FACTORS AFFECTING THE UTILISATION OF INDUSTRIAL ARTS DEPARTMENTS IN SECONDARY SCHOOLS: A STUDY OF SELECTED SECONDARY SCHOOLS IN LUSAKA PROVINCE, ZAMBIA

BY

ATHANASIUS MULINDA MULENGA
B.Sc (Technical Education) University of Malawi

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DEDICATION

This dissertation is dedicated to my dear wife Lafe and my children Chitundu, Mwemeke, Chileshe, Musawa, Mulinda, Mukupa, Kankululu, Kabwe, Chitundu Jnr. and Bupe who bore hardships during my long absence from home, and to my parents.

DECLARATION

I, A. M. MULENGA, hereby declare that this dissertation is my own work and that it has not been previously submitted for a degree at this or any other university.

SIGNED ..... DATE 30/07/03

APPROVAL

This dissertation by **Athanasius Mulinda Mulenga** is approved as partial fulfilment of the requirements for the award of the degree of Master of Education in Educational Administration and Policy Studies by the University of Zambia.

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ABSTRACT

This study was conducted in response to the pertinent need to know how industrial arts departments were being utilised in Zambian secondary schools. This study was concerned with production unit and preventive maintenance activities. This was to establish whether or not the policy pronouncement on the cost sharing measure taken by government by the mid 1980, was being fulfilled. The quest for cost sharing came as a result of the bad economic climate that had crippled Zambia.

The study looked at the factors that could contribute to the utilisation of industrial arts departments in secondary schools, the views held by head teachers, industrial arts teachers and non-industrial arts teachers about the utilisation of the departments and to establish whether or not the location of a school had any influence on the utilisation of the departments.

The study employed a survey research design. The study sample consisted of 74 subjects drawn from nine Lusaka province secondary schools which offered industrial arts education. Research instruments which comprised interviews, self administering questionnaires and observation schedules were used.

Data analysis was done by frequencies and percentages, cross tabulation and regression analysis (where possible) using SPSS computer software programme.

The results of the study revealed that the following factors contributed to the effective or ineffective utilisation of the departments: lack of support by school administration, non operational workshop rooms and insufficient equipment, ineffective departmental management, poor teachers' motivation and attitude towards work, inadequate staffing levels, inadequate provision of materials, and inappropriate training. The views held by head teachers on utilisation of the industrial arts departments were that industrial arts departments were not being used effectively because the production unit was not being conducted. The views of the teachers were that the departments were being utilised well because preventive maintenance was successful despite their observation that the production unit was not being conducted. The location of the

school did not matter in the utilisation of the departments in variables such as production unit, preventive maintenance, theft, and marketing. The location only affected variables such as procurement of materials and tools, where both urban and peri-urban schools revealed that they had problems in procurement ranging from high cost of materials and transport to non availability of materials and tools.

The study concluded that schools were not fulfilling fully the government policy on self reliance and cost sharing measures put in place.

The study recommended the following:-

1. School administrations should support the cause of fund raising by motivating teachers and providing initial capital.
2. The head teachers and heads of department running industrial arts departments should undergo training because they lack the knowledge to supervise the departments.
3. The teacher training curriculum for industrial arts teachers should include industrial arts departmental management and entrepreneurship education.
4. The attitude of all stakeholders in schools should change positively towards work. If this could not change, even if materials and tools were available, nothing could be achieved.
5. There should be unity among all stakeholders and teachers should be honest with themselves as well as to the system they serve.
6. Government should provide enough tools and funds to purchase materials and repair broken down machine tools.
7. There is need to replicate this study and extend it to other provinces in order to find out whether the results obtained in this study could be generalised.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Preview

The inclusion of any subject in the school curriculum in many countries often starts with the policy pronouncements which result from a perceived need to bridge an identified gap in that country's education system (Tembo, 1994). Industrial Arts (IA) Technical Education was introduced into the school curriculum in the same way as other subjects because it was thought to be important.

The importance of Industrial Arts (Technical) education has been stressed repeatedly in the education policy publications of many countries. Spear (1985) reports that in the United Kingdom, a paper presented on the school curriculum produced by the Departments of Education and Science in 1981 attached special importance to technology. It was said that technology was part of the preparation for living and working in a technological society. In most countries, technical education at both school and tertiary levels is meant to train human resources for employment in industries and, to a certain extent, for self employment. (Karlsson, 1991; Nguiru, 1987).

In Zambia, however, the policy for the inclusion of Industrial Arts (Technical) education in the secondary school curriculum was intended to promote, among other things, self reliance of secondary schools (MOE, 1996, 1977). This policy pronouncement came as a result of the poor performance of the economic activities of the country which could no longer support the running costs of schools in full.

The question which prompted this study was that, despite having trained teachers, materials, equipment, and workshops having been provided and school administrations and departmental managements made aware of their responsibility about production, schools were still complaining that there was nothing that was being achieved. In addition, the Ministry of Education Inspectorate report complained about the same problems (MOE 1990).

1.2 Background

Most nations' education policy frameworks call for the integration of technical and vocational education in the general curriculum in order to offer each learner an opportunity to learn basic skills demanded in the world of work (Baiden, 1994).

The development of industrial arts (technical) education is not foreign to the Zambian education system. According to the brief historical background of the development of industrial arts (technical education) outlined by the Education Reform Document of 1977, Technical and Vocational Education was first introduced in Zambia by Christian missionaries. This was done in the pre-colonial era with the aim of developing the human resource needed to help in the building of mission stations and schools. Later on, the colonial Federal and Zambian governments followed suit. The courses established in some institutions were carpentry and brick-laying. In other institutions they taught agriculture and home economics. This was the beginning of trades schools from which technical schools were developed. However, in 1962 and after, most trades schools were closed because they became unpopular.

Following the Saunders' report of 1967,[1] the government decided to formally establish technical education aimed at providing comprehensive programmes. It was recognised that technical education and vocational training deserved the highest priority and that it was a more meaningful and permanent form of national development. At that time, the objectives of the introduction of technical education were to train Zambians who would meet the needs and requirements of industry for skilled human resource and facilitate the attainment of a more meaningful Zambianisation in critical areas of technical and economic activities.

In 1965, in order to meet these objectives, the Government had taken a decision to create two National Technical Schools namely David Kaunda Secondary Technical School in Lusaka, and Hillcrest Secondary Technical School in Livingstone. This was followed by a major expansion in technical education in 1968 by building more technical colleges and trades training institutes. This decision set the pace and pattern of Zambia's present training programmes in the Department of Technical Education and Vocational Training (DTEVT). This had been governed by the Technical Education and Vocational Training (TEVT) Act of 1972 which had been

replaced by Technical Education, Vocation, and Entrepreneurship Training Authority (TEVETA) Act of 1998.

The need to expand technical education at secondary school level prompted the Government to get a loan in 1972 from the World Bank (Education Reform, 1977). This was done so that more pupils could be exposed to technical education.

After 1975, the education sector was dominated by growing shortages of resources due to the poor economy that had hit the country. For instance, between 1975 and 1983, there was a 25% reduction in educational allocations which after allowing for inflation, represented a real reduction of 40% per person (Crackneil, et al., 1994). This situation forced changes in educational planning towards more and more self-reliance. This meant that schools were expected to fend for themselves in meeting some of their expenses. The idea of self reliance led to the reintroduction in 1986 of boarding fees in secondary schools and consequently the enforcement of productive work in schools. Another initiative which came as a result of community participation was the formation of Self Help Action Plan for Education (SHAPE) programme in Primary Schools which was financed by SIDA (Crackneil et al., 1994). In the same period , the Preventive Maintenance System (PMS) was being introduced in secondary schools. The objective of introducing the PMS was to protect school infrastructure which had just been rehabilitated. A brief historical background of PMS is given below.

Between 1964 and 1974 Government was providing funds for maintenance of schools through its service departments of Public Works Department (PWD) to maintain buildings, Mechanical Service Department (MSD) for plant and machinery and Water Affairs Department (WAD) for water supply (ZERP, 1995). The 1970s economic recession made it difficult for the Government to cope with provision of funds for repairs of school infrastructure and equipment. This situation prompted the Ministry of Education to find other means of raising funds to sustain the maintenance aspect in schools. As a result of that production units were started in schools in 1986 (MOE 1996, 1997). But this was not enforced until after 1985 during the time the Government was rehabilitating school infrastructure through the Zambia Education Projects Implementation Unit (ZEPIU). The rehabilitation work was done with the funds provided by

[1] Saunders commission was mandated to look into the establishment of technical education in Zambian schools.

the Norwegian Agency for International Development (NORAD). After realising that the schools which were being rehabilitated were soon being damaged, the government formed a wing within ZEPIU which was in charge of Preventive Maintenance System (PMS) in 1985. PMS was charged with the responsibility of training educational and school personnel in cleaning and repair work (Sunday Times of Zambia, 2000:5).

This PMS was to be achieved through raising funds by production units in the schools. One of the major areas which was thought to carry out this productive work was the Industrial Arts Department. It was planned that as the teachers taught they would carry out repairs of desks, make new furniture for the school, and fund raise to purchase materials to use for regenerating the funds to support PMS. In order to carry out this task, NORAD through ZEPIU conducted a workshop in Livingstone in 1985 for Senior Educational Officials. Arising out of the workshop were the following recommendations:-

(i) to put in place the administrative structure which should be responsible for implementing the general and preventive maintenance systems.

(ii) to organise preventive maintenance system committees in all secondary schools.

(iii) to design training programmes for school administrators, teachers, pupils and communities to sensitise them of the concept of preventive maintenance system.

In essence, the industrial arts department in a secondary school was expected to be at the centre of all preventive maintenance activities, production of furniture and one of the major fund raising sectors of a secondary school. However, that had not been the case.

1.3 Statement of the problem

One of the objectives of the inclusion of industrial arts education in the curriculum is self reliance, which implies income generation and repairs (MOE, 1996:168). This is reflected in the education policy, Educating Our Future, of 1996. The policy emphasises that industrial arts departments should be self sustaining to meet their running costs and, where possible, supplement the expenses of the school. This policy was put in place because Government could not adequately fund the industrial arts departments in secondary schools. However, reports from the Ministry of Education and secondary schools showed that industrial arts departments were still fully dependent on Government funding (MOE, 1990). That was in spite of schools having trained

teachers, equipment, workshops, and materials. In addition, school administrations and industrial arts departmental managements have been aware of the benefits of what industrial arts departments could accrue to the school from its effective utilisation. There was a need, therefore, to find out why industrial arts departments' stakeholders had been failing to achieve that objective . This study was prompted by that need.

1.4 Purpose of the study

The purpose of the study was to identify the factors that affected the utilisation of the Industrial Arts Departments in Secondary Schools.

1.5 Objectives of the study

1.5.1 The general objective of this study was to discuss the sustainability of schools by evaluating the utilisation of Industrial Arts Departments.

The specific objectives of the study were:

1.5.2 to identify the factors that affect the utilisation of industrial arts departments in secondary schools.

1.5.3 to establish the views of head teachers, industrial arts teachers, and non industrial arts teachers about the utilisation of industrial arts departments in secondary schools.

1.5.4 to determine if the location of a school (Urban/Peri-urban) had any influence on the utilisation of industrial arts departments.

1.6 Research questions

The study addressed the following questions:-

1.6.1 What were the factors affecting the utilisation of industrial arts departments in secondary schools?

1.6.2 What were the views held by head teachers, industrial arts teachers and non industrial arts teachers about the utilisation of the department?

1.6.3 Did the location of a secondary school have any influence on the utilisation of the department?

1.7 Significance of the study

It was expected that the findings of the study might help policy makers and practitioners to address problems arising from factors that affected the utilisation of industrial arts departments in secondary schools.

1.8 Limitations of the study

Due to insufficient funds and time the study was limited to nine secondary schools in urban and peri-urban districts of Lusaka Province and was also confined to head teachers, heads of industrial arts departments, industrial arts teachers, and non-industrial arts teachers. However, the study did not include pupils, inspectors of industrial arts and the community. Consequently the results obtained may not readily be generalisable to the whole country.

1.9 Definitions of terms

The following are the definitions of terms used in this study.

1.9.1 **Attitude:** refers to a settled mode of thinking portrayed by a person that has an effect on what that person is doing. This attitude can be positive or negative depending on the situation.

1.9.2 **Administration:** refers to the act of looking after people's welfare using routine bureaucratic methods.

1.9.3 **Effective:** refers to the activity being remarkably achieved. That is, to do something with high expectations.

1.9.4 **Entrepreneur:** refers to a person in effective control of a commercial undertaking or one who undertakes a business or enterprise with the chance of profit making or a loss.

1.9.5 **Entrepreneurship:** refers to the understanding of commercial business or enterprise. It refers to the doing of new things that are being done in a new way (Schumpter, 1947:51)

1.9.6 **Equipment:** refers to tools and other utilities used in doing a job.

1.9.7 **Factors:** refer to circumstances, facts or influences which contribute to a result. For example in this study, lack of support by school administration and insufficient tools are some of the factors which could contribute to departmental success or failure.

1.9.8 **Industrial Arts:** refer to technical subjects or technology. For this study the following subjects are included: metal work, woodwork, and drawing and design.

1.9.9 **Industrial Arts Head of Department:** refers to an experienced and knowledgeable teacher of industrial arts who is appointed to supervise others and control the affairs of running the department. His/her main responsibilities are to acquire materials and equipment and keep them, control the use of equipment and materials and maintenance of equipment.

1.9.10 **Management:** refers to the task of planning, organising, supervising and evaluating so that the aim of the business can be met (Karlsson, 1992). It refers to proper caring of tools and other equipment, workshops, purchasing and wise use of resources, supervision of trained teachers, record keeping and programmes coordination.

1.9.11 **Multi track school:** refers to a school which uses ordinary and technical curriculum.

1.9.12 **Materials:** refer to metals, wood, glue, welding rods, and other things used in carrying out metal or wood projects.

1.9.13 **Policy:** refers to the statement of intentions directed at solving problems in order to achieve or attain desired goals.

1.9.14 **Supervision:** Monitoring activities of subordinates by superiors.

1.9.15 **Teacher Training:** refers to training of teachers either as pre service or in-service at the college.

1.9.16 **Technical and Vocational Curriculum:** refers to a set of subjects taught at school and college involving technical and vocational skills.

1.9.17 **Technical School:** A school which has emphasis on technical subjects curriculum.

1.9.18 **Utilisation:** refers to the use of workshops and other facilities by teachers and pupils in the achievement of entrepreneural skills as may be demonstrated in fund raising and preventive maintenance system.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Preview

This chapter starts with the review of literature on the origin and growth of industrial arts in Zambia followed by a review of the policy on industrial arts (technical) education and a review of some contextually related literature on factors that affect the utilisation of industrial arts departments. The factors referred to are lack of support by school administration, non operational workshop rooms and insufficient equipment, ineffective departmental management, poor teachers' motivation and attitude towards work, inadequate staffing levels and inadequate provision of materials.

2.2 Origin and Growth of Industrial Arts Education in Zambia, Policy and Related Studies

2.2.1 *Origin and Growth of Industrial Arts Education in Zambia*

Industrial Arts education (IAE) or Technical Education (TE) was first introduced in Zambia by the London Missionary Society (LMS) at Mbereshi in Luapula Province in 1903. The Luapula man behind this was Bernard Turner, a missionary who translated into action an idea which was originated by the secretary of the London Missionary Society after he wrote to Rev. John May of Kawimbe in Nothern Province in 1900 as reported by Snelson (1974:13). He noted that:

> It is most important that the converts should learn to read in order that they may attain to a fuller knowledge of scriptures, but I think it is more important that they should learn to live self respecting, progressive Christian lives. The mission that turns out good carpenters and black smiths does more among people such as you have than that which turns out good readers and writers.

The Ministry of education (MOE, 1977:49) confirmed that mission schools had workshops in which some trades or crafts were taught mainly for the purpose of servicing school expansion or for maintenance programmes. This example from missionaries was later followed by the colonial, Federal and Zambian Governments during their times. Luchembe (1994) in his study revealed that by the 1930s the general notion had strongly been imparted that education was the main vehicle

of access to the colonial wage economy. For this reason, higher levels of education were pre-conditional for entering the few more rewarding positions that were available. Snelson (1974) adds that despite the idea of white collar jobs, practical education was part of the school curriculum and had been strengthened upon the recommendation of the Phelps stokes commission which visited the territory in the early 1920s. Snelson argued that the aim of practical education was to contribute towards character training, helping to instil accuracy, neatness, general handiness and respect for manual work. However, the status of technical education was at risk with the coming of independence in 1964 and the notion of a white collar job. Even the new governments' policy did not improve the status of practical education or raise the demand for it as shown by the statement of policy and intent report as shown by Musakanya (1969:9):

> Unfortunately, it would appear that the policy was to dampen the desire for practical work and to encourage every African going to school to look to clerical work or teaching and the ultimate desire for every educated African, thus was born the anathema of present day desire of every literate Zambian to become a white collar worker.

Luchembe (1994) revealed that there was also a general reaction by the new Government which sought to alter the pre-independence school curriculum in order to match the new aspirations of the people.

MOE (1977) reported that from 1962 practical education like carpentry was being discouraged or abandoned altogether because it was becoming unpopular. This official view was reinforced by the fact that only about the dullest students were considered suitable to enter trade schools (Snelson, 1974). The idea of concentrating on educating people for white collar jobs and the closure of trade schools was found to be faulty. The reason was that there were no trained human resources to work in industries. Snelson (1974) and MOE (1977:49) reported the findings of the study of Saunders which had taken place in 1967 to support the expansion of technical education. This support for expansion was as a result of insufficient qualified personnel to work in industries. The need for the expansion of technical education led the government into carrying out the following activities:-

In 1965, the Government had started to expand technical education at secondary school level for the same reason of preparing students who would study technology at the university. This expansion began with David Kaunda and Hillcrest Technical schools. In their study Crackneil,

et al., (1994) revealed that after 1975, the reasons for the expansion of technical education at school level took a different turn. The reasons were not any more to prepare students for further studies but for provision of self-reliance through production activities in secondary schools. They further observed that between 1975 and 1983, there was a 25% reduction in educational allocations which, after allowing for inflation, represented a real reduction of 40% per person. This had earlier on compelled the Government to get a loan from the World Bank in 1972 to introduce industrial arts education (IAE)in all secondary schools. The purpose of introducing IAE in schools was to enhance fund raising ventures. This situation necessitated changes in educational planning towards more and more self-reliance. This entailed that schools were expected to supplement government funding through fund raising activities.

According to the Zambia Education Rehabilitation Project (ZERP) (1995), the economic recession of the 1970s had a telling effect on the management of schools. The government was no longer rehabilitating schools' infrastructure through its service departments namely Mechanical Services Department, (MSD), Public Works Department (PWD) and Water Affairs Department (WAD). This forced the Government to get a loan from the World Bank in 1981 to rehabilitate secondary schools. To safeguard the schools which were rehabilitated, the Government formed a training wing within Zambia Education Projects Implementation Unit (ZEPIU) which was in charge of the rehabilitation of schools. The ZEPIU training wing which was supported by the Norwegian Agency for International Development (NORAD) put up a strong training programme in preventive maintenance for all education stakeholders from the Permanent Secretary to a pupil. Alongside preventive maintenance (PM) a system of production unit (PU) which involved industrial arts education (IAE) was formed to answer the Government Policy Pronouncement on Production Units, that each learning institution should be a production unit (MOE, 1977:47).

