning new ways of thinking and doing, new skills, knowledge, attitudes and so on (Stokking: 1996). Thus the issue of human resource development or staff development is paramount and central to the implementation and development of the educational system in toto. Showers (1988) conducted numerous longitudinal studies in Britain and concluded that “in general , one of the greatest problems in educational development is that there are too many ad hoc and one-off initiatives” (p278). He thus argues that for development to be effective and constructive, then increased training and re-training are essential. He identifies Preservice Education and Training (PRESET) and In Service Education and Training (INSET) as two most vital avenues that need to be developed in order to sustain and promote staff development. PRESET and INSET are ways that can be used to reorientate staff in terms of engaging them in adapted and modified programs. Peters (1989) also argues that PRESET and INSET must be designed so as to provide ongoing, interactive and cumulative learning which are essential to develop new concepts, skills and behaviour. It is therefore important to understand that development, will necessary demand great amount of change and also there must be a willingness amongst the relevant role players within the educational system to accept change. Subsystems design, structure, utilization,

management and evaluation must also be in a position to adapt, adopt and agree to change. If this scenario exists then development will proceed fairly smoothly and efficiently. The functioning of all the components and sub systems within education depends on the type, quality and commitment of the human resources and as such the development of staff is an important ingredient in so far as development as a whole is concerned.

#### **2. 6. 2. 2. MATERIALS DEVELOPMENT:**

According to McDougall (1996), materials development is a concept that refers to the development of resources such as hardware and software that are essential in maintaining the smooth functioning of the various components of the educational system. Here again materials development is not solely concerned with the development of materials for classroom instruction but for the development of materials to sustain the entire educational system. He goes further to add, that materials development is a highly complex process requiring a wide range of skills and a considerable amount of time.

A very interesting concept has been introduced by Osborne (1996) who argues that materials development can also be referred to as “ergonomics”. According to Osborne (1996), ergonomics is a process that is aimed at understanding how individuals interact with their environment especially when introduced to materials / resources and also how to change the environment so that the individual is able to enhance perception of the stimuli (materials).

Thus an important function of ergonomics is to produce and develop materials that could enhance interaction between individuals and the “created environment” (Osborne 1996: 276). Osborne (1996) also argues that the concept, materials must be perceived as referring to hardware and software.

Materials development is thus an important ingredient of educational technology which must be given equal prominence as with all of the other domains. Branch (1994) argues that materials development must be undertaken in conjunction with design. Design actually provides the blue print where a number of experts would have been consulted to effect the best possible design. Branch (1994) also adds that materials development must “field test ideas, strategies and methods” (p16) in accordance with the goals, objectives, outcomes of the educational system.

McDougall’s (1996) argument that materials development always involves a great deal of time is somewhat misleading if we are to consider the various avenues that are at our disposal. With regard to this, we need to understand that materials development can be assisted by making use of material from the environment which are characteristically cheap and in most cases free. Non governmental organisations, business houses, etc sometimes provide gratis materials that could be adapted for use within the educational systems.

There is also an abundant supply of commercially produced materials that over the years have been reduced in terms of cost. Thus the issue of time constraints must not be seen as true for the development of materials as suggested by McDougall (1996).

Materials development must be effected in a structured and consolidated way, where careful consideration must be given to the ability levels of the user, the ethnic background of the user, the cost and financial implications that would be incurred, the evaluation of existing human, technical and physical resources that may be required in tandem.

In the final analysis it becomes evident that staff development and materials development are no easy tasks. There must be careful thought given before any attempt could be made in so far as development is concerned. To re-iterate once again that staff development and materials are only but two aspects of development. There are a host of other aspects that must be developed in the educational system so that an efficient and effective educational system is in place. This is what educational technology is based on and strives for.

### **2. 6. 3. UTILIZATION:**

Utilization refers to the actual use of knowledge, skills and the practical application of information/procedures which in turn are generated via the various elements, components within the system. The purpose of utilization is to bring about a coherent functioning of all the subsystems within the whole system.

The function of utilization is to put into practice models, paradigms, blue prints, etc that have been planned and designed.

Branch (1994) argues that the most important function of utilization is “dissemination”. Ely and Huberman (1994) define dissemination “as the process of communicating information to specific audiences for the purposes of extending knowledge and in certain instances to modify policies and practices” (p.5).

Education must be perceived as a knowledge intensive sector of society and as such there is a constant flow of information, new learning materials, policy decisions, new methods and strategies and outcomes and research results. Based on these assumptions utilization has to be flexible, open, democratic and free of indoctrination . It must also be able to adapt at the shortest possible notice as the development of the information revolution continues. Stokking (1996) also argues that the process of utilization must be significant in terms of keeping abreast of current and anticipated changes and trends. In this way dissemination will promote utilization.

Stokking (1996) argues that in the past, educational systems were too reliant on “Diffusion”, ie. Educational systems depended largely on free information and knowledge without having their own databases and think tanks. However, in the current scenario educational systems have to promote and develop conceptual frameworks wherein a well balanced and thought of dissemination strategy must be worked out.

This will allow for greater mobility and interaction between individuals and subsystems thereby encouraging greater diversity in the accumulation of experiences and practices.



**2. 6. 4. MANAGEMENT:**

Management is the most important linchpin (Branch:1994) in binding together all the domains of educational technology. The success of all the elements, components and subsystems within educational technology depends solely on the type of management in terms of its efficiency and effectiveness. Management concerns are all related to the supervision, provision, development and promotion of human, physical, technical and financial resources within the educational system. All policies, theories, certification, monitoring, utilization, evaluation, design and development must be endorsed by management. Hanson (1990) therefore argues that management must be based on sound knowledge and skills in the sub domains of organisational behaviour, planning, development, team building, staffing, dissemination of information, assessment and evaluation.

A significant aspect of management in educational technology concerns the development of an Educational Management Information System(EMIS). An EMIS is central to the development of well balanced and effective/efficient management. Because of the increased size and complexities of educational systems throughout the world, accountability becomes the central concern of management.

Thus an EMIS would definitely add value especially regarding accountability. Windhaven (1996) supports the idea that educational managers must find it necessary to have more and better information so as to keep track of all the systems and their functioning.

Decisions that managers take during management will thus be based on the information that they can get access to and have at their disposal. This could only become a reality if an EMIS is in place. The EMIS will in essence have an audit of the system in its entirety.

Educational systems throughout the world demands accountability and this could be addressed by directing attention as to how and why certain educational decisions are made. Here again an EMIS will be of vital significance. Kennedy (1984) also supports this view by articulating that an EMIS if structured logically and efficiently, will produce data and information upon which decision about educational policies and practices could be effectively based. It is beyond any doubt that in terms of management, educational technology must involve the introduction of an EMIS.

Windhaven (1996) identifies the following five steps that should be thought about when operating an EMIS.

#### 2. 6. 4 . 1. STEPS IN THE OPERATION OF AN EMIS

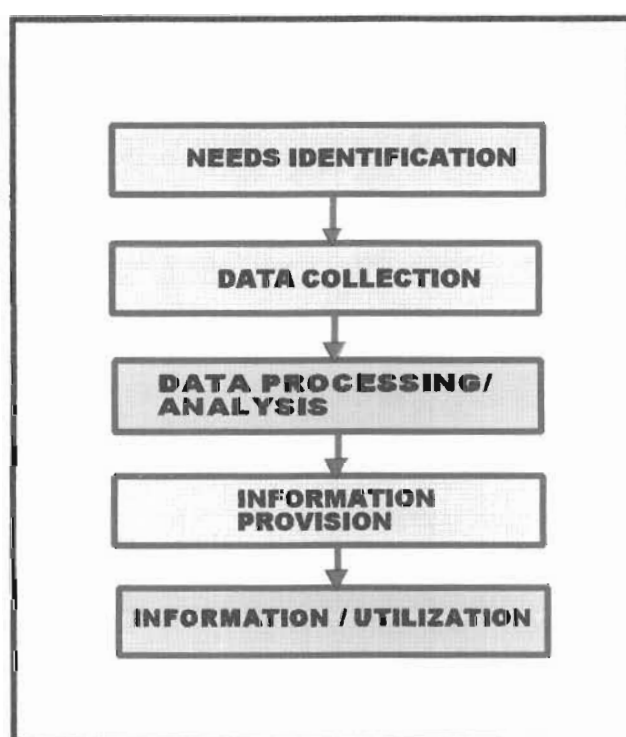


FIGURE 8. : The five steps involved in operating an EMIS -  
Adapted from Windhaven (1996)

**2. 6. 4. 1. 1. Needs Identification:** can be pursued in two ways. Sanders (1989) expresses that the first way could be to invoke a survey of all the decision makers so as to ascertain what data and information they currently use and also additional data that they would like to gain access to. The second way could involve the analysis of the EMIS framework, so as to determine the key components of the management decision making process. Windhaven (1996) stresses the need for a balance between the above two methods or avenues that could be explored and used.

Once the needs have been identified, all proposed data for the EMIS must be judged in terms of the “criteria of relevance, accuracy, timeliness in collection, understandability and affordability” (Windhaven 1996: 97).

**2. 6. 4. 1. 2. Data collection:** Data could be collected via the collection sources.

Emery (1987) identifies the following sources which could be accessed:

- \* day to day records of the operation of the system
- \* census covering all parts of the educational system
- \* special collection exercise intended for dealing with issues for policy or practice for which inadequate information exists from current data collection activities.

**2. 6. 4. 1. 3. Data processing and analysis:** Accuracy is of utmost concern during this step of the EMIS. The data analysis must parallel the EMIS conceptual framework upon which the data collection was based. (Emery : 1987). Large data and information sets could be down loaded into a computer based system with an appropriate and dedicated software package. (Chapman : 1990)

**2. 6. 4. 1. 4. Information Provision:** There must be a universal recognition of the need to provide data in a manner appropriate to the users. Presentation techniques, language, statistical analysis , etc , must be easily identifiable by even the very basic of users. Nuttall (1991) argues that the information provided must be in accordance with the capacity and responsibility of the user.

**2. 6. 4. 1. 5. Information Utilization:** Information gleaned and obtained could be utilized by evaluating existing policies and practices in the educational system. Information could also be used by making comparatives and alternatives for the future (Windhaven: 1996).. Nuttall (1991) also adds that information obtained could be selectively applied to support policies and practices that have been politically and democratically determined.

### **2. 6. 5. EVALUATION AND ASSESSMENT: IS THERE A DIFFERENCE?**

The concepts; Evaluation and Assessment, have been bandied around rather loosely amongst educationists and as a direct result there emerged very conflicting and confusing views about these concepts. Educational systems around the world have developed conceptual frameworks wherein the meanings of evaluation and assessment have been lost and sometimes distorted to such an extent that qualification frameworks have become meaningless. (Wiggins: 1993). Based on the confusion and irrationalities outlined above, it becomes of paramount importance to undertake a careful analysis of both concepts; Evaluation and Assessment.

#### **2. 6. 5. 1. WHAT IS EVALUATION ?**

Evaluation is a process or series of activities that are designed to measure the effectiveness of a system as a whole (Percival and Ellington: 1984). Seels and Richey (1994) argue that evaluation is the process of determining the adequacy of the educational system or the sum of its parts.

According to Wothern and Sanders “Evaluation is the determination of a things value. In education, it is the formal determination of the quality, effectiveness or value of a programme, product, process, objective, or curriculum”. (1987 : 23)

The researcher's view of evaluation is related to the premise that evaluation is used to determine the quality or extent to which a system and its part are functioning in terms of achievement of goals, objectives and outcomes. Evaluation could be a long term or short term process which is based on a holistic approach thereby highlighting the success of the entire system. Evaluation has to carefully consider the type of process that has to be followed. Important attributes of a sound evaluation process must include the inquiry and judgemental method whereby standards have to be set so as to determine quality.

Percival and Ellington argue that over the last three to four decades two contrasting paradigms of evaluation have emerged, viz:

**Social/Anthropological Approach**

**Agricultural/Botanical approach**

According to Alkin(1985) the Social/Anthropological Paradigm evaluates the outputs against the inputs. This approach is based on the quantification, ie. the differences between the outputs and inputs are always treated statistically. This approach has a major flaw in that it discards and ignores the various components, elements and subsystems that are inherent in any given situation such as the learning environment, multiculturalism, content and structure, methods, strategies, etc.

The Agricultural / Botanical Paradigm views evaluation as “an ongoing process” (Smith: 1996). This approach is based on subjectivity and the application of personal value judgements.

Wiggins (1993) also favours this approach for it is not rigid by structure and nature. Wiggins (1993) also argues that the Agricultural / Botanical Approach allows freedom for the evaluator in terms of providing the evaluator with greater scope in specific areas of interest as and when they become apparent.

From the two contrasting approaches discussed above, the second approach seems to be most valuable whereby it takes into account the systems approach in educational technology thus allowing for ongoing analysis in determining the worth and quality of systems and it's parts. The Agricultural / Botanical approach allows for flexibility whereby the evaluator is given greater scope and the results are more qualitative than quantitative. Social sciences cannot rely too heavily on quantification since it will serve to assign numbers/statistics to human perceptions and emotions. There must be a balance between quantitative evaluation and qualitative evaluation.

There are two sub - domains of evaluation, namely the summative evaluation and formative evaluation. Formative evaluation is involved with gathering data and information on adequacy and using this data/information for further development. (Percival and Ellington: 1984).

Summative evaluation on the other hand involves gathering information and data which in turn is used to make decision about utilization.(Seels and Richey: 1994).



Thus it becomes abundantly clear that summative evaluation is based on the collection of comparative data and information while formative evaluation is based on the collection of technical data (Seels and Richey:1994)

Scriven(1969) sums up the distinction between summative and formative evaluation by stating that “ when the cook tastes the soup, that’s formative evaluation; when the guests taste the soup, that’s summative evaluation”(156).

#### **2. 6. 5. 2. ASSESSMENT:**

Educational technology recognises the value of assessment and has thus placed great emphasis, on it as an integral domain. Indeed there is no arguing about the significance of assessment. It is a commonplace activity that all individuals carry out. Stufflebeam(1969) argues that assessment strategies in most educational systems are distorted because assessment frameworks are designed “to prove rather than improve”(p59). It is therefore essential to understand assessment as far different from evaluation.

Smith(1996) argues that assessment refers to those activities that are designed to measure achievement. Various methods could be used to measure the achievements of systems and individuals within the system. There are strong indications that achievement levels are based on quantification through the assigning of numbers/statistics.

All assessment methods and strategies must be based on validity, reliability, practicality, appropriateness, fairness and usefulness. In fact the assessment design must consider all the possible elements, components and subsystems that have a bearing on the entire system to be assessed.

The following assessment methods are commonly used in educational technology:

**2. 6. 5. 2. 1. CRITERION REFERENCED TESTS:**

Criterion referenced tests are based on techniques for determining mastery of pre-specified content (Seels and Richey: 1994). Thus the criterion for determining adequacy is the extent to which the objectives have been met. The attitudes, skills and mastery of knowledge that are relative to the achievements of the objectives are of prime interest and concern. In criterion referenced tests, a cut off score is established against which scores of individuals or systems are compared and in this way a standard is set.

**2. 6. 5.2. 2. NORM REFERENCED TESTS:**

This approach contrasts sharply with the criterion referenced tests. Norm-referenced assessments involve tests of ability and attainment which are used to establish and identify differences between individuals or systems. Thus the assessments are used to obtain an holistic picture of how the attainment/s of one system or individual compares to another similar system or individual.

**2. 6. 5. 2. 3. CONTINUOUS ASSESSMENT:**

This approach is based on an ongoing assessment which takes into account every possible influence on the system or individual that is being assessed. There is a strong case for the continuous assessment strategy because it has been argued that it is less stressful and more consistent than the other two approaches.

In conclusion a number of interesting issues have become clear whereby a distinction between evaluation and assessment is necessary. Evaluation is based on determining the worth or value which is usually undertaken on a more holistic stance while assessment is the accurate measurement of achievement. Each of these two concepts also use different strategies and methods as a conceptual framework.

Finally, it is worth noting Percival and Ellington's concluding remarks on evaluation and assessment:

“It is important to draw a clear distinction between the processes of evaluation and assessment, because, although the terms are often considered to be virtually synonymous when used in common parlance, they have in fact radically different connotations when used in an educational or training context”. (1984 : 110)

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**CHAPTER THREE**  
**METHODOLOGY**

<b>TABLE OF CONTENTS</b>
--------------------------

<b>3.1. INTRODUCTION:</b> .....	<b>80</b>
<b>3.2. THE RESEARCH INSTRUMENT:</b> .....	<b>81</b>
<b>3.3. WHY THE SURVEY METHOD?:</b> .....	<b>81</b>
<b>3.4. RESEARCH INSTRUMENT:</b> .....	<b>83</b>
<b>3.5. SAMPLE AREA:</b> .....	<b>83</b>
<b>3.5.1. BRIEF HISTORY OF PHOENIX:</b> .....	<b>84</b>
<b>3.5.2. WHY PHOENIX?:</b> .....	<b>85</b>
<b>3.6. DEFINING THE SAMPLE:</b> .....	<b>86</b>
<b>3.6.1. TARGET POPULATION:</b> .....	<b>86</b>
<b>3.6.2. TOTAL NUMBER OF PRIMARY AND SECONDARY SCHOOLS         IN PHOENIX:</b> .....	<b>87</b>
<b>3.6.3. SAMPLE SIZE OF SCHOOLS AND RESPONDENTS:</b> .....	<b>87</b>
<b>3.7. SAMPLE METHOD:</b> .....	<b>87</b>
<b>3.8. ANALYSIS OF DATA:</b> .....	<b>88</b>
<b>3.9. THE PILOT STUDY:</b> .....	<b>89</b>
<b>BIBLIOGRAPHY:</b> .....	<b>91</b>

**3. 1. INTRODUCTION:**

Research in education is a disciplined attempt to address questions, solve problems and test hypotheses through the careful collection and analysis of data for the express purpose of description, explanation, generalisation and prediction (Babbie 1977). However, the researcher must not lose sight of the aims and objectives of the research, that is to say, in the final analysis the research must be able to make valuable and positive inputs into existing knowledge around the topic of research and this could be achieved via the clarification of those aspects that led to confusion, debates and even misunderstandings prior to the research being undertaken. (Anderson : 1990).

Based on the above premise, this research study will enhance one's understanding of how educationists understand the concept "Educational Technology" and secondly it will evaluate the role, practice and policy that guide educational technology in KwaZulu Natal. Further, this research will provide valuable recommendations as to how a policy framework could be formulated to sustain and promote educational technology in the province of KwaZulu Natal. In so doing it will definitely contribute to societal progress (Anderson: 1990) in KwaZulu Natal and South Africa as a whole especially considering, the infancy of our democracy and the transformation that has engulfed amongst others, the educational system.

### **3. 2. THE RESEARCH METHOD:**

Following on the above principles, the researcher had to provide and obtain data and information on the perceptions of educational technology amongst educationists and educators in KwaZulu Natal. The data and information collected related directly to the role, practice and policy of educational technology in the province of KwaZulu Natal. With this in mind the researcher had to consider very carefully all the research methods available in terms of choosing the most practical and appropriate one.

After due consideration the researcher opted for the “Survey Method”.

### **3. 3. WHY THE SURVEY METHOD?**

Notwithstanding the constraints of time and cost, the survey research method was considered to be most practical and appropriate for it allowed the use of making descriptive assertions (Babbie : 1977) and secondly, although the survey method implies simplicity, it nevertheless allowed for a wide range of sophistication in terms of making qualitative and quantitative descriptions. Every research study should introduce a balance between quantitative and qualitative data. (Anderson : 1990)

There is much debate as to the use of descriptive data in research, however Anderson(1990) argues very strongly that descriptive data analysis, if presented sophisticatedly, can provide valuable input.

Thus sophisticated descriptions in terms of grouping data and presenting them in graphs, tables, scattergrams, histograms, and the like are provided. Correlations are also provided so that various aspects are compared and contrasted to increase the degree of triangulation thereby enhancing the validity of the research findings. The presentation of the data is such that they are all well organised and planned so that a suitable overall picture can be obtained at a glance. The researcher has also provided summary data in the form of standard deviations, measurement of norms, etc. Qualitative data and information in terms of descriptions, ranges from brief narrative paragraphs to detailed pages.

Another important feature or attribute of this survey is that the “cross sectional research method” (Babbie 1977: 167) was employed. Cross sectional research allowed for single time research whereby data gathered at one point in time did not effect the research if changes took place in time. Therefore the research findings and conclusions obtained will hold true and be of interest to a wide range of stakeholders in education at any point in time.



**3. 4. RESEARCH INSTRUMENT:**

Two types of research instruments were used in this study, namely questionnaires and interviews. The questionnaires can best be described as open ended as it allowed for respondents to give their own views and perceptions ( Campbell, 1963 : 21 ) to questions that were asked. The questionnaire was unambiguous, simple and easy to comprehend. As far as possible the questionnaires were hand delivered to the relevant respondents that were included in the sample. This increased the response rate drastically and in total every questionnaire given was returned and completed. Questionnaires were given to educators at schools. Originally, interviews were to have been conducted with the subject advisor who was in charge of assisting and guiding schools and educators in the Phoenix region. However, this was not possible as there was no subject advisor available at the time of conducting this research. A subject advisor in resource and library provisioning was in existence but the person was unwilling to co-operate with the researcher. The person also indicated that their unwillingness was due to the fact that they did not have any knowledge of Educational Technology per se.

**3. 5. SAMPLE AREA:**

The survey research was conducted in Phoenix.

