A COMPARATIVE STUDY OF THE CURRICULUM FOR SECONDARY TECHNICAL AND SELECTED MULTITRACK SECONDARY SCHOOLS IN ZAMBIA

BY

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF EDUCATION

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A P P R O V A L

THIS DISSERTATION OF **ADRIAN KORINTO CHAPASUKA TEMBO** IS APPROVED AS FULFILLING PART OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF EDUCATION BY THE UNIVERSITY OF ZAMBIA.

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D E D I C A T I O N

To my wife Rosie and our Children Bessie, Charity, Robert, Rabecca, Richard and Ella.

A B S T R A C T

This study tested the hypotheses that there are no significant differences in the nature of the curriculum, supportive Human and material resources and Grade 12 Examination Results in Woodwork and Geometrical Drawing between Secondary Technical and Multitrack Secondary Schools.

The sample consisted four boarding male Secondary Schools out of a population of ten. Guided partly by the case study model advocated by Robert State (1969) questionnaires and structured interviews were designed to compare input in planning and developing the curriculum, supportive Human and material resources and the output in terms of scholarstic outcomes in woodwork and Geometrical Drawing at Grade 12 Examination level between Secondary Technical and Multitrack Secondary Schools. Data were analysed through percentages, cross tabulation procedures and contigency tables. The Chi-square was finally used to statistically test hypotheses on material resources and examination results.

The overal analysis showed that there are no significant differences between theoretical inputs in the nature of the carriculum, provision of Human and material resources and the output in Grade 12 examination results in Woodwork and Geometrical Drawing between the two types of Secondary Schools.

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INTRODUCTION

The tenets of Human capital theory advocated by Theodore Schultz (1961) and other economists, continue to inspire search for relevant education systems in many third world countries. The rationale for this theory is that education produces human resources necessary for economic and social development. This contention has influenced educational planning and development in many third world countries since the 1960s.

Several third world leaders responded by embracing the notion that education could be used as an effective and powerful tool in accelerating the processes of socio-economic development. Nyerere (1967, Safaya (1976), and Educational Reforms in Zambia (1967).

The strongest expression of political endorsement which influenced many African countries to invest heavily in Education, came from the Education conference held in Addis Ababa, Ethiopia (1961).

In the process of such investments, many countries find themselves facing unintended consequences. Many Youths who complete an Education cycle fail to get admission to the next stage or entry into training institutions. Their efforts to find wage employment turn to be fruitless because of limited labour markets. As schooling raises their hopes for white collar jobs, such youths, finding life unattractive in rural areas, drift to towns thereby causing more social problems.

This state of affairs leads society into blaming the system of education arguing that it is not related to the needs of the employment situation. In such circumstances a common reaction is for Ministries of Education to work out further modifications on the school curriculum.

BACKGROUND TO THE STUDY

Curriculum change is a topic constantly discussed in Education. Schools, colleges and universities are always changing their curricula to match with new demands.

Such changes are either designed deliberately or through external pressure. The history of curriculum development in Zambia dates back to 1966 when the Education Act unifying the systems of Education was passed. This was followed by the creation of the English Medium Centre to develop a relevant curriculum for the Zambia Primary Course. In 1970 the Centre was re-named Curriculum Development Centre. Its main functions were the derivation of Educational objectives, formulation of syllabuses, advising on methodology and drawing evaluation programmes. The creation of the National Curriculum Council in 1973, introduced subject curricular committees through which it was envisaged that relevant curricular programmes would be formulated.

Writers on Educational change call the process of modifying a school curriculum 'Innovation'. This term has been defined differently by many writers. House (1974:21) for example defines an innovation as a deliberate systematic attempt to change schools through the introduction of new ideas and techniques. Peter et al (1977:103) conceiving an innovation as an external contruction defines it as a significant departure from an existing practice. Nisbet's (1982:6) definition is more inclusive when he views innovation as 'any new policy, syllabus, method or organisational change,

which is intended to improve teaching and learning', is close to the present study which views the term innovation as the process by which a new idea or practice comes to be adopted by an individual, a group or an organisation resulting in restructuring of relationships or events.

Zambia like many third world countries, has a centralised system of education which emphasises uniformity, central planning and supervision. Hawes (1979:45) indicates that some third world countries like Ghana, Kenya, Uganda and Zambia to name but a few, have established Curriculum Development Centres to sustain uniformity and centralised supervision.

Modifying a school curriculum in such countries may start from a political pronouncement or public debate. In order to ensure compliance, such systems usually employ what Bennie et al (1969) has called the power-co-ercive strategy which only allows limited participation from the users and ignores some environmental factors which militate against effective implementation. It is for this reason that Hawes (1979) has pointed out that

curriculum planning must be done in terms of political, social and economic contexts in which it is to operate.

Literature indicates that scholars in the field of curriculum, have analysed the process of developing curricular from various view points. One such prominent scholar is Tyler (1949) who has provided a dominant theoretical frame work commonly known as the 'Tyler Rationale' and urges curriculum developers to raise four questions as a means of building curricular programmes. First what purposes should the school seek to attain? Second how can learning experiences be selected to help attain these? Third how can learning experiences be organised for effective instruction and fourthly how can learning experiences be evaluated? Elaborating on this conceptual framework, Abbot (1975:75) has explicated that innovations may be introduced into schools in respect to (a) subject matter, content and organisation (b) instructional procedures and technologies (c) methods of organising students for learning (d) methods of organising teachers and students for instruction and (e) methods of organising schools for administrative and supervisory purposes.

From the above persepctives on innovation, it becomes easy to understand that modifying a school curriculum is a problematic process which calls for rational planning. Pressure to modify the curriculum for practical and technical education in Zambia started with feelings for relevant technical and practical education. Trades Schools criticised for poor quality of technical education Phiri (1981). Literature also shows that before independence such schools had been an integral part of the education system, but that they were closed after independence Kelly, M. J. et al (1986).

When the World Bank began assisting Zambia to build secondary schools, the Zambian Government decided to diversify the curriculum, thereby creating multitrack secondary schools. This meant adding subjects like Commerce, Agriculture Science, Home Economics, Typing, Technical Drawing, Metalwork and Woodwork to the academic curriculum. According to Kaluba (1986), there were seventy four (74) secondary schools following the diversification in this manner by 1986.

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Responding to the economic need to provide a base for technical manpower development and convinced that investments in education have utility value, the Government made another decision to establish secondary technical schools to prepare pupils for training at the University of Zambia and at other higher technical institutions to train as technologists or technicians. This led to the establishment of David Kaunda and Hillcrest Technical Schools in 1965 and 1969 respecitively.

Putting the policy objective for establishing secondary technical schools in a clear perspective, a statement issued during the inaugural ceremony for David Kaunda Secondary Technical School read in part as follows:

> This School (David Kaunda) will thus prepare pupils for ultimate training in engineering or applied sciences either as technologists at the University of Zambia or as technicians in one of the senior technical institutions (Ministry of Education Annual Report Report 1965:19).

The implication of this pronouncement is that multitrack secondary schools were not producing human resources necessary for economic development. This led to the Government's decision to establish two national secondary technical schools with a view to giving pupils opportunities to perform well in technical subjects at grade 12 level. Ultimately curriculum planners were overtly called upon to formulate new curriculum programmes for technical subjects. This called for a significant departure from that followed in multitrack secondary schools to new practices in secondary technical schools.

STATEMENT OF THE PROBLEM

Although nearly two decades have passed since the establishment of the two national secondary technical schools, their effectiveness compared to multitrack secondary schools does not seem to have been empirically assessed. Specifically we do not seem to have research data on curriculum input in terms of human and material resources and the resultant output in terms of examination results in technical subjects at grade 12 level.

