

UNIVERSITY OF FORT HARE

**THE INSTRUCTIONAL ROLES OF SCIENCE HEAD
OF DEPARTMENTS AND THE LEARNING OUTCOME
OF "O" LEVEL STUDENTS IN ZIMBABWE.**

BY

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DEDICATION

This study is especially dedicated to my wife Nyevero, who is a constant source of strength to my life. This thesis is particularly a source of brainwave to my sons, Tirivamwe, Takura and Tichaona.

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DECLARATION

I declare that *The instructional roles of science head of departments and the learning outcome of "O" level students in Zimbabwe* is the author's original work and has never been submitted by the author or any one else at any university for any degree. All the sources that have been quoted have been indicated and acknowledged by means of complete references.

Francis Chagonda

Signature

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ACRONYMS

HOD	Head of Department
KRA	Key Result Area
"O" Level	Ordinary level
SMART	Specific Measurable Achievable Focused on Results and Time Framed
CDU	Curriculum Depth Unit
SDC	School Development Committee
ZJC	Zimbabwe Junior Certificate
EO	Education Officer
SEd	Science Educator
SFGP	Science Focus Group
SP	School Principal
TTA	Teacher Training Agency
CE	Certificate in Education
Dip Ed	Diploma in Education
B Ed	Bachelor of Education
BSc	Bachelor of Science
M Ed	Master of Education
M Sc	Master of Science

KEY WORDS

Instructional roles

Curriculum innovation

Decision-making

Educator empowerment

Performance appraisal

The Learning process

Professional-development

Educator Involvement

Administration

Learners' performance

ABSTRACT

The science heads of departments in secondary schools in Zimbabwe are underutilized and as such their instructional roles are abandoned and neglected. Since they are very close to the learners, this spills over to poor learning outcomes. Therefore, they must be empowered in key administrative matters and get the necessary administrative support to enhance learning outcomes at "O" level.

A sample of science heads of department, school principals, science educators and science focus groups were surveyed to assess their perceptions of how they influence and impact on learners' performance in sciences. The study focused on 8 secondary schools in Kadoma District in Zimbabwe. This sample illuminated how the instructional roles of science head of departments and the learning outcome of "O" level students in Zimbabwe is perceived.

The study employed the qualitative approach in order to get an understanding of how informants interpret what goes on at the schools particularly in the science department. Data was analysed using content analysis. What emerged from literature reviewed, informants' responses and the researchers' orientation and values are the following themes: HOD participation in development of science syllabi, instructional roles of science HODs, motivation

of learners in science, assessment of educators and learners' progress, significance of staff development and constraints faced by science HODs.

The picture elicited by the study is that science HODs' participation in decision-making in secondary schools is minimal. In addition, learning outcomes at "O" level are poor because learners are not well motivated. Further, HODs are overloaded with instructional and management responsibility and as such fail to cope with teaching and learning and above all supervision of subordinates. In view of this, assessment of both educators and learners is not done effectively.

The study concluded by suggesting the following areas of further research:

- A critical analysis of educators' job satisfaction in the context of learners' progress in science.
- Managing the implementation of curricular innovation in science departments in secondary schools.

CHAPTER 1

SCIENCE HEAD OF DEPARTMENTS AND STUDENTS' ACHIEVEMENT

1.1 Introduction and background to the research problem.

In the Republic of Zimbabwe, the Ministry of Education, Sport and Culture operates under the guidelines promulgated in her Client Charter's Mission Statement, which aims to:

- provide high quality and relevant primary and secondary education to all children and individuals requiring non-formal education,
- formulate, review policies and coordinate programmes,
- provide institutions and facilities that promote and preserve national identity and cultural heritage, and
- facilitate access to participation in sports, recreation and culture in order to enrich the lives of all the people of Zimbabwe

(Government of Zimbabwe: Ministry of Education, Sport and Culture Client Charter 1996:2).

In the quest to provide high quality education, the Ministry of Education, Sport and Culture in Zimbabwe pegged benchmarks which are used as checks and balances for the success of the learners. The standards which are used to establish whether a school has a positive effect upon its learners' educational outcomes in Zimbabwe are marked at Grade 7, Form 2, Form 4 and Form 6. And hence, failure to assist learners to meet state mandated standards at Ordinary level ("O" level) implies that schools would be clearly performing a disservice to the customers (Schargel 1994:12 as in Steyn and van Niekerk (2002:17). Therefore, it follows that research studies have identified the subject department as an important influence on both students' learning and teaching practice. However, little attention has been devoted to the work of the heads of departments (HODs) (O'Neill 2003:3). In

addition, the leadership role of the HODs has received little attention (Dinham & Green 2001:46) as evidenced by sparsity of literature related to this study.

What emerges from the above is that HODs are not free to do things for themselves because school principals do not want to get out of their way. Effectively, what school principals manage to do is to plant impediments (for example absence of support services, relevant materials, inadequate personal training programmes, lack of funding to the science department) to the HODs' self actualization. Given that HODs are experts in their fields of study, with the necessary resources available, they can take initiative and produce the best learning outcomes.

There are many facets to Science HODs' leadership responsibilities, encompassing routine administration, curriculum leadership, moral leadership, supervision and evaluation. Furthermore, HODs are facing a complex task complicated further by the wide variety of developments in science and technology the world over. For instance, teaching and supervision of science subjects has traditionally been problematic for HODs and school principals, given that many secondary schools in Zimbabwe cannot afford to purchase the necessary laboratory equipment for experiments to be carried out.

The challenge principals and HODs face is to find ways and means of encouraging learners to carry out experiments in laboratories in order to foster developments in

science and technology. The culture of the hands-on experience for candidates goes a long way in motivating the learners and the subsequent improvement in their results at "O" level.

It is against this background that there is heightened expectation by recent research efforts that Heads of Departments contribute or "add value" most to student learning outcomes (Dinham & Green 2001:49, Ferrucci & Carter 2004:2). The studies in science have witnessed the continued examination of educational practices for opportunities of improvement. They have demonstrated that substantial learning gains are possible when the instructional roles of science HODs are articulated. Busher & Harris *et al* (2000: v) as in Dinham & Green (2001:45) contend that:

"subject leadership", "curriculum leadership" and even "moral leadership" rather than administration and "people management" have increasingly been recognized as central in bringing about educational change to meet the needs of the students

In the study of teaching in Sub Saharan Africa, the World Bank singled out outcomes as one of its six priorities for quality education (Oxtoby 1996:104 as cited in Jansen 2001:305). This view is echoed in the following statement:

Without a sense of alignment behind a purpose we drift aimlessly. It cannot be any old purpose either. It must be one that galvanizes, energizes and enthrall people. (Bennis & Goldsmith 1997: xiv in Field *et al* 2000:86).

In essence, high learning outcomes can be achieved if the organizational context of secondary schools explicitly interacts with subject matter, which is reified distinctively through the existence of subject-based departments. On this account, the subject departments set the pace for learners' achievement through the programmes they design in line with requirements of the national curriculum. Therefore, the key role of the subject leader is to question continually, redefine and communicate the purpose of the subject area.

It follows from the above that in educational circles, the benchmarks of national interests are measured in learners' achievement. As an example, in Zimbabwe, the national pass rate at "O" level in public examinations is often between 20% and 25%, (number of candidates with 5 passes or better) (Nziramanga 1999:305). Similarly, in South Africa, in the Western Cape Province in 1999, the Grade 12 learners had a pass rate of 52,1% (Riekert 2000 as in Logotlo and van der Westhuizen 1996:113).

As a result of the poor performance, the stakeholders are seriously concerned with the learners' poor results that suggest a significant wastage of resources. Coined with the learners' poor outcomes is the concomitant emphasis upon the monitorial role of the chief executive given the principals' less time to perform the role of leading professionals (Pollard *et al* 1994 as in Alma 2000:3). As a matter of fact, this study witnessed a pendulum swing towards examination of the instructional roles of science HODs and the learning outcome of "O" level students with specific

reference to the geographically-based Kadoma District urban secondary schools cluster in Zimbabwe.

Studies on the instructional roles of the HODs are presently at the centre stage in educational circles. As an example, White (2004:3) points out that this was so due to mounting political and social pressure on school accountability and standards regarding student-learning outcomes. The need for provision of good learning outcomes triggered the publication of league tables of school examination results in the United Kingdom (UK) and Australia (Boyle 1998 as in White 2004:3). In this view, the work of Harris *et al* (1995) and Sammons, Thomas and Mortimore (1997) are recent examples of studies that have considered the involvement of the subject department level in secondary school effectiveness studies.

This study follows from the dualism that the instructional roles of science HODs have been neglected and that student-learning outcomes at "O" level are poor. Stakeholders (who include parents, subject teachers, subject leaders, school principals, Ministry of Education, Sport and Culture, Ministry of Higher Education and prospective employers) are concerned with this drop in percentage pass rates measured by what learners achieve on completion of a course (Melton 1996:420 cited by Kotze 2003:32, Krathwohl 2000:4). In support of the above, Killen (1996:2) maintains that learners' outcomes "...warranted accountability in education since it rested on the notion that if education is achieving its outcomes, all is well". The

clientele perceive the learners' low outcomes at "O" level as a digression from the state mandated expectations.

In respect of the crucial role played by HODs as middle managers, studies of the HODs as middle managers date from the mid -1980s and emphasize that they are a driving force in secondary schools and are:

pre-occupied with routine administration and crisis management, having little time for strategic thinking, reluctant to monitor the teaching of their colleagues, experiencing considerable differences in the ways departments operate within a school and from school to school and that the department is the crucial "working unit" in the school, and the school performance and departmental performance are not extricably linked, and yet the key indicator of effective departments is their ability to professionally organize teaching, and time is a key constraint for HODs in carrying out their management and leading roles

(Conners 1999:27 as cited by Dinham & Green 2001:46).

Conners, above acknowledges that HODs are overloaded with a lot of responsibility yet they are not in the limelight. He suggests that HODs should be given adequate attention and time in order to effectively carry out their job specifications. Given this platform, what will appear are desirable learning outcomes at "O" level. Therefore, the current study will focus on the instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe. It will focus on Kadoma urban secondary schools in Zimbabwe. These schools have high learner populations and therefore constitute well-established secondary organizational structures.

In view of the fact that teaching makes excessive demands on the educators, research supports a link between:

Participation in Decision-making and commitment	Prawat (1993:177), Angus (1993:30-31) Jenkins (1996:19),
Motivation	A Campo (1993:122),
Job satisfaction	Duke <i>et al</i> (1981:25) Owen (1997:284-285) and
Participatory democracy	Leithwood (1996:93).

as in Jansen (1999:2).

The above observations allow classroom practitioners to take part in activities that centre in the region of teaching and learning. The educators experience ownership of the whole process of teaching and learning if they take part in crucial matters that affect the teaching profession. If they are involved, a sense of self motivation is enhanced and therefore they enjoy being at the work place. In the final analysis, the educators would have greater decision-making power as they feel that they are empowered. And this may also translate into educators having to demonstrate greater efficiency, effectiveness and improved learning outcomes at "O" level. Jansen (1999:240) goes further to emphasise that "the best way of finding what the people think of something is to ask them". In respect of this study, HODs would volunteer information on teaching and learning so that learners' educational outcomes would be satisfactory.

1.2 Statement of the problem

The instructional roles of the science HODs have suffered from a long period of abandonment and neglect. Indeed, there is a dearth in literature relating the same (Turner 1996; Blandford 1997, McClendon and Crowther, 1998 as cited in Fitzgerald 2004:3). It is acknowledged that most school-effectiveness research studies have been large-scale and directed at the level of the whole school (White 2004:11, Dinham and Green 2001, Harris *et al* 1995 and Sammons, Thomas and Mortimore 1997). In a sense, this is odd because these studies stress the importance of an emphasis on teaching and learning in the school, yet it is the departmental rather than whole school management which is closest to this core function (Harris *et al* 1995:297). Adey (2000:429) concurs with the above by pointing out that while HODs increasingly accept responsibility and accountability for quality teaching and learning, they feel ill-equipped to carry out these roles and see themselves essentially as line managers responsible for ensuring that whole school policies and practices are translated into action at departmental level.

It is acknowledged that secondary schools have made tremendous strides in the provision of quality education in Zimbabwe. But, continuing failure at "O" level and neglect of HODs in school management undermine these gains, a crisis which can threaten the achievement of the good intended outcomes. Brown & Rutherford (1998) as cited in Dinham & Green (2001:5) argue that we do not yet understand the complexity of the HOD's role and that initiatives need to be taken and obstacles overcome in order to facilitate and improve teaching and learning in

secondary departments. The little attention given to HODs in administrative matters spills over to poor learning outcomes at "O" level. Given that the average percentage pass rate at "O" level in Zimbabwe is 20% to 25%, it then becomes a cause of concern to stakeholders (Nziramasanga 1999:303). In the face of this dualism of HODs' neglect and poor learning outcomes at "O" level in Zimbabwe, there is a definite need for recognition and empowerment of HODs for a realization of improved learners' achievement in schools.

The effective management of the school's instructional programme is one of the key school management aspects that can create favourable conditions in the school and promote a sound culture of learning and teaching ensuring school effectiveness (Kruger 2003:29). In Zimbabwe, for instance, in 2003, some schools did not produce a single candidate with 5 "O" level passes (Ncube 2003:5). This unpleasant trend in national examinations was an issue raised by Professor Makhurane in his speech at Chinhoyi Technical Teachers' College on 19 August 1996 when he pointed out that stakeholders are perturbed due to uncontrolled poor percentage pass rates at "O" level. Those who fail the examinations resort to using the certificates from the junior grades but, these do not foster economic development at all. He maintains that the education system lacks something because for those candidates who sat for the 1995 "O" level examinations, 27000 out of 117 000 managed to get five subjects or more at grade C or better. Furthermore,

... Some 90 000 failed to obtain a full certificate Thus, while we boast of having done very well in the provision of education since independence, the largest single portion of our annual budget (Z\$4 billion) this financial year has gone to education, we have to

admit that we have not done too well in ensuring that the money is ultimately put to maximum use as demonstrated by success of our children in the schools. As a matter of fact, a large number of schools run by the Rural District Councils have invariably come out with a zero pass rate. Clearly something is wrong somewhere with our teaching (Makhurane as in Siyakwazi & Siyakwazi 1999: v)

The low pass rate is most evident in rural day and high-density suburb secondary schools. This revolves around the growing realization (by educators) that tighter controls and supervision have run their course in their ability to give productivity gains.

Notwithstanding the failure by the schools to improve the learning outcomes, the government is making frantic efforts to upgrade some of the secondary schools to high schools. This results in increases of the workloads of teachers who are in most cases highly demoralized and work under hostile conditions due to dwindling economic situations coupled by administrative deprivation (Herald Reporter 2004:7).

In the same vein as the above, Steyn (2000:267) states that most HODs perform at low levels despite their possession of more talent or intelligence and creativity than their present jobs require or even allow. On the same note, Steyn (2000:267) stresses the significance of recognizing the instructional roles of the HODs by pointing out that "... it is often assumed that people who are familiar with their work are in a better position to be creative to do more with less".

In order to clearly explore the instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe, it is important to define the term HOD. Kemp and Nathan (1989:77) as in Fitzgerald (2004:3) demonstrate the ambiguity of the term HOD, by stating that there is no simple definition of subject head in secondary schools. The operational definition is to say that the HODs are those people whose role places them between the senior management team and those colleagues whose job description does not extend beyond the normal teaching and learning functions.