Owen (1981) and Kunkhuli (1988) outlined the theories which advocate that effective school/organisation performance depended on properly trained human resources, the supply of tools and resources, and how workers were motivated. Other factors were clear goals, an orderly school climate, high expectations and standards, frequent monitoring and assessment of students' progress.

In this study, reference was on entrepreneurship which meant utilisation of facilities found in industrial arts departments by properly trained teachers to create enterprises or businesses. The other factor considered in the utilisation of IAE was the availability of the market where to sell the produce. Donaldson (1985) observed that the important characteristic of an entrepreneur was autonomy and the freedom to make decisions according to the individual's preferences in the light of market opportunities. Practical and vocational studies (Dewey, 1921 and Thompson, 1981) were no longer thought of as subordinate education to general academic education. In fact, in the curriculum being advocated in this study, work and education must meet on equal terms. It should no longer be merely a question of balance in the curriculum but one of school organisation. The way forward should be to search new strategies of integrating theory, practice and production in an interactive and dynamic pedagogy. In support of the foregoing statements, Griachino and Gallingtong (1961:25) described Industrial Arts (Practical subjects) as-

> Instructional workshop of a non vocational type which provides general educational experiences centred around the industrial and technological aspects of life today and offers orientation, production, consumption and recreation through actual experiences with materials and tools.

Griachino and Gallington's idea about production unit in I.A. is supported by Maphosa (1999) who describes education for entrepreneurship (Production) as a central issue in the 1990s. As at the time of the study there were no guidelines as to how this PU in industrial arts education could be done within the broad spectrum of the Zambian education system.

2.2.2 *Policy on industrial arts education*

The policy pronouncement of secondary schools which offer industrial arts education engaging in fund raising activities (production unit) meant the introduction of entrepreneurship aspect in the education system (MOE, 1996:168). This entailed that schools should become small businesses contributing to the economic competition, raising the level of popular participation in the economy and promoting growth and equity (World Bank, 1978, and Obi, 1991). This meant that for schools to be small business houses, those in charge should be equipped with the knowledge to run a business. In this case teachers of industrial arts were to be trained in entrepreneurship skills. This called for the inclusion of the entrepreneurship component in the

teacher training curriculum. Much has been talked about the inclusion of entrepreneurship and management courses in the teacher training curriculum and that has been written in both educational policies "Educating Our Future" and "Technical, Vocation and Entrepreneurship Training" (MOE, 1996, TEVET, 1996). Entrepreneural training in teacher education has not yet been developed and has still remained a neglected factor.

While the MOE emphasises fund raising by the industrial arts department, the Ministry of Science, Technology and Vocational Training (MSTVT) does not provide a policy to guide the training of teachers in entrepreneurship to go and carry out PU in secondary schools after teacher training. Having reviewed the TEVET (1996) Policy on Technical Education, Vocation and Enterpreneurship Training, it was found that: the policy did not out line how the entrepreneurship component was going to be achieved in teacher training; the policy did not include entrepreneurship subject on the list of subjects for teacher training and the curriculum still remained as outlined by Eklof and others. The curriculum includes Metal Work, Wood Work, Technical Drawing, as teaching subjects . Education subjects comprised; Educational psychology, Philosophy of education, Sociology of education, General principles of Teaching, practical aspects of teaching, Education aids, Education system of Zambia and Teaching practice (See Appendices 6a – 6c). Subjects such as Management and entrepreneurship which are pertinent to the effective running of the department did not feature. The policy did not also provide for collaboration between the two ministries MOE, and MSTVT in matters concerning teacher training. This has been contrary to the way forward in teacher education which is to search for new strategies of integrating theory, practice and production in an interactive and dynamic pedagogy (Munowengau, 1999).

In summary, it has been discovered that the two policies mentioned above have been very sketchy, they have not clearly spelled out how fund raising in industrial arts departments was to be implemented and later evaluated. Until the time of the study the policies remained on paper, their actual implementation in the schools was not yet in place.

2.2.3 *Related Studies on industrial arts education*

It has been very difficult to find literature which specifically addresses the issue of utilisation of industrial arts departments in Zambian Secondary Schools that offer industrial arts education. The

idea of utilisation as already alluded to in chapter one means the use of industrial arts departments to fund raise and conduct preventive maintenance in schools. This idea of fund raising emanates from the policy pronouncement that each educational institution should be a production unit and that all production projects should be a responsibility of all members of the institution, staff and students (Ministry of Education, 1977:47).

Studies carried out in Zambia (Kunkhuli, 1988; Luchembe, 1994; Lungwangwa, 1980; Mungo, 1998 and Mweetwa, 1999) have been generally about integration of the technical curriculum in the school system, teaching of industrial arts education, production with emphasis on agriculture and the inclusion of the girl child in the learning of technical education. Studies on how industrial arts departments should be used for production have not been conducted.

It should be noted that fund raising activities in secondary schools or education with production, is referred to as "Entrepreneurship" in other countries. This term will be used frequently in this chapter. Studies carried out on Technical and Vocational Education(TVE) focussed their attention on how pupils should be prepared for future employment and self-reliance after leaving school (Munowenyu, 1999; Maphosa, 1999, McNeil, 1990; and Balch, 1989). The studies did not discuss the inclusion of important subjects such as management and entrepreneurship nor did they outline how fund raising should be conducted in industrial arts departments in secondary schools. Consequently, teacher training curriculum was also criticised in Malawi for not providing training in workshop maintenance and management procedures (Thompson, 1992:27). Studies on TVE reveal that in many countries, though there was an urge to change technical teacher curricula, little was done to include management courses and maintenance of equipment. In Botswana, however, the installation and maintenance of equipment were taught as courses in the teacher training (Thompson, 1992). An Earlier study conducted in Mexico by Allen (1988) revealed that there was need to change the industrial arts curriculum to make it more responsive to the demands of the changing time by adding courses such as management.

It can be seen that many countries are still not training teachers to solve some of the financial problems faced by schools through fund raising. The other reason for the failure to solve financial problems in schools through fundraising could be as a result of ineffective school administration

and departmental management. As the old adage says "the success of any organisation depends on a sound administration". Morris (1950:66) revealed that no organisation could improve or advance beyond the thinking of those who directed its operation. Therefore, an administrator in educational organisation, needed to have a sound qualification because he or she set the pace for those who work under his/her supervision. Morris also argued that an administrator by virtue of his/her position could be a tower of strength or a barricade. He further revealed that an administrator should have the intellectual stature, the scope of enlightenment, the education judgement and vigorous leadership for his/her school. In this study a school administrator is viewed as one who holds a key responsibility in making any programme work in a school. It is true to say that if the leader has no relevant knowledge or qualification he/she would find leadership difficult to sustain.

The Ministry of Education (1996:47) acknowledged that teachers in Zambia did not have management training background. Despite the provision of in-service training of teachers, teachers were not trained in professional skills and improvement of administrative and supervisory techniques (MOE, 1977:66)

In the study conducted by Baiden (1994) it was revealed that in Ghana Headteachers of technical schools received instructions in managerial and administrative courses tailored towards the operation of technical institutions. In addition, the encouragement of Technical and Vocation Education (TVE) in Ghana led to the establishment of production unit activities using the entrepreneural skills of technical education. In his study, Ahmed Kreen (1985) came across eight competency areas which could be used as guidelines for developing training curricula for vocation administrators.

In support of Ahmed Kreen, studies carried out in the United Kingdom and other countries showed that student teachers for technology (industrial arts) spent some time considered total training period in an industrial setting within the duration of the course. That arrangement brought together teacher trainers and training staff from industries thereby exposing teacher trainees to industrial management techniques (Commonwealth, 1978; Thompson , 1992 and O'malley, 1986).

According to Sock (1993) the centrality of basing training programmes on identified needs were undisputed in the planning literature. However when one looked at what happened in practice, very few of those people involved in designing training programmes based them on the needs of the clients. Nguiru (1987) revealed that current research findings indicated little direct relationship between education and entrepreneural success. The reason was that there might be little in the present curriculum at all education levels that taught concepts leading to successful entrepreneurship. The fault may lie with the curriculum not with the education system. Nguiru's assertion was in line with what had been happening with the technical education curriculum in Zambia. All stages of curriculum change had been followed but some relevant subjects such as management and entrepreneurship were not included. That was why perhaps there was still no evidence of progress in the area of Production Unit in our secondary schools.

Kunkhuli (1988), in his study conducted in Zambia noted that other researches like Cohen (1981) Tomlison (1981) argued that the leadership (Headteacher) in a school bore ultimate responsibility for how effective or ineffective a school would be. He further indicated that other researchers like Barth (1982); Manasse (1982) argued that effective teachers, good school community interaction and the background of the student population might be responsible for good schools. Kunkhuli's study is similar with this research in that both pieces of research discussed the use of teachers and headteachers in the production unit activities in schools. However, Kunkhuli's study discussed the general school improvement while this study discussed utilisation of I.A. departments where various stakeholders needed to play a part. Kunkhuli observed that there were several factors that made an effective school. What he was trying to show was that an effective school led to effective performance which resulted in better academic performance. The current study is concerned with examining some of the factors brought out by Kunkhuli and how they affected one section of the school, the industrial arts department. Particularly the study was looking at fund raising and preventive maintenance as important variables, which could enhance learning.

A study conducted in Ghana by Baiden (1994) brought out two good ideas for those heading schools which offer industrial arts education. These ideas are the management training for those heading technical institutions and how they should use the technical department to fund raise for school improvement. He noted that in Ghana they recognised the principal's (head's)

responsibility as the chief academic and administrative head responsible for the smooth running of the institution. He further showed that the involvement of the Ghana Education Service (GES) in training heads of technical school through seminars and workshops was purposesful. The aim was to enable them carry out their numerous managerial, administrative duties, and introduce the heads to all aspects of operation of a technical institute effectively and efficiently. From the encouragement given by GES in some of the units, students were engaged in producing goods and providing services in real life situations for customers on semi-commercial basis. This was to generate income to supplement Government grants for their operations.

The study by Karlsson (1992) outlined some management functions of head teachers. These functions included planning, organising, supervising and evaluating so that the aim of the business could be met. It was argued that in management, there should be general and specific objectives of the business or organisation. One of the objectives of industrial arts education, was to create funds in schools. This could be achieved as a result of engaging management functions already alluded to. Karlsson defined management as overall management and financial management. Overall management was responsible for setting up business, making work plans, supervising, organising, marketing and evaluating. Others included settling conflicts, encouraging and inspiring members. On financial management, he explained that it dealt with control of money, budgeting, book keeping, accounting, costing, auditing and pricing. All these aspects were missing in our education system.

Studies conducted by Dettman (1969), Molotsi (1975) Townsend (1984) Krajewski (1977) Schmuck and Runkel (1977) and Gweynn (1965) observed that the school management involved many officers who included head teachers and heads of departments (HOD). These studies showed that supervision was of paramount importance. Supervision they said should be viewed as a complete effort to stimulate, coordinate and guide the continued growth of teachers. The principal/headteacher was seen as a major factor in influencing teachers to change and therefore could not escape the role of a leader. Similarly, the head of department had been given the responsibility to run the department which included the supervision of a teacher. What the studies brought out was the fact that if supervision was absent in the running of the school nothing could be achieved as it is one of the most important tools of management.

Further studies revealed that headteachers had dual role as leaders and as administrators of schools (Savory, 1957; Kwakwa, 1973). As leaders, head teachers provided motivation to their subordinates so that work could be done willingly while, as administrators, they used management functions such as planning, supervision, delegation, coordination and evaluation to have their work carried out by subordinates.

Coulson (1976) indicated that among the many roles examined for the head teacher were the supervision and evaluation of teachers' performance. It has been found that schools do not perform well because they lack proper supervision. The assertion by Coulson is supported by the study carried out by Kwakwa (1973) which disclosed that some headteachers lacked skills in supervision. The reason advanced was that in most cases headteachers are not conversant with many subjects taught in their schools. As a result of that, headteachers were encouraged to work closely with HODs for success in schools.

Marland (1977) confirmed that HODs were important officers as they were experts in their departments. As such headteachers were advised to use these expertise to run their schools. The success of schools was attributed to HODs perfomance in his study. Lambert (1975:37) revealed that HODs did not see that their offices were important. Perhaps this ignorance contributed to their poor performance in running their departments. This meant that the role of HODs should be spelt out more clearly. In his study, Chibesakunda (1983:68) was in support of Lambert's idea. He said, in "Zambia the Ministry of Education had not in most cases outlined what each HOD was to do and how much power he/she had apart from keeping examination safe." In support of Chibesakunda's thought, the Ministry of Education Inspectorate Guideline of 1973 spelt out some duties of HODs, not much was said on other forms of supervision. Contributing to this (Gweny, 1965:232) wrote:

> The Head of Department might be defined as director and supervisor of all work which is carried on in his/her department. Therefore, the very fact that a Head of Department is selected for it, implies that administration delegates some supervisory responsibilities to this Departmental Head and that means he must be trusted.

In most Zambian schools, Industrial Arts Heads of Department (IA HOD) were not trusted by head teachers because they thought IA HOD were dishonest. They thought IA HODs were dishonest because most of their PU activities were done without the knowledge of the head teachers.

The training philosophy and policy of several institutions both Government and private show that they were based on the understanding that training enhances performance. Several studies have revealed that training for education managers was a multi-purpose activity which included orienting new managers (Chumura and Associates, 1987); providing skills and knowledge for the new position (Nadler, 1989), improving the effectiveness and productivity of education managers, reinvigorating turned out managers (Chumura, 1989, Owen, 1981) and reinforcing the ministry's philosophy, policies and procedures.

Analysing the results of the above studies, one would not be wrong to conclude that trained managers were far much better than untrained ones in that they were competent and cost effective. An untrained manager would do a lot of wrong things before arriving at a correct decision because s/he would be using trial and error approach. In the long run the damage that could be done by an untrained manager could be more costly than if they took him/her for training.

Luchembe (1994) studied attitudes that teachers held towards skills training and the occupational aspirations that participants in schools for continuing education held. He was looking at the various kinds of skills training continuing education schools could offer to participants in terms of reducing unemployment for participants. He recommended that the process of training the youths, needed equipment and workshops. If these things were not there nothing fruitful could be achieved. His study overlooked the point of fund raising activities as some of important issues in a school with a technical department.

Among the salient features of the 1977 Education Reforms was the emphasis on education with production. Its aim of combining education with production was mainly to help pupils in schools develop positive attitude towards manual work and to equip them with particular life skills. Among the weaknesses which have been observed is that this type of education system has not been fully implemented due to various factors which include insufficient financial resources (Kelly, 1991).

Lungwangwa (1980:72, 119-120) in his study on education and humanism, acknowledged the inclusion of technical subjects in the school curriculum. He observed that Zambian Humanism as an ideology was a basis of educational requirement in Zambia. The PU activities he discussed were related to agricultural science and food production. He did not ascribe PU to industrial arts education and yet one of the reasons for its inclusion in the school curriculum was for PU in order to supplement government funding to run the schools. His study therefore, lacked information on how industrial arts education could be used for PU to assist schools financially.

Mungo (1998) examined Industrial Arts Teaching in Zambia in which he revealed pertinent issues about Industrial Arts Teaching. He identified the factors responsible for successful teaching of industrial arts as training of industrial arts teachers and how they should be retained, and the supply of teaching materials and equipment. In his study, he looked at the extent to which these factors affected the teaching of the subjects. His findings revealed that 77% of schools taking industrial arts education lacked enough tools and machinery. He observed that although the Ministry of Education supplied tools and machinery, most of them were either stolen due to workshop breakages or lost through carelessness of teachers. My critical review of Mungo's work found that Mungo did not look at how the industrial arts departments could be used with the resources available to generate some funds, which could be used to sustain industrial arts departments themselves and the surplus spent on other school requirements. In his reference to teacher training, while he was unhappy with the type of training offered to teachers of I.A subjects, he did not indicate which subjects should be included in this training. The current study attempted to look at how these departments could be used by teachers to create funds for use by departments and the entire school so that even teaching materials and some equipment could be bought from the same money. In addition, this study proposed subjects needed to be included in teacher training curriculum.

Mweetwa (1999) in her study entitled Pre-service Teacher Training in Zambia, revealed that the teaching of industrial arts education in Zambian schools had been a problem due to the following factors: poorly trained teachers who could not match with the present dictates of technological changes. She laid the blame on the teacher training curriculum which was not adequately broad (See appendix 6b), lack of teaching materials and equipment (i.e. tools and machinery). In addition, she emphasized that Technical Education should be taught with production, as production was one

f the most important activities in technical education. My critical review of Mweetwa's studying as shown that she did not indicate how the teacher training should improve in order to produce eachers who would be able to handle the teaching of technical subjects. In addition no mention vas made of how the production unit and cost sharing ideas could be achieved.

O'malley (1986) examined factors which influenced quality circle a widely used participatory management model in industry to see if it could be applied in public school setting. The study employed both qualitative and quantitative methods. His investigation had a primary purpose of determining if the school employees' skill and knowledge in problem solving were increased and if their attitudes towards themselves, their co-workers, administrators and their jobs in general improved as a result of participation in the quality circle programme. The results of the study showed that the attitudes of participation, confidence and trust, achievement, influence on others, communications, satisfaction, decision making, power and autonomy were significantly more positive for the successful group at 0.05 level or less. Behaviour towards superiors was found to be marginally significant. A critical review of this study has shown that there were many similarities both in methods and findings with my study. Both studies were examining skills, knowledge and attitudes towards work. In addition, the transfer of quality circle management suited well in the school environment where industrial arts operated. This management model was found to be suitable for my research because industrial arts activities belonged to industrial set ups. This type of management was introduced in the education system to try and see if the same management model in industry could work in the education set up.

Bwalya's (1983) study on Production Unit (PU) in some Zambian schools and colleges was conducted to establish organisational problems and prospects faced in the organisation of PU. He used a survey method to collect data which was analysed by observation, percentages, chi-square and gamma measures of association for ordinary variables. He dealt mainly with PU in agriculture which was more relevant to what was expected to be done in institutions of learning to produce more food to enhance food security. Although the focus in his study was on PU in agriculture, information on industrial arts education and its PU was mentioned in passing. His study revealed that the PU conducted in industrial arts department was one of the smaller sections of the PU activities carried out in secondary schools. He cited the problems faced by PU to be operational and administrative. Other problems were lack of qualified teachers to manage PU, theft of tools,

insufficient working tools, lack of awareness of wide range of productive activities and lack of initial capital. One of his recommendations was to train more technical teachers who should teach in schools and carry out PU work.

Bwalya's concern in his study was on agricultural education, its P.U activities and problems. Many learning institutions, as it is indicated, think that PU means agricultural activities only. This is why the current study has looked at PU in industrial arts as an alternative to agricultural PU. In addition the study has tried to find ways and means of how industrial arts PU could be organised.

Ronan (1998) conducted a research on developing entrepreneurship through education. His target population were the tertiary institution students. He looked at factors which contribute to an enabling environment for the growth of entrepreneurship. The factors that were identified are: government incentives, market, finance, education and training. He found that government should support entrepreneurs through grant for plant and machinery, and for training personnel. On the market aspect, he found that before any plan to establish a business is hatched a market should be found and financial aspect put in place so that when the business starts it could not fail. He pointed out that education and training are vital in creating business. He argues that people intending to start an enterprise should be well trained in the field of entrepreneurship.