Concretely the purpose of this study was to compare available facilities in terms of human and material resources needed for the implementation of a proposed curriculum change (input) and scholarstic out comes in terms of examination results at grade 12 level in Geometrical Drawing and Woodwork. It was perceived necessary to compare the two variables in the two types of secondary schools in order to ascertain the degree to which the curriculum for secondary technical schools was diversified to fulfil their specific goal of preparing pupils for training in engineering or applied sciences and to appreciate the significant departure from the traditional curriculum followed in multitrack secondary schools where the objective is to offer prevocational skills in technical subjects, such as Agriculture, Commerce, Typing and Home Economics.

It was in this vein that the study addressed itself to four pivotal questions:

(i) Is there any difference between the curriculum content for secondary technical schools and that followed in multitrack secondary schools?

(ii) Are there differences in the provision of human resources between secondary technical schools and multitrack secondary schools?

(iii) Are there differences in the provision of material resources betweeen secondary technical schools and multitrack secondary schools?

(iv) Are there any differences in examination results for technical subjects at grade 12 level between pupils from secondary technical schools and those from multitrack secondary schools?

HYPOTHESES

The study tested the following Hypotheses:

(i) There is no significant difference in the nature of curriculum for technical subjects between secondary technical schools and multitrack secondary schools.

(ii) There is no significant difference in the provision of human resources for the implementation of the curriculum for technical subjects between secondary technical schools and multitrack secondary schools.

(iii) There is no significant difference in the provision of material resources for the implementation of the curriculum for technical subjects between secondary technical schools and multitrack secondary schools.

(iv) There is no significant difference in grade 12 examination results in technical subjects between secondary technical schools and multitrack secondary schools.

SIGNIFICANCE OF THE STUDY

The Government of Zambia has continued to commit itself to the provision of technical education in specialised schools. This is evidenced by its desire to establish Regional secondary technical schools (Kaluba 1986). Since it appears there has not been a study to evaluate the curriculum for technical subjects in secondary schools, there is need to establish some strengths and weaknesses of existing secondary technical schools in order to provide information on which to base the establishment of Regional secondary technical schools.

This study may therefore help in providing some information needed for improving curricular provision for technical subjects in both existing and prospective Regional secondary technical schools. Since more often educational administrators and curriculum planners are unware of some of the problems which prevent successful curriculum implementation, this study may also help to reveal some of the obstacles and propose solutions which could be used as means of improving the process of implementing curriculum innovation.

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LIMITATIONS OF THE STUDY

The study was limited to the investigation of four single sex male boarding schools namely Hillcrest in the Southern province of Zambia and David Kaunda in Lusaka the Capital city (these are secondary technical schools). Chizongwe in the Eastern Province of Zambia and Kafue in Lusaka Province of Zambia (these are multitrack secondary schools). The proportionate comparative technique used in the study dictated the limitation to only four secondary technical schools, they had to be proportionately compared to two multitrack secondary schools.

It was also limited to single sex male boarding schools in order to avoid intervening variables which may have resulted from factors such as gender differences and other social environmental factors resulting from differences between day and boarding as well as single sex and mixed boarding schools. Aware that the study was an evaluation of the curriculum's external efficiency, only input and output variables were compared. In this regard it was only limited to three aspects of the curriculum namely human resources in terms of number of teachers and their qualification, material resources in terms of selected commonly used equipment in practical

lessons for Woodwork, Technical Drawing and finally the resultant output in terms of examination results in technical subjects at grade 12 level. The study could not observe classroom transactions as it took place during Easter holidays. It was further limited to three years of five-year logical interval namely 1980, 1985, and 1989. But as the researcher could not wait for 1990 results due to limited time, those for 1989 had to be used.

Although these limitations existed, it is hoped that the findings will form a basis for more research into problems which hinder the successful implementation of innovations of the curriculum for technical subjects in secondary technical schools and multitrack secondary schools.

DEFINITION OF TERMS

CURRICULUM: Is the planned experience provided by the school to assist the pupils in attaining the designated learning outcomes to the best of their ability.

DIVERSIFIED CURRICULUM: A curriculum which offers practical and technical subjects along with academic subjects.

MULTITRACK SECONDARY SCHOOLS: Secondary schools which offer a generally diversified curriculum comprising technical subjects, practical subjects and academic subjects.

SECONDARY TECHNICAL SCHOOLS: Secondary schools which offer a narrowly diversified curriculum comprising technical subjects and academic subjects.

INNOVATION: The process by which a new idea of transforming selected multitrack secondary schools into secondary technical schools was adopted in the Zambian system of education.

ORGANISATION OF THE STUDY

The remainder of the study is divided into four chapters. Chapter two presents a review of related literature which bears upon curriculum innovation and implementation. The third chapter focuses upon methodology and procedures followed in the study. The fourth chapter presents the results and discusses pertinent issues emenating from the findings. The fifth chapter presents a summary of findings, salient implications for policy and practice, conclusions and recommendations for research.

CHAPTER 2

REVIEW OF RELATED LITERATURE

The overall objective of this chpater is to review selected literature and related research. The areas reviewed cover the quest for diversification, a review of specific factors which militate against effective curricular diversification under the following variables: the curriculum, social-economic -factors, human and material resources and finally a general survey of selected literature on obstacles to planned curricular implementation.

The quest for curriculum diversification originates from the assumption that there exists a fundamental mis-match in many third world countries between the type of education and training offered in conventional schools and the skills required in the world of work. Basing on this assumption,, it has been generally assumed that diversifying the secondary school curriculum to include pre-vocational subjects such as Industrial Arts, Agriculture, Commerce or Home Economics increases the economic value of education.

There have been two major lines of arguement supporting the diversification of secondary curriculum - one is economic and the other is political. The economic arguement centres around the percieved need to orient the formal education system to the needs of the world of work (Lillies and Hogan 1991, 1993; Dyasena, 1976). The political arguement is based on social-political strategy which pursues equity consideration (Nyerere, 1967). It is believed that an academically oriented system produces inequalities between a small elite and uneducated (those who fail in the system).

The Government of the Republic of Zambia based its reasoning for diversifying the secondary school curriculum on the economic arguement. This was endorsed in the policies for the decade 1985 - 1995 which states that Technical education at secondary school level will be a major emphasis of this policy. Therefore the young must learn skills that will help them after leaving school in order to reduce youth unemployment. (The national policies for the Decade 1985 - 1995 p.34).

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The implementation of diversified education differs from country to country according to specific conditions. In China they tried to integrate education and productive labour through the policy of work and study (Unger, 1982), Education for self reliance in Tanzania (Nyerere, 1967), Production schools in Panama (Lourie, 1978), Barrio high schools in the Phillipines (Orata, 1972) Youth Polytechnics in Kenya (Lauglo, 1989) secondary technical schools in Zambia (Kelly, M J et al 1986). All these took the economic line of reasoning influenced by the desire to increase the economic value of education.

In his famous article in which he opposes the concepts of diversification of the secondary school curriculum, Foster (1966) offers a critique of diversification. He argues that curriculum diversification suffers from inability to attract competent teachers, organise suitable equipment which causes graduates from such schools to be neither proficient in academic knowledge nor specialised in vocational skills thereby retarding the possibility of skill formation on the job. He further argues that much of vocational training provided by formal education methods is not vocational in nature and that workers can be provided with training necessary to be semi-skilled or skilled crafts men in less time and at

lower costs through other effective modes of training.

Foster's vocational school fallacy has led to different interpretations by different authors. One strand of thought tries to examine the returns to vocational training in institutions as compared with that on or off the job in firms. Another concerns the relative merits of vocational training in institutions compared with longer academic schooling coupled with on-the-job training. Most research findings on curricular diversification seem to support Foster's view. A study by Fuller (1976) in India indicates that productivity is raised more by in-firm vocational training than by pre-employment vocational training in schools. Borus (1977) in Israel also found that formal vocational secondary schools have higher costs than other modes of vocational training. Metcalf's (1985) review of studies by Fuller, (1976) and Borus (1977) led to the conclusion that firm -based vocational training had higher pay off than vocational training which take place in schools.