Further, whilst there has been a great deal of concentration on effective schools and effective leadership usually as manifested by the school principal, researchers and policy makers have been slow to focus on individual departments within schools and to question the overall effectiveness of this form of school organisation (Dinham & Green 2001:12).

Given this lack of identity in administrative procedures in educational literature and students' poor outcomes, time would appear ripe for further investigation into the instructional roles of science HODs in secondary schools in Zimbabwe. This then brings our attention to the main research problem of this study which can be stated as the following question: ***To what extent are science head of departments involved in the instructional roles and the learning outcomes of "O" level students in Zimbabwe?***

1.3 Research questions

Some of the critical research questions that will assist to address this research problem are as follows:

- Why are the instructional roles of science HODs abandoned and neglected?
- In what way does a science HOD monitor and evaluate subject teachers' planning and assess learners' work and progress?
- How does a science HOD inspire and enthuse subject teachers and support their professional development and training?

1.4 Purpose of the study

Stakeholders are concerned with learners' poor performance at "O" level. This concern reflects back on science HODs who are the "foot soldiers" of the Ministry of Education, Sport and Culture. They are charged with the responsibility of implementing policies, discharging this service judiciously and efficiently (Zimbabwe Education Act 1996:04). In addition, they are in touch with the work and they possess the expertise. In this study, effort will be made to explore the instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe. The study seeks to solicit information from science HODs about their perceptions on how they influence learners' performance at "O" level. On the whole, the research will pursue the following objectives that are to:

- explore science HODs' instructional roles on learning outcome of "O" level students in Zimbabwe

- examine areas of role conflict between science HODs and school principals and the learning outcome of “O” level students in Zimbabwe and
- explore science HODs’ professional development provision and the learning outcome of “O” level students in Zimbabwe.

1.5 Assumptions of the study

In trying to explore the instructional roles of science HODs and the learning outcome of “O” level students in Zimbabwe, the following factors can strengthen the findings:

- Overlooking the instructional roles of HODs can have a negative impact on learners’ achievements
- Recognition of the significant instructional roles of science subject leaders can have a positive effect on learning outcomes at “O” level
- The empowerment of science subject leaders can be directly linked to students’ improved learning outcomes
- The Ministry of Education, Sport and Culture in Zimbabwe will cooperate by granting the researcher permission to have access to the secondary schools where the informants are providing services
- School authorities, particularly the subject heads and subject teachers will assist by availing the necessary documents and responding to both the questionnaires and interviews

1.6 Delimitations of the research

Parameters are necessary with regard to the various ways in which science HODs perceive their own preparation for the task of managing and leading the departments. This study will focus on Kadoma District urban secondary schools cluster in Zimbabwe. The study is specifically interested in investigating eight secondary schools. Semi-structured interviews will be administered to one Education Officer (EO), eight school principals and eight science HODs. In addition, focus group interviews will be administered to eight focus groups of "O" level learners distributed across the cluster.

The interviews will be targeting the instructional leadership roles of science subject leaders and the learning outcome of "O" level students in Zimbabwe. Furthermore, questionnaires seeking to justify the instructional roles and functions of science HODs will be administered to sixteen subject teachers (two from each of the eight secondary schools). Effort will be also made to examine science "O" level results from each one of the eight secondary schools from 1999 to 2003. In addition, learners' notes and test exercise books as well as educators' mark lists, lesson observation critiques, minutes for staff development sessions will be checked. These will act as a measure of both subject leaders' effectiveness and learners' performance.

1.7 Significance and justification of the study

Research generating knowledge on the instructional roles of science HODs is surfacing in the field of education (Gold 2000, Adey 2000, Dinham and Green 2001, Leithwood 2003, Fitzgerald 2004 and White 2004). However, it is strongly felt that more has to be done in this field. In particular, more emphasis has to be exerted on studies that hinge around demonstrating the effectiveness of science HODs in order that they successfully lead their departments as their leadership potential has a direct bearing on learners' performance. It is hoped that the study will unearth fundamental issues around the students' learning outcomes as they relate to the performance of science HODs (refer to 1.1 introduction and background to the research problem).

The participation of science HODs in making decisions at educational institutions could have implications, for example, refining policies about the central role the subject leaders play in school management and their impact on learners' achievement. The study can reveal the obstacles that impede the learners' achievements. In essence, the results of this study may witness development of policies that involve HODs in school management and increase their accountability on matters of the core business (teaching and learning). The study seeks to establish ways and means of strategically engaging the science HODs as the "hub" of the department.

If this study establishes the relationship between the instructional roles of subject leaders and learners' achievements in Kadoma District, then that can act as the rudder in exploring professional development provision for decision-making. As a follow-up measure to the results of this study, subsequent management training needs of science HODs can be identified in as much as they impact on learning outcomes at "O" level. Essentially, a deeper understanding of the roles of subject leaders in school management and their effect on learners' performance at "O" level will be of vital importance for stakeholders particularly where state mandated outcomes are concerned.

Schwille (1993:698) asserts that "... the productivity view of effectiveness sees output of the organization's primary process as the criterion to judge goal attainment and emphasize the search for organizational characteristics that maximize output." The emphasis on this account is stressed on the institutional arrangements, which foster the attainment of outcomes emanating from concerted efforts from all and sundry. What triggered this study are the poor learning outcomes in science at "O" level in Zimbabwe particularly in the Kadoma District urban secondary schools cluster (Nziramasa 1999:3-20). In addition to the Nziramasa commission of inquiry into education and training, which established that the percentage pass rate of learners at "O" level is between 20% and 25%, the following table illustrates the low percentage pass rate for the schools surveyed from 1999 to 2003.

Table 1.1 "O" level science % pass rate from 1999 to 2003

School Year and % Pass Rate

	1999	2000	2001	2002	2003	Average
A	28	37.6	26.8	30	29.8	31
B	25	33.3	11	17.1	29.2	23
C	47.6	23.2	31	22.8	51.7	35
D	25.5	11	28.5	20.5	13.5	20
E	16.4	21	19.8	28.7	13.4	19.9
F	22	27.1	35.5	35.5	39	29
G	70	68	53	53	62	64

1.8 Limitations of the study

In any research work, the researcher is bound to be drawn back by possible constraints that centre on availability of time, traveling expenses, effectiveness of research instruments and accessing the latest documents on the topic in question amongst other things. In this study, the limitations include the following:

- traveling expenses to the selected schools for interviews with science EO, school principals, science HODs, focus group interviews for learners ;
- postal expenses for questionnaires for subject teachers;
- limited time due to intensive and time-consuming nature of qualitative data collection;
- low response rates on questionnaires, and
- costs incurred in stationery, typing, printing and binding of the thesis.

Notwithstanding the above, the researcher will make effort to reduce limitations by minimizing threats of validity and reliability. According to Leedy (1993:40) validity is concerned with "soundness, the effectiveness of measuring instrument". Similarly, Wolcott (1995:169) maintains that validity entails "the extent to which accurate events are captured". It seeks to establish whether the questionnaires, semi-structured interviews and documents sought to contain the questions and information that appropriately addresses the researcher's problem. It suggests that there must be a clear picture on the link between articulation of the roles of science HODs and learning outcomes at "O" level.

On the other hand, "a measuring instrument is reliable if it yields the same result in repeated applications to the same phenomena" (De Vos 1998:85 as in Van der Westhuizen 2003:90). Verification of reliability and validity will be done by doing a pilot study using respondents similar to those in the actual study, to determine matters such as whether the instruments were clear, whether the task could be performed within the given time constraints and whether a workable, sensitive and reliable scoring procedure had been developed (Heinman 2001:89-90 as in Van der Westhuizen 2003:90). Rehearsals will be done with the tape recorder to determine the time spend with one interviewee and the number of audio-cassettes to be used in the study.

1.9 Definition of terms

1.9.1 Head of department

An HOD refers to an experienced expert in a specific subject area, that is, one who has demonstrated competence in the same discipline. The same professional person can be referred to as the subject head, middle manager or subject advisor or consultant. In this study, a Head of Department is a subject leader who acts strategically in that he/she works systematically over a period of time to achieve long term goals that are shared with all subject staff and are congruent with the overall aim of the school.

1.9.2 Management

Management is the process by which persons in charge "... attempt to use human and other resources as efficiently as possible, in order to ... achieve objectives" (Marx *et al* 1993:54). In addition, Okumbe (1998:2) states that management is the process of designing, developing, and effecting organisational objectives and resources so as to achieve the predetermined organisational goals.

In this study, educational management means the process whereby the HODs are accountable for using the available instructional resources in order to successfully achieve the state mandated goals at their respective schools.

1.9.3 Staff development

This is the initiation of in-service programmes, coordination with other personnel, communication of opportunities for staff development, research in curriculum and long-range programme objectives (Madrazo & Hounshell 1997:9). In this research, staff development means the process of on-the-job training of members of the departments as a team or individually where they augment their knowledge and skills in those curriculum matters that enhance learners' achievements.

1.9.4 Assessment

This is the analysis of test results, maintenance of data on learners' achievements, examination of teaching objectives based on test results and assistance to teachers in self-evaluation. It also includes assignment transfer, load assistance in assignment, equalization of teaching load, resolution of conflict and selection of staff (Madrazo & Hounshell 1997:7). In this study, assessment means careful examination of all the activities that take place at a school, paying particular attention to the key result areas that have to do with motivation, resource provision, demonstration of the skills of the trade (teaching and learning) and thorough supervision.

1.9.5 Decision-making

This refers to any action of taking decisions, through which an organisation is regulated, governed and managed (Mosoge & Van der Westhuizen 1997:196). In

this study, decision-making means full participation by the school subject teams in crucial matters that are pivotal to the development of the school.

1.9.6 Empowerment

Empowerment is the sharing of responsibilities in decision-making, which allows team members at the lowest level in the school management hierarchy to make decisions to improve performance (Johnson, 1993:188 as in Jansen 2001:118). Furthermore, empowerment entails the fundamental transfer of authority and responsibility that include the following: the process by which people are allowed to make decisions regarding assigned tasks, people involvement in the creation of ways to maintain a productive and satisfying work environment and their involvement in the daily problem-solving and decision-making (Herman & Herman 1993:203 and Williams 1994:57 as in Jansen 2001:118). In this study, empowerment means extending authority and responsibility to departments so that there is total involvement of all the central members of the teaching staff in the delivery of quality education in secondary schools.

1.9.7 Conclusion

The pertinent issue in this chapter has been to put to perspective the research problem. The background has been given and the research problem defined. The critical research questions and objectives have been formulated. The target populations have been identified. What the study hopes to achieve has been spelt out and constraints as well as the parameters delineated. The terms that could

pose problems to the reader have been defined according to the context in which they are used. In the next chapter, literature available on the instructional roles of science HODs and their impact on learners' achievement is reviewed.

1.10 Outline of the study

As this study unfolds, the following sequence of chapters will be followed:

Chapter 2:

This concerns itself with an overview of literature on instructional leadership and how it affects learners' performance at "O" level. First, the lens which guides the research will be highlighted then its justification provided. The salient aspects included are the definition of educational leadership, its purpose, middle managers as professionals, teacher autonomy, and most importantly why targeting HODs and learning outcomes at "O" level?

Chapter 3:

Research design discusses the research instruments. Added to this are ethical considerations as well as examination of concepts: triangulation, data analysis, validity and reliability.

Chapter 4:

Research realities and raw data shall be presented, discussed and analysed here. This shall take the form of themes or concepts or patterns that emerge from the researcher's values, literature reviewed, interviews, questionnaires and documentary analysis.

Chapter 5:

This rundowns the research findings and maps out possible future research tasks.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The focus of this chapter is to survey literature that examines the instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe. This will be done by scrutinizing literature from the Internet, textbooks, journals, articles as well as published and unpublished theses.

2.2 Educational management models explaining human interaction

The salient aspects which triggered this study are poor performance by learners and the possible abandonment and neglect of the instructional roles of the science HODs. Because these aspects revolve around the more complex nature of human behaviour, theories which appropriately explain human interactions will be identified to inform this study. Research has established that the explicit and systematic use of theory as a guide to practice is untenable (Bush 2004:22). In addition, "... the application of theories by practicing administrators (is) a difficult and problematic undertaking. Indeed, it is clear that theories are simply not used very much in the realm of practice" (Willower 1980:2 as in Bush 2004:22). In essence:

... there can be little genuine theory in educational administration. It is an applied field ultimately dependent on human will acting within a social context... so, it is unproductive to look for a set of theories ... by which educational administrators may guide administrative behaviour

(Holmes & Wynne 1989:1-2 as in Bush 2004:22).

The above comments suggest that there is a rift between theory and practice in educational leadership and management. In view of this,

the theory-practice gap stands as a Gordian knot of educational administration. Rather than be cut, it has become a permanent fixture of the landscape because it is embedded in the way we construct theories for use ... The theory gap will be removed when we construct different and better theories that predict the effects of practice (English 2002:1 & 3 as in Bush 2004:23).

Individual school principals and HODs together with the schools from which they operate are different and in view of this, educational management employs different perspectives to explain the multiplicity of behaviours exposed at the school communities. In order to cater for the individual differences cutting across the stakeholders, theories which address the uniqueness of human beings will be employed to inform this study. In a school setup, each individual's contribution is important in the overall running of the secondary department.

And hence, it befits at this juncture to say our understanding of knowledge utilization processes is conceived not so much as a set of facts, findings, or generalizations but rather as distinct perspectives which combine facts, values and presuppositions into a complex screen through which knowledge utilization is seen ... through a particular screen one sees certain events, but one may see different scenes through a different screen

(House 1981:17 as in Bush 2004:25).

In this study, the use of the subjective and political models of educational management as outlined by Tony Bush (2004) will be incorporated to offer explanations of human interactions in their natural settings. This brings us to the issue of "conceptual pluralism: a jangling discord of multiple voices" (Bolman and Deal 1997:372 as in Bush 2004:25). The school community experiences

constraints which call for the school leadership to identify the problems that relate to poor learning outcomes and then find workable solutions to address the problems. In the light of this, Griffiths (1997:372) as in Bush (2004:26) claims that:

... the basic idea is that all problems cannot be studied fruitfully using a single theory. Some problems are large and complex and no single theory is capable of encompassing them, while others, although seemingly simple and straightforward, can be understood through use of multiple theories ... particular theories are appropriate to certain problems, but not others...

School administration is aimed at coordinating the efforts of learners, parents and teaching staff towards improvement of teaching and learning (Ozigi 1983:1). This is so because student learning is the "raison d'être" for the existence of schools, and a commitment to this is the prime focus of schools and education systems (White 2004:2). These efforts are realized through the organisational context of high schools that "...explicitly interacts with subject matter, where most secondary schools reify subject-matter distinctions through the existence of subject-based departments" (Grossman & Stodolsky 1995:6 as in Dinham & Green 2001:50).

The subject department constitutes a central feature of the structure of authority and influence in high schools - a structure in which teachers' claims to resources, their justifications of classroom practice, and their assertions of autonomy are closely linked to subject specialisations (Warren 1995:50). Subject specialisation is at the core of this study since the pride of the teaching professionalism lies in the hands of the educators and hence "... we are what we repeatedly do. Excellence, then, is not an act but a habit" (Aristotle as cited in Covey 1992:46).