It can be seen that the factors identified by Ronan were among the factors that are required to run an industrial arts PU in secondary schools. While the government of Zambia provided most of these factors, it was observed that secondary schools did not know how to put all the factors to good use to achieve PU. Schools were not ready for the fund raising ventures perhaps because of inappropriate teacher training and lack of guideline on how to use the resources toward it. Ronan did not relate his study to institutional enterprise but to individual students in an institution. The current study, therefore, was designed to examine the factors mentioned above to see how they could be used to generate funds in an industrial arts department in a secondary school, using the expertise of a trained industrial arts teacher.

In conclusion of this chapter, it is noted that the pronouncement of the policy that all learning institutions become production units by the head of state meant that schools utilise some of the departments in schools to generate funds to supplement government funding which was dwindling

due to bad national economic trends. Among the departments which were charged with PU activities in schools was industrial arts. The additional responsibility given to the industrial arts department, owing to its nature, was to carry out PM activities.

The idea was that after money is generated it could be used for furniture and building repairs including general maintenance and cleaning. The literature which has been revealed here points to the fact that there were problems that were met in the process of running an industrial arts department. Although the studies reviewed did not talk about institutional fund raising (entrepreneurship) per say, they pointed to the facts of lack of trained industrial arts teachers, insufficient equipment, lack of commitment by school managers and teachers to carry out the fund raising activities. Further, the literature reviewed in this study include the aspect of production in Industrial Arts. Having compared studies carried out abroad and in Zambia I noticed that there was a gap in as far as using Industrial Arts Education for entrepreneurship was concerned. Although literature mentioned that Industrial Arts could be used to generate funds, there were no strategies mentioned to use in achieving that. Some of the notable strategies that were identified from the literature review were broadening the teacher training curriculum which should include entrepreneurship and management courses and to orient head teachers and HODs who head schools which offer Industrial Arts Education.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Preview

In this chapter, descriptions of the techniques used to collect, analyse and interpret data are presented . These include research design, study population, sampling procedure, sample size, research instruments, data collection, data analysis, and data interpretation. The instruments were tested in a pilot study that was conducted on selected people with similar characteristics of the intended study sample. The purpose of conducting the pilot study was to remove ambiguity in the instruments so that the subjects of the study and the researcher would not experience any difficulties. The instruments were revised after the pilot exercise.

3.2 Research Design

This research employed the survey design which was descriptive in nature. It focussed its attention on finding out whether or not industrial arts departments in secondary schools were effectively utilised and managed. The survey design was used as it was found to be the most suitable way of addressing the research questions because of the type of data required from a known population. Robson (1993:124), has noted the assertion that surveying means:-

(i) The collection of a small amount of data in standardised form from a relatively large number of individuals, and

(ii) The selection of samples of individuals from a known population.

Kerlinger(1964:124) has also observed that survey research is typified by the collection of data from a population, or some sample drawn from it to assess the relative incidence, distribution and interrelationships of naturally occurring phenomena. Bryman (1989:104) offers a more formal definition of survey research in support of Robson and Kerlinger.

> Survey research entails the collection of data on a number of units and usually at a single juncture in time, with a view to collecting systematically a body of quantifiable data in respect of a number

of variables which are then examined to discern patterns of association.

To obtain the results of this study, both quantitative and qualitative research methodologies were used because Bell (1993:6) and Robson (1993:19) observed that sometime there were occasions when quantitative research draws on qualitative techniques and vice-versa. Quantitative research methodology is a method of collecting facts and study the relationship of one set of facts to another. It is also known as hypothetical – deductive or simply scientific research method. This method uses scientific techniques that are likely to produce quantified and, if possible generalisable conclusions. Qualitative research methodology is a method of collecting facts to understand individuals' perceptions of the world. It is also known as interpretive or ethnographic research method. It seeks insight rather than statistical analysis (Bell, 1993:5-6 and Robson, 1993:18-19). Qualitative methodology was used on semi-structured interviews for Head Teachers and Heads of Department (HODs), while quantitative methodology employed self-administered questionnaires for teachers.

3.3 Study population

The target areas were all secondary schools in Lusaka Province(see figure 1.1 on page 27). The population subjects included Head Teachers, Deputy Head Teachers, Heads of Department, and all Teachers of different subjects. The population of secondary school teachers in Lusaka Province at the time of the study was 700.

3.4 Sampling

To determine the sample, several factors were considered. In the first place, Lusaka Province consists of urban, peri urban and rural districts. Lusaka City is urban, Chongwe and Kafue districts which are 45 km each from Lusaka are considered peri-urban and Luangwa which is 330 km from Lusaka is a rural district. Since the study was focusing on the performance of industrial arts, only districts which had secondary schools with industrial arts were selected. As a result Chongwe, Kafue and Lusaka districts were selected purposively (see Figure 1.2 on p.27). A stratified sampling technique was used to arrive at the nine (9) secondary schools. Firstly, schools were put in categories such as government schools, mission schools which are solely controlled

by missionaries, grant aided schools which are supported by both the government and missionaries, and private schools from the three districts. Secondly, only Government schools and aided schools were randomly selected. Thirdly, from these schools nine schools which offer industrial arts education were purposefully selected. The study also employed stratified techniques due to many different types of subjects used. Finally, purposeful and systematic random sampling were employed to arrive at the sample required. Systematic random sampling involves choosing a starting point in the sampling frame at random and then choosing every n^{th} person. Thus if a sample of fifty is required from a population of 2000, then every fortieth person is chosen (Robson 1993: 137 – 8). Purposeful sampling is a selection of study subjects based on the known required characteristics. The following schools were selected; In the urban category were David Kaunda, Kamwala, Kabulonga Boys', Libala, Matero Boys' and Munali Senior secondary schools; while in the peri-urban category were Chongwe, Kafue Boys' and Naboye secondary schools.

Fig. 1.1 The Provinces of Zambia

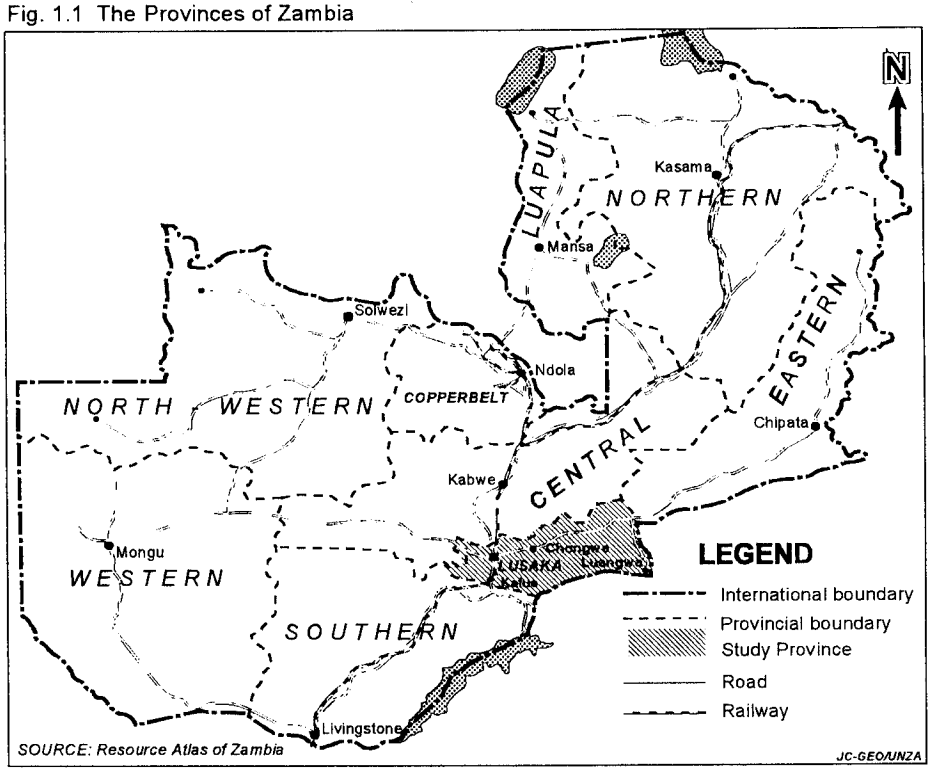
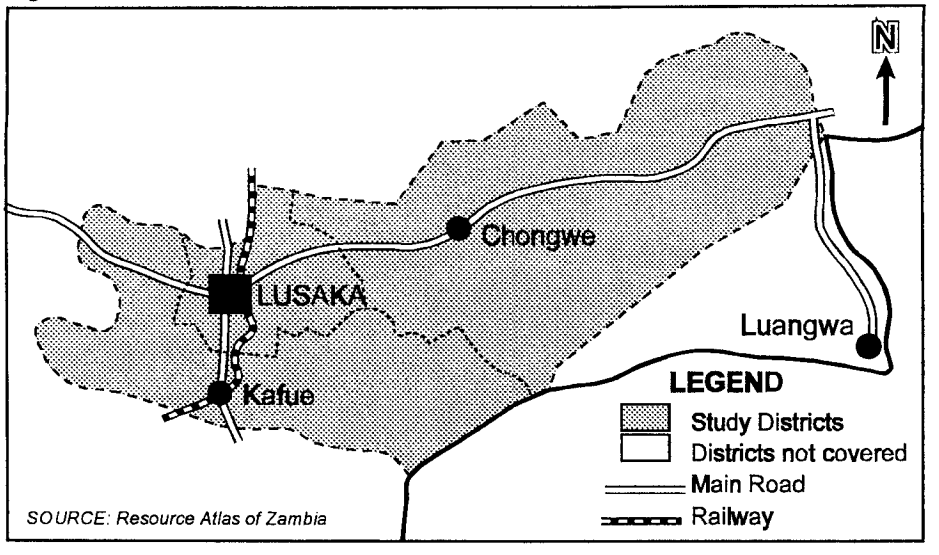


Fig. 1.2 Districts of Lusaka Province



3.5 Sample Size

A total sample of 74 respondents representing 18.5% of the total population of 400 subjects in nine (9) secondary schools which offer industrial arts education were finally obtained from the estimated 100 subjects. The 74 subjects comprised nine head teachers (HTs), nine heads of department (HODs), 25 industrial arts teachers (IATs) and 31 non-industrial arts teachers (NIATs). The distribution of this sample is shown in the table below:-

Table 1: Distribution of respondents per district

District	Sec.School	HT-%	HOD-%	IAT-%	NIAT-%	Total-%
LUSAKA (URBAN)	Munali Kamwala David Kaunda Libala Kabulonga Boys Matero Boys	6 (8.20)	6 (8.20)	19 (25.75)	18 (24.4)	49 (66.2)
KAFUE (Peri-urban)	Kafue Naboye	2 (2.72)	2 (2.72)	3 (4.15)	8 (10.9)	15 (20.2)
CHONGWE (Peri-urban)	Chongwe	1 (1.35)	1 (1.35)	3 (4.15)	5 (6.85)	10 (13.5)
Total	9(100)	9 (12.85)	9 (12.85)	25 (33.85)	31 (40.6)	74 (100)

It can be seen that many of the respondents 49 (66.2%) were drawn from urban schools which had many schools offering industrial arts education.

3.5.1 *Drop Outs of Sample*

The estimated number of 100 subjects could not be achieved because six of the expected 35 IATS were sick, dead or had resigned from the Ministry of Education for greener pastures; seven of the 47 NIATs answered questionnaires were invalid and nine of them were not collected from respondents as they disappeared from schools after questionnaires were distributed. It was difficult for the researcher to get hold of them because the researcher was commuting from the university to study areas and, schools were almost closed.

3.5.2 ***Characteristics of Sample***

(i) *Age*

The majority 49 (66.25%) of the subjects fell between 25 and 45 years old. 10 of them mainly head teachers and NIATs were above 45 years, and 15 of them were below 25 years.

(ii) *Sex*

The majority 55 (74.35%) of the subjects were males while only 19 (25.95) were females.

(iii) *Education background*

Qualification was only confined to HTs, HODs and IATs because they were concerned with the running of the industrial arts department (IAD). Three HTs had masters, three of them Bachelors degrees, two with an advanced Diploma and one with a Diploma. Five HODs had advanced Diplomas and four with a Diploma. Seven IATs had advanced Diplomas while 18 had Diplomas.

(iv) Subjects learnt during teacher training.

It was learnt that all teachers had studied their teaching subjects in their various fields. But only 12 of them had studied management /administration course during the training and no one had studied entrepreneurship.

After teacher training, 28 of the teachers had studied management/administration course while none of them had studied entrepreneurship.

(v) *Length of Service*

Head teachers - Most heads had served between three years and seven years and one of them had served for over 12 years as head teacher. Eight HODs had served between three and 11 years while only one served over 12 years.

The majority of teachers (54) had served between four and 25 years and only two NIAT had served for less than three years.

(vi) *Years served at school* [only HTs & HODs] were asked.

A big number of HTs had served from zero to five years, followed by two who had served between four and seven years. Two of them served between 12 and 25 years.

Seven of the HODs had served between four and 11 years while only one had served for less than three years and the remaining one served for more than 12 years.

3.6 Research Instruments

The following research instruments were used:-

(i) *Questionnaire*

These were self administered. They were two types: one for industrial arts teachers and the other for non industrial arts teachers. For industrial arts teachers, all questions were based on all objectives, while questions for NIATS were based on objective two of the study (See appendices 1 and 3).

(ii) *Semi-structured Interview Schedules*

These were targeted at Heads of Departments and Head Teachers. Each group had a separate interview schedule. For Heads of Department, questions were based on the first and third objectives of the study while for Head Teachers, questions were based on all the three objectives (see appendices 2 and 4).

(iii) *Observation*

Observation was chosen as one of the methods so that the information given in other instruments could be confirmed. It looked at such issues as care of equipment and workshop cleanliness. Preventive maintenance and fund raising activities were also considered. In addition, the availability of equipment was verified. Other aspects looked at were verification of stock taking exercises and departmental meetings (See appendix 5).

3.7 Data Collection

Data collection was conducted in the third term of 2000 academic year during the months of November and December. This exercise took two weeks from 23rd November to 7th December. Multiple data collection methods (i.e questionnaires, interviews and non participant observation) were used in order to achieve triangulation. The collection of data was done by the researcher himself. As it was the third term, it was difficult to access some non industrial arts teachers after they were given questionnaires because most of them were out of the station as schools were about to close. It was also difficult to follow them at their homes as earlier alluded to.

3.7.1 *Procedure for Data Collection*

A letter was obtained from the Head of Department of Educational Administration and Policy Studies, School of Education, University of Zambia to introduce the researcher and the purpose of the research to the Provincial Education Officer who later gave permission to visit the schools (see Appendix 7). The researcher made appointments with respondents for the time to administer questionnaires, conduct interviews and observations as he moved around the schools.

3.8 Data Analysis

Data collected through questionnaires was subjected to computer generated frequencies and percentages as well as cross tabulations and, where possible, regression analysis using statistical package for social sciences (SPSS) software was done. Qualitative data was subjected to coding of themes, categorization and re-categorization of themes until the most significant themes emerged. This information is presented in form of charts and tables in chapter four.

3.9 Data Interpretation

Data interpretation was based on the data which were collected and analysed. After data were put into groups according to strata of respondents and objectives, comparisons were made and conclusions drawn to determine whether or not industrial arts departments were being utilised effectively to support themselves and supplement the efforts of the school administration in maintaining school infrastructure.

3.10 Ethical Issues

All respondents were assured of confidentiality on the information they gave during and after research. Questionnaires were issued to respondents by researcher and collected by researcher himself. Interviews were done in closed rooms without any third party.

CHAPTER FOUR

4.0 PRESENTATION AND INTERPRETATION OF RESULTS

4.1 Preview

This chapter presents the findings and their interpretation obtained from interviews, non participant observation and questionnaires. Frequency tables, percentages and bar charts have been used in the presentation of the data according to the objectives.

4.2 Objective One: Identification of factors affecting the utilisation of industrial arts departments

The study found seven factors in relation to the objective of the identification of factors that affect the utilisation of industrial arts department (IAD) (see table 2 on page 34). Among them, lack of support by school administration, ranked first with 15 (20.35%) of the respondents indicating so. This was closely followed by the non operational workshop rooms and insufficient equipment with 14 (19%) respondents and that of ineffective departmental management with 13 (17.65%), while poor teachers motivation and attitude towards work ranked fourth with 12 (16.3%). The remaining three factors; inadequate staffing levels, had 9 (11.95%), inadequate provision of materials ranked sixth with 6 (8.2%) and appropriate training being the least with 5 (6.85%) respondents. The findings above are illustrated in table 2 on page 34.

Table 2: Factors Affecting the Utilisation of the Industrial Arts Departments

Factors	Frequency		Ranking
	Number	%	
Lack of support by school administration	15	20.27	1
Non operational workshop rooms and insufficient equipment	14	18.91	2
Ineffective departmental management	13	17.56	3
Poor teachers motivation and attitude towards work	12	16.21	4
Inadequate staffing levels	9	12.16	5
Inadequate provision of materials	6	8.11	6
Inappropriate training	5	6.75	7
Total	74	100	-

N = 74

A brief discussion of each factor follows below:

4.2.1 ***Lack of Support of the department by school administration***. Themes which fell under lack of support were *Preventive Maintenance System (PMS), Production Unit (PU)* and visitation/communications by the Head teachers (HTs) to the departments. Only HTs, Heads of Department (HODs), and Industrial Arts Teachers (IATs) were asked the questions. The findings showed that 32 (74.56%) said school administration supported PMS by provision of materials; where as 11 (25.63%) of the respondents said there was no support (see table 3.1). A question on PU revealed that 40 (93.2%) respondents cited that school administration did not support PU and only three (6.99%) of them consented that school administration supported PU by provision of materials and moral support (see table 3.2).

On visitation/communication, 25 (58.25%) respondents reported that the head teachers (HTs) rarely visited the department and consulted with the Heads of Department (HODs)

while 12 (12.96%) respondents revealed that the HTs regularly visited and consulted with HODs and six (13.98%) cited that HTs did not visit the department at all (see table 3.3).

The findings recorded above are illustrated in tables 3.1, 3.2 and 3.3 below.

Table 3.1: Support of PMS by HTS

Support	Yes	No	Total
Material and financial support	32 (74.42%)	11 (25.58%)	43 (100%)
Moral support	0	0	0%

Table 3.2: Support of PU by HTS

Support	Yes	No	Total
Materials and moral support	3 (6.99%)	40 (93%)	43 (100%)
Financial support	0	0	0

Table 3.3: Support of Department through visitation/communication

Visitation/communication	Frequency	Percentage
Regular visitation/ communication	12	27.90
Rare visitation/communication	25	58.13
Hardly any visitation/communication	6	13.95
Total	43	100

4.2.2 ***Non operational workshop rooms and insufficient equipment.*** The results revealed that six schools had workshop rooms for both metal work and wood work (see table 4.1). At least every school had a workshop room, whether of metal work or wood work or both.