An interesting study by Miller and Zaidi (1981) in Brazil and Mexico on factors associated with earnings in Multinational companies concerned with auto and retail services found no evidence to support the hypothesis that earnings were associated with formal vocational training. By contrast they found that earnings were associated with years of education and current job tenure.

Other opponents of the secondary diversified education programmes in challenging the socio-political line of reasoning state that since vocational secondary schooling, such a curriculum hardly qualifies as a cost-effective method to eliminate enrolment discripancies between rich and poor urban and rural students (Metcalf 1985). In spite of numerous arguements for and against diversified education in third world countries have forged ahead with educational reforms through diversification of secondary school curricular.

Having presented a review of the debate on the quest for curricular diversification and some related research findings, the section which follows presents specific findings on efforts to diversify some selected systems of education beginning with the curriculum.

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THE CURRICULUM

During the last decade many developing countries have diversified their curricular at secondary school level by introducing prevocation subjects alongside the traditional academic ones. Several scholars have studied degrees to which such curricular have been diversified. Studies carried out by Kelly et al (1986) on the effort of diversifying the secondary school system in Zambia, found that technical subjects are limited in scope and subjected to academic assessment. Benoit (1974) studied efforts to diversify the system of education in Colombia found that the vocational curriculum was afflicted with anarchy and lacked clarity in its aims and intended outcomes. Sato (1974) studies an effort on the alternative approach to vocational education in Bangkok. He reported that effective curricular change failed because of the inflexible Pedagogy and academically oriented time tabling. Ahmed and Coombs (1975) found that the validation process in technical subjects was tied to rigid academic selection process. Hanson (1971) found no linkage between technical curriculum and training organisations. Psacharopoulus and Loxley (1984) carried out a study similar to the one Kaluba (1986) carried out in Zambia.

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They contrasted the educational and labour market attainments of graduates from academic and vocational schools and schools with different biases in Colombia and Tanzania. They related costs and outcomes in order to get the external efficiency of the respective schools. Outcomes included learning achievement, ability among secondary school leavers to achieve further education. In Colombia results showed no statistical significant difference between mean earnings of those on the two different tracks and in Tanzania the results did not corraborate with the hypothesis that the introduction of pre-vocational studies into secondary schooling could be justified on the basis of economic pay off being greater than for academic schooling.

A careful study of curriculum organisation in diversified secondary schools, led King (1978) to see faults in the way technical subjects enter the traditional curriculum, some are called 'Biases', orientation or pre-vocational . He points out that these words reduce the importance of technical subjects because a Bias merely extends the academic curriculum instead of changing it. He further notes that the words 'Pre' and 'orientation' have negative connotations as they are meant to only offer tastes. He argues that this leads pupils to misplaced attitudes of looking at technical subjects as the only ones demonstrating and connected to the world of work.

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These are very important sentiments raised because this arrangement to a large extent ignores possible avenues of exploring the orientation of other subjects like Science, Maths or Geography to the world of work. In essence, these findings suggest that technical and vocational education continue to be rated inferior to academic education a sad fact to note as socio-economic factors are presented in the next section.

SOCIO-ECONOMIC VARIABLES

Socio-economic factors are fundamental to the process of implementing any innovation because they form the hub of the process of any change effort. Any innovation which is not fully backed by economic factors cannot be successfully implemented. Studies on efforts towards diversification of the system of education in the Caribean by Oxtoby (1977) indicated that the innovation failed because of lack of Coherent development plans, failure to create adequate job opportunities and failure to narrow differentials between urban and rural incomes. King (1978) in his study of the status of technical schools in Kenya, found that low status was ascribed to technical subjects because there were no career

advancements after completion. Similarly, Kaluba (1986) found no provision for technical courses at university level in Zambia. Another study by Kelly, et al (1986) reveals that the status of technical subjects in the Zambian system of education was rather inferio to academic subjects. Lillis (1987) found that the Socio structure and values remain antipathetic towards manual labour with high priority for academic education and white collar aspirations. Foster (1966) and Bernstein (1977) also indicate that when curricular innovations are not in accord with accepted definitions of knowledge, their chances of being effectively implemented become slim.

Studies on costs of sustaining vocational education in secondary schools by Fuller (1966) found technical curricular more expensive than academic curricular. A detailed study by Middleton (1991) on costs of vocational education found that diversified secondary schools have higher costs per student yet they are not more effective than academic secondary schools in enabling graduates to find wage employment. He further explained that vocational training fails because the diversfied curriculum concentrates on low level vocational skills. Diversified programmes do not materially affect choices students make after leaving school and that many

developing countries have not been able to afford competent teachers, appropriate equipment and instructional materials needed for the diversified curriculum. Such analysis led Blaug (1972:199) to state that: "We may as well confess that we know almost nothing about the economics of vocational training, its incidence, its costs and its benefits". These are very serious findings and sentiments which suggest an overhauling of the whole socio-economic system to allow for effective curriculum diversification. The next section presents findings on factors related to teachers.

THE TEACHING FORCE

As agents of any change effort in education, teachers form a very important variable in the process of implementing change in schools. It is therefore imperative that they are adequately prepared. It is also important to include what research says on problems associated with teachers.

Niehoff and Wilder (1974) studied factors which militate against the numbers of vocationally competent teachers and found that the whole social-economic and educational system militates against such teachers because teacher-training entry is dominated by academic criteria.

Welkala (1979) found teachers resisting vocational goals because of their being academically oriented. More recently, Reece and Nyagura (1989) noted that because Headmasters did not posses the knowledge in technical subjects, they did not fully support the policy of diversification in Zimbabwe secondary schools. Kelly, et al (1986) commenting on the Zambian situation, claim that there is resistance among teachers, headmasters and administrators who being part of the highly selective and academically oriented system see no value in diversifying a curriculum. The only conclusion to be drawn from the above findings is that as long as teachers are not well oriented to the new ideas, their inpetus to implement the new idea will always be minimal leading to change without change. The last section on variable presents findings on material resources.

MATERIAL RESOURCES

Literature on material resources shows that they are as vital as any of the above resources. Failure to consider the provision of material resources leads to failure of implementation by teachers. In his study of the state of equipment in some selected schools in India, Fuller (1976) found that teachers failed to implement

the vocational programmes because they were using old and inapproriate equipment. In Thailand, the Ministry of Education (1971) revealed that schools had unused equipment because the available equipment was not appropriate as the equipment was more sophisticated than what was expected. This finding indicates that curriculum planners did not articulate the planned innovation in relations to the required material resources. In Zambia, Zvaiwa (1981) carried out a similar study on efforts to implement Primary English Course. He attributed failure of implementation to lack of Material resources.

The implications of such findings are that well intended innovations can not be effectively implemented without taking into serious consideration all variables including material resources. The section which follows presents a review on general factors which militate against effective curricular implementation. It is expected to show that the process of implementing any educational reform is not straight foward and can not be implemented in isolation.

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After a detailed examination of several reform projects in Education, Obanya (1989) advances the following obstacles common to many reform efforts. He attributes failure to lack of proper diagnosis of educational ills (as in the misconceptions that vocationalization of education would solve problems of unemployment), lack of integration and monitoring mechanisms and lack of support from teachers and wider public.

Studies by Packerd and Donald (1972), Charters and Pellegrim (1972) Bredo, A E and Bredo E R (1975), Gross et al (1971), Sarason (1971) and by Shipman (1975) generally attribute failure for effective implementation to unclear goals, lack of understanding of new roles by participants, insufficient resources and lack of precision and clarity.