**3. 5. 1. BRIEF HISTORY OF PHOENIX:**

Phoenix which is located some 25km north of Durban was named after a sugar cane estate. There were four estates, namely; Phoenix Sugar Estate, Rydalvale Sugar Estate, New Farm Sugar Estate and Natal Sugar Estate. In 1974, the government bought the land from the four sugar estate owners to develop houses for the so - called Indian population. The development of the Phoenix settlement was speeded up in 1976 when more than seven hundred Indian families lost their homes in Tin Town which was located along the Umgeni River Valley in the adjacent Springfield Flats area. Ever since the settlement of Phoenix has continued to sprawl and is now the largest Indian settlement outside of India.

Phoenix is predominantly occupied by Indian inhabitants who can best be described as low to middle income earners. Phoenix has an approximate population of 450 000 inhabitants. There are approximately 43 primary schools and 21 secondary schools located in Phoenix.

### **3. 5. 2. WHY PHOENIX?**

After careful deliberations, the researcher opted for Phoenix as the sample area because of the following reasons:

- \* the researcher has a thorough knowledge of the location of all the schools that were included in the sample
- \* in terms of access and security, distribution of questionnaires and interviews were not problematic and cause for concern. This is significant in the light of the high crime rate that prevails in the province of KwaZulu Natal
- \* all schools in Phoenix have access to electricity, communications and water. Thus the basic infrastructure are in place which are important determinants in assessing educational technology with reference to its role and practice especially as regards the use of electronic and audio-visual teaching machines and equipment.
- \* most of the schools in Phoenix are racially mixed and thus it was significant in ascertaining how educators were using the principles of educational technology to enhance teaching and learning amongst many of the disadvantaged pupils that were enrolling in large numbers at these schools. Phoenix was thus an ideal sample area since it consisted of classrooms that were totally multi-ethnic and

multicultural. In some schools such as Foresthaven Secondary and Sastri Park Secondary the pupil ratio between black and Indian pupils are as high as 50:50.

- \* a well established Teachers' Centre is located in the heart of Phoenix. Phoenix was therefore an ideal choice as the effectiveness of this teachers' centre in promoting and sustaining educational technology would be verified.

### **3. 6. DEFINING THE SAMPLE:**

#### **3. 6. 1. TARGET POPULATION:**

At first glance it would have appeared desirable to collect data from all the stakeholders in Phoenix as regards educational technology. However, due, to financial and time constraints it was impractical and often undesirable (Anderson:1990) to carry out a survey including such a large target population. Consequently the research was based on conducting a survey whereby an attempt was made to reach a sample of the desired number of educators. Detailed information was then collected from these educators via open ended questionnaires which was handed to them personally. The target population thus consisted of educators from both primary and secondary schools located in Phoenix.

### 3. 6. 2. TOTAL NUMBER OF PRIMARY AND SECONDARY SCHOOLS IN PHOENIX:

TOTAL NUMBER OF SCHOOLS IN PHOENIX		
SECONDARY	PRIMARY	TOTAL
21	43	64

TABLE 1.

### 3. 6. 3. SAMPLE SIZE OF SCHOOLS AND RESPONDENTS:

SAMPLE SIZE OF:					
SCHOOLS			TEACHERS		
Secondary	Primary	TOTAL	Secondary	Primary	TOTAL
5	9	14	50	90	140

TABLE 2.

Approximately 25% of the schools in the area of Phoenix were selected as indicated by Table 2.

### 3. 7. SAMPLE METHOD:

The systematic sample method was used to select the sample population. The systematic sample method allowed for the curtailing of costs

(Persell, 1976 : 212) and time in choosing the desired number of respondents.

It was economically unviable to include the entire 64 schools in the sample population as illustrated by table 3.2. Thus the researcher opted for the systematic sample method. Using the systematic sampling method, the researcher chose every 5th school from the entire list of both primary and secondary schools in Phoenix. Using the staff register from each of the schools identified in the sample population, every 4th teacher was selected as part of the sample population.

To overcome some of the major bias and prejudice that is characteristic of the systematic sample method, the researcher took careful precaution with special emphasis on eliminating bias in terms of gender, race, class, creed, subjects and grades being taught by respective teachers.

### **3. 8. ANALYSIS OF DATA:**

All the closed ended questions contained in the questionnaire were coded using the SPSS Package. The SPSS Package is a computer statistics package that is designed mainly for use in research conducted within all the social sciences. This package is very accurate not forgetting its versatility. The data collected and assimilated are illustrated via pie graphs, bar graphs, scattergrams and histograms in chapter four.

### **3. 9. THE PILOT STUDY:**

A pilot study was conducted so as to identify and assess possible problems that commonly appears during the survey proper. The pilot study was thus an attempt to clear up confusion and misunderstandings that were directly related to the questionnaires.

The pilot study was specifically carried out to test for some of the following problems:

- \* time management and the length of the questionnaire
- \* ambiguities and confusion of terminologies and concepts
- \* grammatical errors
- \* repetition

Four teachers residing in Parkgate, Verulam were selected as participants in the pilot study. These four respondents were assured of their anonymity at all times in respect of their address, name and the school they taught at. These four respondents volunteered willingly and were asked to report to the Civic Hall in Ottawa on a single day where all of them were asked to complete a questionnaire each.

On conclusion of the pilot study, the following characteristics were derived at, namely:

- \* time management was well balanced.
- \* the length of the questionnaire was adequate
- \* all questions asked, were pertinent and covered all aspects related to the purpose of the study
- \* there were no grammatical errors
- \* questions were unambiguous
- \* terminology used in the questionnaire were adequately coped with, by the respondents

In conclusion the pilot study proved beyond doubt that there was no need for any modifications or changes to the questions or layout in the questionnaire.



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*research*. New York: Prentice Hall

**CHAPTER FOUR**  
**PRESENTATION AND ANALYSIS OF DATA**

<b>TABLE OF CONTENTS</b>
--------------------------

<b>4. INTRODUCTION.....</b>	<b>96</b>
<b>4.1. UNDERSTANDING OF THE CONCEPT “TECHNOLOGY” .....</b>	<b>97</b>
<b>4.1.1. WHAT IS “TECHNOLOGY?”.....</b>	<b>97</b>
<b>4.1.2. RELATIONSHIP BETWEEN AGE GROUP AND THE PERCEPTION OF THE CONCEPT “TECHNOLOGY” .....</b>	<b>99</b>
<b>4.1.3. RELATIONSHIP BETWEEN POST LEVEL AND THE UNDERSTANDING OF THE CONCEPT “TECHNOLOGY” .....</b>	<b>100</b>
<b>4.2. UNDERSTANDING OF THE CONCEPT “EDUCATIONAL TECHNOLOGY”.....</b>	<b>103</b>
<b>4.2.1. DID YOU COME ACROSS THE CONCEPT “EDUCATIONAL TECHNOLOGY?” .....</b>	<b>103</b>
<b>4.2.2. WHERE DID YOU FIRST COME ACROSS THE CONCEPT ‘EDUCATIONAL TECHNOLOGY?’.....</b>	<b>106</b>
<b>4.2.3. WHO IS THE PERSON IN - CHARGE OF THE MEDIA CENTRE?.....</b>	<b>109</b>
<b>4.2.4. “SUPPORT AND QUALIFICATION” OF MEDIA CENTRE STAFF.....</b>	<b>110</b>
<b>4.2.5. THE RELATIONSHIP BETWEEN “DID YOU COME ACROSS THE CONCEPT “EDUCATIONAL TECHNOLOGY” AND “WHO IS IN - CHARGE OF THE MEDIA CENTRE?” .....</b>	<b>112</b>
<b>4.2.6. PERCEPTION OF THE CONCEPT “EDUCATIONAL TECHNOLOGY” .....</b>	<b>114</b>
<b>4.2.7. RELATIONSHIP BETWEEN SCHOOL TYPE (PRIMARY/ SECONDARY) AND THE UNDERSTANDING OF THE CONCEPT “EDUCATIONAL TECHNOLOGY”.....</b>	<b>115</b>
<b>4.2.8. RELATIONSHIP BETWEEN THE LEVEL OF QUALIFICATION AND THE UNDERSTANDING OF THE CONCEPT “EDUCATIONAL TECHNOLOGY” .....</b>	<b>116</b>

4.2.9. RELATIONSHIP BETWEEN AGE AND THE UNDERSTANDING OF THE CONCEPT “EDUCATIONAL TECHNOLOGY”.....	118
4.2.10. RELATIONSHIP BETWEEN TERTIARY INSTITUTION WHERE THE RESPONDENT GRADUATED AND THE UNDERSTANDING OF CONCEPT “EDUCATIONAL TECHNOLOGY”.....	120
4.2.11. IS THERE A DIFFERENCE BETWEEN “TECHNOLOGY OF EDUCATION AND TECHNOLOGY IN EDUCATION?”.....	123
4.2.12. WHAT IS THE DIFFERENCE BETWEEN “TECHNOLOGY OF EDUCATION AND TECHNOLOGY IN EDUCATION?”.....	124
4.2.13. WOULD YOU LIKE TO KNOW MORE ABOUT “EDUCATIONAL TECHNOLOGY”.....	126
4.2.14. WHY WOULD YOU LIKE TO KNOW MORE ABOUT “EDUCATIONAL TECHNOLOGY” ? .....	127
4.2.15. WHICH OF THE FOLLOWING WOULD YOU WELCOME THE MOST IN ORDER TO INCREASE YOUR UNDERSTANDING OF THE CONCEPT “EDUCATIONAL TECHNOLOGY”.....	130
 4.3. EXISTING STRUCTURES AND POLICIES OF “EDUCATIONAL TECHNOLOGY” IN KWAZULU NATAL.....	 132
4.3.1. DOES YOUR PROVINCE HAVE A DIRECTORATE OF “EDUCATIONAL TECHNOLOGY”.....	132
4.3.2. ARE YOU AWARE OF THE EXISTENCE OF SUBJECT ADVISORS IN “EDUCATIONAL TECHNOLOGY” IN YOUR PROVINCE?.....	134
4.3.3. REASONS FOR THE NON EXISTENCE OF SUBJECT ADVISORS AND A DIRECTORATE FOR “EDUCATIONAL TECHNOLOGY”.....	135
4.3.4. WHAT MAJOR CHANGES WOULD YOU LIKE TO SEE AS REGARDS “EDUCATIONAL TECHNOLOGY” IN THE PROVINCE KZN AND ITS’ SECONDARY SCHOOLS?.....	137
4.3.5. ARE YOU AWARE OF THE “TECHNOLOGY ENHANCE LEARNING INVESTIGATION THAT WAS CARRIED OUT BY THE NATIONAL MINISTRY OF EDUCATION IN 1996?.....	140

**4.4. EDUCATIONAL TECHNOLOGY: THE USE OF MEDIA CENTRES BY EDUCATORS IN KZN SCHOOLS..... 142**

**4.4.1. HOW OFTEN DO YOU VISIT THE MEDIA CENTRE AT YOUR SCHOOL?..... 142**

**4.4.2. REASONS FOR “SELDOM / NEVER” VISITING THE MEDIA CENTRE AT YOUR SCHOOL..... 143**

**4.4.3. 1. IS YOUR SCHOOL MEDIA CENTRE FUNCTIONING AT ITS’ OPTIMUM LEVEL?..... 145**

**4.4.3.2. WHAT ARE POSSIBLE REASONS FOR YOUR SCHOOLS’ MEDIA CENTRE NOT FUNCTIONING AT ITS’ OPTIMUM LEVEL?..... 146**

**4.5. EDUCATIONAL TECHNOLOGY AND THE LEVEL OF COMPUTER LITERACY AMONGST EDUCATORS IN KZN SCHOOLS..... 149**

**4.5.1. ARE YOU COMPUTER LITERATE?..... 149**

**4.5.2. DO YOU HAVE ACCESS TO COMPUTERS AT YOUR SCHOOL?... 150**

**BIBLIOGRAPHY..... 154**

**4. INTRODUCTION:**

Chapter four presents the summary of all the data that was collected from the 120 questionnaires that respondents completed. Fortunately the response rate was 100%. This was ensured by the researcher handing out the questionnaires personally, well in advance, thus enabling respondents to have sufficient time to complete the questionnaire. The researcher made numerous telephonic reminders to the relevant respondents. The researcher established a cordial rapport with the respondents and thus they were ever willing to complete the questionnaires.

This is a chapter which incorporates statistics, tables and graphs in summary form after which a detailed analysis follows. The information is presented in a rather simplistic format where deductions can be easily identifiable. It is hoped that the research findings are unambiguous and thereby provide valuable inputs into the perception of educational technology, its role, practice and policy in the province of KwaZulu Natal.

#### 4.1. UNDERSTANDING OF THE CONCEPT "TECHNOLOGY" :

##### 4.1.1. WHAT IS "TECHNOLOGY"

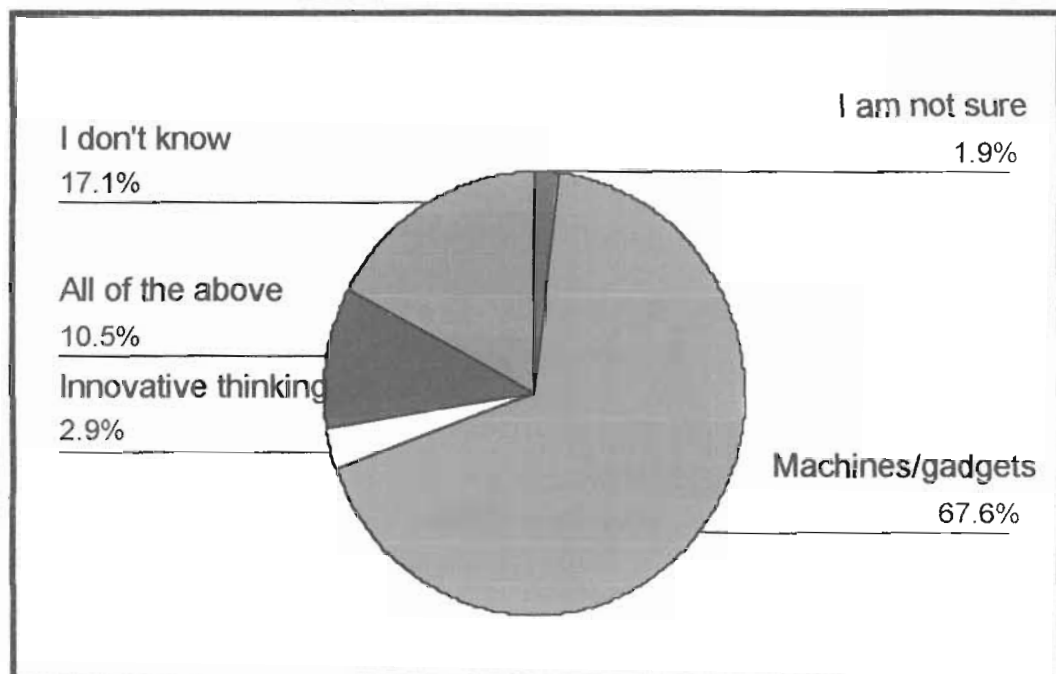


FIGURE 9. : PERCEPTION OF THE CONCEPT "TECHNOLOGY"

Figure 9. indicates that 67,1% of the respondents understood the concept "technology" as machines and gadgets; while 17,1% indicated that they do not know what the concept was. 10.5% indicated that the

concept “technology” referred to both innovative thinking, machines and gadgets. 2.9% indicated that “Technology referred to innovative thinking while 1.9% of the respondents were not sure as to the meaning of “technology”.

The statistics provided by Figure 9. are rather alarming and cause for concern. It is disappointing to note that a large majority of the educators that responded to the questionnaires did not have the correct perception of the concept “technology”. In fact 89.5% ( 67,6 % machines and gadgets; 17.1% did not know and 2.9% innovative thinking) of the respondents were either doubtful or ignorant as to the meanings and implications of the concept “technology”. Nearly two thirds (67.65) of the respondents perceived “technology” as solely related to gadgets and machines. This is rather disconcerting taking into account that these respondents could be underachieving as far as the enhancement of teaching and learning is concerned. They could use the lack and unavailability of teaching machines and gadgets as their defence in giving reasons as to their underachievement in their respective classrooms. These educators could also believe that, without teaching gadgets and machines there could be no meaningful and effective learning and teaching taking place.

Thus these educators could be misconstrued into believing that without the necessary teaching machines, equipment and gadgets, teaching and learning are not possible in classrooms.



#### 4.1.2. RELATIONSHIP BETWEEN AGE GROUP AND THE PERCEPTION OF THE CONCEPT "TECHNOLOGY"

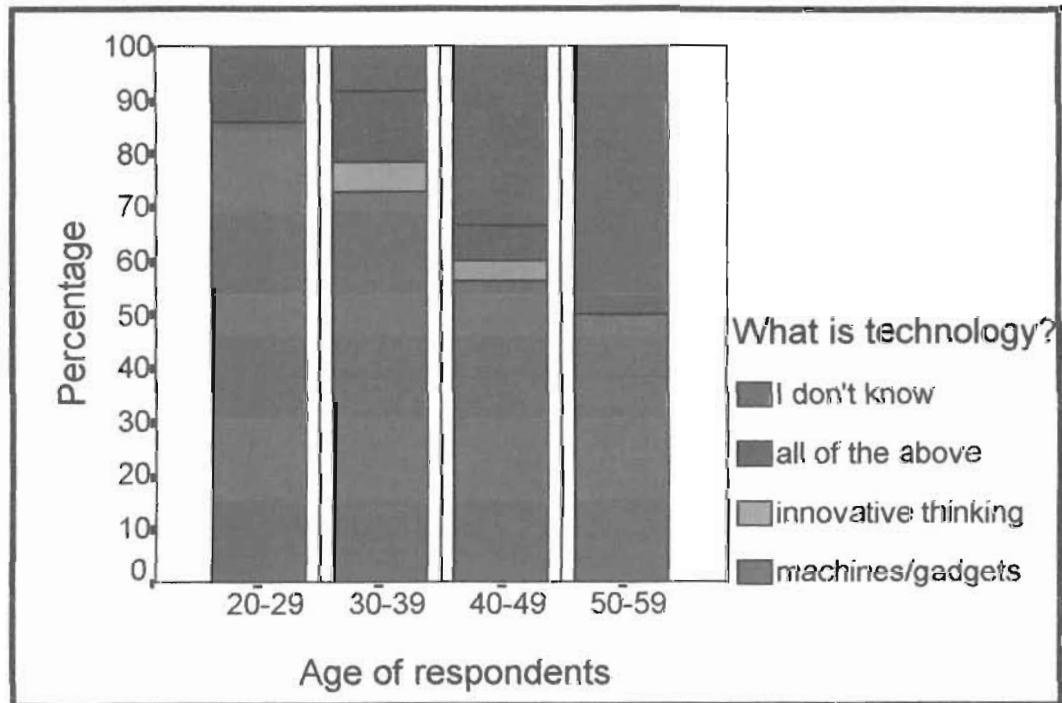


FIGURE 10. : RELATIONSHIP BETWEEN AGE GROUP AND THE UNDERSTANDING OF THE CONCEPT "TECHNOLOGY"

Figure 10. shows a significant relationship between age and the perception of the concept "Technology". The majority (52%) of the respondents who indicated they did not know the concept "Technology" fell within the 50 - 59 age group; 36% fell within the 40 - 49 age group; 12% within the 30 -39 age group.

No respondents between the 20 - 29 age group indicated that they are not au fait with the concept "Technology". Thus as the age group level increased there was a commensurate decrease in the understanding of the concept "Technology" amongst the respondents. In the 50 - 59 age group not one respondent was able to perceive "Technology" as a combination of machines, gadget and innovative thinking. This does not augur well for teachers in the older age group as their lack of understanding the concept "Technology" could impact negatively in terms of fulfilling and implementing their duties and tasks to enhance the quality of teaching and learning.

#### 4.1.3. RELATIONSHIP BETWEEN POST LEVEL AND THE UNDERSTANDING OF THE CONCEPT "TECHNOLOGY"

POST LEVEL	NO. OF RESPONDENTS	MACHINES AND GADGETS	INNOVATIVE THINKING	ALL OF THE ABOVE	I DON'T KNOW	TOTAL
01	90	20	30	22	18	90
02	24	18	—	—	06	24
03	06	—	01	04	01	06
TOT	120	38	31	26	25	120

TABLE 3. : RELATIONSHIP BETWEEN POST LEVEL AND THE PERCEPTION OF THE CONCEPT "TECHNOLOGY"



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Table 1. indicates that of the 6 respondents in the level 3 category, 4 respondents indicated the correct understanding of the concept “Technology” ie. Technology refers to the combination of innovative thinking and machines and gadgets. The percentage understanding amongst level 3 educators is therefore high , ie. 66,6% ( 4 out of 6) .

1 (16.6% - 1 out of 6) indicated that they did not have an understanding of “Technology” and a further 1 (16,6% - 1 out of 6) respondent also indicated that they perceived “Technology” as machines and gadgets.

Amongst level 2 educators, the statistics in Table 1. are most discouraging as no one from the 24 respondents was able to correctly perceive the concept “Technology”. In fact 6 (25%) indicated that they do not understand the concept “Technology” at all while 18 (75%) of the respondents from the level 2 category perceived “Technology” as machines and gadgets. There is much concern for level 2 educators in the light of them being one of the most fundamental and influential role players in so far as offering pastoral care, guidance and supervision of level 1 educators within their respective departments at school.