Only two schools, Munali and Naboye had no single workshop in operation, though they had benches as was confirmed by observation. Apart from workshops, schools had adequate number of machine tools, although a good number of them were defective (see tables 4.2 and 4.3). It was also found that five schools had a few essential metal work hand tools while four had nothing (see table 4.4). The picture was different as regards wood work tools where only Munali school had no single tool whilst eight of them had at least 35 tools.

Table 4.1: Operational and non-operational workshop rooms in schools

School	Metal work room			Wood work room		
	No. of room	Operational room	Non-operational room	No. of rooms	Operational rooms	Non-operational rooms
Munali	1	0	1	2	0	2
Kamwala	1	1	0	1	1	0
David Kaunda	3	3	0	3	3	0
Libala	1	1	0	1	1	0
Kabulonga Boys	2	1	1	2	2	0
Matero Boys	0	0	0	1	1	0
Kafue	1	0	1	1	0	1
Naboye	0	0	0	1	1	0
Chongwe	0	0	0	1	1	0

Table 4.2 shows that Matero Boys, Naboye, Kafue and Chongwe had no metal work machines. The rest of the schools had some machines including Munali which had only two welding and one drilling machines.

Table 4.2: Number and condition of Metal work machine tools per school

School	1. Lathe			2.Welding Machine			3. Power Saw			4. Shaper		
	No	Condition		No	Condition		No	Condition		No	Condition	
		G	B		G	B		G	B		G	B
Munali	6	0	6	2	2	0	2	0	2	2	0	2
Kamwala	3	1	2	1	1	0	1	1	0	1	0	1
David Kaunda	10	6	4	7	6	1	1	1	0	2	0	2
Libala	4	0	4	1	1	0	1	0	1	1	0	1
Kabulonga Boys	6	2	4	1	1	0	2	1	1	2	1	1
Matero Boys	0	0	0	0	0	0	0	0	0	0	0	0
Naboye	0	0	0	0	0	0	0	0	0	0	0	0
Kafue	0	0	0	0	0	0	0	0	0	0	0	0
Chongwe	0	0	0	0	0	0	0	0	0	0	0	0
Total	29	9	20	12	11	1	7	3	4	8	1	7

Continuation of the above table

	5. Milling Machine			6. Drill Machine			7. Grinder			Total		
	No	Condition		No	Condition		No	Condition		No	Condition	
		B	G		B	G		B	G		G	B
Munali	0	0	0	1	1	0	1	0	1	14	2	12
Kamwala	0	0	0	2	2	0	1	1	0	9	6	3
David Kaunda	3	1	2	4	3	1	2	2	0	29	19	10
Libala	0	0	0	2	2	0	3	1	2	12	4	8
Kabulonga Boys	0	0	0	4	4	0	1	1	0	16	10	6
Matero Boys	0	0	0	0	0	0	3	3	0	3	3	0
Naboye	0	0	0	0	0	0	0	0	0	0	0	0
Kafue	0	0	0	0	0	0	0	0	0	0	0	0
Chongwe	0	0	0	0	0	0	0	0	0	0	0	0
Total	3	1	2	13	12	1	8	6	2	83	44	39

Key

G = Good- working

B = Bad - Not working

Table 4.3 below shows that apart from Munali and Naboye Secondary schools, all schools had essential machine tools such as wood lathe, circular saw, and planner.

Table 4.3: Number and condition of Wood Work machine tools per school

	1. W/Lathe			2. Planner			3. Circular Saw			4. Sander		
School	No	G	B	No	G	B	No	G	B	No	G	B
Munali	2	0	2	2	0	2	1	1	0	0	0	0
Kamwala	1	1	0	1	1	0	1	1	0	0	0	0
David Kaunda	2	1	1	1	1	0	1	1	0	0	0	0
Libala	2	1	1	1	0	1	1	1	0	0	0	0
Kabulonga Boys	3	3	0	2	2	0	2	2	0	0	0	0
Matero	1	1	0	1	1	0	1	1	0	0	0	0
Naboye	0	0	0	0	0	0	0	0	0	0	0	0
Kafue	1	0	1	1	1	0	1	1	0	0	0	0
Chongwe	1	0	1	0	0	0	1	1	0	0	0	0
Total	13	7	6	9	6	3	9	9	0	0	0	0

Continuation of the above table

	5. S. Moulder			6. Mortiser			7. Drilling Machine			Total		
	No	G	B	No	G	B	No	G	B	No	G	B
Munali	0	0	0	0	0	0	1	0	1	6	1	5
Kamwala	0	0	0	0	0	0	1	1	0	4	4	0
David Kaunda	3	3	0	0	0	0	3	2	1	10	8	2
Libala	0	0	0	0	0	0	1	1	0	5	3	2
Kabulonga Boys	0	0	0	0	0	0	2	2	0	10	10	0
Matero Boys	0	0	0	0	0	0	0	0	0	3	3	0
Naboye	0	0	0	0	0	0	0	0	0	0	0	0
Kafue	0	0	0	0	0	0	1	0	1	4	2	2
Chongwe	0	0	0	0	0	0	0	0	0	2	1	1
Total	3	3	0	0	0	0	9	6	3	44	32	12

Key

G = Good - working

B = Bad = Not working

The table below shows that, of the five schools which had metal workshop rooms, only Munali had no tools. The rest had at least a number of essential tools which could enable them do some projects.

Table 4.4: Availability of required essential metal work hand tools per school

	1. H/Saw		2. Rule		3. File		4. T/Square		5. Scriber	
	No.R	No.A	No.R	No.A	No.R	No.A	No.R	No.A	No.R	No.A
Munali	30	0	30	0	30	0	30	0	20	0
Kamwala	20	15	20	5	40	20	10	5	20	3
David Kaunda	40	25	30	10	240	192	30	20	20	0
Libala	15	7	20	10	50	10	30	7	30	16
Kabulonga Boys	10	6	30	3	25	20	20	10	20	0
Matero	0	0	0	0	0	0	0	0	0	0
Kafue	0	0	0	0	0	0	0	0	0	0
Naboye	0	0	0	0	0	0	0	0	0	0
Chongwe	0	0	0	0	0	0	0	0	0	0
Total	135	53	130	28	385	242	120	42	110	19

Continuation of the above table

	6. Twist Bits		7. Chisels		8. Hammer		9. Hand Drill		Total	
	No.R	No.A	No.R	No.A	No.R	No.A	No.R	No.A	No.R	No.A
Munali	25	0	30	0	20	0	5	0	230	0
Kamwala	55	45	15	10	10	8	2	0	192	108
David Kaunda	105	15	80	40	30	8	3	1	578	310
Libala	55	15	40	18	40	6	5	0	285	88
Kabulonga Boys	0	0	20	0	10	3	4	4	139	46
Matero Boys	0	0	0	0	0	0	0	0	0	0
Kafue	0	0	0	0	0	0	0	0	0	0
Naboye	0	0	0	0	0	0	0	0	0	0
Chongwe	0	0	0	0	0	0	0	0	0	0
Total	240	75	185	68	110	25	19	5	1,424	544

Key

No = Number

R = Required

A = Available

The table below shows that apart form Munali, all schools including Naboye which did not have equipment had a number of essential Wood Work hand tools which could be used to do some work.

Table 4.5: Availability of required essential woodwork hand tools per school

	1. Hand saw		2. Resp		3. M.Chisal		4. P. Chisal		5. S. Cramp		6. Hammer	
Schools	No.R	No.A	No.R	No.A	No.R	No.A	No. R	No. A	No. R	No. A	No. R	
Munali	30	0	30	0	20	0	20	0	10	0	30	0
Kamwala	5	0	5	5	20	6	20	3	10	0	15	4
D.Kaunda	45	10	45	0	50	50	202	202	30	4	45	6
Libala	10	2	5	1	20	10	20	10	6	2	5	1
Kabulonga Boys	10	5	5	2	20	0	20	0	10	3	10	2
Matero Boys	10	4	20	0	50	15	40	1	15	6	30	6
Kafue	8	1	15	0	100	100	50	0	15	0	15	0
Naboye	15	4	15	3	15	3	20	6	6	3	20	10
Chongwe	20	3	10	0	60	2	40	15	10	3	20	1
Total	153	29	150	11	355	186	432	237	112	21	190	30

Continuation of the above table

	7. Rule		8. T/Square		9. Planes		10. T.Saw		11. Mallet		Total	
	No. R	No. A	No. R	No. A	No. R	No. A	No. R	No. A	No. R	No. A	No. R	No. A
Munali	30	0	30	0	30	0	30	0	30	0	290	0
Kamwala	20	1	20	5	30	5	10	8	30	10	185	35
D. Kaunda	60	16	68	12	45	12	45	8	60	30	695	368
Libala	30	10	20	7	20	7	20	4	40	30	196	74
Kabulonga Boys	30	30	5	20	30	20	30	6	30	10	200	98
Matero Boys	30	21	30	5	50	5	40	20	20	10	335	93
Kafue	20	5	20	10	25	10	25	8	25	10	318	144
Naboye	20	7	15	2	30	2	30	6	30	12	216	53
Chongwe	40	15	45	18	45	18	54	17	25	9	369	101
Total	280	105	253	79	305	79	284	77	290	121	2,799	956

Key
No = Number
R = Required
A = Available

4.2.3 ***Ineffective departmental management***

i) Teacher Involvement in Decision Making

When asked about involvement in departmental decision making by industrial arts teachers (IATs) 41 (63.07%) of the respondents who included HODS, IATS, Non Industrial Arts Teachers (NIATs) agreed that HODs involved teachers in decision making where as 24 (39.92%) did not agree.

The reasons given by the 41 respondents were that HODs implemented what others suggested and the departments improved in terms of activities such as PMS.

ii) *Departmental meeting*

After enquiring about departmental meetings, the majority 32 (94.1%) of HOD and IATs who responded agreed that departmental meetings were held and only 2 (5.9%) of respondents disagreed. At least departmental meetings were held from two to four times per term.

iii) *Stock taking*

On stock taking only HODs and IATs were involved. The study revealed that 30 (88.2%) of the respondents said that they were conducting stock taking, while four (11.76%) did not conduct stock taking. Those who did not conduct stock taking indicated that they had no tools to stock take. The teachers who were found with shortages were surcharged.

iv) *Maintenance of equipment*

The majority, 28 (82.35%) respondents consented that the maintenance of equipment was poor while 6 (17.64%) of them said schools maintained the equipment. This is confirmed from tables 4.2 to 4.3 that many equipment were in poor state.

v) *Replacement of worn out and broken down tools*

Although 10 (29.4%) of the respondents said replacement of tools was done, the majority 24 (70.59%) of them did not agree with that.

4.2.4 *Poor teachers' motivation and attitude towards work (PMS and PU)*

(i) Attitude towards PMS

The majority 41 (95.18%) of the respondents consented that teachers were motivated and their attitude towards PM was good while three (6.81%) of them said IATS were poorly motivated and had bad attitude towards PM.

(ii) Attitude towards PU

When asked about the attitude towards PU, 38 (88.37%) responses revealed that IATs were not motivated and had bad attitude towards PU and only five (11.6%) of them indicated that IATs were motivated and had good attitude towards PU. It was discovered that Production Unit was done by individual teachers without the knowledge of HTs.

4.2.5 *Inadequate Staffing Levels*

Established staffing levels for industrial arts teachers in secondary schools

The following are the established numbers of industrial arts teachers required in a secondary school.

(i) A school with one industrial arts workshop needs two teachers.

(ii) A school with two industrial arts workshops requires four teachers and,

(iii) A school with three industrial arts workshops needs six teachers and this goes on in the multiples of two.

The result indicated that each school had at least one teacher. The distribution of these teachers per school are indicated in figure on page 43.

Figure 2: Distribution of IATs Per school

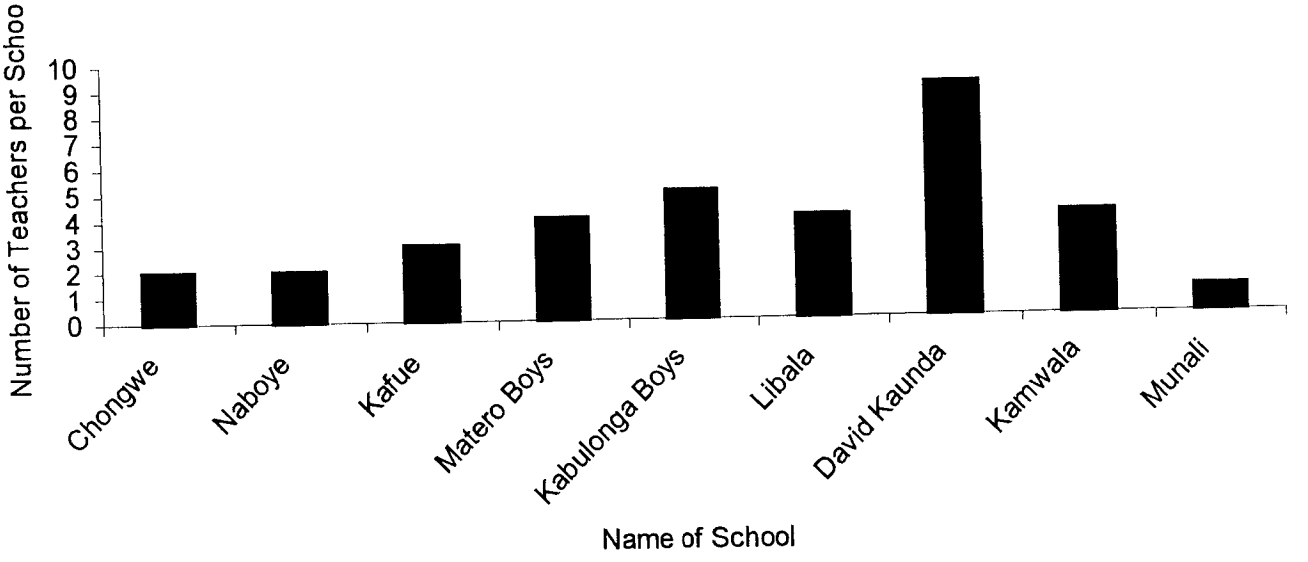


Figure 2 shows the number of teachers per school. David Kaunda being a technical school had nine teachers seconded by Kabulonga school for boys which had five teachers. Matero boys, Kamwala and Libala had four teachers each. Kafue boys had three followed by Chongwe and Naboye which had two teachers each. Munali was the only school which had one teacher.

4.2.6 *Inadequate provision of materials*

As many as 41 (95.34%) of respondents involving HTs, HODs and IATs believed that materials for PMS was provided for by the school administration, while a small number two (4.66%) had an opposing view. HTs revealed that they assisted PMS because it was easy to monitor the activity. However, materials for PU were not provided.

Reasons given by HTs for not providing materials for PU were as follows:-

i) Industrial arts department was supposed to make its own money,

ii) Teachers were not honest. At one time HTs loaned them money but they did not make any profit for the schools. Instead HTs could see them making money for themselves,

iii) HTs found it difficult to monitor and supervise the operations of industrial arts departments since HTs did not know much about what went on in the department, and

iv) *Teachers and the HODs have had bad attitude towards PU and were not cooperative with the schools' administration.*

4.2.7 *Inappropriate training*

i) *Teachers training*

When asked about teacher training courses or subjects taken, all the 56 teachers indicated to have taken the teaching courses during training. But only 12 (21.4%) of them said had taken an administration course and none had taken entrepreneurship course (see table 5 below).

Having enquired whether or not teachers had taken any administrative or entrepreneurial course after training. 28 (50%) of the 56 respondents agreed to have taken administration and none had taken entrepreneurship. The table below illustrates the findings.

Table 5 shows that administration/management course was not a compulsory course during teacher training. The fifty percent situation indicated "after teacher training" shows that the 28 (50%) respondents who did administration took it as a private course on their own. Entrepreneurship did not even feature during and after teacher training.

Table 5: Courses/Subjects taken by teachers

	Course	Yes	%	No	%	Total	%
During Teacher Training	Teaching subject	56	(100)	0		56	(100)
	Administration/management	12	(21.4)	44	(78.57)	56	(100)
	Entrepreneurship	0		56	(100)	56	(100)
After Teachers Training	Administration/management	28	(50)	28	(50.0)	56	(100)
	Entrepreneurship	0		56	(100.0)	56	(100)

ii) *HOD training*

When asked whether or not HODs had had induction or orientation course after being appointed to the post, the results showed that 13 (72.2%) of the HTs and HODs indicated that no orientation was done after HODs were appointed , whereas five (27.8%) of the same respondents revealed that there was orientation conducted by HTs on HODs after their appointment.

iii) *Head teacher training*

Of the nine respondents, eight (88.8%) observed that it was necessary to train head teachers who run schools which offered industrial arts education in specific management/supervisory skills, whereas only one (11.1%) respondent indicated that it was not necessary.

When asked why it was necessary to train HTs, all the eight (88.8%) respondents stated that managers should have specific knowledge for effective supervision of specialised departments.

In concluding objective one, it can be seen that the results which were obtained revealed that school administration did not support the industrial arts department fully. Support was only seen in PMS and not in PU. Over 66% of the schools had workshop rooms and a number of equipment. Departmental management was not effective and teachers had bad attitude towards work. Each school had at least a teacher though inadequate. It was found that the provision of materials and financial assistance leaned towards PMs at the expense of other activities. On training it was discovered that all respondents had not received appropriate training to enable them carry out the fund raising activities in industrial arts department.

4.3 Objective Two: Establishing the views of Head teachers, industrial arts teachers and non-industrial arts teachers about the utilisation of the industrial arts department in secondary schools.

4.3.1 *The question was what were the views of HTs and teachers about the utilisation of IA departments?*

The views of HTs and two groups of teachers were different with regards to effective utilisation of the industrial arts department in secondary schools. However, the views of all the respondents, HTs and teachers were similar in the case of PMS, PU and Marketing (see table 6) below.

On effective utilisation, four out of nine HTs, said there was no effective utilisation of the departments while 14 out of 25 IATs and 16 out of 31 NIATs agreed that there was effective utilisation of the departments. Concerning PMS, eight out of nine HTs said PMS was effective and all 25 IATs and 16 of the NIATs agreed with the HTs' view. The view of the HTs about PU was negative as it was evident by eight of them who refuted that PU was effective in schools. Both teacher groups, 15 out of 25 IATs and 20 out of 31 NIATs supported the HTs view that PU was ineffective.

Marketing was found not to be a problem, as eight HTs; 13 IATs and 20 NIATs all said so.

Table 6: Views of head teachers and teachers about the utilisation of IA department

Strata	Total respondents	Effective utilisation		PMS		PU		Marketing problems	
		Yes	No	Yes	No	Yes	No	Yes	No
HT	9 (13.86)	4 (6.16%)	5 (7.7)	8 (12.32)	1 (1.54)	1 (1.54)	8 (12.32)	1 (1.54)	8 (12.32)
IAT	25 (38.5)	14 (21.56)	11 (16.94)	25 (38.5)	0	10 (15.4)	15 (23.1)	12 (18.48)	13 (20.02)
NIAT	31(47.7)	16 (24.64)	15 (23.1)	16 (24.64)	15 (23.1)	11 (16.94)	20 (30.8)	11 (16.94)	20 (30.8)
Total	65 (100%)	34 (52.31)	31 (47.69)	49 (75.38)	16 (24.61)	22 (33.84)	43 (66.15)	24 (36.96)	41 (63.08)

n = 65

Following the previous question, respondents were asked to give reasons why industrial arts departments were ineffectively used. The following tables (7.1 and 7.2) indicate the reasons according to HTs and teachers for the sake of comparison.