Hirst (1974) and Green (1983) as in Field *et al* (2000:87) explain that differential bodies of knowledge contribute essential things that we need to know, and develop specific and often unique skills that enable us to become better thinkers and doers. Knowledge gives us confidence and raises self-esteem. In this context, the subject-based departments need to be better understood as a significant aspect of the "multiple embedded contexts of the secondary school work place" (McLaughlin & Talbert 1990:4, Gutierrez, 1998:75 as in Dinham & Green 2001:50). In addition, the instructional roles of science HODs need to be understood from the feelings, emotions, experiences, and values of the informants.

2.3 Conceptual framework

This study will be addressed in the light of the post-positivist lens, where reality is a social construction, in that humans or subjects create meaning and intelligibility through the mutual construction of symbols, languages, identities, practices and social structures (Peterson and Runyan 1999:73). In other words, the physical world has no social meaning independent of that imposed by human thought and actions. The respondents, in this case shall define practically what obtains in science departments through interviews and questionnaires. The process of HOD-educator-principal engagement will be discussed to verify its links with learner achievement at "O" level.

2.3.1 Subjective models of educational management

As was highlighted above, subjective models of educational management according to Bush (2004:95) emanated from the desire to establish fitting explanations on human interaction. In this light, disagreements in the degree of fit between management theory and practice gave an impetus to the emergence of both the political and subjective models of educational management. To begin with, the subjective perspectives suggest that each person has a subjective and selective perception of the institution. Each one of the various participants in the institutions has a different meaning for the events and situations. Institutions are reflected as complex units, which reflect the numerous meanings and perceptions of all the people within them. Institutions are social constructions in the sense that they emerge from the interaction of their participants. Subjective models thus posit that

... organisations are the creation of people within them. Participants are thought to interpret situations in different situations in different ways and these individual perceptions are derived from their background and values. Organizations have different meanings for each of their members and exist only in the experience of those members (Bush 1995: 93).

Helms (1999:198) as in Bush (2003:113) add that "subjective theories presuppose that human beings are autonomous and reflective beings, actively constructing the

world around them". The social world consists of people interacting with each other, negotiating patterns of relationships and constructing a view of the world. This study is interested in the secondary departments and what obtains in them. More attention will be given to the instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe. Thus, school principals, educators and learners will contribute information to inform this study. Furthermore, Evers & Lakomski (1999:97) as in Bush (2003:114) argue that "no adequate understanding of organisations seems possible without some appeal to human subjectivity, to the interpretations people place on their actions and those of others".

In this regard, interpretations cluster into patterns because members of science departments share meanings that emerge from the subject expertise. The expertise emanate from exposure to the hands-on experiences during the course of training at both the formal schools as well as the teacher education institutions during pre-service programmes through to university education.

The science educators would be teaching concepts they are familiar with and thus confidently demonstrating that they are knowledgeable in that field. In this respect, "the drive to see organisations as a single kind of entity with a life of its own apart from the perceptions and beliefs of those involved in it blinds us to its complexity and the variety of organisations people create around themselves" (Greenfield 1973:571 as in Bush 2003:114). In addition, subjective models emphasize the beliefs and perceptions of individual members of institutions. Accordingly, the

subjective models “focus on the individual and emphasize individual perspectives” (Hermes 1999:198 as in Bush 2003:114). At department level, different values and aspirations of individual educators, support staff and learners is considered important. Participants experience the institution from different standpoints and interpret events and situations according to their own background and motivations (Bush 2003:115).

It is against this background that the administrative structure of a department derives benefit from such kind of arrangements. In addition, the structure accommodates every member in the department to contribute meaningfully as a member of a winning team. It is in the same vein that “the school is not the same reality for all teachers. Each teacher brings a perspective to the school and to his place within it, which is to some extent unique” (Ribbins *et al* 1981:117 as in Bush 2003:115). For this reason, every educator will be accountable for the learning outcomes at “O” level and hence the need to elicit their desires, values and feelings about the instructional roles of science HODs and the learning outcome of “O” level students in Zimbabwe.

The concerns of the subjective models are the meanings placed on events by school principals, science HODs and educators within the education system. The focus is on the individual interpretation of the behaviour rather than the situations and actions themselves. The different meanings placed on situations by various participants are products of their values, background and experience. Strain

(1996:59) as in Bush (2003:116) argue that "choice ... is always a subjective affair" and identifies three sets of beliefs in examining the choice behaviour of individuals:

- beliefs about the world, how it works and should work,
- beliefs about the chooser's own situation, what is feasible and desirable in relation to a set of actions which seem to be available,
- beliefs about a range of desirable outcomes (Strain 1996 as in Bush 2003:116).

Subjective models treat structure as a product of human interaction rather than something which is fixed or predetermined:

Most managers appear to be of the opinion that structure in organisations is pre-existent that all organisations have a predetermined structure into which people must fit. This is not so. Structure is simply a description of what people do and how they relate, organisation structure is a grossly simplified description of jobs and relationships... A structure cannot be imposed on an organization; it can only derive from what people do... (Gray 1982:34 as in Bush 2003:117).

2.3.2 Political models of educational management

As with the subjective models, the political models emerged from the quest to provide explanations on how the stakeholders in educational settings construct meaning of what obtains in schools. They assume that in organisations, policy and decision-making emerge through the process of negotiation and bargaining (Bush 1995:73). Interest groups develop and form alliances in pursuit of particular policy objectives. Conflict is viewed as a natural phenomenon and power accrues to

dominant coalitions rather than being the preserve of formal leaders (Bush 2003:89). In the education system, political models are often described as "micropolitics" (Ball, 1987, Hoyle 1999 as cited in Bush 2003:89). Micropolitics is defined as

...the interaction and political ideologies of social systems of teacher, administrators, teachers and pupils within school buildings. These may be viewed as internal organizational subsystems. Micropolitical analysis is also concerned with external system issues as those arising in the interaction between professional and lay subsystems... (Mawhinney 1999:161 in Bush 2003:89).

In addition, schools operate under the guidelines promulgated by the department of education in consultation with all the stakeholders. This aspect of involvement in decisions which are inclined to long term plans are very critical at any effective secondary department. Similarly,

...when we look at the complex and dynamic processes that explode on the modern campus today, we see neither the rigid, formal aspects of bureaucracy nor the calm consensus-directed elements of an academic collegium. On the contrary... (interest groups) emerge... These groups articulate their interests in many different ways, bringing pressure on the decision-making process from any number of angles... Power and influence, once articulated, go through a complex process until policies are shaped, reshaped and forged out of the competing claims of the multiple groups... (Baldrige 1971:19-20 as in Bush 2003:19).

According to Bush (2003:91) there are five major features to the political model as indicated below:

1. they tend to focus on group activity than the institution as a whole;
2. they are concerned with interests and interest groups. In this respect, they consider the values, desires, expectations, theoretical, and social orientations of individuals as they relate to their behaviours."...we tend to think of interests in a spatial way, as areas of concern that we wish to

preserve or enlarge or as positions we wish to protect or achieve... the flow of politics is intimately connected with this way of positioning ourselves" (Morgan 1997:161 in Bush 2003:92);

3. political models stress the prevalence of conflict in organisations. Individuals in an organisation bring different ideas from their different backgrounds. These differences spill over to the proliferation of conflicting ideas as to how departmental heads manage their teams.

....It's a personality problem ... Conflict is regarded as an unfortunate state that in more favourable circumstances would disappear... (in practice) conflict will always be present in organisations... its source rests in some perceived or real divergence of interest... (Morgan 1997:167 in Bush 2003:93);

- 4 political models assume that the goals of organisations are unstable, ambiguous and contested. Individuals, interest groups and coalitions have their own purposes and act towards their achievement. Ideally, departments may function using a one way communication system in which decisions descend from the top to the bottom. Those who implement the decisions are not invited to voice their concerns but in this respect, the political frame advocates a situation whereby everyone who matters is taken on board to contribute towards the success of the institution. "...different individuals and groups have different objectives and resources, and each attempt to bargain with other members or coalitions to influence goals and decision-making process" (Bolman & Deal, 1991:190 as in Bush 2003:93).

- 5 decisions within political arenas emerge after a complex process of bargaining and negotiation. According to Bolman & Deal (1991:186) in

Bush (2003:94), "organisational goals and decisions emerge from ongoing processes of bargaining, negotiation, and jockeying for position among members of different coalitions".

This clearly illustrates that interest groups develop and form alliances in pursuit of particular policy objectives. Conflict is viewed as a natural phenomenon and power accrues with dominant coalitions rather than being the preserve of formal leaders. This model presupposes that the educators contribute to the design of the content they teach. When educators participate in the process of curriculum designing, it follows that the syllabus would be homegrown and subsequently easy to interpret and impart the knowledge and skills thereof. As a follow-up to the above, it is of interest to note that "when teachers have chosen their work settings, and have been active in designing their own school's programme, they will be more committed to implementing those programmes effectively" (Chubb and More 1990 as in Leithwood 2003:37).

2.3.3 Summary

What emerges from the two models is that all the stakeholders are supposed to make contributions towards the development of the school. The instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe will therefore be articulated. If the job specification of each and every player is outlined, then meaningful activities will be witnessed starting from the senior school

management team through to the learners. The educators and learners will develop a sense of ownership so that they are accountable for the learning outcomes at "O" level.

Therefore, aspects of both the subjective and political models will be used to inform this study. This becomes apparent from the nature of the organisational structure of the subject departments and the instructional roles that science HODs play. The science educators decide on the instructional strategies to employ in imparting knowledge and skills. They consult each other on the most appropriate techniques to use in teaching. As a matter of fact, they bargain on the budget of the department so that resources allocated to them enable them to function effectively. However, in this respect, their budgets may be dishonoured by the school management team.

For all intents and purposes, educators in the departments define what obtains in their department. The definition of the wide array of activities lined-up for the candidates depends mostly on the educators in the department and most importantly the kind of leadership in place. This study seeks to uncover how the sciences HODs are involved in decision-making at their schools. But, what does leadership entail?

2.4 Educational leadership

Leading is defined as how managers can direct and influence subordinates and encourage them to work willingly and perform essential tasks within the

organisation to set aims and objectives (Walters 1991:6). On the other hand, Palmer (2003: 76) puts it as the ability to get work done with and through others, while at the same time winning their confidence, respect, loyalty and willing cooperation. Another dimension of leadership that closely draws the participants nearer the problem so that whatever step is taken, all will be following is that:

...to lead is to take some responsibility for getting a group or organization from one place to another, from one state of being to another or one course of action to another... leading means having skill in assuming responsibility for getting a group to take some purposeful action

(Neagley *et al* 1969:13 as in Blanchard *et al* 1986:54)

In support of the above, educational managers should identify crucial goals that needs to be addressed so that the procedures that will be undertaken to provide solutions are known to all educators so that effective leadership takes place:

...after defining the vision and mission statement, the leader has to persuade others to come along with him. He must clearly show the obstacles that lie between here where he is and there where he is going can be overcome. An important consideration is that he must not move too fast and disappear beyond the valleys and hills. He must lead by being with the people...

(Makhurane cited by Gambanga 1997:7).

By deduction, educational leadership is a process whereby the leader demonstrates the following attributes: knowledge of human nature, subject knowledge, ability to communicate, solve problems, make decisions, take risks, listen and delegate in order to achieve the goals and objectives of the institution. On the same note, Lynden Gratton's study of several US and UK companies led her to confirm the need "to create and develop a vision of the future that is compelling and engaging, and provides a shared view of what could be possible and how this could be achieved" (Stoll 2005:11). Similarly, in the scriptures leadership is not different as is presented below:

Moses ... chose capable men from among the Israelites. He appointed them leaders of thousands, hundreds, fifties and tens. They served as judges for the people on a permanent basis, bringing the difficult cases to Moses but deciding the smaller disputes themselves.

(Good News Bible: Exodus chapter 18 verses 25 and 26).

Essentially, a leader has to make an assessment of the subordinates so that on delegation and subsequent execution of tasks, the decisions are made in a more rational and professional manner. "Leadership should draw its strength from solidarity, much more than from authority ... (and) ... operates from persuasion, cooperation and consensus, than by imposition" (Our Global Neighbourhood 1995:17). Furthermore, such leaders should be accountable for achieving results at the subject department level and have the authority to change the way work is carried out at the subject department, and - most importantly - should have the "passion for creating better results" (Senge 1999:16-17).

What emerges from the above observations is that leadership demands that the leader has a clear vision, and understands fully the mission of the organisation s/he leads. In addition, it is not enough for the leader alone to have such a vision, for its realization depends, to a large extent, on it being shared by all the people of the institution. In other words, leadership is about having vision and articulating, ordering priorities, getting others to go with you, constantly reviewing what you are doing and holding on to things you value. Echoing the same view, literature has it that "...giving a voice to all people is the foundation of an organisation that is willing to experiment and learn" (Heifetz and Laurie 1997:129).

In this context, this can be possible if the instructional roles of science HODs are not abandoned and neglected. Each and every educator has to go along with what

will have been agreed in departmental meetings. This enables the people involved to account for their behaviour especially when it comes to learners' performance and taking cognisance of the instructional roles of the HOD.

This study seeks to establish whether educational leadership is an essential aspect in the secondary school departments. Whilst literature revealed that the HODs invariably confuse their responsibilities, Worner & Brown (1993:43) in White (2004:9) maintain that HODs represent "an underutilized source of instructional leadership". They use experience to solve the day-to-day departmental problems. On the contrary, experience may not be the best teacher, since one can repeat similar mistakes over and over again. In support of this "... it is wishful thinking to assume that experience will teach leaders everything they need to know" (Copeland *et al*, 2002:75 as in Bush 2004:23). Perhaps, this study will establish whether poor performance at "O" level emanates from poor administrative focuses.

2.5 Purpose of educational leadership

Potgieter (1971:28) as cited in Blanchard *et al* (1986:187) posits that the purpose of educational leadership is "to order in the process of giving meaning to the feeling of the group, identify and achieve common goals in a meaningful way". In addition, Bester (1970:14) as in Blanchard *et al* (1986:187) adds that "it is to influence and inspire, guide and equip followers for fulfillment of their calling according to his basic religious motive". This addresses this research's third

question that concerns itself with how science HODs improve and enthuse subject teachers and support their professional development and training.

Drawing from the above, the purpose of educational leadership lies in the ability of the HOD to plan strategically the best way to employ both the human and material resources at his or her disposal to ensure the achievement of set goals. The objectives set become key values for which people are unified. Failure to take cognisance of the human element in order to combine it with institutional goals, the HOD may not produce good results at the end of the year. Therefore, the central mission of leadership, in the quest for leadership articulated, is to create conditions for equality, freedom, justice and security for all that they lead. Learning outcomes at "O" level thus depend heavily on aspects of teaching and learning, and these are subjects of discussion that follows.

This research looks forward to ascertain whether the science HODs fail to order (in the process of giving meaning to the feeling of the group), identify and achieve common goals in a meaningful way. It seeks to address whether the HODs have enough potential to guide the educators and learners in order to achieve good learning outcomes. Fundamentally, literature has established that HODs lack managerial knowledge and skills for their roles, but the researcher wishes to find out from the informants whether this is real. This lack of clarity matters because it

contributes to the role ambiguity and role conflict, which in turn creates stress for individual HODs (White 2004:7).

2.6 Instructional leadership

Subject-departments refer to something that has more or less been taken for granted in both educational policy and the professional psyche of secondary teachers generally (Dinham and Green 2001:1). It is in the distinctive administrative units (departments) that this research centres on: Koehler (1993:11) as in Dinham & Green (2001:14) state that "department chairs walk a tightrope between the maintenance and survival needs of the school and the human and professional needs of the people within it". Southworth (2002:29) as in Bush (2003:15) points out that instructional leadership "... is strongly concerned with teaching and learning, including the professional learning of teachers as well as student growth". On the other hand, Bush (2003:16) and Leithwood *et al* (1999:8) as in Hopkins (2004:10) emphasises that instructional leadership focuses on the behaviours of educators as they engage in activities (teaching and learning) directly affecting the growth of learners.