Level 2 educators are therefore seen as the immediate managers, supervisors, advisors and counsellors of level 1 educators in the hierarchy that is prevalent in the school system. Thus for level 2 educators not to have a thorough understanding of the concept “technology” is definitely going to be detrimental towards the aspiration of effective end efficient teaching and learning.

Table 1. also indicates that there is no meaningful relationship between post levels and the understanding of the concept “Technology”.

However, as indicated earlier, there is grave concern for the high percentage of level 2 educators who were unable to understand the concept “Technology”.

There could be arguments, that level 2 educators were a minority in the sample, however one needs to view them as being small in the sample size since schools do not have many level 2 educators. On average there are between 3 to 5 level 2 educators in the secondary schools while between 1 and 2 in the primary school. These figures are not the norm but could be used as an average that is prevalent in most schools.

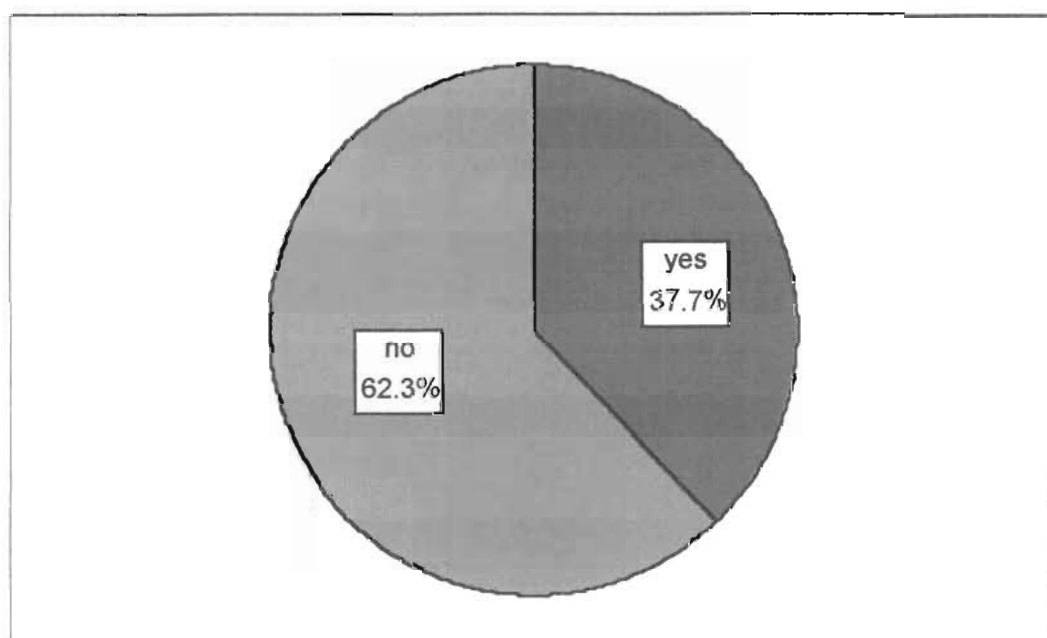
Level 2 educators comprise mainly of Heads of Departments of the various subject groupings in the secondary schools while in the primary schools level 2 educators exist for the various groups of grades, example grade 1 to grade 3 will have one level 2 while grades 3 to 7 might have another.

## 4.2. UNDERSTANDING OF THE CONCEPT

### "EDUCATIONAL TECHNOLOGY":

#### 4.2.1. DID YOU COME ACROSS THE CONCEPT

#### "EDUCATIONAL TECHNOLOGY"?



**FIGURE 11. : FAMILIARITY WITH THE CONCEPT "EDUCATIONAL TECHNOLOGY"**

Figure: 4.3. shows that the majority of the respondents (62,3%) did not come across the concept "Educational technology". This is most distressing in that educational technology over the last four to five decades has developed into a significant discipline in it's own right.

The impact of educational technology has been demonstrated in most countries of the world with special reference to enhancing the quality of teaching and learning.

The definitions provided in chapter two clearly identify the value and significance of educational technology and for educators in South Africa not to have come across this concept is totally unacceptable. South Africa has now grown into a democracy where expectations are high amongst the so called disadvantaged communities and thus educational technology must be seen as having significant power towards fulfilling the expectations of the masses especially with the least amount of costs and time available. However, it seems that the new democracy has not given birth to the much need renaissance that our education system so deserves. The amalgamation and overhauling of the previous seventeen different departments of education also seems to have resulted in no major gains that one would have hoped for. This is remonstrated by the lack of understanding and poor perceptions of educational technology that is prevalent amongst educators at the school level.

One might tend to argue that this research was conducted in the so called “advantaged community” but the statistics provided in the figure above negates any notion of advantage that educators in Phoenix have. If educators have not by now come across the concept, educational technology then surely one cannot brand them as being advantaged.

However, we could conclude that the South African education system is still too traditional and as such, has not yet incorporated the ideals and principles of post modernism which have identified the value and significance of educational technology.

37,7% of the respondents indicated that they have indeed come across the concept “educational technology”. This is a rather small percentage when one considers the position of South Africa in terms of it’s successes in various other fields such as in the military , etc. Here, again, arguments could be put forward blaming apartheid and it’s various structures for the ignorance amongst educators of the concept, “Educational Technology”. However, given the three years of democracy, one would surely expect some kind of professional development that is being supported by the National Ministry of Education or more importantly some kind of workshops, seminars, INSET and PRESET programmes that are being undertaken by provincial departments of education to uplift education so as to increase equality of opportunities for those who were less advantaged. However, this does not seem the case as the statistics show a very different picture.

#### 4.2.2. WHERE DID YOU FIRST COME ACROSS THE CONCEPT “EDUCATIONAL TECHNOLOGY”?

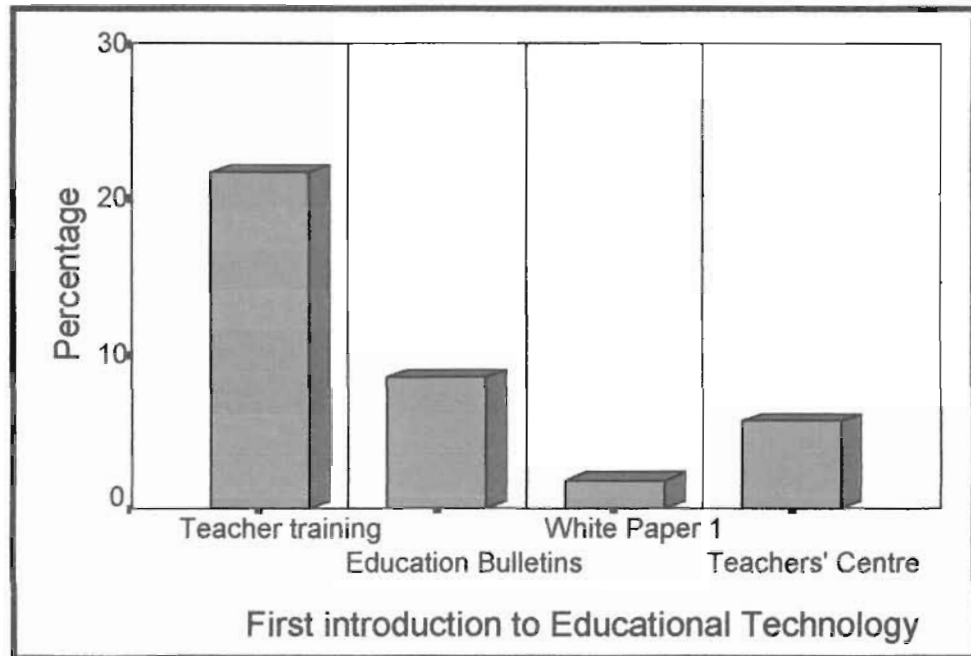


FIGURE 12. : FIRST INTRODUCTION TO THE CONCEPT “EDUCATIONAL TECHNOLOGY”

Of the 37% (Figure 12.) of the respondents who claimed that they came across the concept, “Educational Technology”, 21,7% indicated that they came across the concept during their teacher training, 7,3% stated that they came across the concept from education bulletins, while 6.5% indicated that they came across, “Educational Technology” from their



local Teachers' Centre and finally 2,2% indicated that they came across "Educational technology" from the White Paper 1 on Education and Training.

When the statistics from Figure 12. were converted so as to represent a total percentage out of 100 then the following scenario emerged:

I CAME ACROSS THE CONCEPT "EDUCATIONAL TECHNOLOGY.....	%
during my teacher training:	58,0
from education bulletins:	19,7
from my local teacher's centre:	16,6
from White Paper 1:	5,7
<b>TOTAL</b>	<b>100</b>

**TABLE 4. : FIRST INTRODUCTION TO THE CONCEPT "EDUCATIONAL TECHNOLOGY"**

The above percentages indicate very strongly that teacher training institutions have been exposing teacher trainees to the concept, "Educational technology".

However, Teachers' Centres were lacking in terms of promoting educational technology. This is indicated by the very low percentage of 16,6% who indicated that they first came across the concept "Educational technology" from their local Teachers' Centre.

The questionnaire also included a category for teacher librarians as a source of which respondents could have come across the concept, however not one respondent indicated that he/she came across the concept, “Educational Technology” from their school’s teacher - librarian.

Based on this, it was therefore necessary to analyse whether schools were staffed with qualified teacher-librarians, who were in charge of media centres.

### 4.2.3. WHO IS THE PERSON IN - CHARGE OF THE MEDIA CENTRE?

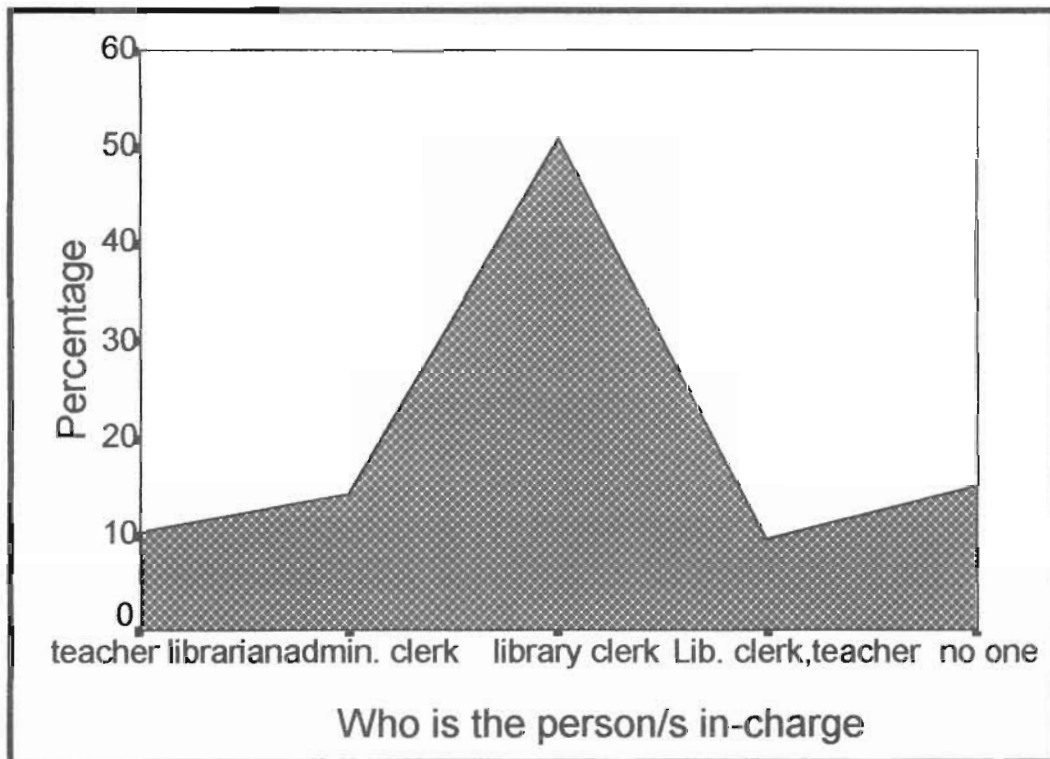


FIGURE 13. : THE MANAGEMENT OF MEDIA CENTRES

The statistics in Figure 13. indicate that 50% of the respondents found library clerks that managed media centres at their schools; while 14% stated that administration clerks managed their media centres in schools; 10% indicated that teacher librarians managed the media centres at their schools, while 17% indicated that no one was in charge of managing their media centres at their respective schools.

#### 4.2.4. "SUPPORT AND QUALIFICATIONS" OF MEDIA CENTRE PERSONNEL:

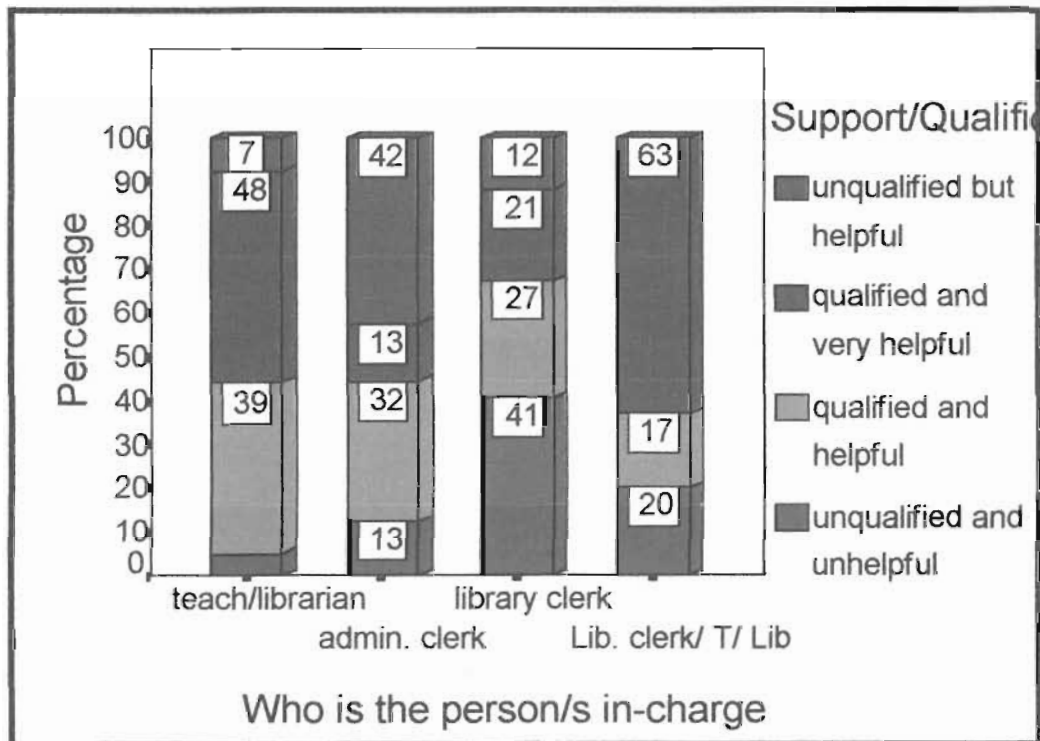


FIGURE 14. : THE LEVEL OF QUALIFICATION AND TYPE OF SUPPORT OFFERED BY MEDIA CENTRE PERSONNEL.

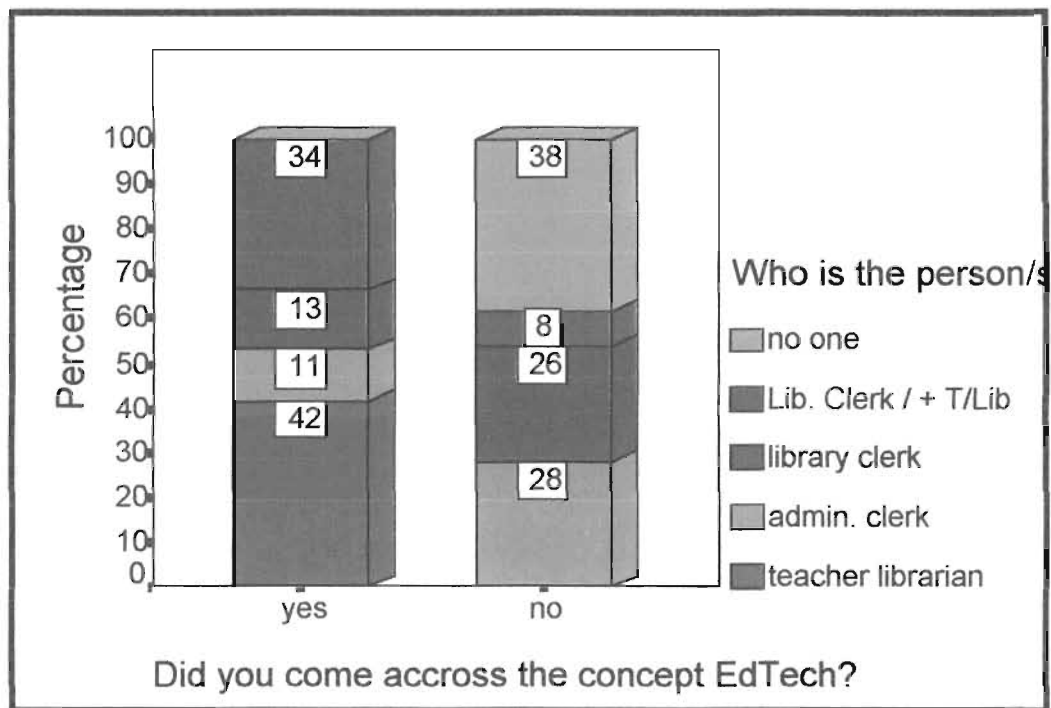
Of all those respondents who indicated that teacher librarians were in charge of their school's media centre: 48% indicated that these personnel were qualified and very helpful; 39% stated that teacher librarians were qualified and helpful.

7% indicated that they were unqualified but helpful while only 6% indicated that teacher librarians were unqualified and unhelpful.

Of those respondents who indicated that library clerks managed their school's media centres: 41% stated that they were unqualified and unhelpful; 27% also indicated that library clerks were qualified and helpful; while 21% stated these library clerks were qualified and very helpful while 12% stated that the clerks were unqualified but helpful.

63% of the respondents indicated that the combination of teacher librarians and library clerks who were in charge of their school's media centre were qualified and very helpful; 20% indicated that they were unqualified and unhelpful while 17% stated that they were qualified and helpful.

**4.2.5. THE RELATIONSHIP BETWEEN “DID YOU COME ACROSS THE CONCEPT EDUCATIONAL TECHNOLOGY?” AND “WHO IS IN CHARGE OF THE MEDIA CENTRE?”**



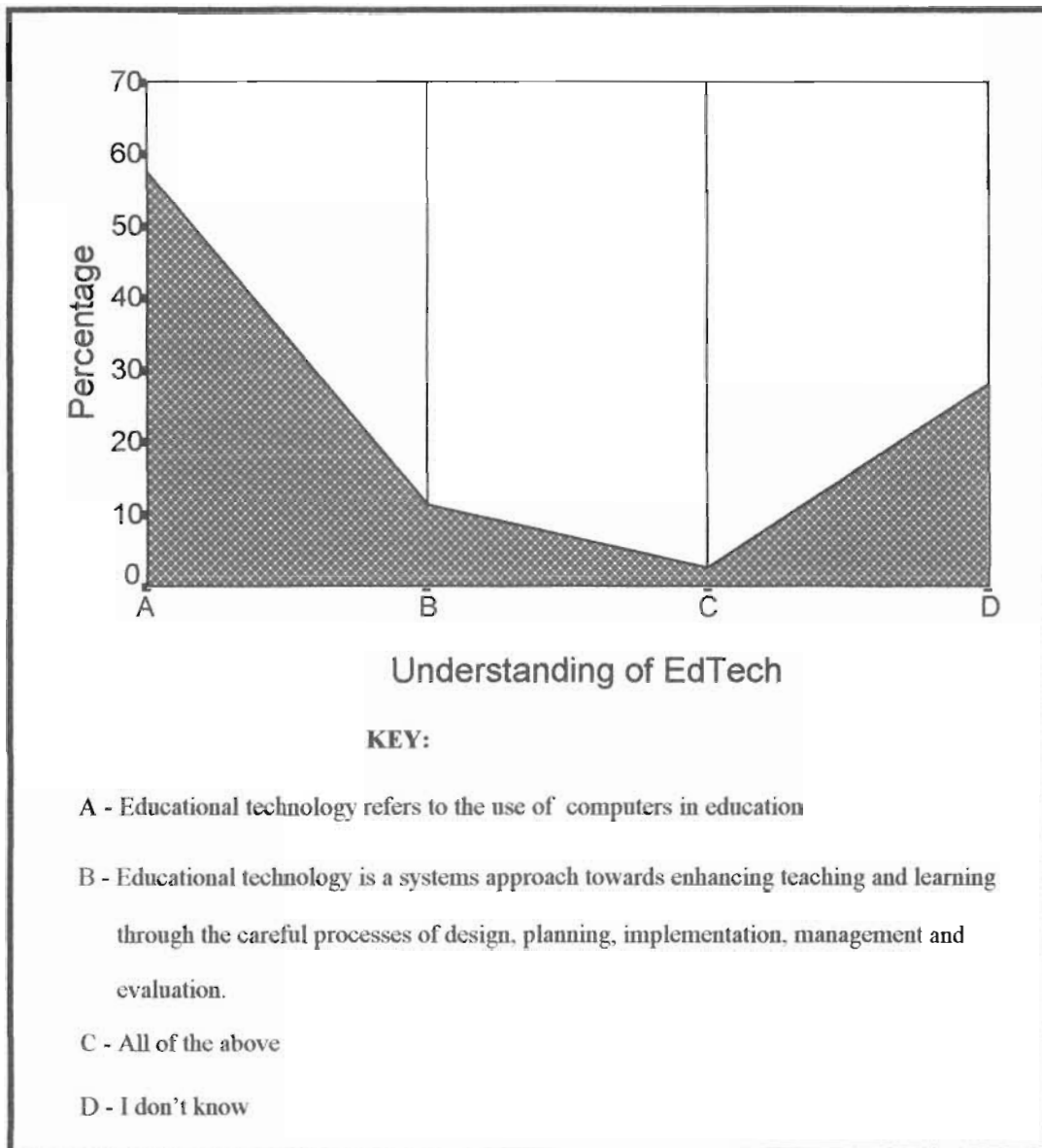
**FIGURE 15. : RELATIONSHIP BETWEEN THE FAMILIARITY WITH THE CONCEPT “EDUCATIONAL TECHNOLOGY” AND THE PERSON IN - CHARGE OF THE SCHOOL MEDIA CENTRE**

Figure 15. indicates that of all those who indicated that administration clerks were in charge of their school’s media centre - 32% indicated that these personnel were qualified and helpful;

42% indicated that they were unqualified but helpful; 13% stated that they were unqualified and unhelpful and finally 13% also indicated that these staff were qualified and very helpful. The above graph indicates that, of all those respondents who indicated that they had come across the concept, “Educational Technology”- 42% were located in schools that were managed by teacher librarians; 34% came from schools whose media centres were managed by library clerks and teacher librarians combined together; 11% were from schools whose media centres were managed by administrative clerks while 13 % came from schools whose media centres were managed by library clerks alone.