Table 7.1 HTs reasons for ineffective utilisation of IA department

Reasons	Frequency	Ranking
Negative attitude of teachers	3	1
Negative attitude of school administration	2	2
Ineffective HOD	2	3
Poor teachers motivation, insufficient funding, lack of materials	2	4
Total	9	-

n = 5

More than one respondent mentioned one particular reason. Of the five HTs who said industrial arts was not effectively used, three of them mentioned negative attitude of the teachers towards work as an outstanding reason. Negative attitude of school administration towards the department, ineffective HODS; and poor teacher motivation, insufficient funding, and lack of materials were listed by two respondents each (see table 7.1).

Table 7.2 Teachers' reasons for ineffective utilisation of IA departments (PU)

Reason	Frequency	Ranking
No projects to generate fund	12	1
Materials and tools are not enough	6	2
Lack of money to buy materials, tools	4	3
Attitude of school administration was bad	2	4
Workshops not operational	2	5
Under utilisation of equipment	2	6
Poor department management	1	7
Teachers concentrate on their personal projects	1	8
Inadequate staffing	1	9
Total	31	-

Note that more than one respondent mentioned a particular reason.
Reasons why marketing could not be a problem were that the schools had a lot of workers who could be potential buyers and no one had tried it because there was nothing to sell.

PMS- there was indication that schools were engaged in PMS, mainly in desk repairs, burglar proofing and general cleaning.

Having given the reasons why industrial arts were not performing well in the field of PU, the respondents' suggestions on how performance of industrial arts could be improved in school were as follows (see table 8 on page 49):-

Table 8: Suggestions for improvement of utilisation of IA departments

Suggestions	Frequency	Ranking
Increased funding from government	10 (15.4%)	1
More equipment should be sourced	9 (13.86%)	2
Teachers should change their negative attitude towards work	8 (12.32%)	3
School administration should support the departments	7 (10.78%)	4
Repair and maintain new and old equipment	6 (9.24%)	5
Conduct training on how to manage workshop	5 (7.7%)	6
Motivate teachers	4 (6.16%)	7
HODS should be responsible and accountable	4 (6.16%)	8
Develop marketing strategies	4 (6.16%)	9
Workshops should be operational	3 (4.62%)	10
Clean workshop and machines	2 (3.08%)	11
Fund raising should be supported	2 (3.08%)	12
Involve pupils in PMS and PU	1 (1.54%)	13
Total	65 (100%)	-

The question on the views was directed on HTs, IATs and NIATs. Although only 31 respondents suggested that utilisation of industrial arts was not effective, the subsequent question on suggestions for the improvement of utilisation was answered by all 65 respondents. All respondents' suggestions were ranked according to the frequency with the suggestions that "government should increase funding" ranking highest with 10 (15.4%) respondents. It was closely followed by "more equipment should be sourced" with nine (13.85%) respondents. The "change of attitude by teachers towards work" was ranked third with eight (12.30%) respondents supporting it . "School administration supporting the department" and "repair and maintenance of new and old equipment" ranked fourth and fifth with seven (10.77%) and six (9.23%)respondents supporting them, respectively. Other reasons presented in order of frequency were "training for HTs, and HODs" on how to manage the department with five (7.7%) respondents supporting it; "motivation of teachers" "responsibility and accountability of HODS," "developing marketing strategies" had four (6.16%) respondents each. The remaining three

reasons namely "workshop should be operational" had three respondents, while "support of fund raising" and "involvement of pupils in PMS and PU" had two (3.08%) respondents each.

4.3.2 Was there any money raised, transparency and accountability in the department?

i) Amount of money raised

The majority 43 (66.22%) respondents said there was no money raised through PU, while 22 (33.88%) of them agreed that some money was made.

ii) When asked how the money was kept and spent, it was discovered that 43 (66.22%) of the respondents did not respond. The 22 (33.88%) respondents who said some money was raised, revealed that money was kept by the bursar and that it was used on purchasing of materials.

iii) Transparency and accountability: Nearly all the respondents, 38 (95%) said there was no transparency and accountability in the way IA Department were being run, where as 2 (5%) said there was transparency and accountability. When asked for the reasons why there was no transparency and accoutability, the following reasons were given:-

a) Teachers were dishonest as they conducted PU without the knowledge of HTs;
b) HODs did not have any record of what was being done at the departments;
c) The head teachers did not provide any supervision due to lack of knowledge of what was going on in the department; and
d) HODs were very incompetent and irresponsible.

In concluding objective two, it was established that HTs views on utilisation of the department were that industrial arts departments were not succeeding in PU though they were trying to work hard at PMs. Among the reasons they advanced as the cause, were teachers' dishonest attitudes towards work, negative attitude of school administration and ineffective HODs. The teachers' views were that, IAD were being utilised effectively because PMS was succeeding in schools though they consented that PU was not

successful,. They gave reasons for the state of affairs as lack of PU projects, equipment, materials, bad HTs attitude towards IAD, non operational workshop and under utilisation of equipment.

4.4 Objective Three: Determination of whether or not location of the secondary school (Urban/Peri-Urban) had any influence on the utilisation of industrial arts departments.

4.4.1 *To test for influence that the location might have on the utilisation of the departments*

The following variables were cross tabulated with the locations urban or peri-urban: thefts, procurement of materials and equipment, replacement of worn out equipment, conducting of PMS, and PU, and raising of money. For comparison's purposes each location and stratum were considered independent of the other (see table 9 on page 52).

Table 9: Influence of location of the school on utilisation of the departments

Location	Stratum	1. Total of Respondents	2. Did you experience thefts and loses?			3. Is it easy to procure materials and tools?		
			Yes %	No %	N/a %	Yes %	No %	N/A %
Urban	HT	6 (19.35)	5 (16.1)	1 (3.2)	0	4 (12.9)	1 (3.2)	1 (3.2)
	HOD	6 (19.35)	5 (16.1)	1 (3.2)	0	4 (12.9)	1 (3.2)	1 (3.2)
	IAT	19 (612)	10 (32.2)	8 (25.8)	1(3.2)	0	0	19 (61.2)
Total		31 (100)	20 (64.5)	10 (32.2)	1(3.2)	8 (25.82	2 (6.45)	21 (67.6)
Peri-urban	HT	3 (25)	3 (25)	0	0	0	2 (16.7)	1 (8.3)
	HOD	3 (25)	3 (25)	0	0	0	3 (25)	0
	IAT	6 (50)	4 (33.3)	2 (16.7)	0	0	9 (75)	3 (25)
Total		12 (100)	10 (83.3)	2 (16.7)	0	0	9 (75)	3 (25)

Continuation of the above table?

			4. Is it easy to replace worn out tools			5. Do you conduct PMS?		
			Yes %	No %	N/A %	Yes %	No %	N/A %
Urban	HT	6 (19.35)	4 (12.9)	2 (6.4)	0	5 (16.1)	1 (3.2)	0
	HOD	6 (19.35)	4 (12.9)	2 (6.4)	0	5 (16.1)	1 (3.2)	0
	IAT	19 (612.2)	0	0	19 (61.2)	13 (41.9)	6 (19.35)	0
Total		31 (100)	8 (25.8)	4 (12.9)	19 (61.2)	23 (74.1)	8 (25.8)	0
Peri-urban	HT	3 (25)	0	3 (25)	0	3 (25)	0	0
	HOD	3 (25)	0	3 (25)	0	3 (25)	0	0
	IAT	6 (50)	0	0	6 (50)	6 (50)	0	0
Total		12 (100)	0	6 (50)	6 (50)	12 (100)	0	0

Continuation of the above table?

			6. Do you conduct PU			7. Do you raise any money?		
Urban			Yes %	No %	N/A %	Yes %	No %	N/A %
	HT	6 (19.35)	0	6 (19.35)	0	0	6 (19.35)	0
	HOD	6 (19.35)	3 (9.6)	3 (9.6)	0	3 (9.6)	3 (9.6)	0
	IAT	19 (61.12)	7 (22.5)	12 (38.7)	0	7 (22.5)	12 (38.7)	0
Total		31 (100)	10 (32.2)	21 (67.7)	0	10 (32.2)	21 (67.7)	0
Peri-urban			Yes %	No %	N/A %	Yes %	No %	N/A %
	HT	3 (25)	1 (8.3)	2 (16.7)	0	1 (8.3)	2 (16.7)	0
	HOD	3 (25)	0	3 (25)	0	0	3 (25)	0
	IAT	6 (50)	1 (8.3)	5 (41.7)	0	1 (8.3)	5 (41.7)	0
Total		12 (100)	2 (16.7)	10 (83.3)	0	2 (16.7)	10 (83.3)	0

Table 9 shows that the location of the school did not matter when it came to thefts of equipment. Both urban and peri-urban experienced thefts. For example, out of 31 respondents from urban area, 20 (64.5%) of them said there were thefts in their schools. Similarly 10 (83.3%) of the respondents from peri-urban areas agreed that thefts had taken place in their schools.

As to whether or not procurement for materials and tools was easy, it was discovered that eight (25.82%) mainly HTs and HODs observed that it was easy to procure materials and tools in urban areas, whereas all 19 (61.2%) IATs remained silent about the matter. The reason could be that they were not involved in buying. Those from peri-urban areas 75% said that it was not easy to purchase materials and tools. For the variable procurement location had influence because each area was affected. For example, only 25.8% of urban respondents said it was easy and none among the peri-urban agreed to that. Location of the school had influence on replacement of worn out tools in case of urban, where 8 (25.8%) respondents (mainly HTs and HODs) agreed that it was easy while 19 IATs did not know anything. The reason for IATs not knowing any thing could be that they were not responsible for replacement of tools. In this variable, it was neither easy nor difficult to replace worn out tools in Peri-urban areas as it was evident that 50% of respondents said it was easy while 50% of them said it was not easy.

As regards PMS, location had no influence on both urban and Peri-urban because results show that PMS was a success story in both urban and peri-urban areas. For PU, it was an opposite response to that of PMS. 21 (67.7%) of the urban respondents denied that there was a PU. Only 10 (32.2%) of them agreed. The 10 (83.3%) Peri-urban respondents also refused that PU was in practice. Only 2 (16.7%) of them agreed that PU had taken place. On the money issue, the same 21 (67.7%) of the urban respondents said money was not raised and 10 (32.2%) of them agreed that money was raised. The Peri-urban respondents who denied that money was raised were 10 (83.3%) while those who agreed were 2 (16.7%).

From the results, it can be seen that location had influence on both urban and peri-urban area in procurement of materials and tools, and replacement of worn out tools; while it had no influence on thefts, PMS, PU and fund raising as both urban and peri-urban areas were affected.

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4.4.2 ***The above results were further tested by use of multiple regression analysis to find the influence of location on PMS, PU, purchase, thefts, markets and raising of money.***

The results showed that the location of the school had no influence on PMs, PU, thefts, marketing and raising of the money, as all fell outside the intervals of 0.331 and 0.825. However, results indicated that there was influence on materials and equipment procurements at 0.963 over the intervals of 0.180 and 0.188 at 95% confidence interval for Beta 0.016.

4.4.3 ***Problems faced due to location of the school***

The following were the identified problems faced by the respondents:-

i) *Urban area:-*

a) Acquisition of materials such as wood was expensive in town

b) Thefts were rampant

c) Lack of money

ii) *Peri-Urban*

a) Areas were far from sources of materials especially metals and equipment. As a result transport was costly.

b) Thefts were numerous

c) Lack of money

iii) *General causes for thefts and losses*

The following were identified as general causes of thefts and losses:-

a) Locking systems/mechanisms in the workshops were not strong;

b) Workshops were not burglar proofed;

c) Lack of security personnel;

d) Schools were not fenced;

e) Schools were built in unsafe areas and had vast grounds and

f) Carelessness of HODs and teachers.

In concluding objective three, it is clearly seen from the results that location had little influence in most of the variables apart from purchases of materials and equipment, and replacement of worn out tools. In addition, the problems which were faced in both areas were acquisition of materials, thefts, lack of money and distance from the sources of materials. The causes for thefts ranged from unprotected and unsecured workshop rooms and unsafe areas in which schools were built, to carelessness of HODs.

In concluding this chapter, the following main findings were identified:
Sex, age, education background, experience in service and length of period the head teacher and HOD served at a particular schools did not help in the effective utilisation of the department. Training for teachers of industrial arts was not tailored for entrepreneurship. Generally, it was found that both HTs and HODs were not given any training/orientation after they had been appointed to their posts. The factors that were identified included lack of school administration support, non operational workshop rooms and insufficient equipment, ineffective departmental management, poor teachers' motivation and attitude towards work, inadequate staffing levels, inadequate provision of materials, and inappropriate training. The view held by HTs, was that industrial arts departments in secondary schools were not utilised effectively because the PU activities were not conducted while teachers' view was that I.A departments in secondary schools were utilised effectively because PMS was succeeding, although teachers agreed that PU was not conducted effectively. The location of the school did not influence the utilisation of the departments in thefts, losses, PU, PMS, marketing and in fund raising. It was found that location influenced materials and equipment procurements.

CHAPTER FIVE

5.0. DISCUSSIONS OF THE RESULTS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Preview

This chapter comprises two sections. Section one is about discussions of the results while section two is based on conclusions and recommendations of the study. Section one discusses the factors that affect the utilisation of the industrial arts departments in secondary schools. The discussions are based on the results, presented in chapter four. The section will be discussed according to the three objectives namely:

5.1.1 The identification of the factors that affected the utilisation of industrial arts departments in secondary schools.

5.1.2 The establishment of the views of head teachers, industrial arts teachers and non industrial art teachers about the utilisation of industrial arts departments in secondary schools.

5.1.3 The determination of whether or not the location of a secondary school(urban/peri-urban) had any influence on the utilisation of industrial arts departments.

5.2 Background data

The study sought to establish whether or not age, sex, length of period one worked at the school, length of period the heads of department (HODs) or head teachers (HTs) served in their posts, qualifications of HODs, Industrial Arts Teachers and the subjects trained in, could assist these officers to utilise the industrial arts departments effectively. It was established that all the above variables did not have any impact on the effective utilisation of the departments in fund raising. Considering that most of the respondents were old enough, had a good education, had worked for more than three years at their schools, and had served long in their posts (table 1, chapter 3), one expected good performance from the production units.

For example, in the case of qualifications, it was revealed that out of nine (100%) HTs

six (66.6%) of them had at least degrees while five (55.6%) of the nine(100%) HODs had skill upgrading certificates and of the 25 IATs, only seven had the skills upgrading certificates, the rest of the 18 IATs had diplomas. The highest qualification of industrial arts teachers obtainable in Zambia at the time of this study was the Skills Upgrading Certificate. This background information from chapter three under sample size, revealed that the variables mentioned above were not responsible for the effective use of industrial arts departments in terms of PU. This means other factors were at play. Perhaps lack of suitable teacher training could be among the causes. This argument is supported by Owen (1981) and Kunkhuli (1988) who observed that proper effective school performance depended on properly trained human resources.

The concept of effectiveness is complex and has been defined in numerous ways. Typical indicators of effectiveness include group output, group morale and satisfaction of group members (Wayne and others, 1987). Wayne, however, draws in a simpler definition of effectiveness namely, the extent to which the group accomplishes its primary task. Wayne and others conclude that though the group's output is not entirely a function of the leader's skills, the leader's effectiveness is judged on how well the group achieves its tasks. In this study, the effectiveness in respect of our reference point – utilisation – is not seen in our leaders in secondary schools.

5.3 Section One – Discussions of the Results

5.3.1 Objective one: Identification of factors affecting the utilisation of industrial arts departments

The factors which were identified from the study were lack of support by school administration, non operational workshop rooms and insufficient equipment, ineffective departmental management, poor teachers' motivation and attitude towards work, inadequate staffing levels, provision of materials and inappropriate training. From the on set, it should be noted that these factors do not work in isolation from each other.

(i) Lack of support by school administration

Lack of support by school administration was found by the researcher to be the most significant of the factors which affected the utilisation of industrial arts departments in secondary schools. The lack of support by school administration had contributed to the ineffective utilisation of the industrial arts departments in secondary schools .

The support which is referred to here concerns provision of materials and finances for conducting PMS and PU, moral support and supervision through visits and communication.

The results revealed that PMS was supported by school administration through materials and financial assistance for repairs of the infrastructure in schools. This was evident by the big number of respondents 32 (74.56%) who supported it (see table 3.1.)

The school administration did not support PU as 40 (93.02%) out of 43 (100%) respondents cited so (see table 3.2). The reason for this imbalance in support of the two programmes might be attributed to the fact that head teachers found it easy to supervise PMS because they had received training in supervision of PMS and could easily monitor what was happening with materials. They found it difficult to provide materials and supervise the PU activities because it was not easy to monitor what was going on in workshops. HTs felt teachers of industrial arts were not honest and could not be trusted with resources to manage on their own.

It is evident that supervision of the departments by the HTs was ineffective because 25 (58.14%) of the respondents reported that HTs rarely visited and consulted with the HODs. Only a small number 12 (27.91%) of them revealed that HTs regularly visited the department while 6 (13.95%) of them said HTs hardly went to their departments. Communication through visits is one of the most important activities in administration. Musaazi (1988) describes communication as conveying information, instructions, advice, feelings, opinion and facts correctly and accurately from one person to another or group of people in a purposeful manner. As results have shown, there was no serious communication because visits were rarely done. Even the few HTs who regularly visited the departments had little impact on the performance of the departments. It is clearly

indicated that the HTs communication through visits were not purposeful as nothing tangible in terms of PU was achieved. The study has also revealed that HTs' supervision of the departments had been weak. Supervision is one of the most important tools used in administration. Coulson (1976) supports this statement by asserting that one of the most important roles of the head teacher is supervision. Results on this issue revealed that the majority of respondents acknowledged that HTs visited them and discussed issues concerning the running of the department. Although there was some visitations by the HTs to the departments things were still not properly done. Observation revealed that equipment in workshops were all very dirty and disorganised. The kind of situation found in the workshops left much to be desired.

(ii) Non operational workshop rooms and insufficient equipment

This factor was ranked second among factors which affected the effective utilisation of the industrial arts departments in secondary schools. The theory on effective performance of a school advocates, among other things, the supply of equipment (Kunkhuli, 1988, Owen, 1981). This means that if the tools and other equipment are not supplied there could be no work done.

Mungo (1998) revealed that 77% of the schools offering industrial arts education in Zambia lacked enough tools. Mwetwa (1999) alluded to the same fact of lack of enough tools in secondary schools which offer industrial arts education. This same problem of not having operational workshop rooms (table 4.1), enough tools and other equipment in secondary schools has also been discovered in this study (tables 4.1- 4.5).

The inference which could be drawn from the facts presented could be that, although some schools did not have operational workshop rooms and enough or lack of equipment, at least other schools had some workshop rooms and equipment. If it is possible that they were teaching and conducting practicals during their teaching and examinations times, then it is also possible that the same tools could be used to fund raise and later use the money raised to make workshop rooms operational and purchase more tools. It could also be true to argue that the lack of enough tools could not be a major factor for not conducting production unit.