In view of the central role played by the science educators, it is imperative that the science HODs demonstrate a willingness to learn in addition to being models that

they are learners too (Southworth 2005:25). Good students take on the identities assigned them, and hopefully make something of them, others don't, for whatever reason (Green & Lee, 1994, as in Dinham & Green 2001:10). These identities will elicit a desirable departmental tone that enhances commitment to teaching and learning. Teachers are supposed to know more than what they have to teach. "If you want to give students a cup, you have to have a bucket for yourself" (Walberg *et al* 1993:687). In support of the above, "If one is a good teacher, s/he always will be a student too, but a student who sees through a teacher's eye" (Siyakwazi & Siyakwazi 1999:27).

Thus, if the science educators take to learning seriously, then it implies that learners may perform highly at the "O" level examinations. This follows from the premise that human beings are gregarious in nature and so learners may benefit from observing and modeling their teachers demonstrating professional prowess (Southworth 2005:25). Basically, this becomes evident when candidates benefit from social learning as educators are the standard mirror from which students emulate.

Studies in recent research stress the principle of equality rather than hierarchy and the process of reflection and growth, rather than compliance (Gordon 1997 as in Munroi 2005:4). The principle of equality, when applied to knowledge enhancement, recognizes that each stakeholder in the science department may have a unique understanding of an issue that can contribute to departmental knowledge. Therefore, the science HODs' leadership influence should be targeted

at learner development through the science educators. In addition, in order to make plans and monitor their impact, the HODs must know how to articulate the targets, measure progress, set realistic attainable goals, recognise cost implications and appreciate the effort and expertise required to realize the target set (Field *et al* 2000:17).

In view of this study, the process of learning and teaching should witness both the educators and learners participating for a total achievement of desired learning outcomes. Of particular concern is that science HODs should be good leaders who accommodate members of the department in the day-to-day running of the department.

From the literature surveyed, there is resounding acknowledgement that HODs have an extremely difficult task. Therefore, the researchers' task is to make an attempt to prove whether the sciences HODs are expected to be everything, everywhere, anytime as is the claim. Answers to whether they are the link between educators and senior administration in a role that requires considerable skill, but possesses only limited formal authority will be revealed. This study seeks as well to discover if departments are optimally effective with respect to the role conflict between school principals and HODs. Furthermore, the researcher is interested in uncovering whether most of the HODs have demonstrated good instructional qualities for instance, furthering their professional skills and encouraging subordinates to take up challenging degrees, even if they do not have authority and administrative support.

2.7 Specialisation

School inspection had its roots in the United Kingdom during the industrial revolution, (Brighouse & Moon 1995 as cited in Jansen 2001:305). The first inspectors of schools were not appointed under the Education Legislation but under the Factories Act. Around 1839, and thirty years thereafter, the inspectorates were developed along denominational lines with separate inspectors for the Church of England, Non-Conformists and the Catholic Schools. Initially, it was not a requirement that inspectors should have taught or had experience of schools they were to inspect. The 1870 Act discontinued the denominational split of the inspectorate and by 1880; parliament debated the need for some kind of training for inspectors, (Brighouse 1995:5 as in Jansen 2001:306). In 1911, counties tended to have organisers who advised and organised matters for health, safety and latest available equipment.

This study seeks to uncover the degree of fit in subject specialization in the UK and the practice in Kadoma District secondary schools cluster in Zimbabwe. The researcher has interest in establishing if the pattern compares very well with the current practice in subject specialisations and the subsequent monitoring of all the departmental programmes by HODs. Departmentalisation of subject matter set a prerequisite for the subject leader to become a subject specialist in that respective field so that s/he gives direction on what obtains in the subject department. This becomes the major way the department can realise its full potential and improve

learners' achievement at "O" level. The HOD in science can monitor and evaluate the work s/he is well-versed-in. The members in the department for instance feel comfortable in discussing matters arising from lesson observations by their subject leader. The feedback will always be viewed in a manner that paves way for improvement in lesson delivery as well as enhancing learner participation.

However, what this study seeks to reveal is whether the HODs further their professional desires and at the same time cater for the needs of their departments. This is also true in respect to principals. While it is acknowledged that experience is the best teacher, knowledge of the more complex nature of human beings is a necessary prerequisite for both school principals and HODs.

2.8 The instructional roles of science HODs

As has been noted earlier on, improvement in subject leadership and management has been less marked. The crucial role of the science HODs can be put as "... the day-to-day responsibility for ensuring good planning and promoting better teaching in order to secure and sustain high standards across the curriculum" (Munroi 2005:7). The job description of an HOD would be:

...the management of people (including learners, teachers and ancillary staff), management of curriculum development and implementation, the management of resources (equipment and accommodation) and finances. The best job description also emphasise the importance of communication about their own area with learners and parents, with teachers within the department as well as across the school, and with the primary and tertiary sectors...

(South Africa: Department of education and skills 2004:2)

All subjects have their own internal logic and it is for the HOD to represent this logic in the precise selection of content and of teaching and learning processes (Winkley 1990 as in Field *et al* 2000:23). Knowledge is fundamental to judgement, values, attitudes and beliefs, and must therefore form the basis of curriculum. HODs must therefore know and understand the content of curriculum before even giving consideration to the application of knowledge (Hirst 1993 as in Field *et al* 2000:23).

With this background, the HOD will be able to advise colleagues on the most appropriate teaching methods, together with the most advantageous learning environments (Hornby *et al* 1999:16 as in Field *et al* 2000:39). Central to the instructional role of the HOD is the provision of leadership and direction for the subject and ensuring that it is managed and organized to meet the aims and objectives of the school and the subject (Teacher Training Agency's National Standards 1998a:4 as in Field *et al* 2000:79).

The salient aspect raised above is that the job description sets the contribution of HODs to the development and direction of the whole school through their involvement in planning, policy-making and implementation and departmental review. What comes to mind is that any form of role conflict between the school principal and the science HOD will derail the progress in the department.

Whilst knowledge is fundamental to judgement, values, attitudes and beliefs culminating in the formation of the curriculum, this study seeks to find out if science HODs and educators are not consulted on the design stage of the content they

implement. The researcher intends to establish the mechanisms put in place by the subject specialists to introduce innovations if learners perform badly in sciences. Literature support participation by stakeholders especially those who implement the syllabus in schools and hence this study intends to find out if the informants are consulted on what to include, what to leave out and reasons for taking such decisions. As a matter of fact, the researcher will establish whether the science HODs' crucial role is neglected.

2.9 Middle managers as professionals

Schools with high learners' achievements typically possess leaders such as HODs who make significant contributions to the success of academic programmes (Bushher & Harris 1999:31 as in Ferrucci & Carter 2004:2). There is substantial evidence that HODs have great potential for influencing learners' achievement (Harris, Jamieson & Russ 1995 in Ferrucci & Carter 2004:3). The assumption that those who implement solutions should be part of the decision-making process has implications for the level of decision-making and the distribution of power between school principals and teachers (Kirby & Colbert, 1994:140 in Steyn cited by Van der Westhuizen 1999:131).

In support of the above, decisions should be made by teachers who are in touch with the work and who know what they are doing (Smyth 1995:169 as in Steyn

1998:131). In this context, Gulliford 1985:22 as in Field *et al* (2000:37) suggests that all "successful teachers have to do, it seems, is to apply 'good teaching' in a way that failure is replaced by a sense of achievement". The HOD should aim at planning work that ensures that "the situation is seen in terms of the need to modify teaching strategies in a non-threatening way, rather than as an indication of the innate disability of the child" (Farrell 1997:143 as in Field *et al* 2000:54).

Since participation by educators in the running of the school is both their right and duty (Bottery 1992:163), denying them to do so will be detrimental to the clientele. Educators should make valuable contributions to their department so that leaving them out in the process of decision-making can witness them distancing themselves from implementation of those decisions. The observation below underlines the importance of engaging stakeholders in decision-making and hence the assertion "...I know of no more encouraging fact than the unquestionable ability of man to elevate his life by conscious endeavor" (Henry David Thoreau as in Covey 1992:66).

In addition, Siskin & Little (1995:1) maintain that the subject department defines "in crucial ways who teachers are, what they do, where and with whom they work, and how that work is perceived by others". In addition, Warren (1997:50) uphold that subject departments constitute a central feature of the structure of authority and influence in high schools, a structure in which teachers' claims to resources, their justifications of classroom practice, and their assertions of autonomy are closely linked to subject specialisations. This also links up with John Dewey's philosophy

of empowerment of teachers and the enlargement of their participation in school decision-making (Makcy 1994:48 as in Steyn 1998:13).

Rice & Schneider (1994) as in Mosoge & Van der Westhuizen (1997:197) replicated research on teachers' desire for participation in decision-making and found that teachers still expressed deprivation especially in managerial issues though a narrowing of the gap between actual and desired participation was discernible. In line with the same findings, Wright (1980) cited by Mosoge & Van der Westhuizen (1997:197) found that teachers perceived least influence in fiscal management, teaching assistants and personnel selection in addition to deprivation in management issues and saturation in technical issues for both urban and suburban schools in South Africa. However, in a normal situation, the material that finds its way into the curriculum comes from a school's or HOD's analysis of what an individual needs and what society requires for success (Howell *et al* 1993 as in Field *et al* 2000:78).

On the contrary, Lukhwereni (1995:33) established that school management teams are not aware of their roles. This observation suggests that HODs must be enlightened with respect to their instructional roles so that they unflinchingly accept the obligation to take the lead in performing them with dedication. The instructional roles, which are not clearly defined to the HODs, spill over to poor student learning outcomes.

In this study, the researcher aims to establish whether the HODs engage in decision-making at their respective institutions. Even as literature reveals that

incorporation of everyone's piece of mind in decision-making is significant, the researcher wishes to establish whether there is a link between theory and the researched. Since the subject-department is the backbone of the school, lack of involvement breeds negative attitudes on the part of the educators. The trust that the Ministry of Education, Sport and Culture has in deploying educators in schools is done in the hope that learners would achieve the best they can. Notwithstanding this trust, the learning outcomes are poor; however, identifying the source of the problem will be the main thrust of this study.

The interaction that there is between the educators, learners, parents or guardians, prospective employers should be tailor-made to create an environment where everyone aims higher and produces desirable learning outcomes at "O" level. By incorporating the HODs in decisions that affect them should suffice reproduction of energies to produce the best learning outcomes.

2.10 Why focusing on HODs and learning outcomes?

A middle manager is simultaneously a leader, a manager and administrator who works with and through other people to achieve key tasks and activities (Bush & West-Burnham 1994:34). The fact that school principals are overloaded with responsibilities at the school has occasioned a shift of attention from the principals as effective school leaders. Williams & Portin (1997) as in Walberg *et al* (1998:283) states that in the USA and UK, the principals find less time to lead and or participate in instructional programmes when they are spending increasing amounts of time managing budgets, completing reports and attending to

managerial tasks. In addition, Walberg *et al* (1993:352) maintain that school principals leave the profession or take lesser posts within the school due to high stress, the impact of sheer load and working more hours.

What seems to be the missing link in literature is the impact science HODs' instructional roles have on learners' achievement. The following is an attempt to describe what effective science HODs do: leading a team, providing inspection, encouragement and assistance to the members of the department, and providing support to the school's senior management team. Subject leaders highlight on subject teachers that they should know what levels of attainment learners are generally likely to meet at particular ages and set learners' objectives which reflect these (Emerson & Goddard 1989:25 as in Field *et al* 2000 :19). In the same vein, research studies in the USA, UK, New Zealand and China hold a common point of departure in so far as the outline of the activities that define the HODs is concerned. They include the following:

Managing the work of a team or Of colleagues	Gold (1998), Gunter & Rutherford (2000:37)
Curriculum planning and resource provision	Caldwell & Spinks (1998:3)
Managing structures and processes	Blankford (1997:54) and
Evaluation of teachers and Programmes of learning	Turner (1996:231)

All as in (Field *et al* 2002 21-27). Each of these activities is outlined below:

2.10.1 Managing the work of a team

The HOD should be in a position to identify content relevant to the development of science and technology at the national level. In order to achieve the above, the subject leader lines-up a series of seminars and workshops so that important matters related to learning and teaching are discussed. These are rare occasions because they are limited by inadequate resources. Methods of instruction that elicit good learning outcomes are also discussed, tried and tested by way of demonstrations by science specialists. The science team can then confidently carry out experiments so that learners benefit fully from the lessons. This study sets to find out whether this is happening effectively in sciences departments.

2.10.2 Curriculum planning

The science HOD is expected to identify topical issues that trigger scientific thinking. When this has been said and done, all the opportunities for learning provided by the school will be realized (Stakes & Hornby 1997 as in Field *et al* 2000:37). There is also inclusion of the most appropriate materials for use in teaching science. Learners can realise their full potential in an environment supportive of exploration through manipulation of materials.

2.10.3 Managing structures and processes

The administrative structures should be clearly articulated to allow every member of the department to position himself where s/he fits in. The processes of teaching and learning would flow smoothly in my opinion since the hardships and or challenges facing the departments would be channeled systematically. Settings in which all the members involved know their job specifications give room for each and everyone to perfectly execute the tasks assigned to him.

2.10.4 Evaluation of teachers and processes

Field *et al* (2000:26) identify the four key aspects of assessment namely:

1 Formative:

This is where the assessment procedure must generate data which help to inform learners' future progress.

2 Diagnostic:

Educators identify the particular learners' needs.

3 Summative:

This provides an indication of all that has been attained.

4 Evaluative:

This will assist the teachers in ascertaining how effective the teaching methods have been.

From this repertoire of linkages, the HODs can be in a position to ascertain good outcomes from learners writing national examinations. This can be possible if and only if science HODs gallantly observe professionally the job specifications of educators in their departments. More attention has to be given to the learners who should be accorded an opportunity to do more work. These sentiments are advanced by Comenius (1592-1670) as in Siyakwazi & Siyakwazi (1999: ii) who pointed out that "my goal is to seek and find a method by which the teacher teaches less and the learner learns more". Performance levels would increase because learners tend to remember those aspects they will have participated in. For example, engaging the learners to a wide array of activities in order to provoke thought and discussion gives them a leeway to excel in their studies. As science is more of a practical subject, exposing learners to the hands-on-experience will generate more of the "Aha-experience" and subsequently an improvement in learning outcomes.

In this study, the researcher seeks to establish whether the eight departments to be investigated will provide evidence to the fact that all of them are able to track learners' progress at all year levels and provide useful information to guide departmental self-review and programme evaluation. It is also the wish of the researcher to establish whether a sense of oneness prevails in the departments such that if provided with the necessary administrative support in procurement of chemicals, would learners exhibit outstanding performance at "O" level? The

HODs may agree with colleagues in the department on matters of significance, but without the financial back-up, learners will continue to suffer.

2.11 Teacher autonomy

Kant as cited in Hill (2004:43) defines autonomy as self-determination. An autonomous person is the one who is in control of his or her life rather than being controlled by outside forces. White & Rosinfield (1999:1) cited by Dinham & Green (2001:46) write about the notion that subject departments are seen as "potentially influential sites" with the HODs responsible for the development of a motivated collegial team of workers united in direction and committed to learning of their learners. Zigarell in Heller & Rath (1996:103) concurs with the above by pointing out that teachers should have great autonomy both within the classroom and over school policy matters.