Studies concerned with the implementing environment by Goollad J and Klein M F (1973) and Winter (1970) attributed failure to lack of back ground preparations in the school climate. this led Miles (1965) to postulate the concept of 'organisational health' through which he urges curriculum planners to consider the relationship

between what is planned and what obtains in the implementing environment. Silberman (1970) and Macdonald and Rudduck (1978) concerned with external influence on users, seriously warn that externally designed curricular reforms which exclude user involvement, lead to experiences of enxiety, confusion, frustration and to some extent abandonment by implementers.

Although the foregoing research findings present only negative results, the study by Baldridge and Deal (1975) highlights a successful change effort. The success of the innovation was attributed to the administration which precisely articulated the content of the proposed innovation, background environment preparations and integrated monitoring mechanisms in the process of implementation. The most partinent point to note from these studies is that the process of implementing a curriculum is a complex undertaking which is why Fullan (1982) calls it 'multi-dimensional' consisting non-too-clear dynamic interrelationships.

Inspite of numerous arguements put forth in support of diversified education in third world countries, little empirical evidence exists to show the degree to which the most talked about concept of deversification has affected or altered the traditional secondary school curriculum to allow for effective diversification.

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CHAPTER 3

METHODOLOGY AND PROCEDURE

This chapter focuses upon the methods and procedures used when gathering data. It first highlights the guiding framework, followed by a description of the population. The chapter concludes with a discussion of instruments used for collecting data.

THEORETICAL FRAMEWORK

Realising that in Zambia curriculum development is based on the behavioural objectives model (curriculum development in Zambia 1964-1974) and considering the fact that the present study was evaluative in nature, the countenance evaluation model advocated by Robert Stake (1969) was partially used as its guiding theoretical frame work. Stake argues that data for curriculum are congruent only if what was intended actually happens.

Basically, Stake (1969) presents a three-stage research methodology which deals with antecedents, transactions and scholarstic outcomes. Regarding antecedents Stake clarifies that these include environmental background conditions such as available facilities in terms of human and material resources needed for the implementation of

a proposed curriculum innovation which an evaluator should examine. Transactions, on the other hand, are concerned with successive engagements comprising the process of classroom teaching which should also be examined . Finally Stake recommends the examination of what comes out of the planned curriculum change in terms of scholarstic outcomes assessed from pass rates in examination results at a given level.

Although Stake advocates the above three-stage research methodology this study did not go through all the stages during investigations. Due to limitations resulting from inadequate financial resources and the period of investigation which took place during Easter holidays, the study focused only on two variables namely antecendent and scholarstic outcomes at grade 12 level in Geometrical Drawing and Woodwork.

POPULATION DESCRIPTION

The target population comprised ten secondary schools. Of these eight were multitrack secondary schools which the Ministry of General Education Youth and Sport earmarked for transformation into regional secondary technical schools namely: Solwezi in North Western province, Kanseshi in Copperbelt province, Mbala in Luapula province, Kafue in Lusaka province, Serenje in Central provice, Kambule in Western province, Chizongwe in Eastern province and Kasama in Northern province.

SAMPLING TECHNIQUES

The study used the proportionate stratification sampling technique. This involved dividing the sample population into distinct strata comprising two existing National secondary technical schools on one hand and two multitrack secondary schools on the other hand. In order to reduce sampling errors, the stratum was made up of only male single sex boarding schools. The two multitrack secondary schools were picked on economic grounds due to rising transport costs. It was economically viable for the researcher to travel to Chizongwe and Chongwe Secondary Schools (Multitracks) and Hillcrest in Southern province while David Kaunda is within the City of Lusaka (secondary technicals).

PROCEDURE

Two types of research instruments for data collection were prepared (see appendices (i), (ii) and (iii)). Structured interviews and questionnaires, were constructed for the interview with the curriculum specialist for industrial arts at Curriculum Development Centre. A questionnaire divided in two parts was prepared for Headmasters of the Schools in the sample and the other part was for industrial arts Heads of Departments. the researcher physically took the questionnaires to the schools and humbly waited for their completion.

STRUCTURED INTERVIEWS

To obtain information on the nature of the curriculum and examination results, structured interviews were held with the following:-

(a) The curriculum specialist for industrial arts at Curriculum Development Centre. The focus was on the nature of the new Curriculum, teacher orientation, inservice training and financial support from Government.

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(b) The Examinations Council of Zambia. The focus was on examination results for technical subjects (**Woodwork**, Technical Drawing and **Metalwork**). Finding records not conducive for the needed information the researcher got data from the Computer Centre at the University of Zambia.

QUESTIONNAIRES

Having been granted permission by the Ministry of General Education Youth and Sport, the researcher delivered questionnaires to selected schools. Part I was completed by all Headmasters in sampled schools. The focus was on the number of teachers in industrial arts, their qualifications in terms of degree holders in the relevant field and Diploma holders. It also sought their feelings of the status of technical subjects through a five point rating scale. Part II was completed by Heads of Industrial Arts Departments. The focus was on the nature of the curriculum in terms of time allocation, material resources in terms of equipment available in the workshop against what they expected and finally the degree of financial support from Government. Although the questionnaires sounded brief and descriptive, they were prepared

in relation to questions of the study and sought for specific answers in the light of the statement of the problem in Chapter One. The value of the answers lies in the implications raised which are discussed in the Chapter dealing with findings.

VARIABLES

Variables were grouped in the following categories:

(i) Human Resources

Two aspects were investigated under this variable, namely, number of teachers in Industrial Arts Departments and their qualifications in terms of degree and diploma holders. Only a cross tabulation method of comparison was used because the variable had only one category of diploma holders

(ii) Material Resources

This variable was divided into two categories, namely, Woodwork and Geometrical Drawing. Materials frequently used were counted. The following were counted:

(a) Woodwork: Drilling machines, Planes, Hammers and Chisels

(b) Geometrical Drawing: Drawing wards, Tee Squares, and Set Squares.

EXAMINATION RESULTS

Only two of the three industrial arts subjects were compared because in some years **metalwork** was not examined in some schools in the sample (Kafue 1989 and Hillcrest 1980). In order to get a proportionate and straight forward comparison, results in Woodwork and Geometrical Drawing which appeared in all years were compared in this category. The comparison was based on the number of pupils who sat examinations and their pass rates.

DATA COLLECTION

Data were collected during the month of April, 1990 by the researcher from all sample schools personally. Helped by Heads of Industrial Arts Departments, he physically counted selected materials available and calculated the shortfall by dividing class population into required number and subtracting available from required or vice versa. Examination results were obtained from the Computer Centre at the University of Zambia.

CONTROL VARIABLES

In order to reduce intervening variables, such as gender differences, social environmental differences between day and boarding schools and also between mixed and single schools,

only single sex male boarding schools were investigated. To standardise responses only Headmasters and Heads of Industrial Arts Departments were requested to complete the questionnaires.

DATA ANALYSIS

The analysis of data consisted of break downs by use of the mean, the standard deviation and percentages. Cross tabulations were also used due to categorical nature of some variables. Having measured the data at nominal level the Chi-square was used to test statistical significance of the following hypotheses:

(i) There is no significant difference in the provision of material resources for the implementation of the curriculum for technical subjects between secondary technical schools and multitrack secondary schools.

(ii) There is no significant difference in grade 12 examination results in technical subjects between pupils from s technical schools and those from multitrack secondar s.

In Chapter four (4) which follows, results are presented and discussed.

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CHAPTER 4

RESULTS AND DISCUSSION

The objectives of this Chapter are to present and discuss pertinent issues enanating from the findings. It has been divided into five parts, the first three deal with input variables while the last part deals with output variable. The Chapter concludes with the presentation of analysed data.