Referring to results presented in tables 4.1 – 4.5, it can be seen that David Kaunda, Kamwala and other schools had substantial numbers of tools and operational workshop rooms but they too did not conduct production unit. The only exceptional schools which had no workshop rooms and tools were Munali and Naboye and it is normal not to expect these schools to do any work in P.U.

In conclusion, experience has shown that with a few essential hand tools, one is able to complete a project in either wood work or metal work. In addition, a workshop room is not very necessary because other people operate from makeshift workshop spaces which may be on an open area, provided there is a bench to work from.

(iii) Ineffective departmental management

Though rated as number three factor with 19% responses (table 2) departmental management is one of the most important factors to consider seriously. Departmental management could be considered as the "heart" of the school administration control. This is considered as such because the school is run through departments. The headteacher depends very much on these departmental heads because they are the ones who control teachers and facilities which are essential for the running of a school. Effective departmental management is one which is needed in the running of a department. The departmental management includes various activities among them supervising teachers, organising activities of the departments such as stock taking, departmental meetings and maintenance of equipment. Marland (1971) supports the idea that HODs are important officers as they are experts in their departments. The study revealed that the departmental management in schools was ineffective.

Results have shown that although 41 (63.14%) of the respondents said that HODs involved other people in making decisions for the departments, HODs did not use the decisions from others for the benefit of the departments, hence failure to manage PU activity. A critical look at the statements given does not agree with what has been said of HODs implementing what others suggested and departments improving in their activities. If this situation was as it is portrayed then there could have been a lot of money in the departments and equipment could have been repaired.

It is beyond any reasonable doubt that departmental meetings were being conducted, as 94.1% of the respondents observed so. This showed that there was communication between teachers and HODs and between the department and the school administration through minutes of the departmental meetings. After checking the minutes of the departmental meetings, it was discovered that departments were making requests to the schools' administration for loan facilities to use for fund raising. Despite the industrial arts departments requesting for loans, none of the school administrations gave loans to them. The school administrations' refusal to give loans to the departments was a reaction to their non-payment of previous loans. Besides the non-payment of loans, head teachers reportedly did not provide materials for PU for fear that teachers could misuse the materials.

Stocktaking is paramount in the monitoring of the use and care of resources. It also provides accountability of resources. Results showed that stock taking was being conducted as 88.2% of respondents said so. Only schools which had no tools did not carry out stocktaking. This was proved to be true through observation by actual checking of the stock books. A critical look at this, shows that although the activity was being done, it still did not contribute to the economic activities of the departments.

Maintenance and replacement of equipment was found to be poor. The results showed that 82.32% of the respondents agreed to that. Tables 4.2 and 4.3 show that most schools had equipment which were in a poor state. Replacement of worn out and broken down tools was not effectively done. This was done by very few schools as indicated by 29.4% while many schools 70.56% did not do anything. It appears that this trend of not replacing tools had caused the depletion of tools in many schools. This trend could easily be reversed if headteachers understood the usefulness of having an industrial arts department in a secondary school.

(iv) Poor teacher motivation and attitude towards work

Motivation and attitude are inseparable because motivation has an effect on the behaviour of any person. This is why the two terms motivation and attitude appear together. Referring to motivation, Atkinson (1964) says that motivation is difficult to define because

the term has no fixed meaning. However, he defines it as a process governing individual choices among different forms of voluntary activities.

Paul Hersey and associates (1996) explain that people differ not only in their ability to do things but also in their will to do or motivation. Motives are sometimes defined as needs, wants, drives, or impulses within the individual. Motives are the "whys" of behaviour. That is, motivation involves the direction of behaviour, the strength of response and the persistence of the behaviour. In order to maintain and sustain behaviour (attitude) the surrounding environment must reinforce the intensity and direction of individual drives or forces.

This study has revealed that industrial arts teachers were not adequately motivated thereby leading to the bad attitude developed towards fund raising activities. In their responses, industrial arts teachers (table 7.2) gave reasons why industrial arts departments were not utilised effectively. The environment around them could not provide motivation to drive their behaviour towards work. Since the school administration and departmental management did not provide motivation, the teachers themselves got self motivation by conducting production unit individually. School administration had called this kind of activity by teachers as dishonest. Results also indicated that there was no transparency and accountability in the way production unit was being done in schools. Teachers worked without the knowledge of the HTs but with the full knowledge of the HOD. This was supported by the fact that six (66.7%) head teachers said there was no transparency in the way industrial arts departments were operating where as six (66.7%) HODs said there was transparency in the way the departments were operating. The contrasting views between the HTs and HODs indicate that there seems to be no cooperation between the two groups.

(v) Inadequate staffing levels

As can be drawn from the results of the study, staffing levels in schools were not very badly affected although the numbers were not sufficient in five schools, namely Kabulonga, Libala, David Kaunda, Kamwala and Munali.. According to the normal situation, schools which are multi-track such as Kabulonga school for boys which

was not a technical school but had four workshops needed to have at least eight teachers while a technical school such as David Kaunda with six workshops needed to have at least 12 teachers. Results had shown that out of nine schools, only four (44.4%) of them had the required number of teachers. These schools were Chongwe, Naboye, Kafue and Matero secondary schools.

Though it appeared that some schools had fewer teachers than others in essence the numbers of teachers available could still support PU. In situations where teachers were serious with work even one teacher could do a lot of production work by mobilising pupils whom s/he could motivate to produce something.

The staffing levels, therefore, were not an issue for not conducting PU in secondary schools. If teachers themselves could fund raise for their own money using the same school facilities available, surely they could also do the same for the schools. This situation, consequently, pointed to the bad attitude that teachers had for public activities.

(vi) Inadequate provision of materials

The majority, eight (88.9%) headteachers, majority six (66.7%) HODs, and majority of industrial arts teachers 18 (72%) agreed that material provision was done by the schools through Parent Teachers Association (PTA). Investigations of the reasons why PU was not being conducted revealed that lack of materials was among the prominent reasons. This result is supported by Kelly (1991) and Owen (1981) who state that the performance of production unit activities is known to be affected by the lack of materials and insufficient financial resources. The situation presented here might suggest that although the materials were bought they were not enough that is probably why they were used for preventive maintenance alone which head teachers were sure of controlling and supervising.

Further enquiry was made to find out why PU did not receive support in terms of materials and finance from headteachers. The headteachers cited the following reasons for not supporting the departments:

Industrial arts departments were supposed to raise their own funds and they said teachers were dishonest. They further stated that at certain times, headteachers loaned the departments some money which departments failed to pay back. Meanwhile, teachers in the departments were using the materials for their personal gain. Headteachers added that it was difficult to supervise industrial arts teachers because headteachers did not have insight of whatever teachers were doing in the workshops. They contended that HODs and their teachers were not co-operative and that their attitude towards PU activities was bad.

(vii) Inappropriate training

(a) Teachers training

Effective school performance depends on properly trained human resources (Owen, 1981, Kunkhuli, 1988 and Musaazi,1988). This study has revealed that teacher training in Zambia has no emphasis on the management aspects of departments in schools. The results in this study have revealed that industrial arts teachers are not trained with a view to go and carry out production unit activities in secondary schools after their training. This fact was revealed by the type of subjects found in the curriculum of industrial arts teachers training at the Technical and Vocational Teachers College in Luanshya (see appendix 6a – 6b). The syllabuses showed that management and entrepreneurship courses were not part of teacher training courses. The problem which existed was that the policy on education with production had not been implemented through the training of suitable teachers to handle the fund raising programmes. Training teachers in technical skills alone without entrepreneurship skills to enable them to set up fund raising activities in schools would be asking for too much from them. Although the results indicated that 21.4% of the teachers were trained in management during teacher training, it was not compulsory. Further, results have shown that after training, 50% of teachers indicated that they had studied management (see table 5). Still, this was not specific management training for the type of work they were engaged in.

(b) HOD training

Results showed that 72.2% of respondents said HODs had no orientation after they were appointed to head the departments, while 27.8% consented. Although 27.8% of respondents said orientation was given to some HODs after appointment, indications were that the orientation was not effective. It was further observed that if they were trained they could use their influence to entice both teachers and headteachers to support fund raising activities.

(c) Head teachers training

Eight (88.8%) of the nine respondents supported the idea that head teachers who manage schools with industrial arts departments need to undergo a specific training in management and supervision to enable them supervise the departments effectively. The assertion is supported by Musaazi (1988) who observes that the survival of organisations such as schools is depended largely on the administrative service available. He adds that administration influences the results to be achieved, the direction to be pursued and the priorities to be recognised within the organisation. He emphasises that an administrator needs to undergo an administrative course. For that reason, it is important that those who are appointed to run schools which offer industrial arts undergo an orientation course when they are appointed to head such schools.

Studies have revealed that training for education managers is a multi purpose activity which includes orienting new managers, providing skills and knowledge for the new position, improving the effectiveness and productivity of education managers, reinvigorating turned out managers and reinforcing the ministries philosophy, policies and procedures (Chumura, 1987; Nadler, 1989 and Owen, 1981).

Education managers in Zambia are not trained in administrative skills (MOE 1996; 1997), unlike their counterparts in Ghana, to enable them work effectively. The study by Baiden (1994) revealed that the Ghana education Service (GES) conducted seminars and workshops for heads of technical schools so that they could effectively carry out their numerous managerial and administrative duties. This was to enable HTs understand the complex nature of the technical wing of a school.

This study reveals that school administrators have no capacity to run industrial arts departments because they do not possess the relevant knowledge required to do that. As evident in this study, the headteachers interviewed openly acknowledged the fact that it was necessary to train headteachers who were appointed to run schools which offer industrial arts education. In addition, the study has discovered that no single school out of the nine schools researched on, had shown any significant performance in the production unit activities of the departments (see table 9). The activity which had been successfully done was PMS because teachers as well as headteachers and HODs were trained.

In summary, objective one has brought out the fact that for any successful performance, human resource needed to be appropriately trained in order to use other factors for effective performance.

5.4 Objective two: Establishing the views held by headteachers, industrial arts teachers, and non-industrial arts teachers about the utilisation of industrial arts departments

The objective tested general and particular views held by the three groups of respondents mentioned above on the utilisation of industrial arts departments . The utilisation activities referred to in this study are fund raising and preventive maintenance.

(i) Effective Utilisation

The general views were that the majority of the headteachers five (56.6%), felt industrial arts departments were not generally being utilised effectively whereas 14 (56%) industrial arts teachers and 16 (54.8%) non industrial arts teachers felt industrial arts departments were being run effectively (table 6 chapter 4). The reasons given for each group's view can be found in tables 7.1 and 7.2 in chapter 4. It is interesting to note that HTs did not hide their bad feelings towards industrial arts teachers and HODs. They revealed that IATs had negative attitude towards P.U. while IATs did not blame themselves. While the HTs blamed the teachers and HODs, they recognised that they were also to blame as they did not support the departments materially and financially. It was also interesting to note that lack of projects to generate funds was cited by teachers as the most outstanding reason for ineffective utilisation of departments. Other reasons teachers mentioned were

lack of materials and bad attitude of HTs towards the industrial arts departments.
After establishing the general views of the respondents, the study considered the particular views on PMS and PU activities in each group of respondents.

(ii) Preventive Maintenance System (PMS)

One of the tests for effective utilisation of the industrial arts department in this study is the preventive maintenance system. The results on preventive maintenance showed that all groups agreed that preventive maintenance was successful in secondary schools. This is supported by the results in table 6 in chapter 4. The results indicated that eight (88.9%) out of nine headteachers, 25(100%) of industrial arts teachers and 16 (54.8%) out of 31 non industrial arts teachers all agreed that PMS was successful. Preventive maintenance system involved a lot of activities. Some of them were cleaning and repair of the following : buildings, roofs, machinery desks and also fixing of burglar bars on windows and grill doors on door frames.

Results showed that 35 out of 43 respondents agreed that the majority of the schools were repairing desks and burglar proofing the buildings. The rest of the activities mentioned were unattended to. The PMS activities were supported by headteachers. It is deduced that the reason for the support of PMS could be the fear of being reprimanded by higher authorities if they found that the head teacher neglected to secure the school buildings to prevent thefts. Another reason could be that since they were the ones purchasing materials they had no fear of misuse of funds by the industrial arts teachers. Industrial arts teachers were thought to be dishonest people who could not be trusted with anything. The other factor which contributed to the success of PMS was that nearly all HTS, HODs and IATs were trained in PMS.

(iii) Production Unit

The results from table 6 in chapter 4 indicated that all the three groups of the respondents revealed that there was no production unit in their schools. Going by the frequencies and percentages, eight (88.9%) out of the nine headteachers, 15 (60%) of the 25 industrial arts teachers and 20 (66.2%) of the 31 non industrial arts teachers consented that they had no P.U. in their schools. The results were proved by observation as well. Although one

(11.1%) of the nine HTs, three (33.3%) of the nine HODs and eight (32%) of the IATs agreed that there was P.U in schools, the P.U. which was there was not official. It was established that individual teachers were responsible for the P.U which existed . The evidence was seen in two schools where already made pieces of furniture could not be accounted for as schools' projects as there was no record to prove that. The situation which was found confirmed the headteachers arguements that there was no transparency in the way industrial arts departments were being managed and that teachers were dishonest. The conclusion which emerged is that there were no production unit activities carried out in secondary schools, though 12 (25.5%) of the respondents agreed that there was production unit in schools as they referred to production unit on an individual teacher basis.

5.5. Objective three: Determination of whether or not the location of a school had any influence on the utilisation of industrial arts departments

The variables which were tested against the locations of the schools were:- thefts and losses, procurement of materials' replacement of worn out tools, preventive maintenance system (PMS), production unit activities (PU) and marketing strategies (see tables 8 and 9 in chapter 4). In addition, the variables presented were treated against location in order to determine the statistical influence location had on the mentioned variables.

(i) Thefts and losses

The majority, 30 of the 43 respondents both from urban and peri-urban areas, agreed that they had experienced thefts of tools and burglaries of workshops. The main reason for the thefts and burglaries were unsecured workshops, schools were built in unsafe areas, and the carelessness of HODs.

It could be deduced that the location had no significant influence as 0.38% fell outside of the limits of influence of the thefts and burglaries because schools in both urban and peri-urban experienced thefts and burglaries.

(ii) Procurement of Materials

It was revealed that the majority, four (66.6%) of the six headteachers and four (66.6%)

of the six HODs from urban schools agreed that it was easy to purchase materials because materials were within reach. It was surprising to note that no teacher indicated that it was easy to purchase materials. The nine (47.7%) industrial arts teachers who did not agree gave a reason of lack of money. It could be deduced from these results that teachers were not involved in purchase of materials, although earlier results showed that teachers were involved in decision making.

All the respondents from peri-urban schools stated that it was not easy to purchase materials. Apart from lack of money they gave other reasons such as materials were far away from their districts in Lusaka, and that transport from their station to Lusaka was too costly. The location here had influence on the supply of materials. In addition, results revealed that if a school was situated in town, materials were easily obtainable because all the materials were within reach and transport was not costly. Similarly, schools in peri-urban areas had problems such as costly transport, and unavailable materials.

The only thing which was not affected by location was lack of money which was found in both locations. In conclusion, it could be said that location of the school influenced the purchases of materials.

(iii) Replacement of worn out tools

All the headteachers and HODs from urban schools agreed that it was easy to replace worn out tools . They mentioned that if money was available, replacement of tools was easy because they were within town. However, those from peri-urban schools mentioned that it was not easy to replace worn out equipment because of distances involved from their districts to Lusaka where such tools were found and due to lack of money. They revealed that if one had money to buy tools one needed extra money for transport and food in order to reach Lusaka. It could be deduced from these results that location had influence on the replacement of worn out tools in schools.

(iv) Preventive Maintenance System (PMS)

Results indicated that PMS was successful in both urban and peri urban schools. The

frequency percentages ranged from 72.2% to 100% of those who agreed. The results showed that the location of the school had no influence on preventive maintenance system because urban as well as peri-urban experienced success.

(v) Production Unit (PU)

Apart from 10 (32.2%) respondents from urban schools and 2 (16.7%) respondents from peri-urban schools, who agreed that there was PU in their schools, the rest, 21 (67.7%) from urban and the 10 (83.3%) from peri-urban did not agree (refer to table 9). It could be inferred that the 2 (32.2%) urban respondents who agreed that they had PU were those who were allowed by HODs to make items for sell without the knowledge of the head teacher and whose workshops were found with ready items to sell. Similarly, the two respondents from peri-urban who agreed that they had fund raising activities in their schools were not telling the truth. They were acting dishonestly because even in those schools where they came from there were no records of PU at all. The information concerning money which was raised and kept by the bursars was not true because there was no record which was shown.

In conclusion, results have shown that there was no school which had PU and therefore location of the school had no influence at all on PU as both urban and peri-urban schools had no PU.

The information concerning money which was raised and kept by the bursars and spent on materials could not be verified because there were no records to show that. The results on procurement of materials showed that the schools provided materials through other means and not from money raised through PU activities.

(vi) Marketing

The marketing situation was difficult to determine since there were no items to market. However, results showed that there was need to find markets before production. There was a big possibility that marketing could not be a problem because schools had a lot of workers who could be potential buyers.

5.6 Ancillary Information

In addition to the results obtained from the fieldwork, there were data gathered during the researcher's interaction with other people and access to other unpublished literature. During the time of the research, the researcher had a priviledge to attend a subject review meeting which was conducted by the Technical and Vocational Teachers College at Baluba Motel, Luanshya. During that workshop, a lot of information was revealed which confirmed the results which were obtained from the research. The prominent information was on the inadequate teacher training syllabuses (TVTC, 2001) see appendix 6C and bad attitude of HTs, HODs and industrial arts teachers towards production unit activities (MOE/LR/4/15/47). The latter reason was given by the Chief Inspector of Schools in one of his opening speeches during a Zambia Industrial Arts Teachers Association Meeting.

All in all, the chapter has revealed that the factors which were responsible for utilisation of industrial arts departments were all not used to the success of fund raising activities which could support school projects including PMS.

The chapter has also shown that the views held by the headteachers and both teacher groups about the utilisation of the departments varied. Headteachers believed that there was no effective utilisation of the departments due to the fact that there were no activities in production unit to which the teacher groups agreed. The location was acknowledged by all groups to be insignificant to most of the variables tested against it, except purchases of materials and replacement of worn out tools which were significant to the location.

The ancillary information revealed that industrial arts teacher training was insufficient and that the non productive nature of these departments was caused by the bad attitude of most of the school based stakeholders.

5.7 Section Two - Conclusions and Recommendations

5.7.1 Conclusions

(a) Objective one: Identification of the factors affecting the utilisation of the industrial arts departments in secondary schools.

The results revealed that in all the groups of respondents namely head teacher, head of department, industrial arts teacher and non-industrial arts teacher the following variables had no effect on the utilisation of the departments for fund raising: age, sex, length of service in the post, length of service in the school, qualification attained and number of teachers in a school. The factors that emerged in this study were:- lack of support by school administration, non operational workshop rooms and insufficient equipment, ineffective departmental management, poor teachers' motivation and attitude towards work, inadequate provision of materials, and inappropriate training.