Similarly, Heifetz & Laurie (1997:129) as cited in McREL (2002:13) point out that "giving a voice to all people is the foundation of an organisation that is willing to experiment and learn". To achieve quality education in schools, there should be a concerted effort by all, and everyone should experience "ownership" of the approach (Lewish 1993:22 as in Steyn 2001:15). In addition, "...many teachers feel that no administrator can understand as well as they do what really goes on in the classroom, and that they themselves can judge what teaching practices are best suited to the particular group of learners in their classes" (Bredo in Gorton 1993:263). Similarly, teachers take an active hand in decisions affecting their

learners, teaching team or department, the materials and the supplies that affect their ability to succeed most directly (Ackerman *et al* 1996:113).

By implication, sciences HODs become more responsible and accountable for their actions if they take part in the process of decision-making in the schools. Steyn cited by Van der Westhuizen (1998:131) observed that in South Africa, the transformation of education could only succeed if teachers are at liberty to make informed decisions and share power equally in schools. In Zimbabwe, and indeed in Kadoma District, science HODs are not empowered in administrative matters. They play it safe in the peripheries but the notion that if the school principal goes so goes the school will not be "stomached" because there is no sense of ownership.

The life of the science department and more importantly that of the school is such that every member makes a contribution because their roles are so crucial in determining learners' outcomes (Mortimore *et al* 1988, Rutter *et al* 1979, and Sammons *et al* 1997 as cited in Reynolds 2004:16). Every learner would benefit in a situation where a free flow of ideas exist. Since individual perspectives are important in qualitative studies, lack of HODs voices triggers dissatisfaction and subsequently, it is learners who suffer. On this note, it is the role of the HOD to ensure that the science educators are highly motivated and their ideas are taken into account to ensure that they are well represented. Becker (1975:112) supports the above by asserting that "man (also read woman) is driven by an essential

'dualism', he needs both to be a part of something and to stick out. He needs ... to be a conforming member of a winning team, and (also) to be a star in his own right." Therefore, desirable learners' achievement will be witnessed if the departmental leadership is characterized by simultaneously "top down-ness" and "bottom up-ness" (Murphy and Louis 1994 as cited in Reynolds 2004:16). There will be a free-flow of ideas to improve learners' achievement if every science educator is accorded an opportunity to take part in issues that centre on teaching and learning.

In this research, effort will be made to attempt to establish whether educators express satisfaction in the manner in which they control the departmental life. Whilst literature revealed that teaching and learning serves as the major preoccupation of educators, this study is interested in ascertaining if it is true that HODs are sidelined in articulating their concerns. Further, this study seeks to establish if HODs experience a sense of ownership and then effectively employ Parkinson's Law of dormancy. The law states that individuals whose interests are not catered for in an organisation become inactive and wait for the next thing to happen. They no longer seek alternative ways of improving their departments and subsequently this would spill over to poor learning outcomes.

What is apparent is that stakeholders expect educators to perform miracles. They may attribute poor performance to lack of educator commitment. But going deeper into this matter, schools may be inadequately equipped in as much as the

provision of chemicals and apparatus is concerned. The parents may not be supporting schools by way of assisting with alternative ways of funding the science department. This department is expensive to run and therefore its budget should be higher than any other department. The researcher's task is to find out if the same is a true reflection of secondary schools in Kadoma District in Zimbabwe.

2.12 Stakeholders' expectation

(Leddick, 1993:38, Murgatroyd, 1993:269, Crammer, 1996:360, Konoprucki, 1996:22) as Jansen (2001:114) state that schools are being urged to produce higher standards of performance, educators have been pressurized to prepare learners for a changed work place and world and taxpayers are demanding value for their money. The HODs have key leadership functions that revolve around the concern to accomplish the tasks and the concern to maintain good relationships among the people in the organisation. Failure by the middle managers to perform satisfactorily would trigger a disarticulation on the part of the stakeholders. Thus, Steyn as in Jansen (2001:117) maintain that schools would be performing a disservice to their customers if they failed to assist their learners' to meet state mandated standards.

In essence, the HODs in sciences are expected to motivate staff to have high expectations for learners' in order to illustrate that they have high expectations of what it is possible for them to achieve from the HOD. Effective HODs "guard the integrity of the classroom" (Teddle *et al* 1989 as in Reynolds 2004:17) since this is

where they gain credibility and integrity for themselves and their departments. Stakeholders look forward to witnessing high rates of return from their children's educational investment.

This study therefore seeks to investigate the degree to which stakeholders' expectations are met in sciences. In addition, the constraints that bedevil the learning outcomes will be exposed.

2.13 Focused teaching and learning

HODs need a strong theoretical foundation of current knowledge of teaching and learning (Hill 2005:32). They have to ensure that modern concepts of teaching and learning are understood by educators and are reflected in the departmental programmes. Up-to-date knowledge of teaching and learning is critical if the science HODs have to create a culture within their departments that embodies high expectations of learners' achievement and confidence in the capacity of educators and of the department to realise those expectations.

However, this requires a system that promotes organisational learning for example through workshops and seminars. Educators would function effectively in an institution which accommodates a combination of off- and on- campus learning, coupled with demonstration teaching, mentoring, coaching and opportunities for department educators to debrief and reflect on their practice and progress (Hill

2005:33). This would suggest an improvement in the professional standards of the department that would spill-over to the improvement of learning outcomes.

The focus of this study on the instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe entails that the methods of instruction should be appropriate to the demands of the content. Science educators are therefore called upon to discuss those crucial matters that would give learners an impetus to achieve high scores in science.

In South Africa, Blauw (1998:8-9), Chisholm & Vally, (1996:5-30), as cited by Kruger (2003:207) identified the following as drawbacks in the achievement of acceptable practice of teaching and learning:

- Negative attitude amongst learners and educators that are remnants from the opposition against the segregated education system of the apartheid era.
- The poor state of repair of school buildings and facilities.
- The large shortcomings in the provision of resources, facilities and equipment.
- The lack of management skills needed to deal with the challenges of school management which are crucial to forming a sound culture of learning and teaching in a school.
- Overcrowded classrooms
- Poor relationships among principal, educators, learners and parents.

Under these circumstances, the process of teaching and learning becomes unbearable. An atmosphere of this nature does not support attainment of favourable learners' outcomes. It is, however, such difficult environments that call for stakeholder participation in order to realise desirable learning outcomes.

Whilst the literature reviewed revealed that educators acquire professional qualifications as licenses to practice, this study intends to establish whether the culture of learning is prevalent within the HODs and the educators. It seeks to find out whether there are contingent measures put in place to enhance educators' and HODs' professional education provision.

2.14 Monitoring and assessment of learners

Design of monitoring and assessment of students needs to be such to ensure that consistent, coherent information is generated on a regular basis of the progress of the learners (Fitzgerald 2004:17). Assessment is important to establish whether targets have been met and whether progress has been made towards ensuring that all learners' meet set standards. Assessment means gathering information about individual learners' level of performance or achievement. Effective science educators make a habit of monitoring their learners' progress so that they can ensure that each learner is always working within his or her level of challenge or "zone of proximal development" (Vygotsky 1978 as cited in Hill 2004:33). Science educators would then be able to develop a profile for each learner, to establish

starting points for instruction, and to use this diagnostic information to drive classroom instruction (Hill 2004:33).

Because stakeholders expect results, assessment, especially that designed to determine what learners know at a specific point of time, in this particular case at the end of the year, is inescapable. When anyone is trying to learn, feedback about the effort has three elements: recognition of the desired goal, evidence about present position, and some understanding of a way to close the gap between the two. All three must be understood to some degree by anyone before s/he can take action to improve learning (Partin 2005:113).

In any learning activity, learners need to establish objectives. These objectives set by the learners give them impetus to work hard. The educators should provide an atmosphere where learners have a clear picture on the progress they will have made during the course of the year. Assessment would therefore provide an impetus for both learners and educators to work hard in order to both face the challenges and produce the best they can.

This study proposes to uncover the monitoring and assessment procedures in sciences departments in Kadoma District secondary schools in Zimbabwe. It also seeks to put forward the targets set by sciences departments and the subsequent checks and balances put in place to both achieve and measure the targets set.

2.15 Instructional strategies

Educators bear in mind that one size does not fit all. "Most classes include a broad range of learners without a broad range of maturity, ability, motivation, temperament, home environment and interest" (Partin 2005:104). In the sciences, educators recommend instructional strategies which involve learners. And hence,

... it is extremely desirable to have assessment occur in the context of learners working on problems, projects, or products that genuinely engage them, that hold their interest and motivate them to do well. Such exercises may not be as easy to design as the standard multiple-choice entry, but they are far more likely to elicit a learners' full repertoire of skill and to yield information that is useful for subsequent advice and placement...

(Gardner 1993:178 as in Partin 2005:105).

Therefore the use of the Socratic method of stimulating the creative or critical thinking in learners through skillful questioning can be especially valuable. It is important that science HODs emphasize the importance of focusing on the learning needs of each learner. Teaching and learning calls for educators to have a detailed understanding of how children learn. On this note, Scheerens & Bosker (1997:106) as in Hill (2004:33) invoke the system-theoretical concept of "meta-control" to express the over-arching control and influence exercised by an educationally- or instructionally-oriented HOD with respect to classroom teaching strategies. With the meta-control scheme on board, the HOD would vigorously work towards the creation of a common language to talk about and reflect upon classroom teaching (Fullan 2005:6). This does not become an end in itself but the starting point for refining and readjustment of the instruction.

In this study an attempt will be made to establish whether such instructional strategies and meta-control systems are utilised in sciences departments in Kadoma District secondary schools in Zimbabwe.

2.16 Conclusion

The literature related to the instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe seem to suggest that a direct relationship exists between participation in decision-making and high learners' achievement. Given this likelihood, this study intends to find out whether HODs have a very crucial role in teaching and learning of the subject matter. Effort will be made to ascertain whether the sciences HODs' instructional role is being abandoned and neglected as well as whether the above triggers high failure rate for learners at "O" level.

After having reviewed literature, what follows next is an examination of the research methodology.

CHAPTER 3

RESEARCH DESIGN

3.1 Introduction

The aim of this chapter is to discuss the research methodology, the sample of the study, method of sampling to be used, the research instruments to be used and more importantly how data will be dealt with. On the same note, some important ethical issues will be highlighted as well as data verification by triangulation.

3.2 The qualitative method

It makes little sense to seek general laws of how society works because society is only the sum total of the many complex social situations that are going on at one time... (Payne & Payne 2004:176).

The study on the instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe will be explored using the qualitative method. Qualitative methods focus primarily on the kind of evidence (what people tell you, what they feel) that will enable the researcher to understand the meaning of what

is going on. They illuminate issues and turn-up possible explanations: essentially a search for meaning - as is all research (Bill 2000:10). As humans are always in a process of becoming, they are influenced by how they see themselves, by how others see them, and by what they want to become.

In a sense, in qualitative research, therefore, the researched are not viewed as objects with given properties like norms and attitudes which can be measured, but as actors whose actions can only be adequately interpreted and explained if there is a thorough understanding of their frame of reference and contexts (Allan 1997:178). Qualitative research is characterized as an attempt to obtain an in-depth understanding of the meanings and definitions of the situation presented by informants, rather than the production of quantitative measurements of the characteristics of behaviours (Wainwright 1997:13).

Qualitative methods provide detailed and non-quantitative accounts of small groups, seeking to interpret the meaning people make of their lives in natural settings, on the assumption that social interactions form an integrated set of relationships best understood by inductive procedures (Payne & Payne 2004:175).

Moody (2002:2) concurs with the above by pointing out that qualitative methods tend to be applied more easily in real world settings, but lack internal validity (alternative explanation of results, lack of control) and external validity (usually concerned with a single case: limits generalisability to other settings). Also,

interpretation of data is by nature much more subjective than quantitative methods since it is easy to read what you want into data. "Core to the qualitative method is the desire to seek out and interpret the meanings that people bring to their own actions rather than describing... statistical associations between variables" (Payne & Payne 2004:176).

In essence, actions are treated as part of a holistic social process and context, rather than something that can be extracted and studied in isolation. As such, Bryman (1988) in Payne & Payne (2004:166) maintains that "it makes little sense to seek general laws of how society works because society is only the sum total of the many complex social situations that are going on at one time". This study uses the qualitative method because the researcher seeks to discover the reasons of poor learner outcomes at "O" level and why HODs' instructional roles are neglected. The aim is to get the data from HODs and learners themselves whose experiences, feelings, attitudes are sought out.

Qualitative methods therefore, are interested in encountering social phenomena as they occur naturally. A lot of focus is on the detail of human life since they explore the data they encounter and allow ideas to emerge from them. The central concern is giving attention on how individuals interact, emphasising the interpretation of the meanings which each brings to the interaction and the way mutual understandings are negotiated. In this respect, HODs, educators, school

principals and learners will give their accounts on reasons for poor learning outcomes at "O" level.

Qualitative and quantitative methods sometimes overlap (Payne & Payne 2004:175). In support of this assertion, in practice, no research method is entirely qualitative or quantitative (Yin 1994 as in Moody 2002:2). While Strauss & Corbin (1990:17) defines qualitative research as that "research that produces findings not arrived at by means of statistical procedures, or other means of quantification", it follows that quantitative methods "... consists of the counting of how frequently things happen... and the presentation of these frequencies as summaries in tables and graphs" (Frankfort-Nachmias & Leon-Guerrero 2000:72-108 as in Payne & Payne 2004:181). In addition to the above, quantitative methods are those which involve counting and measuring the much dreaded subject of statistics (Bill 2000:9).

A study of this nature aims at helping this researcher in understanding the world in which we live and why things are the way they are. Qualitative methods are aimed to investigate situations where little is known about what is there or what is going on and to "get under the skin" of the group or organization to find out what really happens - the informal reality which can be perceived from the inside (Bill 2000:11). In addition, the researcher will have a clear picture of the lifeworld of individuals or groups studied from their own frame of reference (Patton 1990:114).

By implication, the first hand information from the respondents will be elicited from their work places.

3.3 Sampling

This study took cognisance of the informants who are in touch with the matter under discussion. In sampling, there is a great need for well-calculated thinking because the respondents affect the information that will be collected and determines the sort of claims that can be made about the meaning of information (Arksey & Knight 1999:50). In this case in point, a selected sample of a science education officer, school principals, science HODs, subject teachers and focus groups of science learners at "O" level will be provided with an opportunity to express their feelings, understanding and desires on the instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe. In order to establish what obtains in the science departments, the researcher will be the instrument and in the process approaches fieldwork without being constrained by predetermined categories of analysis (Patton 2002:14, Chisaka & Vakalisa 2003:175).

The study employed purposive sampling. This is a situation in which the researcher simply handpicks the sample because to his or her judgment they are typical of what s/he wants (Ofo 2004:15). By so doing, information-rich cases whose study will illuminate the questions under study are selected (Patton 1990:1969 as in Slater 2004:1). Subjects are selected because of some

characteristics. Patton (1990:169) proposed the following cases for purposive sampling:

- Extreme/deviant case - where learning from highly unusual manifestations of the phenomenon of interest, for instance outstanding success or notable failure. In this case, it is notable failure by learners at "O" level that triggered this study.
- Intensity - information rich cases that manifest the phenomenon intensely, but not extremely, such as good learners/poor learners, above average or below average. In this study the sample that appears to be representative of the population under study is as follows: one science education officer, eight school principals, eight science HODs from selected schools in Kadoma District, sixteen subject teachers (two from each of the selected schools teaching in the science department) and more importantly focus groups of "O" level science learners. Furthermore, relevant documents as detailed on the next session will also be scrutinized.