The significance of these statistics is that, the majority of respondents who came across the concept, “Educational Technology” had in actual fact came from schools whose media centres were managed by teacher librarians who were qualified and provided “helpful to very helpful” support. This is also substantive evidence that solidifies the value and significance of media centres with qualified personnel. There is thus strong evidence that indicates a relationship between media centres, qualified media centre staff and the perception of educational technology.

### 4.2.6. PERCEPTION OF THE CONCEPT “EDUCATIONAL TECHNOLOGY”



**FIGURE 16 : PERCEPTION OF THE CONCEPT “EDUCATIONAL TECHNOLOGY”**

Figure 16. indicates that 57% of the respondents understand the concept, “educational technology” as referring to the use of computers in



education. 29% of the respondents did not have any idea as to the meaning of “educational technology”. 11% of the respondents understood “Educational technology” as a systems approach towards enhancing teaching and learning through the careful processes of design, planning, implementation, management and evaluation. 3% understood, “educational technology as all of the above, ie. The use of computers in education and as a systems approach.....

#### 4.2.7. RELATIONSHIP BETWEEN SCHOOL TYPE (PRIMARY/SECONDARY) AND UNDERSTANDING OF “EDUCATIONAL TECHNOLOGY”

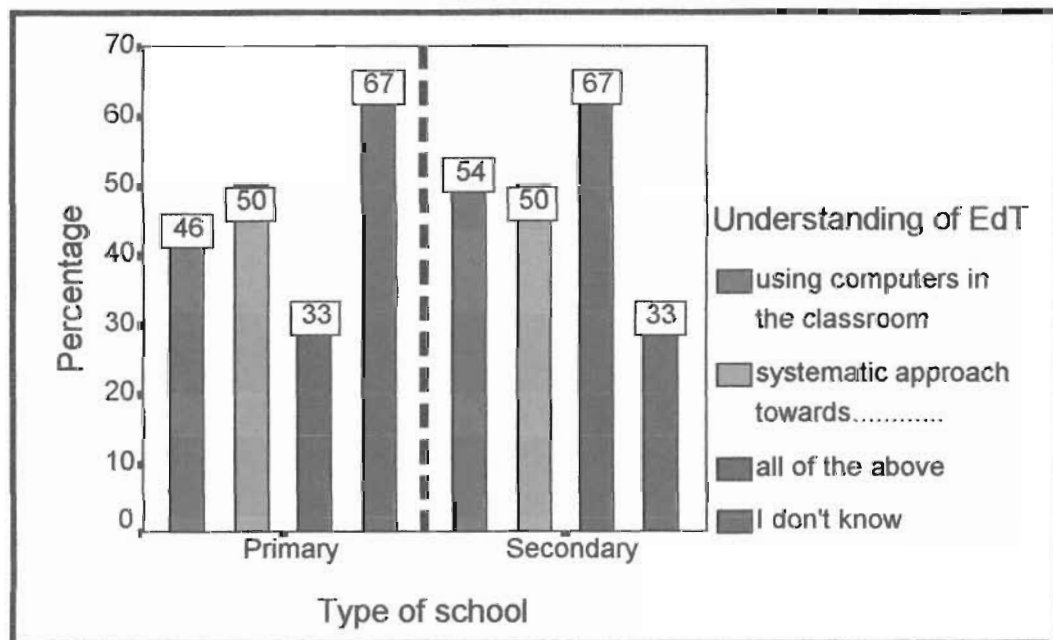
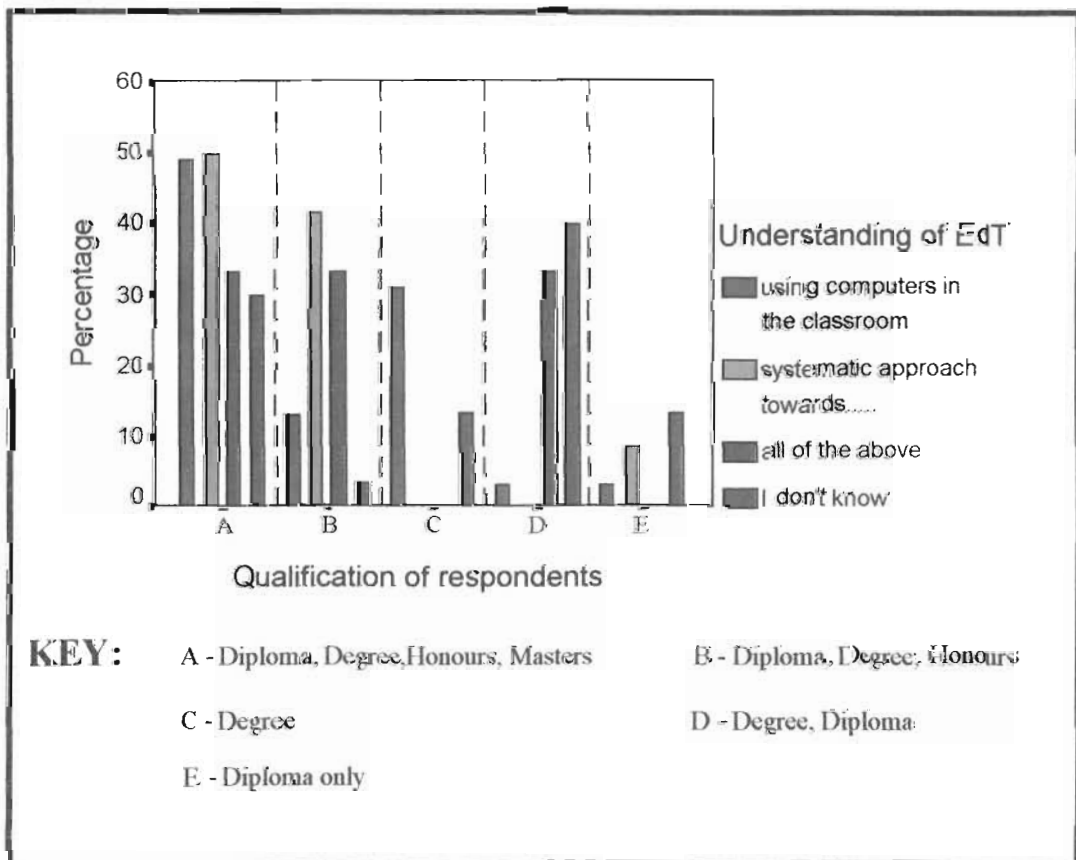


FIGURE 17. : RELATIONSHIP BETWEEN THE TYPE OF SCHOOL AND UNDERSTANDING OF THE CONCEPT, “EDUCATIONAL TECHNOLOGY”

Figure 17. indicates a relationship between the understanding of the concept “Educational technology” and the type of school (primary/secondary) in which the respondents taught at. For the category “I don’t know” - 67% of the respondents taught at primary schools while 33% taught at secondary schools. This indicates that educators from secondary schools had a better understanding of the concept “Educational technology” than their counterparts from the primary schools.

**4.2.8. RELATIONSHIP BETWEEN THE LEVEL OF QUALIFICATION AND THE UNDERSTANDING OF THE CONCEPT “EDUCATIONAL TECHNOLOGY”**



**FIGURE 18. : RELATIONSHIP BETWEEN LEVEL OF QUALIFICATION AND THE UNDERSTANDING OF THE CONCEPT “EDUCATIONAL TECHNOLOGY”**

The statistics assimilated in Figure 18., indicate that there is a direct link between the levels of qualifications and the way in which the concept, “Educational Technology” is perceived by the respective respondents. In essence, there was a relationship whereby the higher the qualification the better the understanding of the concept, “Educational Technology”. 50% of the respondents who indicated that educational technology is a systems approach towards enhancing teaching and learning through the careful process of design, planning, implementation, management and evaluation were qualified with a diploma, degree, honours and masters. Not one respondent who had only a degree or diploma was able to understand the concept “Educational technology”.

Thus, the statistics obtained prove that respondents who had a higher qualification, were able to understand the concept, “educational technology” much better than those with lower qualifications. This could justify the analysis of educational technology which is underpinned by its evolutionary nature (Percival and Ellington: 1984) and thus as the respondents began to further their studies they in turn were able to understand the concept “educational technology”. This must be seen against a background which regards the discipline, “educational technology” as being rather recent and new in the South African educational landscape.

#### 4.2.9. RELATIONSHIP BETWEEN AGE AND THE UNDERSTANDING OF THE CONCEPT “EDUCATIONAL TECHNOLOGY”

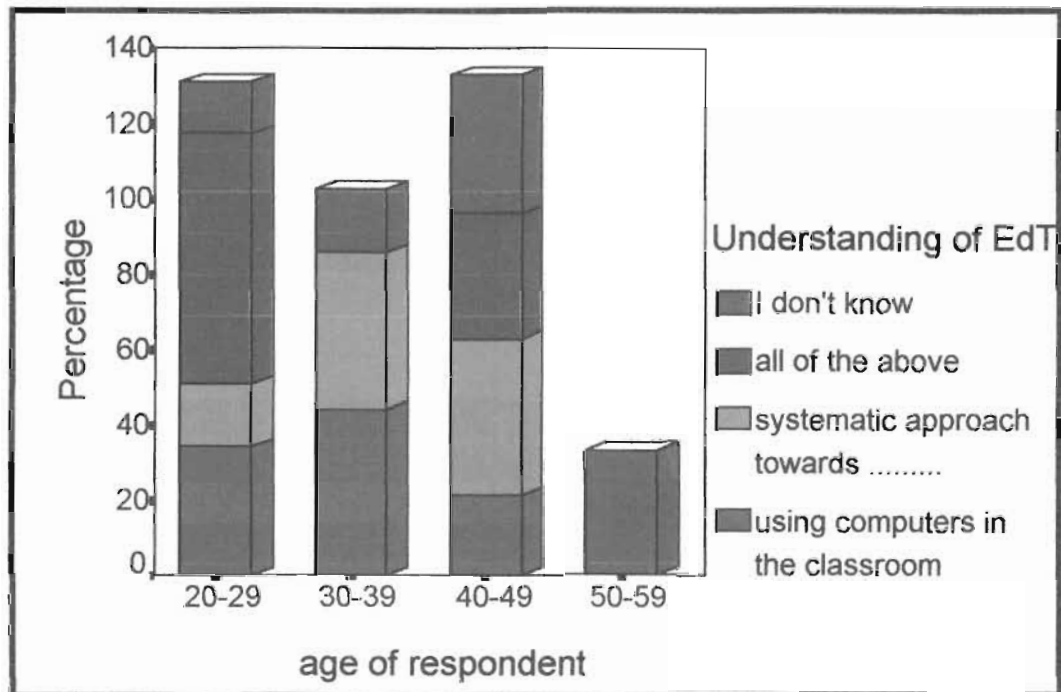


FIGURE 19. : RELATIONSHIP BETWEEN AGE AND UNDERSTANDING OF THE CONCEPT, “EDUCATIONAL TECHNOLOGY”

Of all the respondents who indicated “ I don’t know ” the concept “Educational Technology” - 35% were between the ages of 40 to 49 years; 35% were between the ages 50 to 59. 13% were between the ages 20 to 29 while 17% were between the ages 30 to 39.

Thus, the older the respondent, the lesser the likelihood was, of the respondent understanding the concept , “educational technology”

On the other hand 67% of the respondents who indicated the correct

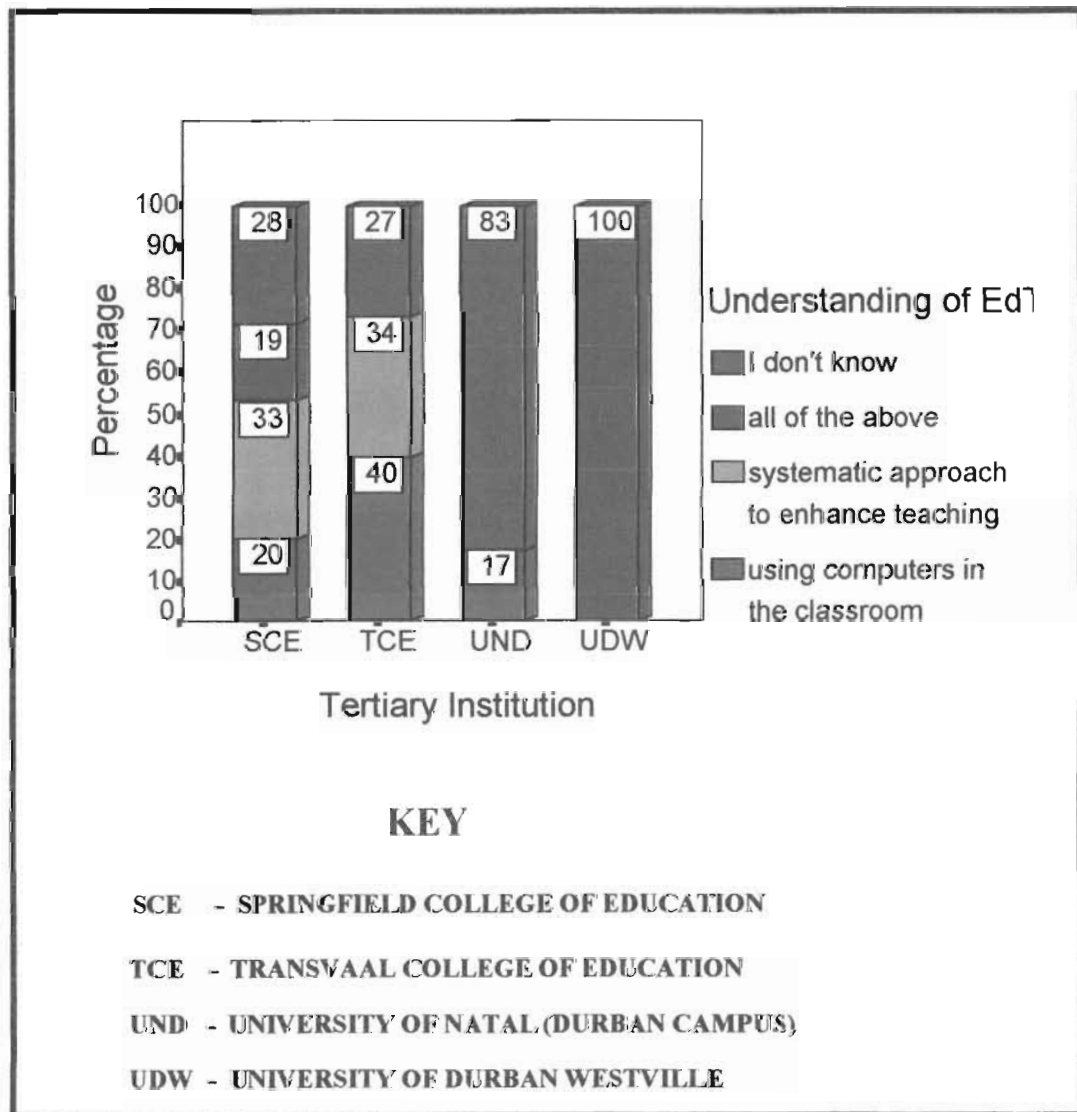
understanding of the concept “Educational Technology, ie it is a systems approach towards enhancing teaching and learning through the careful processes of design, planning, implementation, management and evaluation and the use of computers in the classroom, came from the age group 20 to 29.

No respondent from the age group 50 to 59 were able to understand the concept, “educational technology”

There was a strong relationship between the age group and the level of understanding the concept “Educational technology”. Thus the younger the respondent the more the likelihood was of them understanding the concept “Educational technology”

There was also a direct relationship between the understanding of the concept “Technology” and the age of the respondent (see Figure 10.). The older the respondent the less he/she understood the concept, “Technology”.

**4.2.10. RELATIONSHIP BETWEEN THE TERTIARY INSTITUTION WHERE THE RESPONDENT GRADUATED AND THE UNDERSTANDING OF THE CONCEPT “EDUCATIONAL TECHNOLOGY”**



**FIGURE: 20 ; RELATIONSHIP BETWEEN TERTIARY INSTITUTION AND THE UNDERSTANDING OF THE CONCEPT, “EDUCATIONAL TECHNOLOGY”**

Figure 20. indicates that there is a very strong relationship between the level of understanding the concept, “educational technology” and the tertiary institution where the respondent graduated. Of all those respondents who graduated at the University of Durban Westville (UDW), 100% indicated that Educational Technology is a systems approach towards enhancing teaching and learning through the careful design, planning, implementation, management and evaluation and the use of computers in education.

From those who graduated at Springfield College of Education (SCE) - 28% did not understand the concept, “educational technology”; 33% indicated that educational technology was a combination of the systems approach and the use of computers in education; 20% stated that educational technology was about the use of computers in the classroom while 33% indicated that educational technology was a systems approach.

Of those who graduated at the University of Natal (UND) 83% did not understand the concept, “educational technology” while 17% indicated that educational technology was all about the use of computers in education. No respondent from the University of Natal (UND) understood the concept, “Educational technology”.

From those respondents who graduated at the Transvaal College of Education (TCE), 27% did not understand the concept, “Educational Technology”, 34% indicated that educational technology was a systems approach and 40% indicated that educational technology was about the use of computers in education. Here again no respondent understood the concept, “educational technology”

From the preceding analysis, it becomes evident that teacher training institutions had definitely played a vital role in the respondents understanding of the concept, “educational technology”.

From the given statistics, the University of Durban Westville (UDW) stands out indicating that its teacher education modules and programmes has had an impact on the respective respondents perceptions of “educational technology”. Respondents from other tertiary institutions showed very little understanding of the concept, “educational technology”, especially respondents from Springfield College of Education (SCE) and the University of Natal (UND).

Another important aspect is that of the varying terminology that is being bandied around in place of “educational technology”. It was found that there were no fewer than 4 different terminology being used in the various tertiary institutions in KwaZulu Natal, viz: Media Education; AV Education; Media Science; Materials Development; etc.



#### 4.2.11. IS THERE A DIFFERENCE BETWEEN TECHNOLOGY OF EDUCATION AND TECHNOLOGY IN EDUCATION?

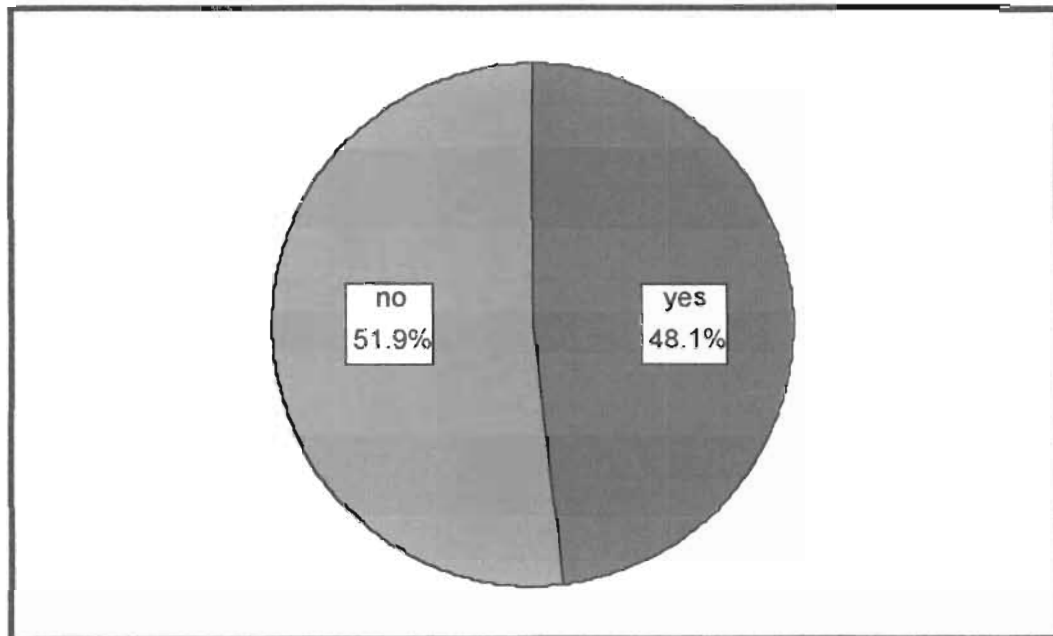


FIGURE 21. : IS THERE A DIFFERENCE BETWEEN TECHNOLOGY OF EDUCATION AND TECHNOLOGY IN EDUCATION ?