(i) NATURE OF THE CURRICULUM

The Curriculum Specialist for Industrial Arts At Curriculum Development Centre was asked questions which sought information on various aspects concerning the curriculum for technical subjects in secondary technical schools. Below are findings;

Asked whether the curriculum for technical subjects in secondary technical schools differed from the curriculum for multitrack secondary schools, the Curriculum Specialist explained that the Curriculum Development Centre prepared a curriculum for secondary technical schools when the decision to establish them was made. Table 1 below shows the planned curriculum for secondary technical schools and Table 2 shows the traditional curriculum for multitrack secondary schools.

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On teacher orientation for the new curricular and inservice training, the curriculum specialist explained that the Ministry of General Education Youth and Sport did not prepare any specific orientation programmes. The Government however made available a one year inservice course for Industrial Arts teachers at Luanshya Technical and Vocational Teachers' College to obtain Advanced Diploma Certificates. Asked whether there were teaching materials specifically prepared for the implementation of the proposed curriculum, it was explained that the Curriculum Development Centre did not prepare new materials for the planned curriculum consequently teachers in the two secondary technical schools continue to use the same materials as in multitrack secondary schools.

Answering the question whether secondary technical schools received more financial allocation than multitrack secondary schools for Industrial Arts Departments, the Specialist explained that allocation of funds from government was the same in all secondary schools. The researcher inquired whether the two secondary technical schools offered the same subject combinations considering their similar goal of preparing pupils for higher training in technical fields. The curriculum specialist explained that they offered the same

academic subjects but differed on technical subjects because one offers them as compulsory while the other offers them as optional subjects. Table 3 below shows the curriculum for the two schools.

Table 1: CURRICULUM AS OFFERED BY THE TWO SECONDARY TECHNICAL SCHOOLS

DAVID KAUNDA	HILLCREST
Compulsory Subjects	**Compulsory Subject**
English	English
Mathematics	Mathematics
Chemistry	Chemistry
Physics	Physics
Biology	Biology
Woodwork	**Optional Subjects**
Geometrical Drawing	History
Optional Subjects	Geography
Literature in English	**Metalwork**
History	Woodwork
Geography	Technical Drawing
Additional Mathematics	Additional Mathematics
	Literature in English

SOURCE: School time tables in Secondary technical schools

In order to assess Headmasters' attitudes towards technical subjects in relation to other subjects on the curriculum, the five point rating scale Likert (1932) was used. Number one indicating the highest and five the lowest value.

Headmasters rated them as shown below:

Table 2: SUBJECT RATING BY HEADMASTERS IN SAMPLE SCHOOLS

SCHOOL	FIRST	SECOND	THIRD
HILLCREST	SCIENCES	TECHNICAL SUBJECTS	ENGLISH
DAVID KAUNDA	ENGLISH	TECHNICAL SUBJECTS	SCIENCES
CHIZONGWE	SCIENCES	TECHNICAL SUBJECTS	ENGLISH
KAFUE	SCIENCES	TECHNICAL SUBJECTS	ENGLISH

The implication of these results is that since all Headmasters rated technical subjects second, they treat them as appendages to academic subjects which they value highly.

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Heads of Industrial Arts Departments were asked questions which solicited information on time allocation and their opinion on whether time allocation was adequate or not. Table 5 below shows period allocation in all sample schools.

Table 3: **PERIOD ALLOCATION FOR WOODWORK AND GEOMETRICAL DRAWING**

SCHOOL	WOODWORK	GEOMETRICAL DRAWING
Hillcrest	4	5
David Kaunda	4	4
Chizongwe	4	4
Kafue	4	4

SOURCE: School time tables in sample schools

Asked whether time allocated was sufficient or not, only the Head of Industrial Arts Department for Hillcrest claimed that it was sufficient. Heads of Departments in the other three schools pointed out that it was insufficient because they needed at least three double periods a week which can be divided into two categories first, one double period of 80 minutes to be used for theory while

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the other two doubles of 160 minutes would be used for practial work. The implication of this insufficient allocation of time on policy, is that, technical subjects are not allocated adequate time to achieve the objectives of orienting pupils towards practial skills.

These findings raise interesting issues for dicussion. But before that, it is important to remember that the human capital theory which has continued to influence the search for relevant education, is guided by the concept of modernisation which assumes that individuals and nations become modern when they change from traditional to modern values. Its concept frame work has greatly influenced societal assumptions about what counts as valid knowledge and valid schooling (Bernstein, 1977). These assumptions ultimately affect the degree to which curricular innovations get adopted. As Foster (1966) has indicated, when curricular innovations are not in accord with accepted definitions of knowledge, their chances of being effectively implemented become slim.

Results from the present study indicate that despite theoretical claims for the needed quality of technical education, changes

in the curriculum for secondary technical schools are superficial (Kaluba 1986). Pertinent issues such as status of technical subjects, time allocation, financial support and teaching material were not considered as vital variables in the process of this specialised diversification. The only minor changes effected were the title 'secondary technical' and the narrow diversification of technical subjects. Interestingly, the study also found disparities in how the officially decided curriculum was implemented in the two secondary technical schools. David Kaunda Secondary School offers technical subject as compulsory while Hillcrest Secondary Technical School offers them as options. This shows lack of supportive attitudes and serious implementation strategy.

From the above findings, it becomes easy to understand that beneath the surface of the advocacy for secondary technical schools resides serious historical cultural and philosophical questions which appear to thwart desired objectives in technical education.

These are serious implicit obstacles to curriculum change which call for a reconsideration of the present process of planning and developing the curriculum for secondary technical schools.

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Infact a just position between tables 1 and 2 above show that the curriculum for multitrack secondary schools took into account many variables such as: time allocation, number of subjects to be optioned, subject combination etc. The curriculum for secondary technical schools on the other hand shows no changes in the hierarchy of the established curriculum followed in multitrack secondary schools.

It is contended here that without considerable changes in content, methodology, time allocation and financial support for the implementation of curricular innovation fundamental changes cannot materialise. Effort without the articulation of the above variable only lead to a concept which Smith and Keith (1971) call ' Facade'. This is a concept in which schools present an artificial image to the public when in practice they continue to operate on traditional lines. It goes without saying therefore that the nature of curriculum for technical schools is not in line with the concept of 'secondary technical' because its narrow diversification emphasises science not technical subjects.

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(ii) **HUMAN RESOURCES**

Headmasters were asked questions which sought to bring out information on staffing, teacher-qualifications and to rate the staffing situation in their schools. Below are the findings.

Regarding the numbers of teachers and their qualifications Headmasters supplied the following statistics reflected in table 6 below:

Table 4: **NUMBER AND QUALIFICATION OF TEACHERS IN INDUSTRIAL ARTS DEPARTMENTS**

SCHOOLS	DEGREE HOLDERS	DIPLOMA HOLDERS	TOTAL
Hillcrest	0	9	9
David Kaunda	0	12	12
Chizongwe	0	3	3
Kafue	0	1	1
Grand Totals	0	25	25

SOURCE: Departmental records in all sample schools

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In an attemp to find out their opinions on the staffing situation, Headmasters were asked to rate the situation in their schools on a four point scale (of poor, very poor, good, very good). Hillcrest rated the situation as poor while Kafue, Chizongwe and David Kaunda rated their situation as very poor.

Before discussing findings of this variable, it is also important to recognise the interplay between the system of education and the social and economic system in the Zambian context. First one needs to remember that the basis for establishing secondary technical schools was to increase the economic relevance of education. The area of science and technology would therefore be developed through secondary technical schools. This ultimately suggests that society valued science subjects more than technical subjects which subsquently meant improving the science curriculum and its supportive variables teachers and material resources. The obvious implication on the curriculum for technical subjects is second class treatment. This interplay has ultimately affected the status and supply of teachers in the area of technical education in the Zambian system of education.