3.4 Pilot study

A pilot study was carried out with science HODs and school principals. They were selected from secondary schools in Kwekwe District because they have the same characteristics with the sample in the full study. These were also convenient to the researcher as they are close to his place of residence. The school principals, science HODs and educators are crucial informants of this study as they constitute

the school management and thus shoulder the responsibility of implementing school policies.

Semi-structured interviews were carried out with two school principals and two science HODs. Focus group interviews were done with a group of nine "O" level learners. This assisted in coming to grips with some of the practical aspects of establishing access, making contact and conducting the interviews (Seidman 1991:30). As a model of the full study on a small scale, a pilot study helps to ascertain the extent to which research findings can be replicated (Merriam 2001:205). It is done primarily to fix ambiguous questions before the full study is started. An interview schedule was employed (Kumar 1999:109). It aids in keeping focused to relevant issues.

Questionnaires were also piloted and the questions, which repeated themselves, were restructured. The observation by Openheim (1992:48 as cited in Cohen *et al* 2000:261) that "...everything about questionnaires should be piloted, nothing to be excluded, not even the typeface or the quality of the paper," was taken on board.

Questionnaires were piloted on two science educators and it was also established that learners are equally an important element to consider in order to get a balanced picture of the instructional roles of HODs and the learning outcome of "O" level students in Zimbabwe. The educators are important in this study because

they are involved in the scheming, teaching and evaluation of learning and teaching processes. The questionnaire used is attached as Appendix E.

The study employed the following research instruments:

- interviews
- questionnaires and
- examination of relevant documentary sources.

3.5 Interviews

Interviewing is defined as a conversation with a purpose of getting information (Berg 2001: 66 as cited in Patton 2002:16). In addition, Cohen *et al* (2000:267) point out that: "interviews enable participants (be they interviewers or interviewees) to discuss their interpretations of the world in which they live and to express how they regard situations from their own point of view". It is data in face-to-face settings, using an oral question-and-answer format which either employs the same questions in a systematic or structured way for all respondents to talk about issues in less directed but discursive manner (Payne & Payne 2004:129). In other words, "it is a face-to-face interaction in which oral questions are posed by an interviewer to solicit oral responses from the interviewee" (Nkpa 1997:82).

In view of the above, the playfield will be leveled to allow participants to freely express their experiences. This study will use focus group interviews and semi-structured interviews.

3.5.1. Focus group interviews

Focus group interviews are a group of interacting individuals having common interest or characteristics, brought together by a moderator who uses the group and its interaction as a way to gain information about a specific or focused issue (Marczak & Sewell 2001:1). They involve organised discussion with a selected group of individuals to gain information about the views and experiences of a topic (Gibbs 2004:1). In addition, focus groups are a group of individuals selected and assembled by researchers to discuss and comment on, from personal experiences the topic that is the subject of the research (Powell *et al* 1996:499). Therefore, the focus group interviews "rely heavily upon the systematic questioning of several individuals simultaneously in a formal and informal setting" (Denzin & Lincoln 2003:364-365).

This study will interview 8 focus groups of "O" level science learners. Focus group interviews with the learners in the education system will be used because they are especially well-suited to explore the attitudes and experiences of the informants (Morgan & Spanish 1984:260 as in Steyn & Van Wyk 1999:39). All focus group interviews, as well as the interviews with school principals and science HODs, will be audio taped and transcribed with the informants' permission. Their contribution

will enable the researcher to gain information about causes of poor performance and most importantly the role played by educators to improve the results.

3.5.1.1 Purpose of focus groups

The purpose of focus group interviews is to provide insights about how people perceive a situation (Marczak & Sewell 2001:2). It can also be an efficient technique because the researcher can gather information about several people in one session (Thomas & Nelson 2001:36). The main purpose of focus group interviews is to draw upon respondents' attitudes, feelings, beliefs, experiences and reactions in a way which would not be feasible using other methods (Morgan 1997:12).

3.5.1.2 Merits of focus group interviews

No single research instrument can extract relevant, reliable and accurate data from the informants. Each one of the instruments has its strength and weaknesses. And as such, the following are the strength of focus group interviews:

- There is depth and richness of information that can be learned from focus group interviews.
- Members of the group remind each other of details they might otherwise not have mentioned if interviewed privately (Merton *et al* 1990 in Bartels *et al* 2004:7).
- The focus group discussion is particularly effective in providing information about why people think or feel the way they do (Krueger in Bartels *et al* 2004:7). In this study, focus group interviews will focus on learners at "O" level

for the purpose of gathering information about poor performance at "O" level and the assistance they get from science educators.

- Furthermore, focus group interviews provide quality controls because participants tend to provide checks and balances on one another and can serve to curb false or extreme views (Patton 1998 as in Thomas & Nelson 2001:337). The researcher will select and assemble a homogeneous group consisting of 9 "O" level learners for the purpose of this study. This is in keeping with what researchers recommend, as an example, there should be "... a balance between the need to have enough people for lively discussion and the danger of an overwhelming group size must be achieved" (Barnett 2005:5). A small group will enable the researcher to see learners participating and interacting freely.

In this study, use of focus group interviews will give learners a voice to spell out their views, experiences, feelings and concerns in relation to poor performance at "O" level in science. The atmosphere that motivates a free flow of ideas regarding the instructional roles of HODs, and the learning outcome of "O" level students in Zimbabwe will obtain. The focus group interview guide is attached as Appendix H.

3.5.2 The semi-structured interviews

Semi-structured interviews or focused interviews as the name suggests are a number of predetermined questions and / or topics, which are presented to the subjects. The interviewer identifies a number of pertinent aspects s/he wants to be

sure of addressing (Hancock 2002:7). It involves a series of open-ended questions based on the involvement of HODs in curriculum design, staff development, and evaluation of teaching performance, assessment of learners' work, school policy on homework and recruitment of science teachers. The open-ended nature of questions defines the topic under investigation but provides opportunities for both interviewer and interviewee to discuss some topics in more detail.

Bill (2001:65) made the following comment:

... it can seem almost 'natural' there is a pace, a fluency, a responsiveness that seems to have nothing of 'technique' about it ... flexibility is what makes the semi-structured interview such a productive research tool, and the 'naturalness' rests on a clear structure, carefully developed and practiced.

He went further to assert that "questions are open where the answer is open. That's where the element of discovery comes in" (Bill 2001:66).

A carefully worded interview schedule will be assembled to elicit responses from the informants. In this study questions will appeal to the experiences, feelings of the school principals and their science HODs. A radio-cassette will be used to record and store data for future use as well as to demonstrate to the respondents that their contributions are important if they have to improve on their situation.

The interview schedule can be simpler than the one for structured ... and may include the following: introductory comments, list of topic headings and possibly key questions to ask under these headings, set of associated prompts and closing comments (Robson 1993:238).

Notes will also be taken because electrical gadgets may compromise the purpose of the interviews. Semi-structured interviews will be conducted with science HODs, school principals and a science Education Officer.

3.5.2.1 Advantages of semi-structured interviews

Each of the data collection instruments has its own advantages and disadvantages. The following are some of the advantages of semi-structured interviews:

- There is flexibility in that the informants allow room for probing, room for explanation and clarification.
- The researcher has greater control of the interview in that s/he can arrange the environment conducive for the interview.
- There should be a high response rate because the language can be changed too, for instance in this research, language can be changed from English to Chishona, the local language for both the respondents and the researcher.
- There is also room to collect supplementary information for instance lesson observation critiques, mark lists of students, "O" level results analysis over years will be made available to this researcher. These findings will appear in the next chapter.

3.5.2.2 Disadvantages of semi-structured interviews

There are also those aspects of the semi-structured interviews that pose problems to researchers. These make it difficult for the researchers to collect reliable

information from the respondents. The following is an attempt to shade some light on these factors

- Respondents find it difficult to volunteer confidential information to researchers for fear of confidentiality.
- They may not be sure whether or not the findings would be used for purposes other than solving educational problems. However, the informants will be assured that the research is for the purpose of this study only in line with ethical considerations undertaken.
- It will be costly to travel to the eight secondary schools to be visited for interviews.
- A lot of time will be wasted in booking for appointments with the school principals and the HODs.
- Dates would continue to change as the school authorities invariably commit themselves to their core business.

Interviews will be tape recorded in order to demonstrate to informants the degree to which their responses are valued (Arksey & Knight 1999:25). Constant referencing is possible because the interviews recorded will last long. Furthermore, informal interviews will take the form of conversation with informants at different times as the opportunity presents itself. In addition to recorded responses, the researcher will handle the responses by taking down notes during the interviews. The interview schedules are attached as Appendices:

- F for school principals.
- G for science HODs.
- H for "O" level science focus group.

3.6 Questionnaires

A questionnaire is a carefully designed instrument for collecting data in accordance with specifications of the research questions. It may be used to ascertain facts, opinions, beliefs, attitudes and practices (Nkpa 1997:74). Questionnaires are documents containing questions designed to solicit information appropriate for analysis (Chikoko & Mhloyi 1995:164). Fixed choice questions allow the researcher to collect a large quantity of data from a considerable number of people over a relatively short period of time. The open-ended questions will allow respondents to compose their own answers so that valid data may be provided since respondents can say what they mean in their own words.

For the purpose of this study, open-ended questions will be distributed to the sixteen subject teachers. This will enable the researcher to have access to data which is sometimes buried deep within the minds or within the attitudes, feelings or reactions of respondents. Cohen *et al* (2000:225) echoes the above by pointing out that open-ended questions invite an honest, personal comment from the respondents. The questions will centre on the issues which attempt to address the reasons for high failure rates at "O" level and why HODs' instructional roles are abandoned and neglected.

3.6.1 Advantages of questionnaires

Questionnaires will be used in order to triangulate responses from semi-structured interviews. They have their own weaknesses but these will be strengthened by responses from other instruments of data collection.

The following are the advantages of questionnaires:

- They are wide-spread in that they can be used to collect large quantities of data from a considerable number of people over a relatively short period of time (Milne 2005:2).
- There is little personal involvement and therefore less danger of researcher influence.
- Respondents act to the same stimuli (in this case, same questions, same order, and same difficulty).
- Respondents complete questions freely and can afford time to consult sources of information and this increase the validity of responses (Payne & Payne 2004:186).
- Questionnaires are easy to administer, and as such information is collected in a standardized way.
- Questionnaires can be used for sensitive topics which users may feel uncomfortable speaking to an interviewer about
- Science educators will have time to think about their answers, as they are not usually required to reply immediately.

3.6.2 Disadvantages of questionnaires

The following are some of the disadvantages of questionnaires:

- It is time consuming to pilot questionnaires in an effort to avoid ambiguous questions.
- Questionnaires are standardised so it is not possible to explain any points in the questions that participants might misinterpret.
- This could be partially solved by piloting the questions on a small group of students or at least friends and colleagues (Milne 2005:2).
- Despite its reliability, it lacks validity. Different answers to the same questions reflect differences in respondents because the respondents may interpret wording of questions differently and hence responses to one questionnaire may be false (Payne & Payne 2004:189). The people who choose the same answer may not mean the same answer.
- The distance between the researcher and the respondents counts because the latter may not be given time to explain ambiguous questions.
- The questionnaires cannot probe informants if they supply either inadequate responses or interesting ones, if there is need for some elucidation. The researcher wishes to acknowledge that travel expenses will be incurred in trips to collect completed questionnaires.
- Respondents from the same school may consult each other giving rise to uniform responses and may reduce the validity of the data.

3.7 Documentary sources

Not only interviews and questionnaires can unearth the instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe but written documents can shade some light on what it is that obtains in science departments. Relevant documents will be used in this study. Documents help to understand the philosophy of an organization (Hancock 2002:9). Existing documents are secondary sources of data because they do not entail direct contact and interaction with the study subjects (Obikeze, 1990:68 as cited in Ofo 2004:3).

In this way, a clear picture of what obtains in the science departments and how this impact on learners' achievement shall be unearthed by way of examining the school policy documents, mission statements, annual reports, minutes, codes of conduct, "O" level learners' results, lesson observation guides as well as learners' note books, test exercise books, and educators' critiques from observation and or supervision by the school principal and the science HODs.

Relevant documents are to be considered because they give direction and vision on how the departments are run. They could contain a clear testimony of whether teaching and learning takes place in schools or not. One can actually ascertain the degree of work and assistance given to learners by the educators as well as how the assessment by HODs and school principals impact on the work of the science educators.

On evaluation, educators should give comments which will be encouraging to learners so that progress of learners is not deterred. However, conflicting comments could breed negative attitude on educators and hence evidence of inadequate work and assistance given to learners. This could spill-over to poor learner outcomes in science as shown earlier on by the low percentage pass rates in national examinations.

3.8 Triangulation

Arksey & Knight (1999:121) claim that "the basic idea of triangulation is that data are obtained from a wide range of different and multiple sources, using a variety of methods, investigators and theories". Merriam (2001:204) concurs with the above by maintaining that triangulation is used "to confirm the emerging findings". In respect of information gathered, regularities of data from different sources, situations and methods will be compared to see whether the same pattern keeps recurring. This will add to the trustworthiness of empirical materials.

Research has established that multiple sources of information should be sought and used because no single source of information can be trusted to provide a comprehensive perspective of issues being researched (Patton 1990:244). The questions directed to different respondents concerning a single theme can bring forth a balanced outlook of what it is that is being studied. In addition, Schwandt (1997:163) points out that "...data from different sources or methods must necessarily converge on or be aggregated to reveal the truth". In this study,

different informants and data collection instruments will be used to validate data. The responses from questionnaires will be complete when those from interviews are added (Mouton 1996:156). On this account, an aspect of consistency comes into play as data will be verified by different respondents involved in science departments.

3.9 Ethical considerations.

The purpose of ethical considerations is to ensure that human respondents participate in research freely. The researcher will gain entry to the secondary schools by equipping himself with a letter of introduction from his supervisor. This letter will be attached as Appendix A. Attached to appendix A will be the researchers' letter seeking permission to carry out research. This letter will be attached in this study as Appendix B. The response from the District Education Officer will be attached as Appendix C.

In this research, two ethical principles and four ethical guidelines as propounded by Terre Blanche and Durrheim (1999:66-70), will be taken on board.

3.9.1 Three Ethical Principles

3.9.1.1. Autonomy:

The researcher undertakes to ensure that voluntary and informed consent will be obtained from all persons participating in the study. The researcher accepts the

freedom of participants to withdraw from the research, as well as the participants' right to anonymity in any publication emerging from the research.

3.9.1.2. Safety:

The researcher accepts that the research should do no harm to the research participants or any other person or group of persons. This principle of safety in participation ensures that respondents must not be placed at risk or harm of any kind, learners will be interviewed following clearance from the school authorities. The school administration will authorize the interviews on the basis that a school management team acts "in loco parentis", which means shouldering the parents' responsibilities during their absence as long as learners are following the school curriculum. Because learners are to be interviewed, permission will be sought in advance from parents and it will be made clear that participation is voluntary, (Babbie & Mouton, 2003:527-535, Henning, van Rensburg & Suit 2004:73).

3.9.1.3 Beneficence

The researcher accepts that the research should prove of benefit, if not directly to the research participants, at least generally (to other researchers or the society).