Figure 21. indicates that 48.1% of the respondents indicated that there was a difference between the two concepts: Technology of Education and Technology in Education. 51.9% stated that there was no difference between the concepts: Technology of Education and Technology in Education.

**4.2.12. WHAT IS THE DIFFERENCE BETWEEN:  
“TECHNOLOGY OF EDUCATION (X) AND  
TECHNOLOGY IN EDUCATION (Y) ”?**

<b>DIFFERENCES BETWEEN TECHNOLOGY OF EDUCATION ( X ) AND TECHNOLOGY IN EDUCATION ( Y )</b>	<b>% RESPONSE</b>
1. X refers to computers Y refers to OHPs, TV, etc	10
2. X refers to engineering Y refers to teachers, principals, HODs, etc	18
3. X refers to teaching practices, methods, strategies, etc Y refers to hardware, software, machines, gadgets, etc	13
4. I am not sure	59
<b>TOTAL</b>	<b>100</b>

**TABLE 5. : DIFFERENCES BETWEEN TECHNOLOGY OF EDUCATION AND  
TECHNOLOGY IN EDUCATION**

The above was an open ended question whereby 120 responses were analysed after which the 4 categories in table 4.3. emerged.

Of all the respondents who indicated that there was a difference between Technology of Education and Technology in Education: 59% indicated “I was not sure” of the difference, although the respondents felt that indeed there was a difference. This proves that the introduction of various terminologies are problematic in terms of its assimilation and understanding. 13% indicated the more acceptable difference, ie : that “Technology in Education was about the application and use of various

machines and gadgets in education, namely hardware and software while “Technology of Education” is about teaching and learning strategies, methods and practices in education and training. However, as was indicated in chapter two, both these concepts must be seen as being in use and fundamental within the entire or whole system of the educational landscape, ie. Technology of and Technology in Education must also be seen to be used in facets of administration, management, evaluation, etc. and not only in classroom practices.

Finally it must be stressed that although Technology in Education and Technology of Education are functionally different, they nevertheless support each other and also are very much dependent on each other. These two concepts must therefore be contextualised as being part of a larger system where each of the parts/subsystems work in harmony to maintain an efficient and effective system as a whole. The differences between these two concepts are thus illustrated simply to provide an in depth analysis of the concept, “educational technology”. Educationists are sometimes confused as regards terminology and therefore it was imperative to provide meanings and contextualise both Technology in Education and Technology of Education within “educational technology”.

### 4.2.13. WOULD YOU LIKE TO KNOW MORE ABOUT “EDUCATIONAL TECHNOLOGY”?

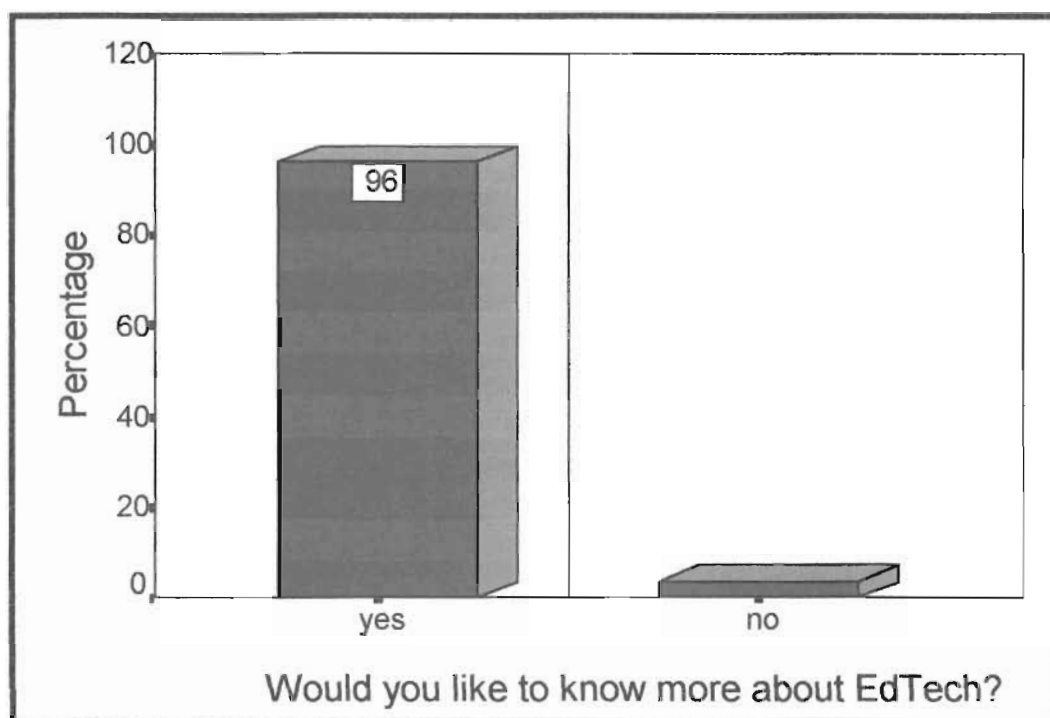


FIGURE 22. : WOULD YOU LIKE MORE INFORMATION ON THE CONCEPT, “EDUCATIONAL TECHNOLOGY

Figure 22. illustrates that 96% (YES) of the respondents wanted to “know more” about “educational technology”, while 4% (NO) indicated that they do not want to “know more”. It is clear that the majority of the respondents want to increase their knowledge and understanding of the discipline “educational technology”. This kind of commitment is highly commendable on the part of educators. Provincial departments together with the National Department of Education will thus encounter very little problems especially in trying to persuade its members to accept educational technology.

#### 4.2.14. WHY DO YOU LIKE TO KNOW MORE ABOUT “EDUCATIONAL TECHNOLOGY”?

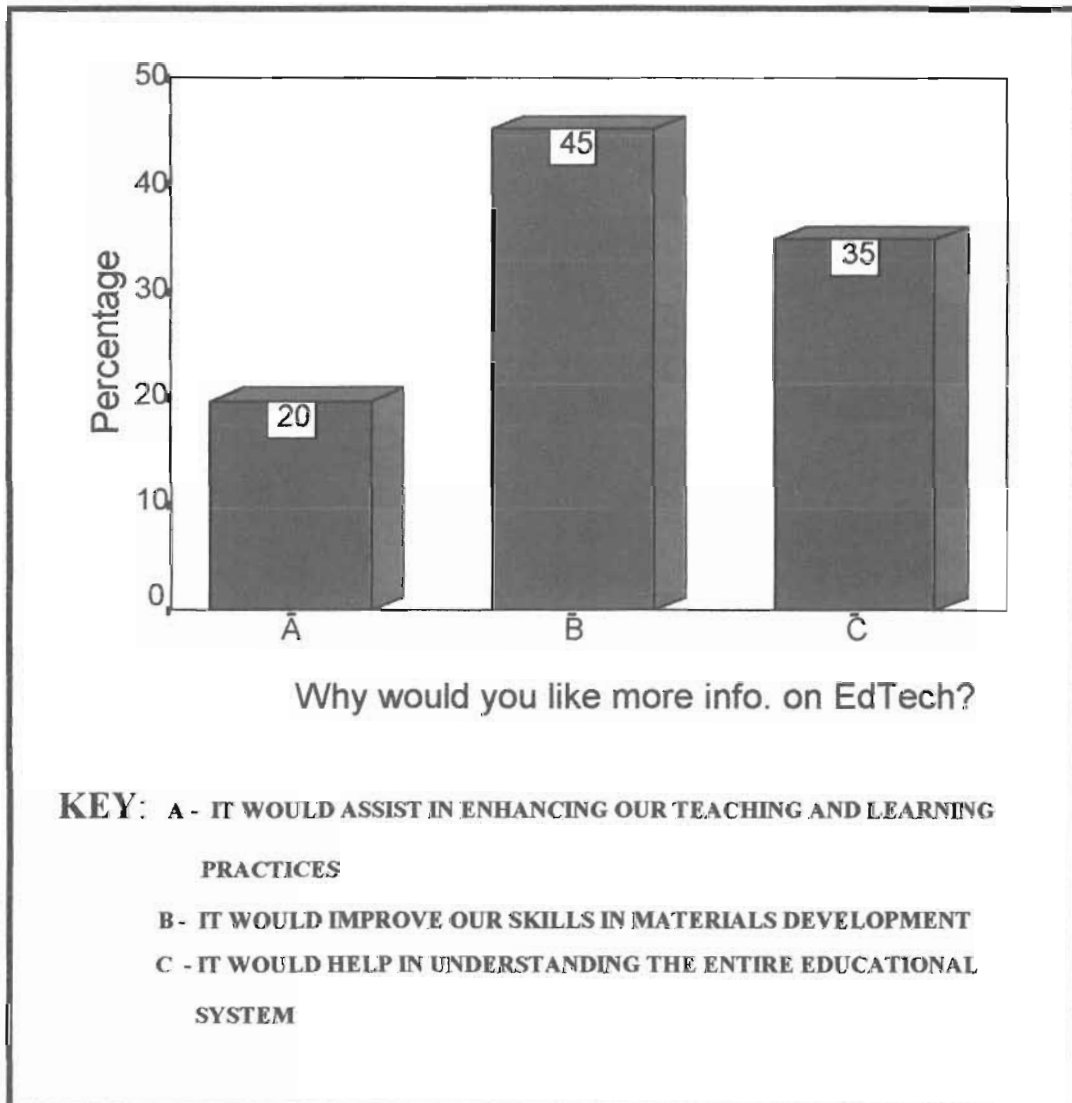


FIGURE 23. : WHY WOULD YOU PREFER MORE INFORMATION ON  
THE CONCEPT, “EDUCATIONAL TECHNOLOGY” ?

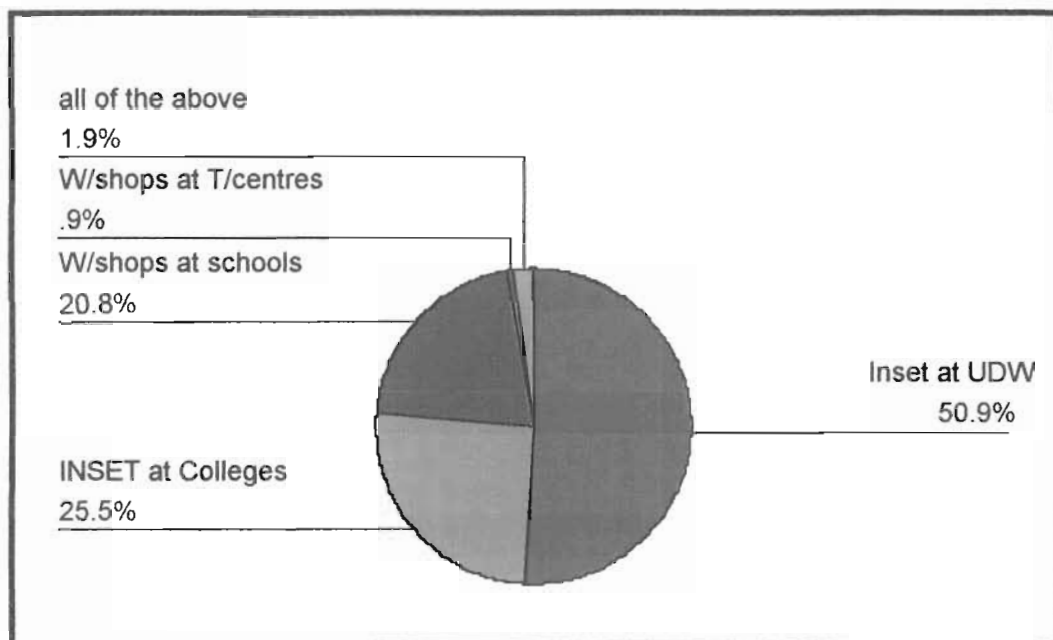
The question “Why do you want to know more about educational technology?” was an open ended question where respondents gave their own personal views. All the responses given were grouped into the on three categories. On analysing the three categories, the following statistics were derived at. Namely, that 20% of the respondents wanted more information about educational technology because it would assist in enhancing their teaching and learning practices. 45% indicated that they wanted to know more about educational technology as it will improve their skills in developing materials and resources for their teaching.

36% of the respondents indicated that they would want to know more about educational technology because it would help them understand the entire education system within which they function / operate.

From the responses given, it emerged that educators at school are showing increasing interest in wanting to know more about educational technology. This proves beyond any doubt that educators are willing to learn and grow in terms of increasing their knowledge and skills so that they can strive for educational excellence. It was also interesting to note that 36% of the respondents felt that by wanting to know more about educational technology, they can in effect understand the entire education system.

This is important because there seems to be a vacuum amongst educators who do not see their role as being partly embedded in a system where the sum of its parts are more than the whole. This kind of perception is fundamental where the educator understands that whatever he / she does within the sub systems, will definitely impact on the whole system. This must be seen within the ambit of forging links and partnerships within the system for efficiency and effectiveness towards enhancing teaching and learning thereby increasing the quality of life within society.

**4.2.15. WHICH OF THE FOLLOWING WOULD YOU WELCOME THE MOST IN ORDER TO INCREASE YOUR UNDERSTANDING OF THE CONCEPT “EDUCATIONAL TECHNOLOGY”?**



**FIGURE 24. : PREFERENCES FOR INCREASING THE KNOWLEDGE OF THE CONCEPT, “EDUCATIONAL TECHNOLOGY”**

All of the respondents showed a keen interest in wanting to learn more about educational technology. However there were varying degrees of methods by which respondents wanted to gain a better insight into educational technology.



The questionnaire provided seven categories which each respondent could choose as a means of gaining insight into educational technology. 50.9% of the respondents indicated that they welcomed INSET programmes at the University of Durban Westville; 25.9% indicated that they would prefer INSET programmes at a College of Education (the majority preferred Springfield College of Education); 20.9% indicated their preference for workshops and seminars to be conducted at their respective schools; .9% wanted workshops or seminars at their local teachers' centre while 1.9% indicated their preference for all of the above.

From the statistics above it emerges that more than half of all the respondents have faith INSET programmes conducted at the University of Durban Westville and thus 50.9% indicated the same.

Teachers' Centres seem to be very low in preference amongst the respondents and this does not augur well. Teachers' Centres must be able to play a significant role in terms of providing added support for educators in its area of service. Large amounts of money are spent in servicing Teachers' Centres and if educators are not content with attending workshops and seminars conducted there, then it proves that teachers' centres are indeed not up to their task at hand.

### 4.3. EXISTING STRUCTURES AND POLICIES OF EDUCATIONAL TECHNOLOGY IN KWAZULU NATAL:

#### 4.3.1. DOES YOUR PROVINCE HAVE A DIRECTORATE IN “EDUCATIONAL TECHNOLOGY?”

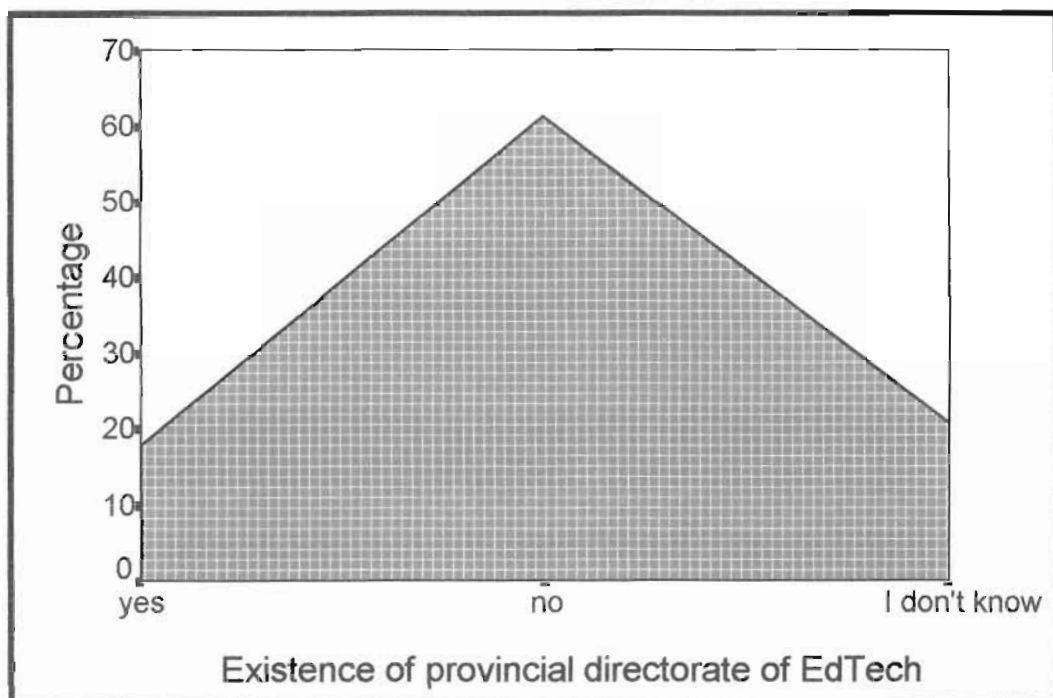


FIGURE 25. : EXISTENCE OF A PROVINCIAL DIRECTORATE FOR EDUCATIONAL TECHNOLOGY IN KZN

62% of the respondents felt that there was no directorate in Educational Technology in the province of KwaZulu Natal. 20% stated that they did not know whether a directorate existed while 18% (YES) indicated that there was a provincial directorate for educational technology in KZN.

The questionnaires were issued to respondents during the period July 1996 to September 1996. At this stage there was no directorate for Educational Technology since a level five post entitled “Chief Education Specialist : Educational Technology” was only advertised sometime in October 1996. Subsequently this post was filled in January 1997. Thus, at the time of issue of this questionnaire, there was no directorate associated with the description “ Educational Technology”.

The Western Cape was one of the first provinces to create a directorate in educational technology. This was accomplished in 1995. Provinces such as Mphumalanga have yet to create a directorate for Educational Technology.

#### 4.3.2. ARE YOU AWARE OF THE EXISTENCE OF SUBJECT ADVISORS IN EDUCATIONAL TECHNOLOGY IN YOUR PROVINCE?

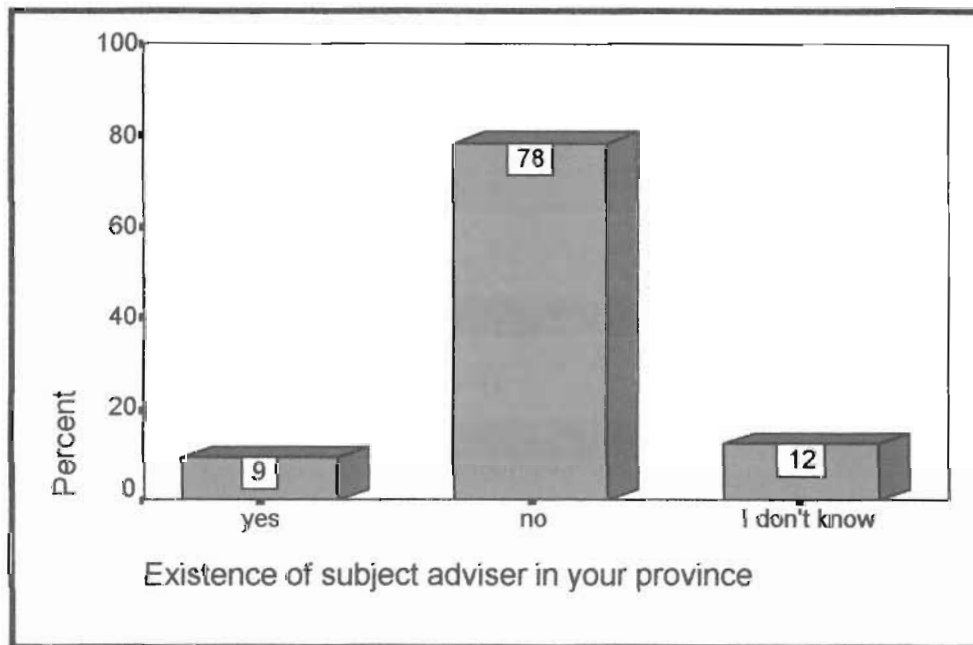


FIGURE 26. : EXISTENCE OF SUBJECT ADVISORS FOR EDUCATIONAL TECHNOLOGY IN KZN

Figure 26. shows 78% of the respondents indicated that subject advisors of educational technology do not exist in their province. 12% indicated that they was unaware if subject advisors existed while only 9% indicated that KwaZulu Natal's Provincial Department of Education did indeed have subject advisors for educational technology.

### 4.3.3. REASONS FOR THE NON EXISTENCE OF SUBJECT ADVISORS AND A DIRECTORATE FOR EDUCATIONAL TECHNOLOGY IN KWAZULU NATAL.