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The present study found that teachers in all sample secondary schools were inadequate and lowly qualified. They were all Diploma holders and handled senior classes. This state of affairs indicates that teacher-quality was not considered an important variable or if it was, no serious steps were taken to improve the situation over the years. This is especially so considering the fact that the structure for training teachers is as follows:- Primary teacher training colleges train teachers for Grades 1 to 7, secondary teachers colleges train teachers for Grades 8 to 9 and the University of Zambia train teachers for Grades 10 to 12, Kelly, M J et al (1986).

While the University of Zambia has not trained enough teachers for Industrial Arts (Kaluba, 1986), it was also sad to note through an interview with the Curriculum Specialist at Curriculum Development Centre that the Department has lost over 75% of its teachers through early retirement, and resignations aimed at finding greener pastures elsewhere. This could be the reason why the curriculum for technical subjects in secondary technical schools is treated differently (optioned and compulsory). The number of available qualified teachers for the subjects may influence Headmasters to offer these subjects either optionally

or on a compulsory basis. Suprisingly the interview with the Senior Inspector of Schools at the Headquarters revealed that he was not aware that one school optioned the subject. The obvious implication here is that technical subjects are not treated seriously as other subjects.

This finding does not therefore tally well with the quest for qualify technical education. Similarly, findings by Niehoff and Wilder (1974) in Ethiopia, led the researchers to state that poor quality vocational teachers result from entry requirements into training colleges which are dominated by academic criteria.

Responses on the question of factors which influenced teaching style in technical subjects, indicated that teachers were influenced by making pupils pass examinations than the acquisition of skills. This clearly suggests that such teachers are not in accord with the objectives of diversification. This finding is similar to Wijemanne and Welkala's (1975) study in Sri Lanka where it was found that teachers allocated to teach vocational subjects resisted vocational objectives because of their being tied to academic goals and methods of teaching.

Arising from the above discussion, one can see that the interplay between the education system and the social and economic system affects the supply and quality of teachers for Industrial

Arts in secondary technical schools. More seriously the study has revealed that the existing secondary technical schools are being managed by administrators without technical qualifications. The implication of such leadership as Nyagura and Reece (1989) found in Zimbabwe is that it does not consider the training of students in technical fields as top priority. Such attitudes humper the implementation of the curriculum for technical and practical subjects.

MATERIAL RESOURCES

The questionnaire on material resources compared what the schools were expected to have against what was actually available at the time of study. The study selected the most frequently used tools in practical lessons of Woodwork and Geometrical Drawing. The same types of tools were compared in both types of schools.

Regarding the situation in secondary technical schools, data on selected material resources (tools) are presented in table 7 below.

Table 5: THE STATE OF SELECTED MATERIAL RESOURCES IN SECONDARY TECHNICAL SCHOOL

MATERIALS	HILLCREST		DAVID KAUNDA	
	NUMBER EXPECTED	NUMBER AVAILABLE	NUMBER EXPECTED	NUMBER AVAILABLE
WOOD WORK				
Drilling Machines	6	3	4	2
Planes	60	7	20	8
Hammers	15	5	20	13
Chisels	240	60	30	13
TOTALS	321	75	74	36
GEOMETRICAL DRAWING				
Drawing wards	120	99	120	106
Tee Squares	120	88	120	130
Set Squares	210	138	120	110
TOTALS	450	325	360	346
GRAND TOTALS	771	400	434	382

SOURCES: School records.

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With respect to the situation in Multitrack Secondary Schools the data on selected material resources are presented under Table 6 below.

Table 6: THE STATE OF SELECTED MATERIAL IN MULTITRACK SECONDARY SCHOOLS

	CHIZONGWE		KAFUE	
	NUMBER EXPECTED	NUMBER AVAILABLE	NUMBER EXPECTED	NUMBER AVAILABLE
MATERIALS				
Drilling Machines	2	1	2	1
Planes	26	13	20	1
Hammers	50	33	20	0
Chisels	100	80	20	16
TOTALS	178	127	62	18
GEOMETRICAL DRAWING				
Drawing Squares	20	100	20	20
Tee Squares	20	100	20	20
Set squares	100	11	20	16
TOTALS	140	211	60	56
GRAND TOTALS	478	220	122	74

SOURCE: School records.

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Results from the present study support the theoretical position taken by Fuller (1976) who postulates that if change is to be effectively implemented in education, it must be preceived as an economic investment. Conceptually Fuller is urging those initiating change in education to seriously consider the costs of innovations and precisely articulate their budgets before they can be adopted in schools. The findings of this study suggest rather minimal resulting in material shortages. In the process of physically counting materials for Industrial Arts in sample schools, the research saw that the shortfall was partly caused by unusable old tools some of which could be used but lacked essential spare parts. Heads of Industrial arts departments in sample schools expressed concern on good machines which could not be used because of lack of simple spare parts. These conditions imply that the decision to establish secondary technical schools did not take into account high costs of purchasing the needed materials and the costs of sustaining them. It also shows that the Government did not consider seriously the possibility of producing the required materials locally to avoid the dependency on imported materials.

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(iv) GRADE 12 EXAMINATION RESULTS IN WOOD-WORK AND GEOMETRICAL DRAWING

Before this variable is discussed, it is important to mention that results of all input variables, that is, the curriculum, human resources, and material resources have indicated insignificant input into curriculum innovation for secondary technical schools. The fourth part presents and discusses the findings of the output variable in terms of scholarstic outcomes in Grade 12 Examinations for 1980, 1985 and 1989 in wood-work and geometrical drawing. Table 9 below shows the results in wood-work for all schools in the sample.

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Table 7: GRADE 12 EXAMINATION RESULTS IN WOOD-WORK

(a) SECONDARY TECHNICAL SCHOOLS					
		1980	1985	1989	TOTALS
1. Hill Crest	Number of Candidates	35	72	72	179
	Pass %	77	35	81	Mean 81%
2. David Kaunda	Number of Candidates	40	57	72	169
	Pass %	90	86	83	Mean 88%
b. MULTITRACK SECONDARY SCHOOLS					
1. Chizongwe	Number of Candidates	1	29	21	51
	Pass %	100	85	89	Mean 91%
2. Kafue	Number of Candidates	15	10	9	34
	Pass %	86	88	85	Mean 86%

SOURCE: COMPUTER CENTRE UNIVERSITY OF ZAMBIA.

Regarding results for Geometrical drawing, Table 10 below shows the results for the two types of schools.

Table 8: GRADE 12 RESULTS IN GEOMETRICAL DRAWING

SCHOOL		1980	1985	1989	TOTALS
(a) SECONDARY TECHNICAL SCHOOLS	NUMBER OF CANDIDATES	77	163	163	403
(i) Hill Crest	Pass %	90	81	93	Mean 88%
(ii) David Kaunda	Number of Candidates	35	59	59	153
	Pass %	82	84	88	Mean 85%
(b) MULTITRACK SECONDARY SCHOOL (i) Chizongwe	Number of Candidates	57	83	83	223
	Pass %	88	88	83	Mean 86%
(ii) Kafue	Number of Candidates	15	9	10	34
	Pass %	86	83	85	Mean 85%

SOURCE: The Computer Centre, University of Zambia, Lusaka

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The guiding theoretical implication in this variable is the recognition of the relationship between intention and realisation as propounded by Robert Stake (1969). Its salient feature is an awareness that intention can only be realised if adequate inputs are provided to support the intention. Due to minimal and insignificant input evidenced in the nature of the curriculum, quality and quantity of teachers and material resources, Grade 12 examination results in woodwork and geometrical drawing in secondary technical schools were similar to those in multitrack secondary school. This was also born out by Kaluba's (1986) finding that training in technical secondary schools was no better than that for graduates of multitrack secondary schools who study similar technical subjects. The final part of this chapter presents the analysed data.