3.9. 2 Four Ethical Guidelines

3.9.2.1 Consent:

The researcher undertakes to ensure that participants receive a full, non-technical and clear explanation of tasks expected of them, so that they can make an

informed choice, (Terre Blanche & Durrheim 1999:66). The core elements include the following:

- A disclosure of the nature and purpose of research procedures and an identification of any procedures that are experimental.
- A disclosure of any risks and the anticipated benefits of the research, either to the subject or the society.
- Where therapy is involved, a description of alternative procedures or courses of treatment, if any, that might be advantageous to the subject, and
- A provision for ensuring that subjects understand they may ask questions and or withdraw at any time from the research.

3.9.2.2. Confidentiality:

The researcher undertakes to ensure that limits to confidentiality will be clearly specified and that participants are informed as to how the data is to be recorded, stored and processed for release. Information about individual subjects will be kept private. Privacy will be protected by keeping subjects anonymous and safeguarding information once collected. Acronyms will be assigned to individual subjects for identification.

3.9.2.3. Competence:

The researcher undertakes to perform these procedures, which he is

competent to conduct.

3.9.2.4. Reporting Results:

Any results obtained from this study will be published with careful attention to the rights of participants.

3.10 Validity of the study

Validity entails the soundness and effectiveness of the measuring instrument (Leedy 1993:40). On the other hand, it is the extent to which accurate events are captured (Wolcott 1995:169). Validity in this study seeks to establish whether the semi-structured interviews, the open-ended questionnaires and the documents to be reviewed address why the instructional roles of the HODs are abandoned and neglected and why learners' performance at "O" level is poor.

This study seeks to achieve validity by stating procedures explicitly and also providing evidence of data (raw and in process) (Henning 2004:13). In order to make sure that validity is maintained, the researcher will capture interviews on the audio-cassettes and write interview notes to make clear the honesty of both the informants and the researcher.

To satisfy validity in qualitative research methods, the researcher has to talk little, and listen a lot, record accurately, write early, offer informed interpretations, report

fully, be candid and write accurately (Wolcott 1995:48). This study will take heed of Wolcott's suggestions to make the study valid.

3.11 Reliability of the study

In qualitative research, reliability can be regarded as the fit between what the researchers record as data and what actually occurs in the natural setting that is being researched: a degree of accuracy and comprehensiveness of coverage (Bogdan & Biklen in Cohen *et al* 2000:119). In order to obtain reliability, a researcher may have to answer the following questions:

- Would two interviewers using the same schedule or procedure get similar results? And
- Would an interviewer obtain a similar picture using the procedure in different occasions? (Bennett *et al* 1994:278).

In this light, a measuring instrument is reliable if it yields the same result in repeated applications to the same phenomena (De Vos 1998:85 as in Van der Westhuizen and Kamper 2002:90). In data presentation, what informants put forward will be quoted and this enhances the reader's "taste" of the respondents' voices.

3.12 Trustworthiness

In dealing with the instructional roles of the HODs and their impact on "O" level learners' achievement, the following strategies were taken on board:

3.12.1 Triangulation of methods

Semi-structured interviews will be conducted with school principals, science HODs and "O" Level learners' focus groups. Open-ended questionnaires will be issued to science educators and an analysis of relevant school documents (minutes, policy on staff development, lesson observation critiques) and literature control will be employed in this research.

3.12.2 Mechanically recorded data

All interviews are to be tape recorded and transcribed verbatim.

3.12.3 Verbatim Accounts

Direct quotations from transcribed data will be used to illustrate the respondents' points of view. Stakeholders may have different feelings and meanings of subject leaders' roles and their impact on learners' achievements.

3.12. 4 Participants' language

The interviews will be conducted in English, the medium of instruction in science in schools. However, in some instances, respondents could emphasise using Chishona (language of researcher and participants).

3.12.5 Field research

The research will be carried out in Zimbabwe, in Kadoma District, at the schools in the natural location of participants.

3.12.6 Low- inference descriptors

Concrete and precise descriptions from interviews and documents are to be used in the research findings.

3.13 Data collection and analysis

As the processes of data collection unfold, the researcher will employ content analysis. Content analysis involves identifying, coding and categorizing the primary patterns in the data (Strauss and Corbin 1990: 67). This is a procedure for categorisation of verbal or behavioural data, for purposes of classification, summarization and tabulation. It involves coding or classifying data. Extracts of data that are informative in some way will be identified from the transcripts so that important messages hidden in the mass of each interview will be sorted out (Hancock 2002:11). Furthermore, a careful and systematic way of identifying key factors and relationships among them will be done (Wolcott 1994:10 as cited in Van der Westhuizen 2003:178).

To begin with, the informants' responses will be read and re-read. The audiotaped interviews will be listened to over and over again so that the researcher increases familiarity with them. At this juncture the intention will be to use the data "to think with" (Newport 1994:229). In this way, the categories and sub-categories should start to emerge. The literature reviewed and the researcher's experience will assist in identifying the final categories. The researcher will observe his social location and emotional responses of the respondents and hence "writing out our responses to what we are hearing, we then consider how our thoughts and feelings may affect our understanding, our interpretation, and the way we write about that person" (Brown & Gilligan, 1992:27 as in Doucet & Mauthner 2005:6).

Data will be collected by means of the following methods:

The school principals will be interviewed in their offices. Science HODs are to be interviewed in their laboratory blocks in the storerooms used for preparing experiments and some in the staff-rooms. "O" level focus groups will be interviewed in the laboratories. The essence of conducting interviews in their respective settings will deliberately be done to observe the availability or lack of apparatus, chemicals and other requirements for use in their practicals.

Questionnaires are to be distributed to the science educators through the school principal's offices. The school principal will hand them down to the educators via the science HODs. The return path will be the same and this will be done to speed up the process and also to ensure maximum return rate.

3.14 Examination of relevant documents

School documents to be examined will include the following:

- Asset register
- "O" level result analysis
- learners' test and note books
- Programmes for staff development
- Critiques of lesson observation and book inspection

In essence, recorded interviews will be transcribed verbatim. Emerging themes will be identified. The patterns that come out will be matched to that which will present itself from open-ended questionnaires and documents.

3.15 Conclusion

To be able to understand the instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe, the following were undertaken in this study:

- a literature study of the instructional roles of sciences HODs and the learning outcome of "O" level students in Zimbabwe in Kadoma urban secondary schools.
- A qualitative research design will be used to elicit data from the school principals, sciences HODs, sciences educators and focus group interviews with

"O" level science learners. The data obtained will be presented, discussed and analysed in the next chapter.

CHAPTER 4

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1 Introduction

The researcher's attention was captured by educational inputs in curriculum innovation, its implementation and the outputs thereof. It was in the interest of the researcher to establish why the instructional roles of the science HODs are abandoned and neglected. In addition, the researcher endeavoured to establish why the learning outcomes at "O" level are poor. In the process of data collection, the researcher was excited by the observation made by one of the informants and hence:

The heights by great men reached and kept, were not attained by sudden flight, but they, while their companions slept, were toiling upwards in the night (School principal 3 citing Henry. F. Longfellow).

The aim of this study was to establish the instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe. While chapter 3 outlined the research design, instruments employed to gather data and the data analysis plan adopted, chapter four presents the data gathered chiefly from semi-structured interviews, focus group interviews, questionnaires and relevant documents to include departmental files (subject policy), mark lists, departmental budget, lesson observation critiques, key result areas (KRAs) or (work plans) and "O" level results analysis from 1999 to 2003.

To begin with, the research realities will be highlighted. This will be followed by the respondents' profile. Then, the responses from interviews from school principals as well as the science HODs will follow. Responses from both educators and learners on questionnaires and interviews respectively will be presented for the purpose of triangulation. The subsequent section will concurrently deal with the analysis of the responses.

4.2 Research realities

Human beings by nature expose a diversity of behaviour patterns. In this research, the researcher had set a time frame to complete fieldwork. It was a challenge to make sure that the respondents in science departments in secondary schools in Kadoma District in Zimbabwe participated in order to present a balanced report of the instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe.

In the process of data collection, the following aspects are worthy reporting:

4.2.1 Respondents' Enthusiasm

There was resounding cooperation from the majority of respondents. Some participants were so excited that they inquired about what the researcher was going to do with the research findings. Of particular interest was whether there was an immediate solution to the problem of shortage of apparatus, chemicals, textbooks and in some schools the laboratories. From informal discussions, questions asked were pertinent and included the following: How soon should we be expecting the laboratory equipment? For how long are we going to carry-on teaching "skeleton science" for these children are leaving school without science at all?

4.2.2 The value placed on core school business

The period coincided with registration of learners' and payment of "O" level examination fees. School principals were invariably closed in-doors with parents, educators and learners for official business. Now, dealing with the stakeholders was given first priority and the researcher's sessions were rescheduled for the following week "...when dust will have settled down..." as indicated by school principal 1 (joking).

4.2.3 Uncertainties in the education system

The science HOD at school C was a novice and was literally uneasy as the interview unfolded. However, the interviewee gained confidence in the process probably upon realization that the purpose of the interview was not a fault-finding investigation. The researcher had to stop the interview to reassure the interviewee that the interview was for the purpose of this research only and that the researcher and his supervisor will have access to recorded data. On a relatively similar situation, school principal at school D wanted to find out whether electronically recorded data would not appear in the UK or the USA media in the long run?

4.2.4 Demerits of questionnaires

One particular respondent to the questionnaire forgot it home on four occasions up until the researcher gave-up following it up. The motive behind withholding the questionnaire was unknown. In almost the same scenario as the above, the respondent finally cooperated but however asked the researcher to collect the completed questionnaire from one of the schools where the researcher's next visit was on schedule. The inconveniences were due to staggering of sessions where an educator would teach either in the morning session or in the afternoon sessions and then knock-off.

Some questions on the questionnaires were left blank. Perhaps the respondents had no contribution to make or it was not their areas of responsibility.

4.2.5 Shortcomings during field work

There were erratic fuel supplies in Zimbabwe during which time the researcher was doing fieldwork. Transport from one school to the other posed a great problem because the researcher had to resort to using public transport. Some schools visited are located far away from the main roads so the researcher had to complete the remaining distance on foot. The furthest distance the researcher footed was thirty kilometers to and from the school.

Fieldwork in this study was a challenging, exciting and enriching practice. It demanded that the researcher went down to earth and had to be patient, versatile and above all kept well focused.

4.3 Demographic profile of respondents.

As the chief informants of this study are those at the centre of teaching and learning, their licences to the teaching profession are worthy mentioning. The professional qualifications of the informants in this study are represented by the following codes:

C.E	Certificate in Education
Dip. Ed	Diploma in Education
B.Ed	Bachelor of Education
B.Sc	Bachelor of Science
M.Ed	Master of Education
M.Sc	Master of Science

Table 4.1 School principals' profiles

School	Sex	Period of	Professional
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		Continuous Service (years)	Qualifications
A	M	33	C.E
B	M	26	B.Ed
C	F	37	C.E
D	M	29	Dip.Ed
E	F	17	M.Ed
F	M	22	M.Ed
G	M	31	Dip.Ed
H	M	34	M.Ed

The selected sample consisted of one hundred and five subjects, one education officer, eight school principals, eight HODs, sixteen science educators and focus groups of seventy-two "O" level science learners.

4.3.1 School principals

There are two female and six male school principals. The period of service of the school principals ranges from a minimum of seventeen years to thirty-seven years. This gives an average of twenty-nine years of service provision. The professional qualification ranges from a C.E to an M.Ed.

The above illustrates that all school principals interviewed were tried and tested in school management. The Ministry of Education, Sport and Culture in Zimbabwe promotes educators to higher offices on the basis of seniority in the service. The experience gained by individuals over the years becomes a clear testimony for their ability to execute the job in the most acceptable matter. This enables the school administrators and the subject leaders to head their respective areas with great proficiency. It is however tricky in that some heads might be experienced and at the

same time ineffective. Cases of this nature may not be of benefit to the learners.

Professional qualifications are added advantages because the incumbent principals show commitment by upgrading themselves professionally. Essentially, the school principals interviewed demonstrated the skills of the trade (teaching and learning) so that those they lead build confidence in what they do.

Table 4.2 Science HODs profiles

School	Sex	Period of Continuous service (years)	Professional Qualifications
A	M	11	B.Sc (Chem.)
B	F	17	Dip .Ed
C	M	20	M.Sc (Chem.)
D	M	19	M.Sc (Physics)
E	F	16	M.Sc (Biology)
F	M	26	C.E
G	M	25	B.Sc Physics)
H	F	23	M.Sc (Chem.)

4.3.2 Science HODs

The researcher interviewed three female and five male HODs in the science departments. They have served in the Ministry of Education, Sport and Culture for a period of between eleven and twenty-six years. The average period of service in this case is twenty years. Their professional qualifications range from a C E to an M Sc degree with a diversity of specialisations. Their subject majors consist of Chemistry, Biology, Human and Social Biology and Physics.

What appears in this sample is that on average, science HODs are appointed on the basis of seniority, merit and self-motivation. The period taught in schools demonstrates that the subject leaders will have taught in the department for a number of years before being appointed to the departmental chair. The number of HODs with an M.Sc degree shows commitment to staff development and relevance of subject content to the development of the nation.

In summary, the demographic data of school principals and the science HODs revealed that in both cases, appointment is on the basis of merit, maturity and commitment to achieving the best learner outcomes. Up and above these, there is also consideration of professional development and hence some degree qualifications obtained justify these appointments. The task at hand was to establish whether educator qualifications go hand in hand with the gradings attained by the learners at "O" level.

After having read repeatedly the informants' responses to the questionnaires and listened to the school principals and HODs' responses over and over again, some themes emerged. The literature reviewed and the researcher's experience assisted in identifying the final categories. The following themes featured from the collected data:

HOD participation in syllabus design

Instructional roles of science HODs

Motivation of learners in sciences

Assessment of educators and learner progress

Significance of staff development

Constraints faced by science HODs

The respondents' contributions on a particular theme shall be presented, discussed and analysed concurrently as the study unfolds.

The research will employ the following acronyms which attempt to identify the respondents from which data were obtained:

SP	School principal
HOD	Head of department
SEd	Science educator
S FGP	Student focus group
EO	Education officer

4.4 Emerging themes from data

4.4.1 HOD Participation in development of science syllabi

To the critical question on why the instructional roles of science HODs are abandoned and neglected, SPs, science HODs and SEs answered that science HODs have a minimal contribution to the design of the science syllabi. Common amongst the informants' responses was that science HODs are invited to attend workshops at the provincial, district or cluster centres. It is at such fora that the experts identify critical problem areas that present themselves as learning barriers. HODs share the information as panels and map out the potential learning strategies and learning tactics to enable educators to impart knowledge and skills effectively. The shared experiences then filter down to the members of the department in the form of staff development. The educators will develop some learning reinforcers that enable learners to grasp the information in a much easier manner.

4.4.1.1 Role as Curriculum managers

The SPs' responses were triangulated with science HODs responses as well as with questionnaire responses from SEs to establish the relevance and accuracy of the data. Science HODs shared the same sentiments with their SPs. The informants revealed that resource persons or subject experts are invited to share their great experiences with the science HODs. They also tap into a lot of experiences from science HODs by subdividing the participants into smaller groups, which are in turn assigned tasks for discussion. The SPs revealed that the role of HODs as curriculum managers is visible as claimed by SP1:

....our teachers are invited to meetings ... workshops that have to do with science. Normally they go to the regional centre in Chinhoyi, the Provincial Capital of Mashonaland West Province. In such seminars, our HODs are involved in things that deal with curriculum and science teaching. They discuss problems that they face and possible solutions are sorted out...