(i) *Lack of support by the school administration* – In this case, it was found that the school administration was not supportive in fund raising ventures although there was significant support in preventive maintenance in the areas of material provision for burglar proofing and desk repairs. The reason for supporting PMS was that they could easily monitor the PMS activities while for PU, they found it difficult to monitor the activities. PU activities were not easily monitored due to their technical nature as headteachers were not trained to supervise industrial arts departments. The results showed that although there was communication between the school head and the HOD through visits, communication was not specific and effective to help unproductive nature of the departments.

(ii) *Non operational workshop rooms and insufficient equipment* - The well known idea was that if the industrial arts department had no workshop to work from and sufficient hand tools, there could be no practical work done. The results revealed that the majority of schools had at least rooms to work from and had a reasonable number of hand tools in addition to one or two machine tools which may be very

essential in production work. The bottom line of the argument was that, although the tools may not have been enough, at least the few available tools should have been used to raise funds for the school. Unfortunately, there was no school which used the tools to the advantage of fund raising.

(iii) *Ineffective departmental management*: It is understandable that nothing could be achieved without proper management skills. In this study, it was found that industrial arts heads of departments lacked the skill mainly because they were not trained for that during and after their teacher training.

(iv) *Poor teacher motivation and attitude towards work*: The motives that drove teachers to act in the way they did things depended on the value they attached to that work or the reward that could come from that activity (Musaazi, 1988). The results that were obtained showed that teachers were unhappy due to lack of tools, lack of support by head teacher and poor working atmosphere. It appeared that teachers, HODs and HTs supported preventive maintenance (PM) more than PU simply because all had the knowledge about PMS because they were trained in running PMS.

(v) *Inadequate staffing levels*: The results revealed that each school had at least a teacher, though the numbers were not sufficient in some schools. The fact that there were some teachers in schools meant that some work on PU could be done. This was not the case at all.

(vi) *Inadequate provision of materials*: The results that emerged from the study showed that materials for PM were bought by the administration mainly for welding burglar bars and repair desks. The reason for this was that the material usage was easily monitored at specific work places. School administrators did not supply materials for fundraising because they did not trust teachers that they would use the materials profitably and transparently for the schools' benefit.

(vii) *Teacher training:* It was found that industrial arts teacher training was not appropriate to enable teachers participate in production units because the training lacked essential courses such as entrepreneurship and management.

(b) Objective two: Establishing the views held by head teachers, industrial arts and non industrial arts teachers about the utilisation of industrial arts departments.

The results showed that, generally, head teachers thought the industrial arts departments were not being utilised effectively. Teachers had a different view from the head teachers' view. The majority of the teachers thought the industrial arts departments were being utilised well. The reasons for the varying views on utilisation between head teachers and teachers were as follows:- head teachers felt that although preventive maintenance system (PMS) was successful in two areas of burglar proofing and desk repair on which teachers based their argument, there were still many areas of PMS which were not attended to and that Production Unit did not exist. Teachers views on effective utilisation was based on the successes that were scored in PMS. However, particular views of each individual group indicated that PMS was successful while production Unit (PU) was unsuccessful.

(c) Objective three: Determination of whether or not the location of a secondary school had any influence on the utilisation of industrial arts departments.

It was established that in most cases the location of the school had no influence on the variable that constituted utilisation of the departments. The variables considered were thefts and losses, procurement of materials, replacement of worn out equipment, preventive maintenance, production unit and marketing.

(i) *Thefts and losses*:

It was found that thefts and losses occurred in every school regardless of the location of the school. That is both urban areas and peri-urban area schools experienced thefts and losses.

(ii) *Procurement of materials*

Results revealed that procurement of materials was affected by location of the school because of distances from the sources of materials. Both urban and peri-urban schools were affected in one way or the other.

(iii) *Replacement of worn out tools*:

It was observed that location had influence on this variable. Schools in urban areas found it easy to replace tools while schools in peri-urban areas found it difficult. However, both areas experienced problems of lack of funds.

(iv) *Preventive maintenance*

Preventive maintenance was not affected by location of the school as the results showed. Most of the schools were succeeding in PMS although the success was recorded in burglar proofing and desk repairs.

(v) *Production unit*

Results revealed that production unit in all schools was not successful. There was not even one school among those visited which had shown any activity in PU. So both urban and peri-urban schools were affected.

(vi) *Marketing*

It was found that marketing was not a concern of any one because there was nothing to market. Experience had it that marketing industrial arts products could not be a problem because the market was big within the schools. Teachers and other workers could be potential buyers.

5.7.2 Recommendations

The recommendations are according to the objectives as they affect groups of stake holders and for areas for further research.

(a) *Policy Makers*

(i) Industrial arts teacher training curriculum should include workshop management, and entrepreneurship education.

(ii) When industrial arts heads of department are appointed there should be orientation in the management of industrial arts departments.

(iii) Head teachers who are appointed to head schools which offer industrial arts education should be given training/orientation to enable them understand what activities go on in the industrial arts departments. The inspectorate should develop the training materials in conjunction with the curriculum development centre.

(iv) Government should increase funding to replace worn out equipment instead of leaving schools to fend for themselves.

(v) The appointment of heads of department should be highly competitive and vacant posts should be widely advertised.

(vi) Government should ensure that the policy objectives are well published along with clear instructions as to when, how and by whom the policy is to be implemented.

(b) *Heads of Schools*

(i) The heads of schools should be more supportive to the departments by buying materials and providing moral support to the teachers by doing so they motivate them.

(ii) Heads of schools should step up their monitoring, supervision and communication skills in order to encourage heads of departments to be productive;

(iii) Heads in conjunction with PTA should provide initial capital for production unit in form of a loan.

(iv) Head teachers should communicate with the staff and use a variety of formal and informal techniques to learn about concerns of dissatisfying and satisfying aspects of teachers' work.

(c) *Heads of Department*

(i) Heads of departments should guide other teachers in the maintenance and cleaning of school equipment and keeping them intact.

(ii) HODs should charge and report erring teachers to headteachers and should not support teachers' wrong activities such as making items without the knowledge of school authorities.

(d) *Industrial Arts Teachers*

(i) Teachers should change their negative attitude towards work by getting involved in organising and taking part in PU activities.

(ii) Teachers should be honest with themselves and with the system they serve by being transparent and accountable of their activities. That is they should conduct PU activities with the school authority's knowledge and share the money raised between the school and themselves.

(e) *Further Research Areas*

(i) There is need to replicate this study by somebody and extend it to other provinces in order to find out whether the results obtained in this study could be generalised.

(ii) A study on the same topic to find out views of education authorities at district, Provincial and national levels about the utilisation of industrial arts departments in secondary schools might be useful.

(iii) A study to find out whether or not the policy on education with production in industrial arts education is being fulfilled in Zambia would be necessary.

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APPENDIX 1

SELF ADMINISTERED QUESTIONNAIRE (SAQ) FOR INDUSTRIAL ARTS TEACHERS

THE UNIVERSITY OF ZAMBIA

SCHOOL OF EDUCATION

DEPARTMENT OF EDUCATIONAL ADMINISTRATION AND POLICY STUDIES

FACTORS AFFECTING THE UTILISATION OF INDUSTRIAL ARTS DEPARTMENTS

Questionnaire No ☐☐

Date.....

INTRODUCTION

This questionnaire is one of the research instruments I have developed to help me gather data for my Masters' degree dissertation at the University of Zambia. It is purely an academic exercise which is not meant to find faults in any person. The result of this research will be used for the improvement of industrial arts education.

Please feel free and be as honest as possible in answering the questions. The information given will be treated confidentially. Do not write your name.

By A.M. Mulenga (M.ED Student)

INSTRUCTIONS

The questionnaire comprises three parts.

1. Part one deals with identification data
2. Part two deals with background data
3. Part three is based on objectives of the study
4. Answer all parts.
5. The questionnaire requires you to either tick or supply a short answer.

PART I IDENTIFICATION DATA

Province .....

District .....

School .....

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PART TWO

BACKGROUND DATA

Q1a Sex of respondent 1. Male ☐ 2. Female ☐

Q1b. How old are you? .....

Q2. How long have you served as a teacher? .....

Q3. What is your qualification?

1. Master degree ☐
2. Bachelors degree ☐
3. Advanced Diploma ☐
4. Diploma ☐
5. Skill upgrading Certificate ☐
6. Any Other (Specify) .....

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Q4. What subjects are you teaching

1. Metal Work
2. Wood Work
3. Technical Drawing
4. Geometrical and Mechanical drawing
5. Art and Design
6. Other Specify.....

Q5a. List down the courses (subjects) you took during your teacher training

Subjects	Initial Training	2nd Training	3rd Training		
Metal work					
Wood work					
Technical drawing					
Communication skills					
Education					
Mathematics & Science					
Administration/ Management					

Q5b Did you take a course in management/administration during your teacher training?

1. Yes
2. No

Q5c If the answer is YES to Q5b was it specific to your subject area?

1. Yes
2. No
3. N/A

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PART THREE

SECTION ONE: *Factors affecting the Utilisation of Industrial Arts*

Q6. How many industrial arts workshops do you have?

1 One ☐

2. Two ☐

3. Three ☐

4. Four ☐

5. More than four ☐

Q7a Are the tools available to you and your pupils for use?

1. Yes ☐

2. No ☐

Q7b If answer in 7a is NO why are you not allowed?

1. .....

2. .....

Q8 How do you replace broken, lost and worn out tools?

1. .....

2. .....

3. .....

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Q9a. Has your school receive preventive maintenance tools? ☐

1. Yes ☐
2. No ☐

When .....

9b If the answer is YES, do you use them for preventive maintenance? ☐

1. Yes ☐
2. No ☐
3. N/A ☐

9c Who keeps the tools? ☐

1. .....
2. .....

9d If answer to 9b is NO, why are you not allowed to use them? ☐

1. .....
2. .....

Q10a. Do you take part in preventative maintenance as a department? ☐

1. Yes ☐
2. No ☐

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Q10b. If the answer is YES to Q12a, what type of work do you get involved in preventive maintenance?

1. .....

2. .....

3. .....

Q10c. If the answer is NO to Q12a, what is the reason?

1. .....

2. .....

Q11a Does the School administration support preventive maintenance activities in your department?

1. Yes ☐

2. No ☐

Q11b If answer is YES to 11a, what support are you given?

1. material
2. financial
3. moral
4. Other (Specify).....
5. N/R

Q11c If answer is NO to question 11a, what is the reason?

.....

.....

Q11d. What is the source of materials you use for preventive maintenance?

.....

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Q12. Is the material for teaching supplied by a different source from that which is used for preventive maintenance/fund raising venture?

.....

.....

Q13. What problems are you likely to encounter while doing preventive maintenance system at your school?

.....

Q14a. Do you think the Head of department is managing the department well?

1. Yes ☐

2. No ☐

Q14b. Justify your answer if Yes to Q14a.....

.....

Q14c. Justify your answer if No to Q14a.....

.....

Q15a. Do you conduct stock taking?

1. Yes ☐

2. No ☐

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Q15b. If answer to question 15a is YES, how many times in a year do you stock take?

1. one ☐
2. two ☐
3. three ☐
4. Other (Specify) .....
5. N/R

Q15c. If answer is NO, why don't you conduct stock taking?

.....

.....

Q15d. If it is found that some items have been lost what happens?

1. .....
2. .....

Q16a. Do you undertake production unit/fund raising activities in your department?

1. Yes ☐
2. No ☐

Q16b. If the answer to question 16a is YES, who organises them?

1. HOD
2. Committee appointed by HOD
3. Individual teacher
4. N/A

Q16c If answer is YES to 13a, how much money do you raise per term?

.....

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Q16d Where do you keep the money you raise per term?

.....

Q16e How do you use the money you raise?

1. .....

2. .....

Q16f. If answer is NO to Q16a, why do you not have fund raising?

1. .....

2. .....

Q17a. Does the school administration support fund raising activities?

1. Yes ☐
2. No ☐
3. N/A ☐

Q17b. If answer is YES to Q17a, what support do you receive?

1. material ☐
2. financial ☐
3. moral ☐
4. other (specify) ☐
5. N/A ☐

Q17c. What is the source of materials you use for fund raising activities?

.....

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Q18. Is the material for teaching supplied by a different source from that which is used for preventive maintenance/fund raising venture?

.....

.....

Q19. What problems do you encounter while doing production unit in your school?

.....

.....

Q20a. When you make items for sale do you easily find customers?

1. Yes ☐
2. No ☐
3. N/A ☐

Q20b. If answer is No to question 20a why is it so?.....

.....

Q20c. If answer is YES to question 23a why is it so?.....

.....

Q21. How often does the head teacher visit your department Per week?

1. one
2. two
3. three
4. other (specify).....

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SECTION II

Views held by Teachers about management and utilisation of industrial arts departments.

Q22a Do you think industrial arts department in your school is being managed and utilised well?

1. Yes ☐
2. No ☐

Q22b If answer is Yes to Q22a give reasons.

.....

.....

Q22c If answer is No to Q22a give reasons.

.....

.....

Q23. Suggest ways in which the department could be managed and utilitsed well.

1. .....
2. .....
3. .....

Q24a. In your view does the HOD of 1ndustrial Arts listen to advice from others?

1. Yes ☐
2. No ☐
3. N/A ☐

Q24b. Give reasons for your answer, if YES to Q24a

1 .....

2. .....

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Q24c. If answer is NO to Q24a, give reasons

1 .....

2. .....

SECTION III

Location of the school and its influence on the management and utilisation of the Department.

Q25a Do you think location of your school has an influence on the way you organise the preventive maintenance system and production unit?

1. Yes ☐

2. No ☐

Q25b If answer is YES to Q 25a, state the influence it has on organisation of those activities.

1. .....

2. .....

Q25c If answer is NO to Q 25a, give reasons

1. .....

2. .....

Q25d. State the problems the geographical location of your school has on the purchases of materials you use.

.....

.....

For official use only

Q25e. What problems do you encounter while conducting preventive maintenance in your school?

.....

.....

Q26a Did you experience workshop breakages and thefts?

1. Yes ☐
2. No ☐

Q26b. If answer is YES in Q26a, why was it so? .....

.....

THE END

I thank you very much for your participation

APPENDIX 2

SEMI – STRUCTURED INTERVIEW SCHEDULE (SSI) FOR HEAD TEACHERS

THE UNIVERSITY OF ZA,MBIA
SCHOOL OF EDUCATION
DEPARTMENT OF EDUCATIONAL ADMINISTRATION AND POLICY STUDIES

FACTORS AFFECTING THE UTILISATION OF INDUSTRIAL ARTS DEPARTMENTS – LUSAKA PROVINCE

QUESTIONNAIRE NO. | | |

IDENTIFICATION DATA (FOR OFFICIAL USE)

District:.....

School:.....

Date of Interview:.....

Time of Interview: Start:..... End:.....

Name of Interviewer:.....

Sex of Respondent:.....

Title of Respondent:.....

PART ONE

Background Data

For official use only

Q1. What is your highest qualification? Mention field of study.

1. Diploma
2. Advanced Diploma
3. Degree
4. Masters
5. Other (specify).....

Q2. How long have you served as head teacher?

Q3. How long have you worked at this school?

Q4. How many Industrial Arts teachers do you have at your school?

1. One
2. Two
3. Three
4. Four
6. Five
7. More than five

Q5. Is it your first time to head a school, which has industrial arts departments?

1. Yes
2. No

Q6. How was the Head of Department appointed?

1. Recommendation
2. Advertisement

For official use only

Q10. How often do you visit the Industrial Arts Department?

1. Every day
2. Twice per week
3. One a week
4. Rarely

Q11a. What problems do heads of Industrial Arts Departments find in running their departments?

1. .....
2. .....
3. .....
4. .....

Q11b. What have you done to solve the problems listed in Q11a above?

1. .....
2. .....
3. .....

Q11c. Mention some of the factors you know which contribute to the utilisation of industrial arts department.

1. .....
2. .....
3. .....

Q11d. In your view, do you think it is necessary to provide Head teachers with some kind of training on supervision of Industrial Arts Departments?

1. Yes
2. No

Q11e. Why do you think it is necessary?

1. .....
2. .....
3. .....

For official use only

Q11f. Why do you think it is NOT necessary?

1. .....

2. .....

3. .....

SECTION TWO

VIEWS HELD BY HEAD TEACHERS ABOUT UTILISATION OF INDUSTRIAL ARTS DEPARTMENTS.

Q12a. Do you think industrial arts departments are being utilised as intended?

1. Yes ☐

2. No ☐

Q12b. If the answer is YES, list ways in which the department is being utilised.

1. .....

2. .....

3. .....

4. .....

12c. If the answer is NO to Q12a, what do you think are the reasons for not utilising the department?

1. .....

2. .....

3. .....

13a. Do you have preventive maintenance at your school?

1. Yes ☐ 2. No ☐

If the answer is YES, go to 13(b). If the answer is NO go to 14(a)

For official use only

Q13b. What kind of work in preventive maintenance is the Industrial Arts Department involved in?

1. .....

2. .....

Q14. Suggest ways in which preventive maintenance and production unit could be done.

1. Preventive maintenance.....

.....

2. Production unit.....

.....

Q15a. How easy is it to obtain materials and tools your department uses for production unit?

1. .....

2. .....

Q15b. How easy is it to obtain materials and tools your department uses for preventive maintenance?

1. .....

2. .....

Q15c. Comment on your answer to Q15a.

1. .....

2. .....

3. .....

Q16a. Do you have production unit activities in the department?

1. Yes ☐ 2. No ☐

Q16b. If the answer is YES, how much money is raised per term?

.....

For official use only

Q16c. How does the department use the money raised?

1. .....

2. .....

Q16d. Where do you keep the money you raise?

.....

Q16e. If the answer is NO, why is there no production unit?

1. .....

2. .....

Q17a. How easy is it to obtain materials and tools your department uses for production unit?

1. .....

2. .....

Q17b. How easy is it to obtain materials and tools your department uses for preventive maintenance?

1. .....

2. .....

Q17c. Comment on your answer to Q17a.

1. .....

2. .....

3. .....

Q17d. Comment on your answer to Q17b.

1. .....

2. .....

3. .....

For official use only

Q18a. Does your school have any fund raising activity?

1. Yes ☐ 2. No ☐

Q18b. List the fundraising activities your Industrial Arts Department is doing.

1. .....

2. .....

Q18c. If the answer is NO to Q18a, give reason.

Q18d. Does your department experience problems in selling items they make in the department?

1. Yes ☐ 2. No ☐

Q18e. If the answer is YES to Q18d, what are the problems?

1. The place is rural there are no people to buy ☐

2. The place is in town so competition is stiff ☐

3. N/A ☐

Q19. If answer is NO, what makes it easy to sell items?

1. .....

2. .....

3. .....

Q20a. Do you think there is transparency in the way the Industrial Arts Department is utilised at your school?

1. Yes ☐ 2. No ☐

Q20b. Give reasons for your answer to Q20a, if answer is NO.

1. .....

2. .....

For fficial use only

Q20c. If the answer to Q20a is YES, Give reasons.

1. .....

2. .....

Q21. Suggest ways in which preventive maintenance and production unit could be done.

1. Preventive maintenance.....

.....

2. Production unit.....

.....

SECTION THREE

INFLUENCE OF LOCATION OF SCHOOL AND THE UTILISATION OF DEPARTMENT

Q22a. Is it easy to obtain materials and tools your department uses for production unit?

1. Yes ☐
2. No ☐

Q22b. Is it easy to obtain materials and tools your department uses for preventive maintenance?