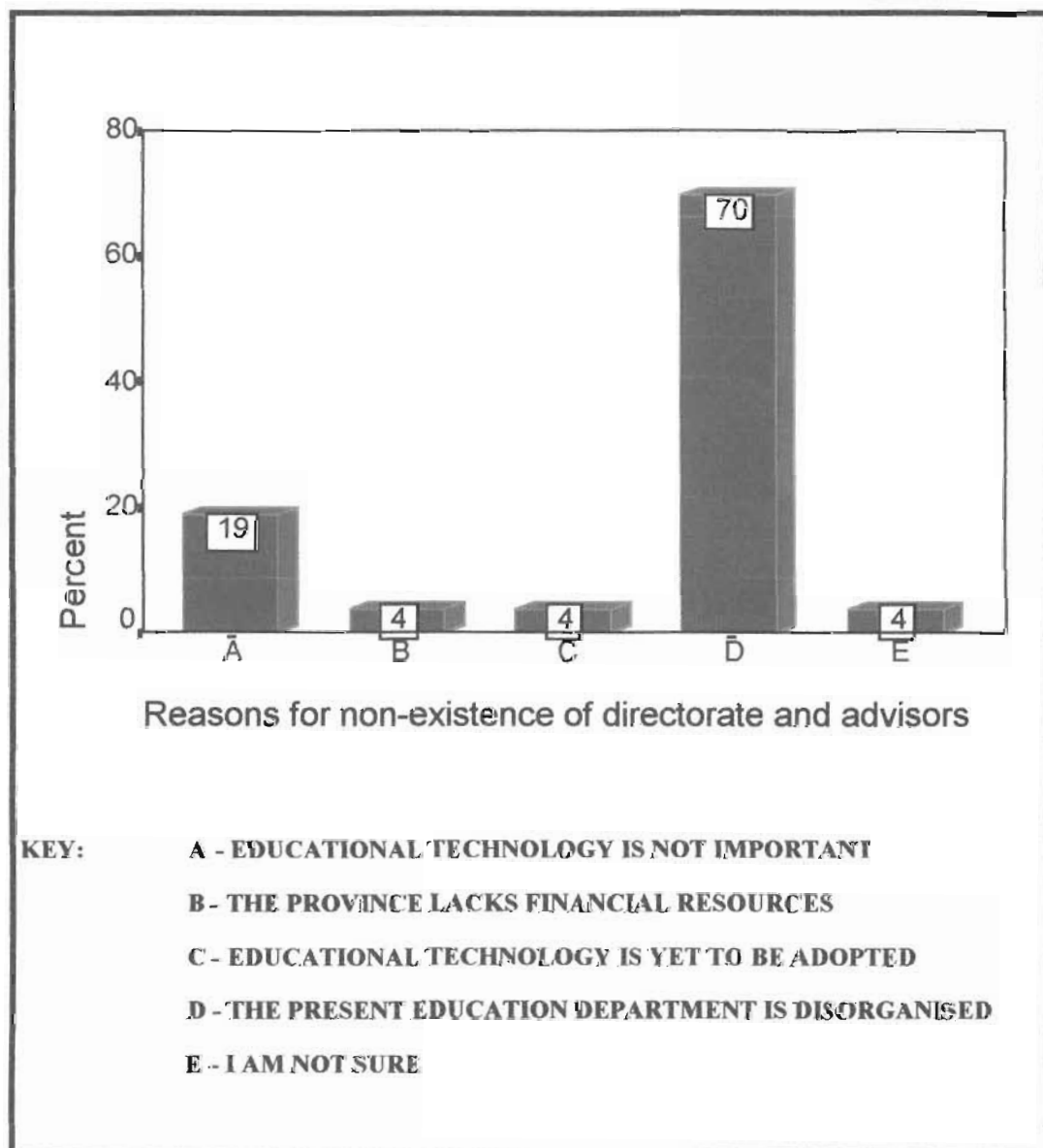


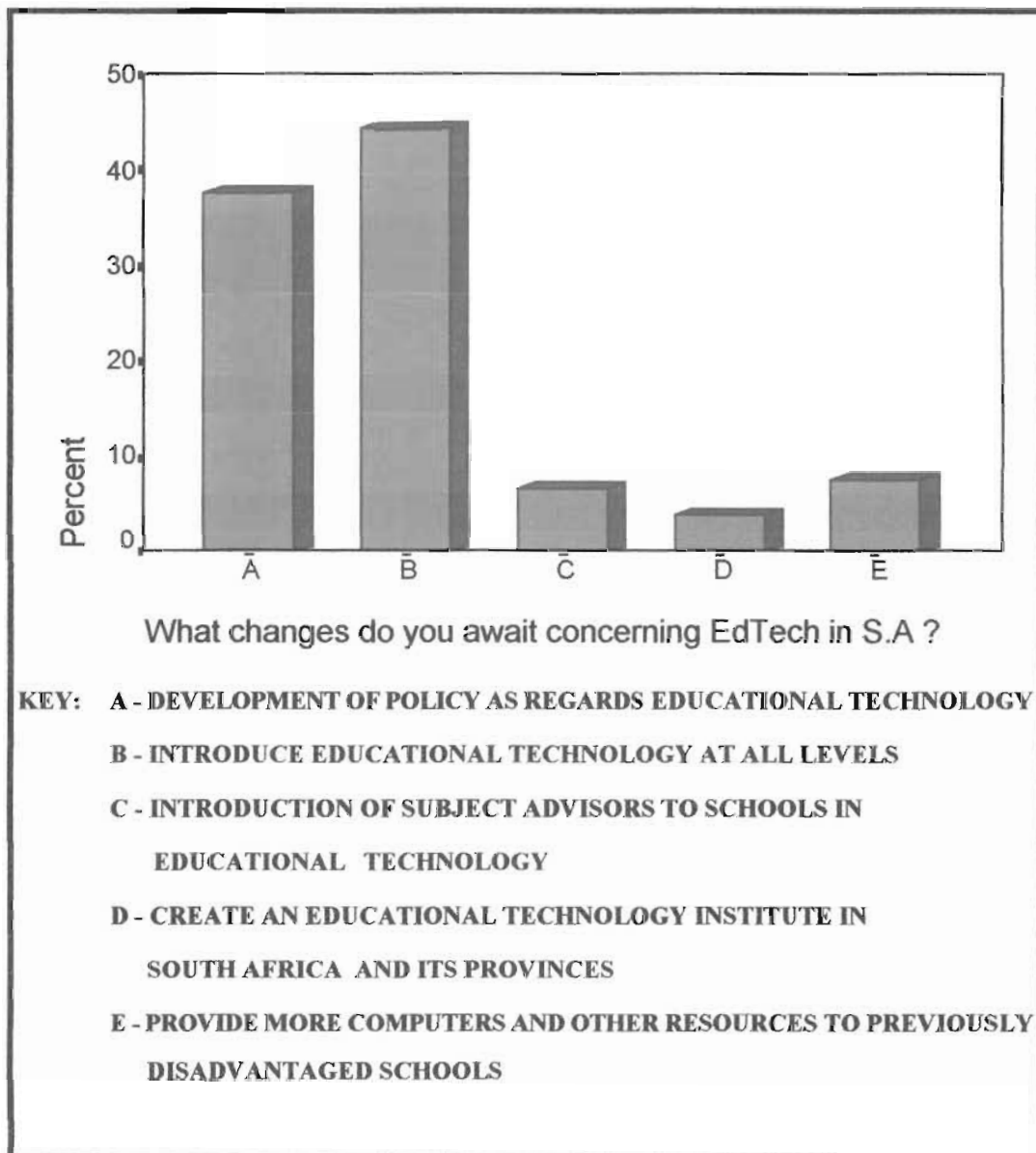
FIGURE 27. : REASONS FOR NON - EXISTENCE OF SUBJECT ADVISORS AND DIRECTORATES FOR EDUCATIONAL TECHNOLOGY IN KZN

70% of the respondents attributed the non existence of subject advisors and directorate of educational technology to the KwaZulu Natal (KZN) Department of Education and Culture(DEC) being disorganised; 20% of the respondents indicated that educational technology is not important and therefore subject advisors and a directorate do not exist in terms of educational technology; 4% indicated that KZN did not have the financial resources; 4% also indicated educational technology is yet to be adopted by KZN and thus subject advisors and a directorate did not exist and a further 4% indicated that they are not sure as to why subject advisors and a directorate do not exist in KZN.

70% who indicated that the present KZN DEC is disorganised reflects very poorly. This perception must have been triggered off by numerous factors or else educators in such large numbers will not have lost faith in their education department. Further, to have such a perception, is negative towards good governance where co-operation between all stakeholders are fundamental in achieving success in education.

Based on these perceptions the KZN DEC has to market itself so as to remove all blemishes and misconceptions that are embedded in the minds of its' employees. There must be something tangible that has to be undertaken so that employees of the KZN DEC can begin to promote and sustain a culture of teaching and learning that is fundamental to society.

**4.3.4. WHAT MAJOR CHANGES WOULD YOU LIKE TO SEE AS REGARDS EDUCATIONAL TECHNOLOGY IN THE PROVINCE OF KWAZULU NATAL AND ITS SCHOOLS?**



**FIGURE 28. : TYPES OF MAJOR CHANGES BEING AWAITED AS REGARDS EDUCATIONAL TECHNOLOGY IN KZN**

The above question ( Figure 28.) appeared as an open ended question in the questionnaire. After analysing all the questionnaires (120 in total), five different categories [refer to Figure 28.- (A, B, C, D, E)] emerged as most common. 44% of the respondents indicated that educational technology must be introduced into the South African educational landscape. This must be done at all levels, however the school level was most popular amongst these respondents. 38% of the respondents indicated that a well formulated policy framework that supports and promotes educational technology must be given top priority.

8% of the respondents stated that more computers and other resources must be provided to schools that were previously disadvantaged. There are three important aspects that are being stressed here. Firstly that, schools in the Phoenix region are being perceived as being previously disadvantaged; and secondly that these schools are under - resourced and finally educators from the Phoenix schools are crying out for more computers. This could mean that educators within this region are coming to realise the value of computers in education and are therefore showing a strong link between computers in education and educational technology. 7% of the respondents indicated that they await the introduction of subject advisors in the field of educational technology in their schools. This demonstrates that educators would most definitely support the role of subject advisors at their school as regards educational technology.

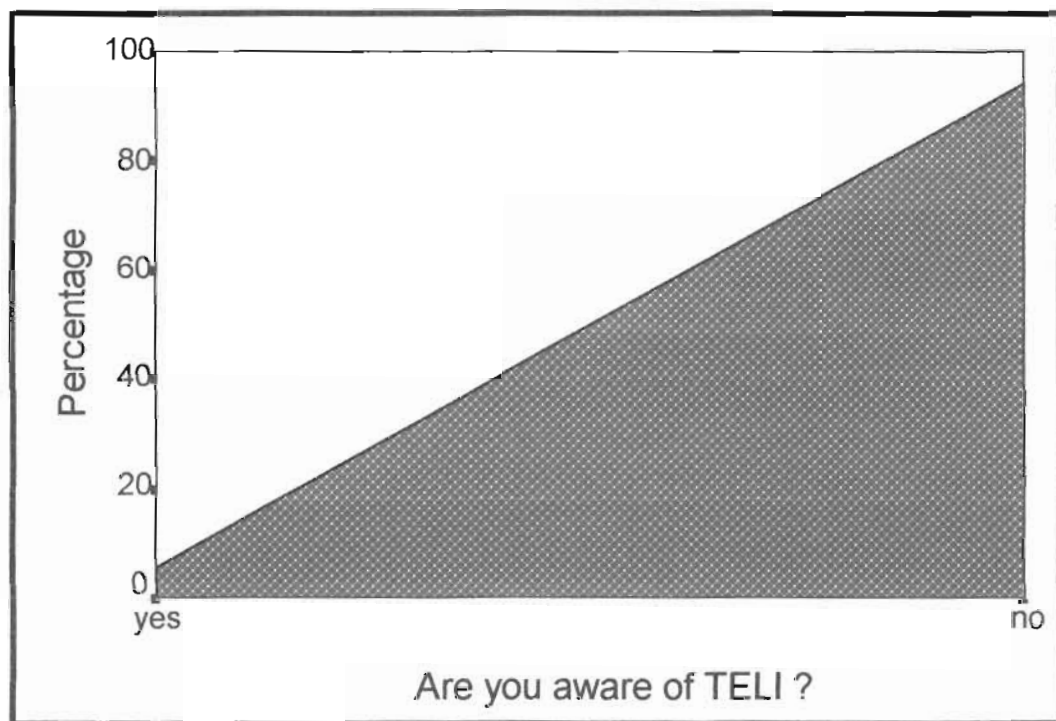


It was rather pleasing to note, that respondents (although a small percentage (4%)) indicated that they await the development and creation of an Educational Technology Institute in South Africa. This is most refreshing in view of Educational Technology Institutes that have been created in most democracies of the world. Amongst the most well known Institutes are the following: Council for Educational Technology (CET) of Britain; Centre for Educational Technology (OOK) of Hungary; Association for Educational Communications and Technology (AECT) of the USA and the Scottish Council for Educational Technology (SCET) of Scotland, Australian Society for Educational Technology (ASET).

The above statistics show that there were no policy frameworks that existed in South Africa and thus South Africa did not have an Educational Technology Institute like many other countries as mentioned earlier on.

However, the most significant aspect of the analysis above is that educators in South Africa are showing very keen interest in the discipline, “Educational Technology”. This augurs well for the implementation of policy since educators are showing willingness to accept educational technology. 44% indicated explicitly that they await the introduction of educational technology in all facets of our education system.

**4.3.5. ARE YOU AWARE OF THE “TECHNOLOGY ENHANCED LEARNING INVESTIGATION” (TELI) THAT WAS CARRIED OUT BY THE NATIONAL MINISTRY OF EDUCATION IN 1996?**



**FIGURE 29. : AWARENESS OF TELI**

94% of the respondents indicated that they were totally unaware of the “Technology enhanced learning investigation” (TELI) that was carried out by the National Ministry of Education.

This is also supported by the statements that appear on page 4 (1996) of the report that was released, which states as follows: “Despite numerous attempts to do so, no visit could be arranged to KwaZulu Natal”. This is in reference to the task team of TELI to carry out research as to the infrastructure , resource availability and perception of technology enhanced learning amongst educators in the province of KwaZulu Natal. Here, again there is substantiation in terms of the perception that was articulated by respondents as related to the education department of KwaZulu Natal being disorganised.

One cannot possibly think of any reason as to why KwaZulu Natal was unwilling or unable to co-operate with the TELI team to allow them to visit our province so as to gage the level and perception of educational technology amongst educationists. This was a golden opportunity that the Education Department of KZN has forsaken. Thus it is no surprise that large scale negative perceptions exists within educationists of the KZN Department of Education and Culture (DEC).

#### 4.4. EDUCATIONAL TECHNOLOGY: THE USE OF MEDIA CENTRES BY EDUCATORS IN KZN SCHOOLS

##### 4.4.1. HOW OFTEN DO YOU VISIT THE MEDIA CENTRE AT YOUR SCHOOL?

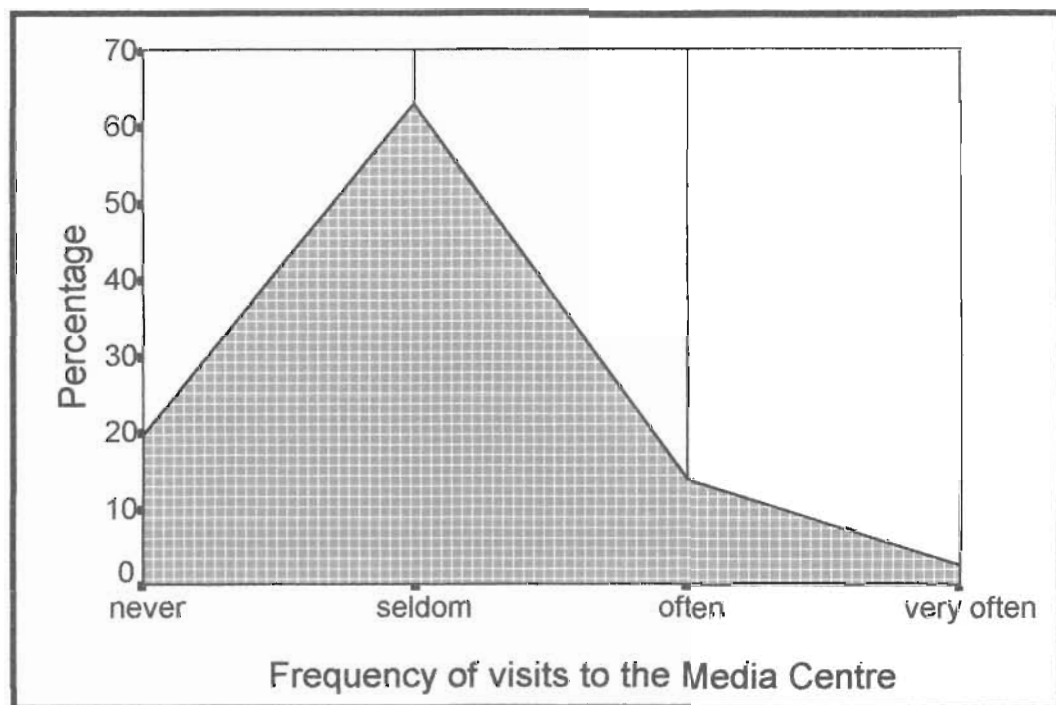


FIGURE 30. : FREQUENCY OF VISITS TO THE SCHOOL MEDIA CENTRE

Figure 30. indicates that the majority (60%) of the respondents seldom visit the media centre at their school; 20% pointed out that they never visit the media centre; 15% indicated they visit the media centre often at their school while 5% stated that they visit their school's media centre very often. These statistics are most discouraging .

Every school firstly should have a media centre and secondly the media centre must be seen as a hive of activity in terms of providing support and assistance to educators especially regarding the development of materials and software and hardware provisions. The media centre should influence the professional growth of both educators and educands.

#### 4.4.2. REASONS FOR “SELDOM OR NEVER” VISITING THE MEDIA CENTRE

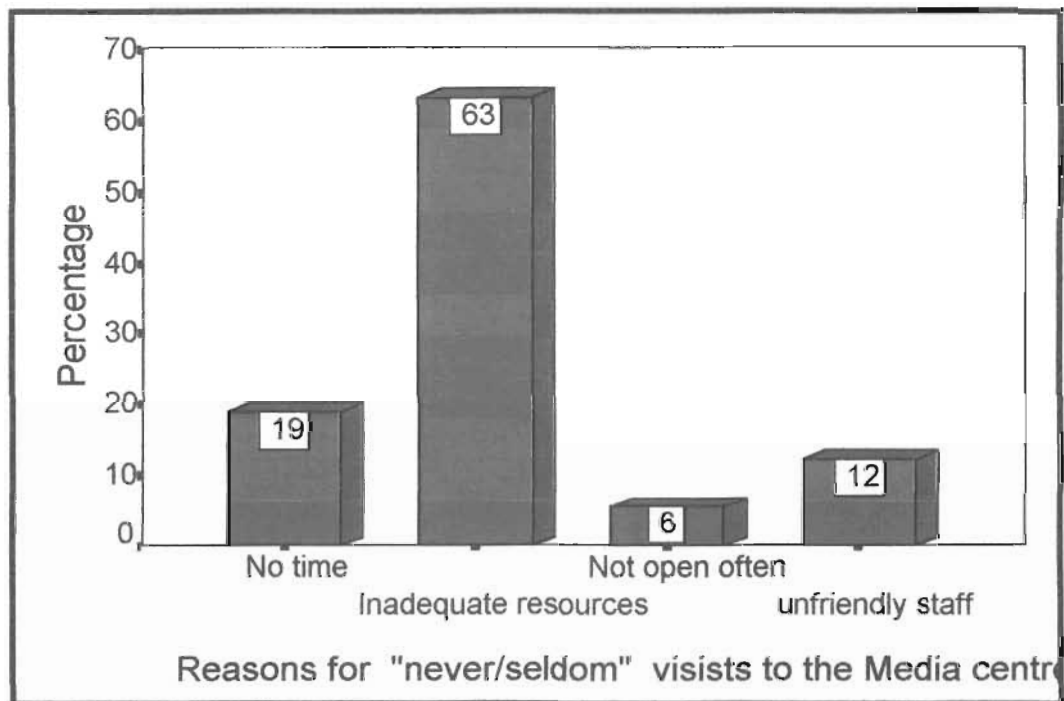


FIGURE 31. : REASONS FOR “NEVER/SELDOM” VISITS TO THE SCHOOL MEDIA CENTRE

Figure 31. gives a summary of all the reasons that respondents gave as to

why they never or seldom visit their schools media centre. The question was open ended where respondents had the opportunity to give an object as possible reason. After analysing the 120 questionnaires four broad categories of reasons emerged, viz:

63% of the respondents indicated that they seldom or never visit their media centre for it had an inadequate and inappropriate resource collection; 19% stated that they did not have the necessary time to visit the media centre; 12% indicated that staff were generally unfriendly and unwelcoming while 6% indicated that they do not visit the media centre for it was not open and accessible often enough.

A very high percentage (63%) indicated that their schools media centre was under resourced, however many questions could be asked as to why such a status quo exists. In most instances, people would use the evils of apartheid with its unequitable resource distribution as the chief reason for school media centres in disadvantaged areas being under - resourced.

However we also need to analyse the effectiveness and status of teacher librarians in terms of qualifications and status in schools. Most schools do not have teacher librarians at the helm of their media centres. This task has been passed onto mainly unqualified clerical staff. And for these reasons most of the unqualified clerical staff are unable to provide the type of support that is required from media centres.

It is hoped that the National Department of Education will rethink its policies on role of teacher librarians and more so the development of media centres at schools. The Phoenix region has numerous qualified teacher librarians, however due to departmental policy they have been removed from media centres and are now teaching subjects in the mainstream.