DATA ANALYSIS

As indicated in chapter three, data were obtained from respondents based partly on Robert Stake's model involving the following variables which were analysed.

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NATURE OF CURRICULUM

The findings revealed that although the Curriculum Development Centre prepared a curriculum for secondary technical schools, only minimal and insignificant changes were made to the tranditional curriculum followed in multitrack secondary schools. The interim curriculum for secondary technical schools narrowed the diversification to only technical subjects (Woodwork, Metalwork, Geometrical and Mechanical Drawing). It recommended that girls would also take such subjects in their secondary technical schools once established.

Issues which constitue fundamental changes remained intact in both schools. Technical subjects remained appendages to academic subjects offered as options, allocated inadequate time with meagre financial support leading to being rated as inferior subjects by Headmasters. A clear outcome from this variable is that difference in the curriculum for the two types of schools are too insignificant to reject the hypothesis. It can therefore be inferred from this finding that there is no significant difference in the nature of the curriculum between secondary technical schools and multitrack secondary schools.

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HUMAN RESOURCES

It was hypothesized that there was no significant difference in Human resource provision (teachers) between secondary techical schools and selected multitrack secondary schools. Although table 6 shows that out of 25 techers in sample schools, 84% are from secondary technical schools against 16% from multitrack schools, Headmasters rated the teacher situation as poor and very poor in all sample schools. This shows that all schools found that all teachers hold Diploma certificates, it implies that the area of techncial education does not receive adequate support to train teachers with university qualifications for senior grades of the secondary school system as is required by Government Policy (Kelly et al 1986). These findings therefore support the above hypothesis.

MATERIAL RESOURCES

The third variable tested the hypothesis that there is no significant difference in material resource provision between secondary technical schools and multitrack secondary schools. An analysis of findings in Table 7 shows that secondary technical schools recorded a mean of 603 expected materials against a mean of 392 available resulting in a short fall mean of 211 materials. A statistical analysis of Table 8 shows that multitrack secondary schools recorded a mean of 300 expected materials against a mean of 153 materials. A statistical computation showed a Chi-square of 2.365 at 0.05 level of significance with probability of 3 degrees. Since the commuted value is much less than the

Critical value of 7.815, the difference was insignificant.

It could therefore be concluded that the findings support the hypothesis that there is no significant difference between the two types of secondary schools in the provision of material resources. The overall conclusion derived from the above input variable is that they showed no differences between the two types of secondary schools.

GRADE 12 EXAMINATION RESULTS IN WOOD-WORK AND GEOMETRICAL DRAWING FOR 19980, 1985 AND 1989

This output variable tested the hypothesis that there was no significant difference in grade 12 examination results in wood-work and geometrical drawing between secondary technical and multitrack secondary schools.

Tables 8 and 9 saw that a total of 1,246 pupils sat for examinations in both wood-work and Geometrical drawing is sample schools on all selected years. Out of this number 904 pupils came from Secondary Technical Schools while 342 points came from Multitrack Secondary Schools.

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Table 9 below shows the X^2 Test on examination results in two Secondary Schools.

Table 9: A X^2 TEST FOR EXAMINATION RESULTS IN WOOD-WORK AND GEOMETRICAL DRAWING BETWEEN SECONDARY TECHNICAL AND MULTI-TRACK SCHOOLS

SCHOOLS	WOOD-WORK PASS RATE MEAN	GEOMETRICAL DRAWING PASS RATE MEAN	RWA TOTAL
SECONDARY TECHNCAL SCHOOLS	84 (85.24)	86 (87.75)	170
MULTI-TRACK SECONDARY SCHOOLS	88 (86.75)	85 (86.24)	173
TOTALS	172	171	343

The results of the X^2 Test were very insignificant (X^2 = 1.14, df 0.05, P.30) lending support to the hypothesis that there is no significant difference in Grade 12 examination results for wood-work and Geometrical drawing between Secondary Technical and Multitrack Secondary Schools.

The Chapter which follows, presents salient implications for policy and practice with recommendations and conclusions

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CHAPTER 5

SUMMARY AND CONCLUSIONS

This chapter presents a summary of findings, the salient implications for policy and pratice, conclusions and recommendations for further research.

SUMMARY OF FINDINGS OF THE STUDY

The study came up with the following findings:

(i) No constructive thought went into the formulation of the relevant curriculum for secondary technical schools to determine a significant departure from the badly diversified curriculum followed in multitrack secondary schools.

(ii) Lack of constructive thought in developing a relevant curriculum led to misplaced emphasis on science subjects instead of technical subjects.

(iii) Available evidence in this study, suggest that the two existing secondary technical schools operate on similar traditional lines of treating technical subjects as appendages to academic subjects, as is the case in multitrack secondary schools.

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IMPLICATIONS OF THE FINDINGS

The findings presented above, have the following implications for policy and practice.

(i) They imply that the process of designing the curriculum for secondary technical schools lacked a guiding philosophy and specified means of implementation. Although the policy objective emphasised the need for adequate pupil preparation for training as technologists, it lacked detailed articulation of such variables as time allocation, teacher-orientation and financial support.

(ii) The Government policy instituted secondary technical schools without altering some traditional attitudes of treating technical subjects as appendages to academic subjects.

(iii) The Government policy described output for secondary technical schools without taking cognisance of existing input and background preparations such as the required materials and numbers of teachers.

(iv) The decision to establish Regional Secondary technical schools was based on superficial, incomplete and incorrect analysis of existing secondary technical schools. Failure to justify their different operational lines in the present study vindicates the above claim.

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(v) The objectives policy of solving the problem of manpower shortage through secondary technical schools implies an erroneous view of solving structural problems through the education system in isolation.

CONCLUSIONS

This study sought to compare the curriculum for technical subjects in the existing national secondary technical schools with the traditionally diversified curriculum followed in Multitrack secondary schools. It has revealed that the narrowly diversified curriculum in secondary technical schools is very much in favour of science subjects. This state of affairs has led to the curriculum for technical subjects to be implemented differently: (offered as options in one school and compulsory in the other), allocated insufficient time and lacking socio-economic support.

In view of these findings, the concept of secondary technical schools seem to be a 'facade'. Given the fact that society emphases science and technology and considering that the major objective for establishing these schools is to prepare students for training as scientists and technologists, it is here concluded that the title secondary technical schools, is a misnomer. In this regard the name 'science high schools' has been proposed.

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The study also urges curriculum planners to organise knowledge in themes through integrated approach to curriculum development. This is an approach through which technical subjects will be appreciated by pupils. The study further recommends that the establishment of Copperbelt University should help uplift the status of technical and practical subjects by introducing programmes and courses in this area at degree level. Recommendations for policy and research arising from the above implications are presented below:

RECOMMENDATIONS FOR FURTHER RESEARCH

There are many topics open for research in this field which the present study has not been able to deal with. The following are some of them:-

First, there is need to determine the relationship between the curriculum for secondary technical schools and that of technical institutions offering similar occupational skills.

Second, there is need to assess the extent to which the Zambian Government has narrowed the gender gap in technical education through curriculum innovation since independence in 1964. This is important because there is a world wide demand for the inclusion of women in all developmental endeavours.

Third, there is need to find out whether there are constradictions between policy and practice in the field of technical Education in Zambia and

Fourth, There is need to find out the impact on curriculum change of the interplay between socio-economic systems and the system of Education.

The topical areas presented above are by no means exhaustive; more areas could be added by an enterprising researcher.

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APPENDICES

MGEYS/101/8/83CONF.