1. Yes ☐
2. No ☐

Q22c. Comment on your answer to Q22a.

1. .....

2. .....

Q22d. Comment on your answer to Q22b.

1. .....

2. .....

For official use only

Q23a. Have you ever experienced any thefts of industrial arts equipment?

1. Yes ☐ 2. ☐

Q23b. What do you think could have been the reason for the theft that occurred in your department?

1. Workshops were not burglar proofed ☐
2. The school is built in un safe place ☐
3. There were no watchmen ☐
4. Other (specify) .....

Q24a. Is it easy to replace worn out tools and broken down machine tools considering the location of schools?

1. Yes ☐
2. No ☐

Q24b. If the answer to Q24a is YES, give reasons.

1. .....
2. .....

Q24c. If the answer to Q24a is No, give reasons.

1. .....
2. .....

Q24d. Is it difficulty to replace tools and broken down machine tools?

1. Yes ☐
2. No ☐

END OF QUESTIONNAIRE

APPENDIX 3

SELF ADMINISTERED QUESTIONNAIRE (SAQ) FOR NON INDUSTRIAL ARTS TEACHERS

THANK YOU VERY MUCH FOR YOUR CO-OPERATION

THE UNIVERSITY OF ZAMBIA
SCHOOL OF DEDUACTION
DEPARTMENT OF EDUCATIONAL ADMINISTRATION AND POLICY STUDIES

FACTORS AFFECTING THE UTILISATION OF INDUSTRIAL ARTS DEPRATMENTS IN LUSAKA PROVINCE

Questionnaire No. ☐☐

Date .....

INTRODUCTION

This questionnaire is one of the research instrument I have developed to help me gather data for my Master's degree dissertation at the University of Zambia. It is purely an academic exercise which is not meant to find faults in any person. The findings of this research will used for the improvement of Industrial Arts Education.

Please feel free and be honest as possible in answering the questions. The information given will be treated confidentially. Do not write your name.

By A.M. Mulenga (MEd Student)

INSTRUCTIONS

The questionnaire comprises three parts.

For official use only

1. Part One deals with identification data.
2. Part two deals with background data.
3. Part three is based on objectives of the study.
4. Answer all parts.
5. The questionnaire require you to either tick (➳) or supply a short answer

PART ONE: IDENTIFICATION DATA

District .....

School .....

PART TWO: BACKGROUND DATA

Q1a. Sex of respondent 1. Male ☐ 2. Female ☐ ☐

Q1b. How old are you? ..... ☐

Q2. How long have you served as a teacher? ..... ☐

Q3. What is your qualification? ☐

1. Master degree ☐
2. Bachelors degree ☐
3. Advanced diploma ☐
4. Diploma ☐
5. Any other (specify) .....

For official use only

Q4. Tick in the spaces provided, the courses (subjects) you took during your teacher training.

Course	During Teacher Training		After Teacher Training	
	Yes	No	Yes	No
Teaching subject				
Administration/management				
Entrepreneurship				

Q4b. If the answer is YES to Q4a, was it specific to your subject area?

1. Yes ☐ 2. No ☐

PART THREE: VIEWS HELD BY TEACHERS ABOUT UTILISATION OF INDUSTRIAL ARTS DEPARTMENTS

Q5a. In your view, do you think Industrial Arts Department in your school is being utilised effectively?

1. Yes ☐ 2. No ☐

Q5b. Give reasons if answer to Q5a is NO.

.....

Q5c. Give reasons if answer to Q5a is YES.

.....

.....

For official use only

Q5d. Do you have preventive maintenance in your school ?

1. Yes ☐ 2. No ☐ 3. ☐ ☐

Q5e. Do you have production unit at your school?

1. Yes ☐ 2. No ☐ 3. ☐ ☐

Q5f. Suggest ways in which the department could be managed and utilised well. ☐

1. .....

.....

2. .....

.....

3. .....

.....

Q6. In your view, what factors contribute to the utilisation of industrial arts department in secondary schools? ☐

.....

.....

.....

Q7a. In your view does the HOD of industrial arts listen to advice from others?

1. Yes ☐ 2. No ☐ 3. ☐ ☐

Q7b. Give reasons for your answer, if answer is YES to Q7a.

.....

.....

For official **use only**

Q7c. Give reasons for your answer, if answer is NO to Q7a.

.....

.....

Q8a. In your view, is there transparency and accountability in the way industrial arts departments are used?

1 Yes ☐ 2. No ☐ 3. N/A ☐ ☐

Q8b. If answer is Yes to Q8a, give reason.

.....

.....

Q8c. If answer is No to Q8a, give reason.

.....

.....

END OF QUESTIONNAIRE

Thank you for your co-operation

APPENDIX 4

SEMI-STRUCUTRED INTERVIEW SCHEDULE FOR HEADS OF DEPARTMENT (SSI)

THE UNIVERSITY OF ZAMBIA

SCHOOL OF EDUCATION

DEPARTMENT OF EDUCATIONAL ADMINISTRATION AND POLICY STUDIES

FACTORS AFFECTING THE UTILISATION OF INDUSTRIAL ARTS DEPARTMENTS IN LUSAKA PROVINCE

Questionnaire No ☐☐

IDENTIFICATION DATA (FOR OFFICIAL USE)

District:.....

School:.....

Date of interview:.....

Time of interview: Start:..... End:.....

Name of interviewer:.....

Sex of respondent:.....

Title of respondent:.....

Checked by:.....

Date checked:.....

Date entered by:.....

PART ONE

For official use only

BACKGROUND DATA

Q1 How long have you served as Head of Department?..... ☐

Q2. How long have you worked at this school?. ..... ☐

Q3. What is your highest educational qualification?

7. Bachelors degree ☐
8. Advanced Diploma ☐
9. Advanced Diploma ☐
10. Certificate ☐
11. Other (Specify) .....

Q4. How many teachers are there in your department? ☐

7. Two ☐
8. Three ☐
9. Four ☐
10. Five ☐
11. More than five ☐

Q5. Is it your first time to head an industrial arts department? ☐

1. Yes ☐ 2. No ☐

Q6. How were you appointed as Head of Department? ☐

1. By recommendation ☐
2. By advertisement ☐

For official use only

PART TWO – OBJECTIVES

SECTION ONE

UTILISATION OF INDUSTRIAL ARTS DEPARTMENT

Q7. Were you given special training or orientation after your appointment as Head of Department? ☐

1. Yes ☐ 2. No ☐

Q7a. If the answer is NO to question 7, how do you manage the Department?

1. .....

2. .....

Q7b. List down the courses (subjects) you took during your training.

Initial training	2nd Training	3rd Training

☐

Q8a. How many workshops do you have? ☐

1. One ☐
2. Two ☐
3. Three ☐

For official use only

Q8b. What machines do you have in these workshops?

METAL WORK	No	Condition		
Lathe				
Welding Machine				
Power Saw				
Shaper				
Grinder				
Milling Mach				
Drilling Mach				
WOOD WORK				
W/Lathe				
Planner				
Circular Saw				
Sander				
Spindle Moulder				
Morticer				
Drilling Machine				

Q8c. Is it possible to work successfully without the above listed machine tools?

1. Yes ☐ 2. No ☐

For official use only

Q8d. How many of the following essential tools do you have?

METAL WORK TOOLS	No. required	No. available
Hack Saw		
Rule		
Scriber		
Harmer		
Try Square		
Hand Drill		
Twist Bits		
Chisels		
Hand Drill		

METAL WORK TOOLS	**No. required**	**No. available**
Hand Saw		
Rasps		
Mortice Chisel		
Paring Chisel		
Sash Grumps		
Hammers		
Rules		
Try Square		
Others (specify)		

Q8e. Do teachers have access to the tools?

1. Yes ☐ 2. No ☐

Q8f. If the answer is NO to question 8e, give reasons.

1. .....

2. .....

For official use only

Q8g. How do you replace worn out tools? ☐

1. .....

2. .....

Q9a. Has your school received preventive maintenance tool kit? ☐

1. Yes ☐ 2. No ☐

Q9b. If the answer YES to question 9a, who keeps the tools? ☐

1. .....

2. .....

Q9c. Are the tools available for use by the Department? ☐

1. Yes ☐ 2. No ☐

Q10a. Do you involve teachers in decision making about matters concerning the Department? ☐

1. Yes ☐ 2. No ☐

Q10b. If the answer is NO, why do you not involve them? ☐

1. .....

2. .....

Q11a. Do you conduct departmental meetings? ☐

1. Yes ☐ 2. No ☐

Q11b. If the answer is YES, how many times do you conduct meetings per term? ☐

1. One ☐

2. Two ☐

3. Three ☐

Q12a. How often do you conduct stock-taking per term? ☐

1. One ☐

2. Two ☐

3. Three ☐

Q12b. What happens to a teacher who is found with shortages of tools? ☐

1. .....

2. .....

For official use only

Q13a. Do you take part in preventive maintenance as a Department? ☐

1. Yes 2. No ☐

Q13b. If the answer is YES to question 13a, what type of work do you do as a Department? ☐

1. .....

2. .....

Q13c. If answer is NO, why don't you take part? ☐

1. .....

2. .....

Q13d. Do you take part in preventive maintenance as an individual? ☐

1. Yes ☐ 2. No ☐

Q13e. If answer is No, why don't you take part? ☐

1. .....

2. .....

Q13f. Who provides materials you use in preventive maintenance?

1. .....

2. .....

Q14a. Do you have production unit/fund raising in your department? ☐

1. Yes ☐ 2. No ☐

Q14b. If the answer is YES, who is in charge of organizing it? ☐

1. .....

2. .....

3. .....

Q14c. Do you take part in fundraising activities as an individual? ☐

1. Yes ☐ 2. No ☐

For official use only

Q14f. Where do you keep the money you raise?

1. Bank ☐
2. With Bursar ☐
3. HOD ☐
4. Departmental Treasurer ☐

Q14g. How is the money you raised used? ☐

1. .....
2. .....
3. .....

Q14h. If the answer is No to question 14a, why do you not have fundraising? ☐

1. .....
2. .....
3. .....

Q15a. When there are problems with materials too use for fundraising, what do you do to solve such problems? ☐

1. .....
2. .....
3. .....

Q15b. Does your school administration support the fundraising activities?

1. Yes ☐ 2. No ☐

Q15c. If the answer is YES, what support do you receive? ☐

1. .....
2. .....
3. .....

Q15d. If the answer is NO, why are you not supported? ☐

1. .....
2. .....
3. .....

☐

For official use only

Q15e. How is this fundraising done?

1. By individual teachers ☐
2. By departments where by all teachers and pupils are involved ☐

Q15f. Who provides material you use in fundraising?

1. .....
2. .....
3. .....

Q16a. How many times does the head teacher visit your department per term?

1. Once per week ☐
2. Twice ☐
3. Thrice ☐

Q16b. Do you discuss matters concerning your department with the head teacher?

1. Yes ☐ 2. No ☐

Q16c. If the answer is YES to question 16b, how often do you meet?

.....

Q17a. Is the material for teaching supplied differently from that which is used for preventive maintenance and fundraising activities?

1. Yes ☐ 2. No ☐

Q17b. Support your answer.....

.....

.....

Q18a. Do you think there is transparency in the way Industrial Arts Department is utilized at your school?

1. Yes ☐ 2. No ☐

Q18b. Give reasons for your answer to Q18a.

1. .....
2. .....

For official use only

SECTION TWO

LOCATION OF THE SCHOOL AND ITS INFLUENCE ON MANAGEMENT AND UTILISATION OF THE DEPARTMENT

Q19a. How easy is it to obtain materials and tools your department uses for production unit and preventive maintenance? ☐

1. .....
2. .....

Q19b. How difficult is it to obtain materials and tools your department uses for production unit and preventive maintenance? ☐

1. .....
2. .....

Q19c. What makes it easy/difficult to obtain materials for

1. Preventive maintenance..... ☐

.....

2. Production unit..... ☐

.....

Q20a. Have you ever experienced any theft of industrial arts equipment at your school? ☐

1. Yes ☐ 2. No ☐

Q20b. What do you think could have been the reason for the thefts that occurred in your department? ☐

1. Workshops were not burglar proofed ☐
2. The school is built in unsafe place ☐
3. There were no watchmen ☐

Q21a. How easy is it to replace worn out tools and broken down machine tools considering the location of your school? ☐

1. .....
2. .....
3. .....

For official use only

Q21b. Why could it be difficult to replace tools and broken down machine tools? ☐

1. .....

2. .....

3. .....

Q22a. Does your department have problems in selling items they make in the Department? ☐

1. Yes ☐ 2. No ☐

Q22b. If the answer is YES, what are the problems? ☐

1. .....

2. .....

Q22c. If the answer is No to question 21a, what makes it easy to sell the items? ☐

1. .....

2. .....

END OF QUESTIONNAIRE

THANK YOU VERY MUCH FOR YOUR COOPERTAION

APPENDIX 5

OBSERVATION (CHECK LIST) SCHEDULE

THE UNIVERSITY OF ZAMBIA

SCHOOL OF EDUCATION
DEPARTMENT OF EDUCATIONAL ADMINISTRATION AND POLICY STUDIES

FACTORS AFFECTING THE UTILISATION OF INDUSTRIAL ARTS DEPARTMENTS IN LUSAKA PROVINCE

DISTRICT _____

SCHOOL _____

DATE _____

Look for the following things to check whether or not they are being attended to.

METAL WORKSHOP						
Item		1	2	3	4	5
1.	Care of machines	Very good	Good	Fair	Poor	Very poor
2.	Care of tools					
3.	Cleanliness of workshop					

WOOD WORKSHOP						
Item		1	2	3	4	5
1.	Care of machines	Very good	Good	Fair	Poor	Very poor
2.	Care of tools					
3.	Cleanliness of workshop					

PREVENTIVE MAINTENANCE SYSTEM (PMS)			
Item		1	2
		Available	Not available
1.	Evidence of PMS		
2.	Evidence of Repair		
3.	Evidence of Cleanliness		

FUNDRAISING			
Item		1	2
		Available	Not available
1.	Evidence of fundraising		
2.	Evidence of projects entries		
3.	Evidence of book-keeping		
4.	Evidence of projects accounts		
5.	Evidence of finished projects		

AVAILABILITY OF EQUIPMENT				
Equipment/Tool		Number	Condition	
1.			Good	Poor
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Were the following documents available?

Departmental meeting minutes

1. Yes ☐ 2. No ☐

Stock books and evidence of stock taking

1. Yes ☐ 2. No ☐

APPENDIX 6A

INDUSTRIAL ARTS TEACHER TRAINING COURSE OUTLINE

Pre Service
Teaching subjects
Educational subjects
Related subjects

INSERVICE
Teaching subjects
Related subjects

DURATION

Pre-service	2 years
In-service	1 year

ASSESSMENT AND EXAMINATIONS
Continuous assessment through carefully selected assignments and tests apply throughout the course, them a final examination at the end of the course work is given.

CERTIFICATION

Pre-service	A University of Zambia teaching Diploma is awarded to successful candidates.
In-service	A Government, skill upgrading certificate is awarded.

ENTRY REQUIRMENT

Pre service	As in appendix 6b
In service	A minimum of three years post qualifying service of skill practice

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Adapted from Mweetwa, (1999) Pre-service training for industrial Arts teachers

APPENDIX 6B

INDUSTRIAL ARTS TEACHER TRAINING SYLLABII

PRE-SERVICE

Programme	INDUSTRIAL ARTS TEACHER TRAINING
Duration	Two years
Credential	Diploma
Location	Luanshya Technical and Vocational Teachers College
Entry Requirements	School Certificate Results 6 with at least one Technical subject; or Four GCE passes, two of which must be English and Technical subject.

Programme INDUSTRIAL ARTS SKILLS TRAINING

Content

Wood Work

Constructing and planing, fastening and iron mongery; glueing; finishing; machines; hand tools; materials; stock control; drawing and design.

Metal Work

Bench work; grinding; turning; shaping; milling; welding; brazing; forging; heat treatment; sheet metal work; art metal work; casting; stock control; drawing and design.

Technical Drawing

Sketching; orthographic drawing; isometric drawing; the circle; said geometry; regular and irregular polygons; Loci of simple mechanisms; the ellipse; horizontal and vertical sections; auxiliary views; lamina; symbols and conventions, intersection; Loci; drawing and design.

Introduction to Extra skills

Woodwork for metal work students and vice-versa.

TEACHER TRAINING

Educational psychology, educational sociology; education system of Zambia; general principles of teaching; practical aspects of teaching; educational aids; teaching practice.

RELATED SUBJECTS

Mathematics; science; communication skills and safety procedures. These are taught throughout the whole course

Employment opportunities case.

Students will graduate with either wood work and technical drawing or metal work and technical drawing as teaching subjects. Successful graduates will be employed by the Ministry of Education to teach in secondary and Basic schools. The teachers are expected to enjoy the same conditions of service as other civil servants including pension on retirement.

Adapted from Eklof et al. Technical and Vocational Teachers' College, Luanshya Zambia (1983)

APPENDIX 6C

REVISED SYLLABII, APRIL, 2001

TECHNICAL AND VOCATIONAL TEACHERS COLLEGE (TVTC)
LUANSHYA - ZAMBIA

INDUSTRIAL ARTS DEPARTMENT

The Industrial Arts Panel reviewed the following subjects:-

- Wood work Technology - Pre service
- Metal work Technology - Pre service
- Geometrical and Mechanical Drawing - Pre service

Subjects recommended for inclusion were:-

- Entrepreneurship
- Workshop Management
- Management of industrial arts departments
- Electricity and Maintenance of equipment

*Advanced University of Zambia Industrial Arts Diploma was recommended to be introduced.

Adapted from the Report on the review of the TVTC Teacher Training Curriculum 2001

APPENDIX 7

Letter of Authority

THE UNIVERSITY OF ZAMBIA
SCHOOL OF EDUCATION

Telephone: 291384
Telegrams: UNZA LUSAKA
Telex: UNZALU ZA 44370
Fax: + 260-1-253952

P O BOX 32379
Lusaka, Zambia

Your Ref:

Our Ref:

16th November, 2000

REPUBLIC OF ZAMBIA
MINISTRY OF EDUCATION
22 NOV 2000
PROVINCIAL EDUCATION OFFICER
LUSAKA REGION
P/B RW 21 E LUSAKA

permission granted

The Provincial Education Officer
Ministry of Education
Provincial Headquarters
P/B RW 21E
LUSAKA

Dear Sir/Madam

PERMISSION TO CONDUCT RESEARCH IN LUSAKA REGION: MR. ATHANASIUS MULENGA - MED STUDENT

I wish to certify that Mr. Mulenga is a registered postgraduate student at the University of Zambia pursuing a degree of Master of Education in Educational Administration.

He will proceed to conduct a research around Lusaka Province. He is expected to visit the following places: Chongwe Secondary School, Kafue Secondary School, Naboye Secondary School, David Kaunda Secondary School, Libala, Kamwala, Kabulonga Boys, Munali Senior and Matero Boys' Secondary Schools.

I would be grateful if at all your office gave him ultimate cooperation for him to achieve his goals.

Thank you in anticipation.

Yours sincerely

Henry J. Msango
HEAD - EDU. ADMIN. & POLICY STUDIES DEPT.

cc Officer Commanding

Lusaka Provincial
Police Command