#### 4.4.3.1. IS YOUR SCHOOL'S MEDIA CENTRE FUNCTIONING AT ITS OPTIMUM LEVEL?

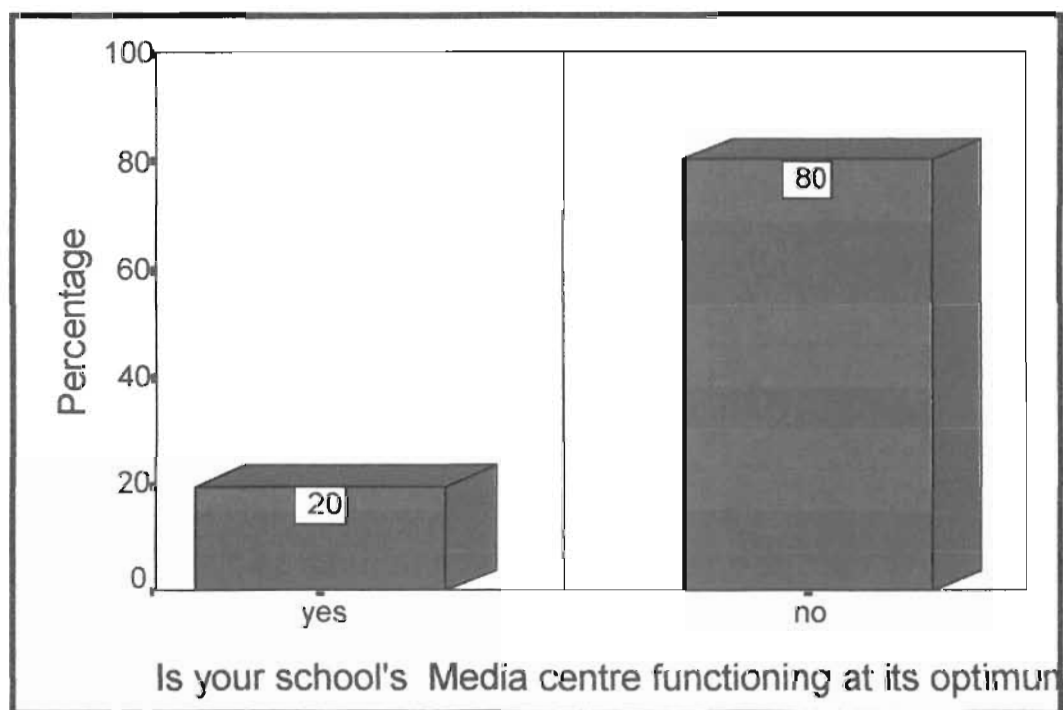


FIGURE 32. : THE LEVEL OF FUNCTIONING OF THE SCHOOL MEDIA CENTRE

#### 4.4.3.2. WHAT ARE POSSIBLE REASONS FOR YOUR SCHOOLS MEDIA CENTRE NOT FUNCTIONING AT IT'S OPTIMUM LEVEL?

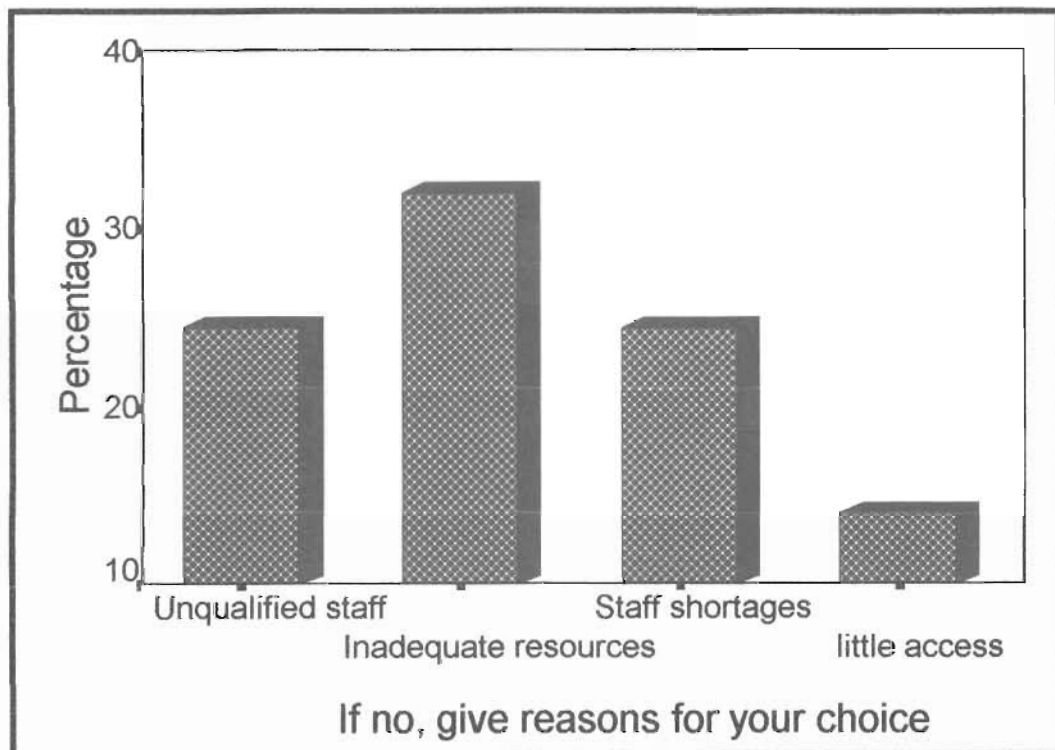


FIGURE 33. : REASONS FOR THE SCHOOL MEDIA CENTRE NOT FUNCTIONING AT ITS OPTIMUM LEVEL.

Of the 80% (Figure 33) of the respondents who indicated that their school's media centre is not functioning at its optimum level gave the following reasons which are illustrated by Figure 33. However, it must be pointed out that this question was also open ended and the categories that merged from the responses given were merely grouped together and presented in Figure 33.



Figure 33. clearly indicates that the majority of the respondents felt that due to inadequate resources (35%) their media centres were not functioning at its capacity; 30% stated that their school's media centre was not functioning at its optimum level because of severe staff shortages. However staff shortages must be seen against the background of qualified staff that have been trained in media centre management and administration but due to departmental policy their roles have been given to clerks who are employed largely on a part time basis. Thus staff shortages are mainly due to departmental policy and not to lack of qualified personnel.

30% also indicated that the media centre was not functioning to capacity because of unqualified staff. This is so because as mentioned earlier that qualified librarians have been removed from the media centre and have been asked to teach in classrooms with regard to school subjects. Their roles have been largely given to mainly unqualified library clerks. With more recent developments these library clerks have also been redeployed to school offices to fulfill administration and clerical matters for the school.

15% of the respondents indicated that they have little access to their schools media centre and the reasons given were that the library clerks who were in charge were now taken away to carry out clerical duties in the schools administration.

Thus, in conclusion it is evident that the KZN DEC has shown no initiative and over the years have diminished the role and value of media centres to zero, ie. media centres have come to a virtual standstill in terms of its optimum functioning and initial role that it was designed and introduced to carry out. This is very sad especially in a country such as ours which endured apartheid education with all its evils of inequality and unequal distribution of resources. Media centres must be seen as important and effective structures in education which had the capacity of strengthening and promoting educational ideals. It is also the support house for educators who must develop and promote resources and materials to enhance the quality of teaching and learning. The value of media centres and its role must be identified as soon as possible if educational technology is to be adopted. In fact educational technology depends on good and efficient media centres to sustain its functioning and effectiveness.

#### 4.5. EDUCATIONAL TECHNOLOGY AND THE LEVEL OF COMPUTER LITERACY AMONGST EDUCATORS IN KZN SCHOOLS

##### 4.5.1. ARE YOU COMPUTER LITERATE?

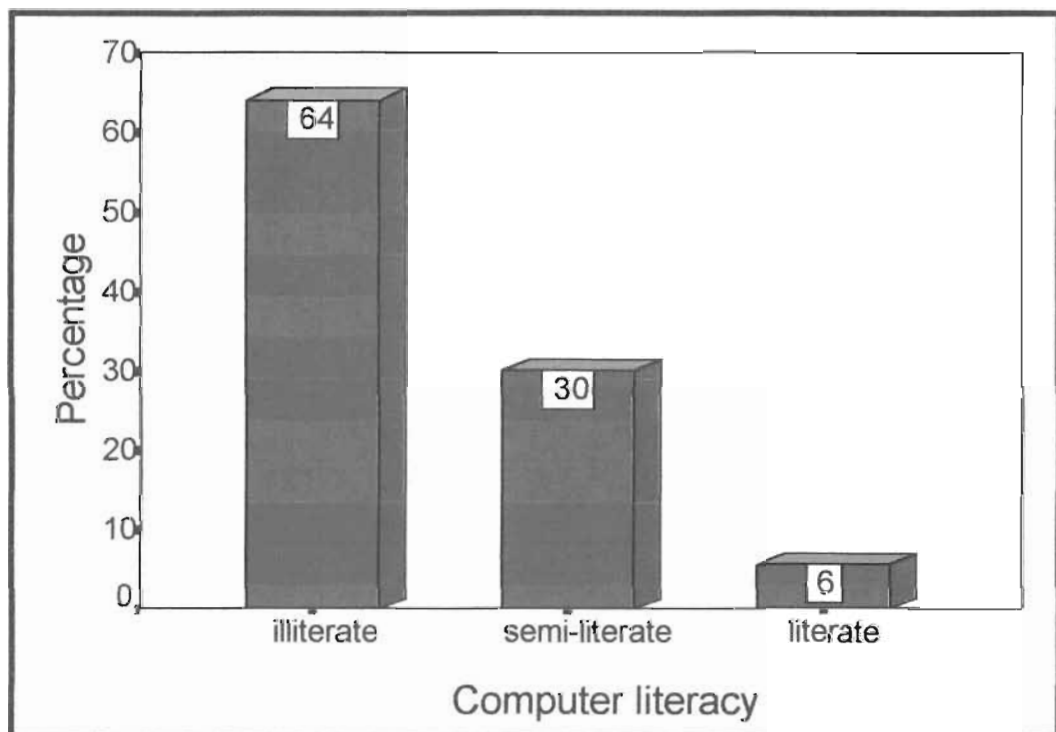


FIGURE 34: LEVEL OF COMPUTER LITERACY

Of the 120 respondents - 77(64% respondents) were computer illiterate; 36 (30%) were semi-literate while 6 (7%) were computer literate. This status quo as regards computer literacy amongst educators in KZN are most disappointing indeed.

It is certain that something drastic has to be done to develop and sustain a more computer literate society in the province of KZN. With the information superhighway of the world, computer knowledge and skills are fast becoming the norm of society. Thus if teachers themselves are, computer illiterate then the school going children of society are certainly disadvantaged. The school must be seen to be fulfilling the needs of society and as such schools are entrusted with the task of preparing youngsters to assume their responsible place in society.

#### 4.5.2. DO YOU HAVE ACCESS TO COMPUTERS AT YOUR SCHOOL?

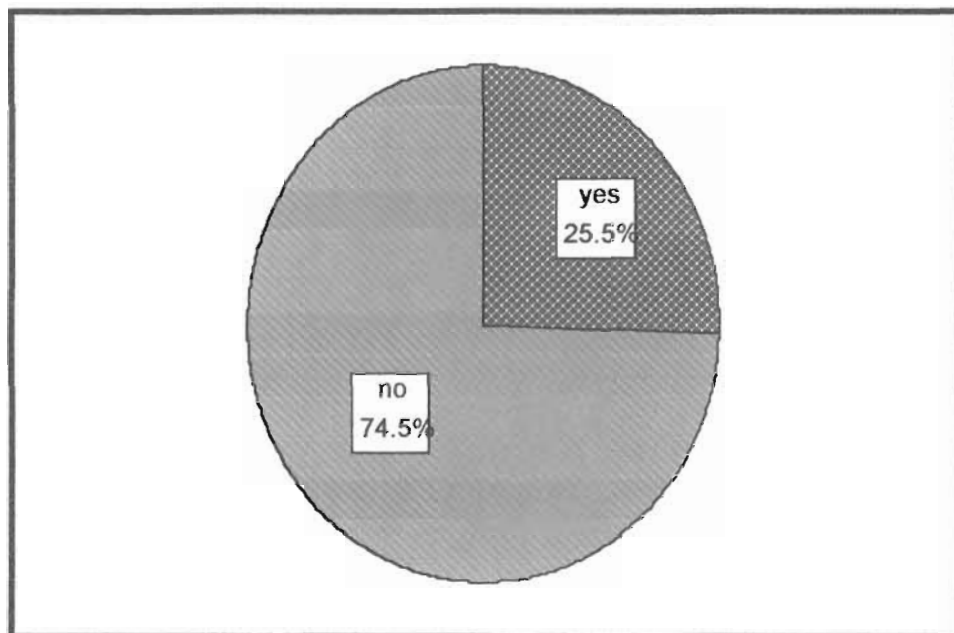


FIGURE 35. : ACCESS TO COMPUTERS AT SCHOOL

The majority of the respondents (74,5%) did not have access to computers at their school. Many reasons were given for non-access to

computers at their school. In this regard the majority of the respondents especially from the primary schools indicated that their school had only one computer which was located in their school's secretary's office. They were not allowed to use this computer of the secretary. In secondary schools, the respondents indicated that although computer studies was offered, many computers were in a state of disrepair and as such they were unable to use these computers. Some respondents also stated that the teacher who was in charge of the computer room was unwilling to allow them access because he / she was instructed by the Head of Department not to allow teachers to use the computers. Here, again one needs to assess this situation in the context of bureaucracy whereby when hardware are broken, then the person in charge has to be accountable to such an extent that he / she is thus discouraged in the first place to allow access.

The research findings presented in this chapter paint a very bleak picture as regards the status of educational technology afforded in South Africa. One would have hoped that with the birth of democracy in 1994, South Africa's educational landscape would have also undergone a complete renaissance especially in terms of redressing the imbalances and inequalities that were perpetuated by apartheid provisioning of education. It has been tried, tested and proved that the in co-operation of educational technology into main stream educational systems is of paramount importance if efficiency and effectiveness are to be attained in so far as

satisfying the aims, goals and expectations of society. The research findings contrary to expectations show beyond doubt that educationists at the school level and more importantly managers of National Education are not in contact with educational changes that are sweeping the world. Thus South African education is at the threshold which is underpinned by antiquated and inappropriate educational provisioning.

The research analysis also shows the damning effect of ignorance and backwardness that are characteristic of many individuals that are at the helm of teaching and learning. It also highlights the fundamental weaknesses and flaws that educationists especially at the school level are going about the business of educating South Africa's future leaders. It is very disturbing to note that educators are very far fetched from the assimilation of basic tenets of education such as, for example, contextualising concepts such as "Technology", "Educational Technology", etc. The level of computer literacy amongst educators is also cause for concern. We live in a global village that has been made possible by the information superhighway. The information superhighway is characterised by electronic mail, Internet, etc.

These information systems are able to connect hosts throughout the world in a matter of seconds. This is fundamental to the access of information, yet the majority of educationists included in this study are computer illiterate.

Another conclusion that this research has highlighted relates directly to the administration, management and control of education in the province of KZN. A very large percentage of respondents were disillusioned with educational managers at the provincial level. They, it seemed were justified because of the tentativeness of the KZN DEC to promote and sustain innovation in education. The unwillingness of the KZN DEC to participate in the Technology Enhanced Investigation that was conducted in 1996 has been a good example to cite in terms of characterising them as apathetic.

Finally, it is hoped that these research findings will be taken cognisance of, especially with attempts being made to accept the value and significance of educational technology in promoting, enhancing and sustaining the quality of teaching and learning that are being expected from the masses in South Africa.

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**CHAPTER FIVE:  
CONCLUSION**

<b>TABLE OF CONTENTS</b>
--------------------------

<b>5. INTRODUCTION.....</b>	<b>158</b>
<b>5.1. UNDERSTANDING OF THE CONCEPT, “EDUCATIONAL TECHNOLOGY”.....</b>	<b>161</b>
<b>5.1.1. THERE EXISTS A STRONG RELATIONSHIP BETWEEN TERTIARY INSTSITUTIONS WHERE THE RESPONDENTS RESPONDENTS GRADUATED AND THE UNDERSTANDING OF THE CONCEPT, ‘EDUCATIONAL TECHNOLOGY.....</b>	<b>163</b>
<b>5.1.2. THERE IS A STRONG RELATIONSHIP BETWEEN AGE LEVEL AND THE UNDERSTANDING OF THE CONCEPT, “EDUCATIONAL TECHNOLOGY”.....</b>	<b>165</b>
<b>5.1.3. RESOURCE/MEDIA CENTRES WITHIN PRIMARY AND SECONDARY SCHOOLS DO NOT PROMOTE AND DEVELOP EDUCATIONAL TECHNOLOGY.....</b>	<b>166</b>
<b>5.2. EDUCATIONAL TECHNOLOGY DOES NOT EXIST WITHIN THE SOUTH AFRICAN EDUCATIONAL SYSTEM AND THUS THERE IS NO POLICY IN PLACE TO SHAPE EDUCATIONAL TECHNOLOGY.</b>	<b>167</b>
<b>5.2.1. THERE EXISTS NO DIRECTORATE OF EDUCATIONAL TECHNOLOGY IN KZN.....</b>	<b>168</b>
<b>5.2.2. THERE EXISTS NO SUBJECT ADVISORS FOR EDUCATIONAL TECHNOLOGY IN KZN.....</b>	<b>169</b>
<b>5.2.3. REASONS FOR THE NON - EXISTENCE OF SUBJECT ADVISORS AND A DIRECTORATE FOR EDUCATIONAL TECHNOLOGY IN KZN.....</b>	<b>169</b>

<b>5.3. THE MAJORITY OF EDUCATORS IN KZN REQUEST MAJOR CHANGES AS REGARDS EDUCATIONAL TECHNOLOGY.....</b>	<b>169</b>
<b>5.4. MAJORITY OF THE EDUCATORS REQUESTED INSET PROGRAMMES FOR IMPROVING THEIR UNDERSTANDING OF THE CONCEPT, “EDUCATIONAL TECHNOLOGY” .....</b>	<b>171</b>
<b>5.5. RECOMMENDATIONS.....</b>	<b>171</b>
<b>5.5.1. ESTABLISHMENT OF EDUCATIONAL TECHNOLOGY INSTITUTE IN SOUTH AFRICA.....</b>	<b>171</b>
<b>5.5.2. INSET PROGRAMMES.....</b>	<b>173</b>
<b>5.5.3. THE DEVELOPMENT/ESTABLISHMENT AND PROMOTION RESOURCE/MEDIA CENTRES IN KZN SCHOOLS.....</b>	<b>174</b>
<b>5.5.4. DEVELOPMENT OF A POLICY FRAMEOWORK ON EDUCATIONAL TECHNOLOGY IN SOUTH AFRICA.....</b>	<b>175</b>

**5. INTRODUCTION:**

The Government of National Unity (GNU) was established in 1994 after the first democratic elections in South Africa. The GNU inherited an educational system that was highly fragmented and disparately fashioned along the lines of racism and subservience which were the cornerstones of apartheid.

Through legislation and the ideals of separate development, the apartheid regime gave itself absolute power in providing an educational system that was totally inferior for the non - white masses compared to their white minority counterparts. These glaring malpractices of educational provisioning for the non white masses was contained and used in every sphere of the education dispensation especially in terms of human, financial, physical and technical resources provided to non - white schools. In essence education for the non - whites was perceived to be a privilege rather than a fundamental basic human right. The policy of apartheid was used as a yardstick to develop education in line with racial bias and oppression and these policies were void of any logical philosophical and epistemological foundations. The educational system provided for the non - white masses was too Eurocentric and underpinned by Christian National Education (CNE). Curricula and syllabi were all centrally designed and implemented with heavy bias and prejudice.

1994 was a watershed year in South Africa's history. The aspirations and eagerness of millions of non - whites were at its peak and their perceptions and expectations were such that indeed, real tangible changes would at last ensue in post apartheid South Africa. Nonetheless, changes did occur. However, the changes and transformation that were expected in the educational system did not materialize to the extent that one would have hoped for. Legislation, policies, etc have gone far enough to remove barriers of oppression and racism. However, nothing, if not very little, has been achieved at the grass roots level, with reference to educational provisioning. The present National Ministry of Education must be vilified for its lack of vision and direction especially in terms of identifying and incorporating educational technology into the sphere of the educational landscape. The National Ministry of Education seems to have learnt very little from the legacies of apartheid and as such has done little to improve and enhance the quality of teaching and learning in the educational sector.

As in the past, policies and major educational initiatives are still being pursued in a piece meal fashion lacking coherency and systemisation. Policy development and innovations in the educational system must proceed within a systems approach, whereby the evaluation of all components and subsystems within the entire system must be taken into account.

All stakeholders must be involved in the educational process. The educational authorities have done little thus far to build and foster a close and successful partnership with business and industry which is so vital for educational success.

Based on these circumstances it would have been most appropriate for the National Ministry of Education to undertake case studies and exchange programmes whereby educational systems of successful countries could have been analysed. Countries of note would have been Hungary which similar to South Africa had to endure years of oppression. Hungary only recently achieved democracy and there were many lessons to have been learnt from their experiences. Hungary also made efficient use of funding from the United Nations Organisation(UNO) to develop educational technology. It has an educational system that has been fundamentally laid on the foundations/principles of educational technology. The influence of educational technology in enhancing the quality of teaching and learning has been long identified by most democracies throughout the world and it is thus rather disconcerting to find that South Africa has yet to incorporate the principles and basis of educational technology.