REPUBLIC OF ZAMBIA

MINISTRY OF GENERAL EDUCATION, YOUTH AND SPORT

P. O. BOX 50093

LUSAKA

23rd March, 1990

TO WHOM IT MAY CONCERN

This is to certify that Mr. A. K. Tembo is a student at the University of Zambia studying for a higher degree (Msters).

Mr. Tembo is currently carrying out Research on Technical Education in Zambia for the purposes of his Dissertation (Thesis).

PLease give him all the assistance he may need as he visits your Institution.

K. B. CHIRWA

SENIOR INSPECTOR OF SCHOOL(S)

MINISTRY OF GENERAL EDUCATION, YOUTH AND SPORT

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(ii)

THE UNIVERSITY OF ZAMBIA, SCHOOL OF EDUCATION DEPARTMENT OF LANGUAGE AND SOCIAL SCIENCES EDUCATION

(1)

1. RESEARCH: A COMPARATIVE STUDY OF THE CURRICULUM FOR SECONDARY TECHNICAL AND SELECTED MULTITRACK SECONDARY SCHOOLS.

2. GENERAL INSTRUCTIONS

(i) Please answer all the questions as honestly as possible.

(ii) The information you will provide is strictly confidential and shall only be used by the Department of Language of Social Sciences Education and the Ministry of General Education Youth and Sport.

(iii) Your co-operation in the collection of this data will be greatly appreciated.

PART I

TO BE COMPLETED BY THE HEADMASTER

For each question, please tick or circle the appropriate answer(s) or give a descriptive statement or indicate numbers as the case may be:-

1. Name of institution and address .....

.....

.....

2. Status: Grade 1 2 3 (Please circle the appropriate number).

3. Which Technical subjects constitute the curriculum of your school?

(a) Metalwork / /

(b) Woodwork / /

(c) Geom. & Mechnical Drawing / /

(d) Geom. & Building Drawing / /

(please tick appropriate boxes).

4. How many teachers are in the Industrial Arts Department?

..... (Please indicate the number).

5. What are their qualifications? (Please indicate numbers).

(a) Those with University Degrees / / / /

(b) Those with College Diplomas / / / /

(c) Those with other qualifications / / / /

(d) Name the qualifications in (c) above / / / /

.....

.....

6. How would you rate the staffing situation in the Industrial Arts Department?

Very Poor	Poor	Good	Very Good
/ /	/ /	/ /	/ /

(Please tick the most appropriate rating).

7. If you were to rank all subjects on the curriculum of your school, how would you rank Industrial Arts?

First	Second	Third	Fourth	Fifth
/ /	/ /	/ /	/ /	/ /

8. Please explain your ranking in number 7 above.

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(iii)

THE UNIVERSITY OF ZAMBIA, SCHOOL OF EDUCATION, DEPARTMENT OF LANGUAGE AND SOCIAL SCIENCES EDUCATION

(2)

1. RESEARCH: A COMPARATIVE STUDY OF THE CURRICULUM FOR SECONDARY TECHNICAL AND SELECTED MULTITRACK SECONDARY SCHOOLS.

2. GENERAL INSTRUCTIONS*

(i) Please answer all the questions as honestly as possible.

(ii) The information you will provide is strictly confidential and shall only be used by the Department of Language and Social Sciences Education and the Ministry of General Education Youth and Sport.

(iii) Your co-operation in the collection of this data will be greatly appreciated.

PART II

TO BE COMPLETED BY HEADS OF DEPARTMENTS

INDUSTRIAL ARTS

For each question, please tick or circle the appropriate answer(s) or give a descriptive statement or indicate numbers as the case may be:

A. NATURE OF CURRICULUM

1. Do you offer technical subjects as options?

Yes / / No / / (Please tick).

2. If yes in No. 1 above, how many technical subjects is a pupil allowed to opt for 1 2 3 4. (Please circle number appropriate).

3. How many periods are allocated to the following subjects per week?

(a) Metalwork / /

(b) Woodwork / /

(c) Geom. & Mech. Drawing / /

(d) Geom. Building Drawing / /

(Please indicate numbers).

4. In your opinion which factor influence your style of teaching most?

1. Passing examination / /

2. Acquiring skills / /

5. What is your opinion about time allocated to technical subjects?

1. Sufficient / /

2. Insufficient / /

(Please tick).

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6. How would you rate the interest of pupils in technical subjects in your school?

1. Very high
2. High
3. Low
4. Very low

(PLease circle your rating).

7. What is the financial support like for practical subjects?

1. Satisfactory
2. Fairly satisfactory
3. Unsatisfactory
4. Very unsatisfactory

8. What other problems do you experience in offering Industrial Arts as school subjects?

.....

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.....

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.....

b. THE STATE OF MATERIAL RESOURCES

Please complete to show equipment available and what is expected.

1. **METALWORK**

	Name of item	No. Available	No. Expected
1.	Files		
2.	Hammers		
3.	Hack saws		
4.	Tray squares		
5.	Centre punches		
6.	Drilling machines		
7.	Centre Lathes		

2 **WOODWORK**

1.	Centre Lathes		
2.	Drilling machines		
3.	Circular saw		
4.	Planes		
5.	Bank saw		
6.	Mallete		
7.	Try squares		
8.	Hammers		
9.	Chisels		
10.	Garages		

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3. TECHNICAL DRAWING

1. Drawing wards		
2. Tea squares		
3. Set squares		

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(v)

THE UNIVERSITY OF ZAMBIA, SCHOOL OF EDUCATION DEPARTMENT OF LANGUAGE AND SOCIAL SCIENCES EDUCATION

1. RESEARCH: A COMPARATIVE STUDY OF THE CURRICULUM FOR SECONDARY TECHNICAL AND SELECTED MULTITRACK SECONDARY SCHOOLS.

2. GENERAL INSTRUCTIONS:

(i) Please be free to answer all the questions as honestly as possible.

(ii) The information you will give is strictly confidential and shall only be used by the Department of Language and Social Sciences Education and the Ministry of General Education Youth and Sport.

(iii) Your co-operation will be highly appreciated.

PART III

STRUCTURED INTERVIEW WITH THE CURRICULUM SPECIALIST AT CURRICULUM

1. Is the curriculum for technical subjects in technical schools different from the one followed in multitrack schools?

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2. If the answer above is yes,

   (a) To what extent did teachers participate in its preparation?

   (b) How were teachers oriented to the new curriculum?

   (c) Is there an on-going programme for inservice training for technical education teachers?

   (d) If the answer to the above question is 'yes' what is the duration of the programme?

   (e) What qualification do the teachers obtain on completion?

3. What materials were prepared for the new curriculum?

4. To what extent were teachers involved in the preparation?

5. Do technical subjects in technical schools require more time than in multitrack secondary schools?

6. Do secondary technical schools receive more financial support than multitrack secondary schools for technical subjects?

7. In your opinion which are the major problems facing the Industrial arts teacher in both schools?

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B. GRADE 12 RESULTS IN TECHNICAL SUBJECTS IN SECONDARY TECHNICAL SCHOOLS AND MULTITRACK SECONDARY SCHOOLS

SCHOOL	YEAR	M/WORK		M/WORK		G.D.D.		G. R. D.	
		P%	No Sat	P%	No Sat	P%	No Sat	P%	No Sat
	1980								
	1985								
	1989								

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THE UNIVERSITY OF ZAMBIA

INTERNAL MEMORANDUM

FROM: Acting Research Secretary TO: The Director - Computer Centre

DATE: 28th May, 1990

MR. ADRIAN K. TEMBO

This is to confirm that Mr. Adrian K. Tembo is a registered Postgraduate Student in the School of Education. Kindly allow him access to the Computer to enable him process his M.Ed Dissertation.

J. MABULA HUCKABAY
ACTING RESEARCH SECRETARY