This research study was thus an attempt to identify, assess and evaluate educational technology in South Africa. Because of the time and cost factor this study was concentrated in Phoenix which is located

approximately 20 kilometres north of Durban in the province of Kwazulu Natal. There were two key questions that this study hoped to answer, namely, How do educationists understand the concept, “educational technology”?; Are there any policies in place that shapes educational technology in primary and secondary schools? Based on these two key questions, the following conclusions were derived at:

### **5.1. UNDERSTANDING OF THE CONCEPT “EDUCATIONAL TECHNOLOGY”**

The study proved beyond doubt that educators in both primary and secondary schools in KZN do not understand the concept, “Educational Technology”. The majority of these educators understood educational technology as the use of computers and teaching machines in the classroom. This mechanistic view of educational technology is cause for concern as it will have a detrimental effect especially for those teachers employed in the so called disadvantaged schools who are under resourced with teaching equipment and machines. The reason for suggesting this is that the research study concluded that some educators felt that their pupil’s poor achievements in various grades were as a direct result of the lack of teaching resources. However, these educators are ill - informed when one considers that fact that education in the past proceeded with little or in some generations with no resources, yet there emerged many scholars who were distinguished in their fields of study. Although

resources can be significant in teaching and learning, it however must not be perceived of as being of sole necessity if quality education and training is to be achieved. It was also evident from the research findings that the majority of respondents were unable to distinguish between technology of education and technology in education. For most respondents there was no difference and thus it was no wonder that respondents placed heavy emphasis on “technology in education”. Technology in education refers to teaching machines, gadgets, and electronic equipment that is being used in classrooms. However of vital importance is “Technology of education” which refers to the teaching strategies and methods employed to enhance the quality of teaching and learning. Both these concept must be seen as having equal importance in the educational landscape. In fact if technology of education is grasped thoroughly then it is reasonably possible to achieve quality in education and training even without teaching resources (technology in education).

Clark (1984) in his article entitled “Reconsidering research on media” carried numerous longitudinal studies and came to the conclusion that media/teaching resources do not necessarily enhance the quality of teaching and learning. He went on to argue that teaching resources whether new or modern always have a novelty effect which with time wears of and thus pupils enthusiasm is lost. Thus Clark(1984) is also of the opinion that the most significant contributor to teaching and learning is the strategies and methods employed to deliver and facilitate instruction.



Further, in analysing the perceptions of educators on the concept, “educational technology”, the following correlations were derived at, namely :

**5.1.1. THERE EXISTS A STRONG RELATIONSHIP BETWEEN TERTIARY INSTITUTIONS WHERE RESPONDENTS GRADUATED AND THEIR UNDERSTANDING OF THE CONCEPT “EDUCATIONAL TECHNOLOGY”**

The following four teacher training institutions were most popular in this study, ie; University of Durban Westville(UDW), Springfield College of Education (SCE), Transvaal College of Education(TCE) and the University of Natal (Durban)(UND).

The study concluded that of these four institutions, UND provided the least input in terms of respondents understanding the concept, “Educational Technology”. In fact 100% of the respondents did not have the correct understanding of the concept “educational technology”. On the other hand 100% of the respondents who graduated at UDW understood the concept, “Educational Technology”. 33% of the respondents who graduated from SCE indicated the correct and acceptable understanding of “educational technology”. This is most disconcerting in view of the fact that SCE is a teacher training institution that is managed and administered by the National Ministry of Education. One would have therefore hoped that teacher training institutions of the

National Department of Education would have been the first, in terms of introducing and equipping their students with the latest and most modern teaching strategies, teaching methods and technological integration with a realisation towards educational reform and transformation. However, this was not the case as this study clearly concludes.

UDW on the hand must be commended since most students who graduated there indicated that they had come across the concept “educational technology” during their education and training. One would therefore assume that UDW has been able to identify the value and significance of “educational technology” and has therefore in co-operated and implemented it into its teacher education program.

It is certain that if all teacher education institutions are able to develop and sustain a strong educational technological background then it will subsequently rub off into school education via its trainees. This will benefit South Africa as a whole in terms of pupils engaging and competing in the international education landscape.

#### **5.1.2. THERE IS A STRONG RELATIONSHIP BETWEEN AGE LEVEL AND THE UNDERSTANDING OF THE CONCEPT “EDUCATIONAL TECHNOLOGY”**

A strong relationship emerged between age level and the respondents understanding of the concept “educational technology”. The older the respondent the less likelihood of them understanding the concept

“educational technology”. However there was one exception where age did not significantly alter respondents understanding of “educational technology”. This exception concerned the respondents “qualification status”, ie, the higher the qualification the better the respondents understood “educational technology”. Thus even elderly respondents understood of the concept “educational technology” as long as they had higher qualifications. This also concludes that further studies in improving qualifications did in fact improve respondents understanding of the concept “educational technology”.

#### **5.1.3. RESOURCE/MEDIA CENTRES WITHIN PRIMARY AND SECONDARY SCHOOLS ARE NOT PROMOTING AND DEVELOPING “EDUCATIONAL TECHNOLOGY”**

From this study it was concluded beyond any doubt that, resource/media centres at both primary and secondary schools are not fulfilling their assumed roles of developing curriculum and support materials; providing hardware and software that educators could use during teaching and learning episodes; etc.

What emerged very clearly was the fact that the majority of media centres/resource centres are not being managed by qualified teacher librarians but instead are being administered and managed by library clerks. As of 1995 all teacher librarians were removed from resource/media centres and were asked to teach formal subjects that are

being taught in the mainstream. Thus resource/media centres are fully in the hands of library clerks who are in the majority unqualified in the field of resource centre management. Therefore one could not hope for these library clerks to provide the support and assistance that are so vital in shaping and sustaining educational technology in schools. However what is amazing is the fact that the majority of respondents indicated that their schools have in their employ, qualified teacher librarians who were removed from the resource/media centres due to departmental policy. The departmental policy of KZN in removing teacher librarians from media centres/resource centres is rather intriguing owing to the fact that media/resource centres form the hub of any educational institution. In fact there exists no educational institution that does not value resource/media centres. It is thus absurd to conscientiae the rationale behind the removal of teacher librarians from resource/media centres in schools.

## **5.2. “EDUCATIONAL TECHNOLOGY DOES NOT EXIST IN SOUTH AFRICA’S EDUCATIONAL LANDSCAPE AND THUS THERE IS NO POLICY IN PLACE THAT SHAPES EDUCATIONAL TECHNOLOGY.**

This study concluded that there exists no policy on “educational technology” in South Africa. This was based on the data supplied by the respondents of whom the majority indicated that there was no Provincial Directorate of Educational Technology, neither were there subject

advisors in educational technology. Not one respondent indicated that subjects advisors in educational technology visited their school to provide assistance and guidance in educational technology.

Three principals also corroborated this by indicating that under apartheid education “library subject advisors visited their schools from time to time offering advice and guidance in terms of subject integration where subject teachers could use the resource/media centre to teach across the curriculum. This also facilitated collaborative teaching where teachers planned, designed and engaged resources together.

#### **5.2.1. THERE EXISTS NO DIRECTORATE OF EDUCATIONAL TECHNOLOGY IN KZN**

The majority (62%) of the respondents indicated that KZN lacked a provincial directorate of Educational Technology. One can therefore safely assume that there exists no policies, frameworks or paradigms where educational technology has been identified as a significant contributor towards enhancing teaching and learning. In January 1997 a subsequent post of “Chief Education Specialist : Educational Technology” was advertised and filled in KZN. This is in stark contrast with other provinces such as the Western Cape, Free State and Gauteng who have created a directorate of Educational Technology as early as 1996.

**5.2.2. THERE EXISTS NO SUBJECT ADVISORS OF EDUCATIONAL TECHNOLOGY IN KZN.**

78% of the respondents indicated that there exists no subject advisers of educational technology in KZN. These respondents also indicated that in the past subject advisors in resource/media centre management visited their schools regularly offering guidance and assistance in the field of book education, software and hardware acquisition, materials development. Thus it was felt by many of the respondents that the new KZN Department of Education was worse off than education provided by the apartheid government. They also cited funding of media centres/resource centres that have been stopped by the new education dispensation.

**5.2.3. REASONS FOR THE NON EXISTENCE OF A DIRECTORATE AND SUBJECT ADVISORS OF EDUCATIONAL TECHNOLOGY IN KZN.**

Essentially there were four reasons that respondents gave in terms of why a directorate and subject advisors do not exist in KZN. Of significance is the high number of respondents who had indicated that KZN Department of Education is disorganised. This is a severe indictment on the image, and regard that educators have for their employer.

The significance of this lies in the fact that 70% indicated that they are disillusioned with their department because they felt that their education

department was disorganised. These respondents also indicated that KZN is being worst beset by problems in the educational sectors and they therefore attributed this to the dragging of the feet of educational authorities on progress towards reforms and transformation of education.

The above perception of the majority of the educators in this survey is damning as the culture of teaching and learning could only subside and not improve if the educators are disillusioned and despondent with their employers. For growth and progress there must exist a close, cordial and bilateral relationship between employer and employee. However this is not the case in KZN.

### **5.3. THE MAJORITY OF EDUCATORS IN KZN REQUESTED MAJOR CHANGES IN EDUCATION AS REGARDS EDUCATIONAL TECHNOLOGY.**

44% of the respondents indicated that educational technology must be introduced as a matter of urgency at levels of education in South Africa. However the respondents also stressed that changes commence first and foremost at the school level. 38% of the respondents also indicated that KZN develop a policy framework which could be used to guide and offer direction in the development and promotion of educational technology. 7% indicated that a directorate and subject advisors be introduced immediately in KZN.

8% wanted more computers and associated resources in schools.

4% stated that an Educational Technology Institute be established in KZN.

In the main there was overwhelming support and agreement that the South African educational system needs to undergo a complete reformation in terms of enhancing the quality of teaching and learning. Respondents were also of the opinion that apathy amongst educators must be addressed as soon as possible with special reference to their perception of the KZN Department of Education whom the majority had indicated was disorganised.

Thus educators have begun to identify the major shortcomings and changes that must be addressed so that our pupils can enjoy the type of educational provisioning that will enable them to compete globally. This necessarily implies the adoption of technology in education and technology of education, ie, “educational technology” .



#### **5.4. MAJORITY OF THE RESPONDENTS REQUESTED IN SERVICE TRAINING PROGRAMMES FOR IMPROVING THEIR UNDERSTANDING OF THE CONCEPT, “EDUCATIONAL TECHNOLOGY.”**

96% of the respondents indicated that they wished to engage in INSET programmes in order to improve their understanding of the concept “educational technology”. The majority of these respondents (51%) also stated that they would welcome INSET programmes from the University of Durban Westville, 25,5% indicated that they would like to attend INSET programmes organised through Springfield College of Education. Based on the above percentages, it appears that the University of Durban Westville is held in very high esteem amongst educators in KZN. Respondents who did not even graduate at UDW were in favour of attending INSET programmes at UDW.

#### **5.5. RECOMMENDATIONS:**

##### **5.5.1. ESTABLISHMENT OF AN EDUCATIONAL TECHNOLOGY INSTITUTE IN SOUTH AFRICA.**

It is strongly recommended that attempts be made in establishing an Educational Technology Institute that can serve as an umbrella body in facilitating, promoting and developing educational technology in South

Africa. Such an institution can play a further role in integrating the various facets of education thereby creating and demanding a systematic approach to education which has proven to be the golden route to educational success throughout the world. Amongst others, the major task of this Institute should be aimed at promoting research and the practice of educational technology in South Africa.

The National Department of Education should be entrusted with the initiation of such an institute so that it can be able to embark on a more systematic and structured policy towards educational provision in South Africa. Major policy formulation and implementation could be thoroughly researched through this institute while involving all the stakeholders in education. Business and industry is not thoroughly involved in South African education and it is therefore hoped that with the formation of an Educational Technology Institute, business and industry will be incorporated into playing a more meaningful role in our educational landscape. There must be a strong and successful partnership between business and education. In a way both are inter - dependant and thus linkages between the two are of paramount importance if we are to prepare pupils for the job market and the economy at large.

### 5.5.2. INSET PROGRAMMES:

IN SERVICE EDUCATION AND TRAINING must commence in earnest. This must be structured and systematically programmed to meet the needs of all educationists in South Africa. It would be logical to begin INSET programmes commencing from the upper hierarchies in the educational system who comprise mainly policy makers at the National Government level. These would include the national minister and all provincial ministers of education. Once these managers are in a position to understand the significance of educational technology then surely policies would emerge where schools level managers will in turn be trained to implement and develop educational technology. Educational technology must be perceived off as a dynamic process that is continuously evolving with the advent new technologies, thinking and strategies that emerge throughout the world as long as man lives. The information explosion that continues to beset us, demands that education change from time to time so that pupils can be adequately prepared to enter the world capable of assimilating and fulfilling their roles in the global society that we live in.

This study further concluded that educators especially at the school level are eagerly waiting workshops, INSET and PRESET programmes on

educational technology. It is therefore certain that very little resistance will emerge from the part of educators. However INSET programmes must have built in mechanisms that must be able to attract individuals to it.

#### **5.5.3. THE DEVELOPMENT/ ESTABLISHMENT AND PROMOTION OF RESOURCE/MEDIA CENTRES IN KZN SCHOOLS:**

It is strongly recommended that resource/media centres be introduced and developed in schools. In those schools where these facilities exist, competent teacher librarians should be reinstated into these centres. The resource/media centre could go a long way in satisfying the requirements and principles underlined by educational technology. It is rather sad that qualified and competent personnel were removed from resource/media centres and absorbed back into the main stream of teaching. Resource/media centres are vital in the light of the introduction of Outcomes Based Education in South Africa(OBE). Fundamental to OBE is resource and materials development.

Thus resource/media centres must be established to fulfill the role of providing, assisting and developing curriculum materials by educators in schools. These resource centres/media centres must also be provided with a range of hardware and software that can in turn be loaned to educators who will have to restructure their teaching methods and strategies.

#### 5.5.4. DEVELOPMENT OF A POLICY FRAMEWORK ON EDUCATIONAL TECHNOLOGY IN SOUTH AFRICA:

South Africa's educational system must be fashioned along the principles of educational technology. There must emerge a well balanced policy framework which spells out exactly how teaching and learning ought to take place under the auspices of transformation towards educational excellence. The policy document must be within the grasp of all stakeholders in terms of it being practical, realistic and adaptable. The policy must include how technology in education and technology of education could be assimilated in enhancing the quality of teaching and learning in south Africa. Valuable information, support and guidance can be obtained from countries which have achieved success in Educational Technology. It is being proposed here that Hungary would be the best suited example in sharing our very own experiences as they too had to endure various types of complexities beset by totalitarianism. Hungary is also a relatively new democracy and it is certain that we can learn and share experiences from/with them.

Finally, it would mean a great deal if educational authorities would come to their senses and begin to identify the losses in ignoring educational technology in South Africa. It is hoped that the conclusion and recommendations offered will be accepted in the spirit with which this research was conducted.

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**7. APPENDICES**

## APPENDIX A : QUESTIONNAIRE

## QUESTIONNAIRE

REF. NO.

[LEAVE BLANK]

Dear Respondent,

I am carrying out research on the "Role and Policy of educational Technology in the province of KwaZulu Natal(KZN). Your input will be of utmost value in drawing conclusions as to the role and practice of educational technology in schools in KZN.

Would you therefore be kind enough to complete the attached questionnaire?

PLEASE TAKE NOTE OF THE FOLLOWING:

1. All responses will be treated with strict confidentiality.
2. Your identity will not be divulged without your permission
3. Answer all questions
4. There are no right and wrong answers.
5. Respond to each question in a manner that will reflect your very own and honest opinion

**THANK YOU FOR YOUR SUPPORT AND PAITENCE**

1997: 02:10

\_\_\_\_\_  
**Devan Govender**

## PART A

## GENERAL INFORMATION ABOUT YOURSELF

## 1. State your age group

20 - 29	
30 - 39	
40 - 49	
50 - 59	
60+	

## 2. At which of the following tertiary institution did you graduate?

Springfield College	
UDW	
UND (Natal)	
UNIZUL	
Adams College	
Edgewood College	
Other(Specify)	

**3. Did you first graduate as a teacher with a....**

3 year diploma	
4 year diploma	
3 year degree	
4 year degree	
other(Specify)	

**4. State your present qualifications and specify the year in which obtained..**

Example: diploma only	X 1992
diploma only	
degree only	
diploma, degree, honours	
diploma, degree, honours, masters	
other (specify)	

**5. State your present category classification**

C	
D	
E	
F	
G	
other(specify)	

**6. State your present post level**

1	
2	
3	
4	
other (Specify)	

**PART B****GENERAL INFORMATION ABOUT YOUR SCHOOL****7. Are you presently teaching in a....**

Primary School	
Secondary School	

**8. Your present school was previously administered by....**

Ex HOD	
Ex HOR	
Ex DET	
Ex HOA	
Ex KZDEC	
Other(Specify)	

**9. State your school's total population**

<400	
401 - 600	
701 - 900	
901 -1000	
>1001	

**10. (A) Is the pupil population at your school racially mixed?**

yes	
no	

**(B) If no, state the predominant race group of the pupils**

Indians	
Blacks	
Coloureds	
Whites	

**©If yes, state the dominant racial mix**

Indians and blacks	
Indians, Blacks, Coloureds	
Blacks and Coloureds	
other(specify)	

**11. State the number of teaching staff at your school**

>15	
16 - 20	
21 - 30	
31 - 40	
41 - 50	
<50	

**PART C****YOUR SCHOOL MEDIA CENTRE/LIBRARY/RESOURCE CENTRE****12. Does your school have a**

library	
media centre	
resource centre	
storeroom for books	
none of the above	
other(specify)	

**13. If your school has any one of (answer to question 12), is the person or persons in charge a**

teacher librarian	
admin clerk	
library assistant(clerk)	
teacher	
I don't know	



**14. Is the above person or persons.....**

unqualified but helpful	
qualified and unhelpful	
qualified and very helpful	
unqualified and unhelpful	
other(specify)	

**15. (A) In your opinion is the library/media centre or resource centre at your school functioning at its optimum capacity?**

yes	
no	

**(B) If no, give a reason/s**

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**16. If yes, give a reason/s**

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**17. How often do you visit the resource centre/media centre/library at your school?**

often	
very often	
seldom	
never	

**18. Give reasons for your answer to question no 17.**

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**PART D**

**YOUR UNDERSTANDING OF EDUCATIONAL TECHNOLOGY**

**19. In your opinion, the concept "Technology" refers to .....**

machines and gadgets	
the process of innovative thinking	
all of the above	
I don't know	
other (specify)	

**20. Have you come across the concept “Educational Technology”?**

yes	
no	

**21. If yes, where and when did you first come across this concept?**

during my final year teacher training at(specify eg. UDW)	
from education bulletins sent to schools by the education department.	
White Paper II on education	
the local teachers centre (specify)	
teacher librarian	
other(specify)	

**22. What is your understanding of the concept “Educational Technology”**

it refers to the use of computers in education	
it is a systems approach towards enhancing teaching and learning through the careful processes of design, planning, implementation, management and evaluation	
all of the above	
I don't know	
other(specify)	

**23. Is there a difference between: X - Technology of education  
Y - Technology in education**

yes	
no	
I don't know	

**24. If your response to Question 23 is yes, then what is the reason/s?**

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**25. In your experience as a teacher, which of the following concepts have you come across thus far, in terms of teaching resources?**

hardware	
software	
underware	
hi-technology	
low-technology	
no-technology	

## PART E

## YOUR DEPARTMENT'S POLICY ON EDUCATIONAL TECHNOLOGY

**26. Does a provincial directorate in Educational Technology exist in your department of education. ?**

yes	
no	
I don't know	

**27. Is there a subject advisor in education Technology that visit your school guiding teachers on the value of educational technology?**

yes	
no	
I don't know	

**28. If no, suggest a reason/s why a subject advisor does not exist.**

Educational Technology is not important	
the province lacks financial resources	
Educational Technology is yet to be adopted	
the present education department is disorganised	
I am not sure	
other(specify)	

**29. Would you as an individual like to know more about**

**educational technology?**

yes	
no	

**30. If yes, why?**

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**31. If yes, which of the following would you welcome most in terms of gaining a deeper insight into educational technology/**

Inservice programmes at a University	
Inservice programmes at a Teacher Training College	
workshops/seminars at school	
workshops/seminars at my local teachers centre	
educational bulletins from the department	
other(specify)	

**31.If no, why?**

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PART F
GENERAL

**32. In terms of Computers, which of the following best describes your knowledge?**

illiterate	
semiliterate	
literate	

**33. If you are computer illiterate, then please give a reason/s as to why?**

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**33. Do you have access to computers at your school?**

Yes	
No	

**34. Which of the following have you come across or heard about?**

Windows	
E-Mail	
Internet	
CD-ROM	

**35. Have you any knowledge of the “Teacher Enhanced Learning Investigation” ( TELI) that was carried out by the National Ministry of Education in 1996?**

yes	
no	

**36. If yes, does your school have a copy of the TELI discussion document?**

yes	
no	
I am not sure	

**37. What major changes would you like to see as regards Educational Technology in KZN schools?**

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***THANK YOU FOR YOUR SUPPORT AND PAITENCE !!!!***

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DEVAN GOVENDER

1997:02:10