In this view, the instructional roles of the HODs are strengthened by participating in seminars. Educators' responses revealed that HODs attend meetings organised by the Provincial Education Officers and this helps in updating them in innovations in the syllabi. In support of this development, Bush (2003:15) claims that instructional leadership "... is strongly concerned with teaching and learning, including the professional learning of teachers as well as student growth".

While Winkley (1990 in Field et al 2000:23) contend that "all subjects have their own internal logic and it is for the HOD to represent this logic in the precise selection of content and of teaching and learning processes", the education system does not seem to take this observation seriously. The respondents indicated that the role of the science HOD is relegated to just the breakdown of the science syllabus into teachable units to go along with the appropriate season of the year. For instance, the topic "Science in Agriculture" to be taught during the time farmers will be busy in their fields (ploughing, planting, weeding, spraying chemicals, cloud seeding) so that learners would link what they learn from school to what they practice at home or see others do.

HOD2 had the following to say:

A series of workshops and seminars are held with subject specialists throughout the country. The contributions from the participants are recorded and tabled at the national level. At this level, the policy makers, industrialists and potential employers suggest content which is appropriate and in tandem with the national ideology. Then a national syllabus is designed and distributed to each and every school. This is what we implement here. But if the content is taught and tested, amendments can be made especially after

both teachers and pupils will have dealt with examination papers. After each and every examination paper in June and November, the chief examiners write reports which are forwarded to schools and the Curriculum Development Unit (CDU). If any innovations are deemed necessary, teams of science specialists in consultation with the stakeholders are invited to discuss the issues raised for consideration to policy makers.

Productive work takes place when goals of the school are understood by all stakeholders (Karpicke & Murphy 1996:27 as in Kruger 2003:209). Seminars are designed to enhance the goals of the education system by empowering those who implement the syllabi. SP3 agrees with the above and maintains that

The HOD is a member of the curriculum committee. Our teachers are invited to meetings... that has to do with science or there is that set programme to which Mathematics and Science teachers participate...at such seminars, we find that our HODs are involved in discussions that have to do with curriculum and science teaching. ...engage in discussions of problem topics they come across when they teach sciences. It is at such fora that some of the HODs are called by the Zimbabwe Schools Examination Council (ZIMSEC) to participate in programmes that have to do with curriculum leadership. They attend workshops where they are staff developed, where they get leadership experience and also gain knowledge of how to manage their departments. Besides that, we encourage the teachers and HODs to staff develop themselves. We have seen over years that some science teachers who were not degreed are now degreed... if you are not a good subject manager, you can not teach effectively. You can not discipline pupils if you are not equipped with the managerial skills. I am referring to a teacher as a classroom manager... they manage departmental assets, teaching ... they plan and teach means that they are very good managers

(Hirst 1993 as in Field *et al* 2000:23) claims that knowledge is fundamental to judgements, values, attitudes and beliefs and must therefore form the basis of curriculum. "Since educators take an active hand in decisions affecting their learners, teaching team or department, the materials and the supplies that affect their ability to succeed most directly" (Ackerman *et al* 1996:113), they should be seen playing a significant role in the design of the content they teach. Furthermore, literature point to the conclusion that there is substantial evidence that HODs have great potential for influencing learners' achievement (Harris, Jamieson & Russ 1995 as in Ferrucci & Carter 2004:3) and seemingly, this concurs with informants'

experiences. This addresses the researcher's question on whether HODs are equipped with managerial skills. And as such the notion of giving a voice to all people as a foundation of an organisation that is willing to experiment and learn (McREL 2002:13) is addressed.

4.4.1.2 Inspiration and Enthusiasm

The question that concerns how science HODs inspire and enthuse subject teachers and support their professional development is addressed by the seminars arranged by the EOs. Some kind of professional development is witnessed if this definition of staff development still stands correct:

... being about making sure that staff are involved in all decisions that affect them, from big change programmes, to the day-to-day decisions on how services are delivered
Munroi (2003:278).

The informants' assertions above revealed that there is wide support for the question of involvement of educators in programmes that affect effective teaching and learning but what triggered this study are the poor results at "O" level in Zimbabwe. It is important to take note of the fact that stakeholders are not pleased with the poor results at "O" level. This follows from the notion that education is an investment, but an investment at a rate of return. This aspect of poor learning outcomes at "O" level brings to mind whether the instructional roles of sciences HODs are clear. Although the informants were in agreement that in-service courses are mounted with various educational institutions, "It is only if people are involved in the process of decision-making that they will own the decisions taken" (Udjombala 2002:49). Furthermore, "...we are likely to modify our own behaviour when we participate in problem

analysis and solution and likely to carry out decisions we have helped make" (Weisbord 1987:89).

With reference to the above citations, a guide of the nature of reality with regards to the instructional roles of science HODs in the curriculum design and the subsequent implementation thereof is provided for. The researcher set out to find out the instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe. What the informants revealed was that the HODs are involved to a limited extent and this gives rise to poor learning outcomes.

SP4 claimed that

In the majority of cases, HODs are restricted to breaking down the national syllabi into teachable units. Their role is to design the school syllabus. However, at some point they are invited to attend workshops where research programmes are handled to develop the subject ...in these panels, they identify problem areas and discuss ... best methods of instruction and appropriate materials to be improvised in teaching topics in the wake of shortages in the provision of chemicals and laboratory equipment.

Echoing the above, Kurt Lewin's core principle has it that:

... we are likely to modify our behaviour when we participate in problem analysis and solution and likely to carry out decisions we have helped make... (Weisbord 1987:89).

4.4.1.3 Relevance of seminars

This is also related to the assertion that "involving people is not a technique, it is the bedrock of social learning, requiring goal focus, feedback, leadership and participation by all relevant actors" (Weisbord 1987:94). The seminars that are attended by the science HODs are important because participants will be expected

to focus on whatever aspect under discussion in relation to the learner, the learning environment and the supporting resources available in order to achieve the best learning outcomes. The suggested ideas would be translated to staff development sessions at the department level in their respective schools. The question of consultation is not ruled out despite the fact that all the HODs may not be incorporated in the innovation process. Some are engaged while others are left out but in all fairness, the HODs have an input somewhere somehow.

4.4.1.4 Limited participation

HOD5 reiterated that their involvement in the design of the syllabi is limited to the classroom since their discussions in subject panels may come up with important suggestions pertaining to improvements in their subject and yet to be frustrated by school authorities who fail to support their decisions.

HOD5 claims:

Yes, we are involved in the manner that there are subject panels ... one of them being science ... when syllabi are formed, the HODs are consulted.... Information is transmitted downwards to subject teachers for comments ... which I think there is indirect participation

Participation in the design of the syllabi is in the best interest of the subject teacher. The educator who would have taken part in innovations made in the subject content stands a greater chance of imparting knowledge and skills to learners. Involvement in the development of content gives impetus to the educators to carry out research in that particular subject so that the discussions would be fruitful.

4.4.1.5 Pattern of learning outcomes

Perhaps, the most important and observable thing in schools is the pattern of learning outcomes. This research focused on "O" level results from 1999 to 2003. The researcher was given duplicate copies of "O" level results from 1999 to 2003. The results analysis by subject was also brought to the researcher's attention. Records kept and regularly completed as an intrinsic part of the teaching process are the most economical way to obtain cumulative information about a learner (Hull 1994:14 as in Field *et al* 2000:48)

The analysis focused on aspects that attributed to good learning outcomes, constraints encountered and ways and means of improving the results. The recommendations from the subject department were concerned with resource provision particularly textbooks, apparatus, chemicals and qualified educators. The following table illustrates the percentage pass rate of "O" level science learners in the seven secondary schools under investigation. One school could not submit their results to the researcher.

Table 4.3 "O" level science % pass rate from 1999 to 2003

School Year and % Pass Rate

	1999	2000	2001	2002	2003	Average
A	28	37.6	26.8	30	29.8	31
B	25	33.3	11	17.1	29.2	23
C	47.6	23.2	31	22.8	51.7	35
D	25.5	11	28.5	20.5	13.5	20
E	16.4	21	19.8	28.7	13.4	19.9

F	22	27.1	35.5	35.5	39	29
G	70	68	53	53	62	64

The average percentage pass rate for the period under review is 27, 7%. The table shows that the average pass rate per school falls within the range of 44, 1 %. The general pattern emerging is that science learners are not doing very well at "O" level. It could also mean that the science educators are not doing justice to the profession. For instance, school E has the least average percentage pass rate of 19, 9%, which shows that over the period under review, the HOD and SEs in the department have not been striving to maintain or improve the percentage pass rate.

4.4.1.6 Importance of Workshops

The SPs, HODs and SEs were in agreement that workshops they engage in are useful. But, these claims turn out to be baseless as witnessed by the poor learning outcomes. One HOD made a strong observation by mentioning that there is lack of focus and commitment on the part of stakeholders. The following statement was made by HOD 6:

In making innovations in sciences, participation by HODs cannot be ruled out completely. They are key to its implementation and hence their experiences converted into voices are valid. What I am not sure of is whether the science HODs are confident in what they teach. You will find most of them highlighting topics which they feel are difficult for students. But, by closely looking at this, one is tempted to make a conclusion that it is the teachers who find it difficult to teach the topics "wazviona" (Shona, for you see). Useful topics are removed from the syllabus because of incompetence, laziness and lack of practical commitment on the part of some teachers "wazviona". At the end of it all, the science we teach is watered down to suit the caliber of teachers I have described and hence when you go to the university, they will have negatively impressed upon students that sciences are very difficult. This is reflected in thin enrolments in this department. I believe that in order to develop our science, learners should have the right frame of mind from the onset. This should be induced by teachers who should make the learning of these subjects as interesting as is possible. There should as well be support in terms of provisions by all stakeholders ... Employers should recruit science teachers who have students at heart ... these must receive training more regularly so that they are not found wanting in as much as content delivery is concerned.

Workshops lose their value when development of science and technology is undermined by scratching out challenging and yet important topics for the development of the national industrial sector.

4.4.1.7 Curriculum innovation

Busher & Harris (1999:31) as in Ferrucci & Carter (2004:2) contend that schools with high learners' achievement typically possess leaders such as HODs who make contributions to the success of academic programmes. In essence, innovations in syllabi should be done through consultations with the people who matter. Stakeholders who take part should be well versed in the ideology of the nation. More so, they should be experts who are aware of the resource base of the nation and the correct starting point for innovations in the syllabi content. Essentially, those in the field of education, teaching specific subjects should take part to give honest, well-focused as well as realistic contributions in order that they implement what they have helped make and are interested in.

The learners who benefit from the knowledge and skills thereof should find it easy to work in their respective fields of work choices. This becomes possible when various sectors orient learners during career guidance sessions so that they emulate specific professions that link up with their subjects of interest. The link between school content and the field of work was highlighted in support of the school-to-work opportunities Act in USA, when secretary of labour Reich stated that "... there

should not be a barrier between education and work. We 're talking about a new economy in which lifelong learning is a necessity for every single member of the American workforce" (Reich, in Olson 1994:21). In Zimbabwe, the Ministry of Education Sport and Culture introduced education with production in the early 80s. The education system aimed at "... developing and promotion of an education system that is relevant to the socio-economic development of Zimbabwe through the provision of entrepreneurial, academic and vocational skills" (Fall 2005:3).

There should be a symbiotic relationship between what is taught in schools and what learners experience in later life. Learners must derive benefit from school experiences which translate into reality at the job market after school.

4.4.2 Instructional roles of science HODs

The informants' responses on the instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe were many and varied. There was a myriad of suggestions on what role it is that science subject leaders do. These include HODs as champions of innovative initiatives, facilitators of adaptability to new behaviour, synthesizers of information and implementers of strategies formulated during meetings.

4.4.2.1 Innovative initiatives

As champions of innovative initiatives, HODs were portrayed as hunters. They survive on improvising materials for use to carry out laboratory experiments. If

laboratory experiments are carried out, then the link between theory and practice becomes clear for learners. It is a subject of discussion by scholars that if learners fail, the educators also fail. According to the cognitive psychologists like Piaget and Bruner, there is no such thing as a dull child, but there are those learners whom we fail to teach and hence the claim that "any idea or problem or body of knowledge can be presented in a form simple enough so that any particular learner can understand it in a recognizable form" (Bruner 1967 as in Flores 2005:2). In support of the above, literature has it that "... you can't teach people everything they need to know. The best you can do is position them where they can find what they need to know when they need to know it" (Papert in Flores 2005:4). This, in a sense, would call for hard work on the educators' behalf to create a learning atmosphere which is conducive to the learner thus catering for the individual differences.

4.4.2.2 HODs as facilitators

Learners' behaviour contributes significantly to the culture of teaching and learning. The educators set the standard behaviour expected of a good learner. The HODs by virtue of their proximity to the learners monitor and control learner behaviour through continuous assessment of their work as individuals and in groups. They keep shaping and reshaping the behaviour of learners so that the standards expected by the society are achieved. HODs are the middlemen between the community and the school administration in matters pertaining to the performance of the department. HODs are blamed for poor learning outcomes because they are placed at the centre of teaching and learning. This becomes the centre of conflict because all

stakeholders should have an important part to play if good results are to be achieved. Informants revealed that learners achieve the best they can through hard work. A lot of effort invested towards achievement of set goals yields good results in the majority of cases and hence

The heights by great men reached and kept, were not attained by sudden flight, but they, while their companions slept, were toiling upwards in the night
(School principal at school C citing Henry. F. Longfellow).

The claim by the school principal above shows that successful learners put a lot of effort in their work. But, when educators and school management are continually at odds, everyone suffers—including learners. Prolonged battles over pay and working conditions are expensive and can drain away the resources, energy, and focus that could be trained on classrooms and learners. The work plans designed by the educators revealed that the objectives set are measurable, achievable and time framed but, HODs fail to achieve the results because they are limited by financial constraints to purchase materials to carry out experiments.

Although some respondents confessed ignorance on the instructional roles of science HODs, the respondents revealed that subject leaders have a daunting task for the work of the members in the department they lead. They are accountable to the stakeholders for learners' performance in examinations at "O" level in both the June and November sitting.

School principals, HODs and SEs highlighted that an HOD is frequently required to work in a variety of capacities and perform a broad set of tasks. It is in this view that the respondents submitted the following responsibilities of an HOD:

4.4.2.3 Strategic direction and development of the subject

HODs are responsible for designing the school science syllabus deriving from the national syllabus. The assumption is that when HODs get the necessary support from the administration, teaching and learning can take place smoothly giving rise to good learning outcomes. The survey conducted revealed the prevalence of haziness in the instructional roles of science HODs. And, yet, awareness of parameters from which one operates is very important, considering the effect of ownership of the enterprise. The following section follows up the respondents' minds and hearts on instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe. SP4 explains

an HOD is a manager of the department. His duty is to look after the laboratory equipment, design curriculum, and teach fellow teachers and learners. He has to be careful when experiments are carried out and so he teaches amongst other things safety precautions. On specific periods, he staff develops teachers ... communicates with the head and heads the school if both the school principal and the deputy are away

This is echoed by SP5 who asserts that

an HOD in my view is a person who has commitment to professional output. A person with zeal... inducts new teachers in the department, examines schemes of work and consults the colleagues in the department in the event of any development in the subject content. He assists those student teachers on teaching practice

SP2 adds that

the HOD makes orders of the department in consultation with colleagues in the department and as the "fundi," (expert) he works with targets which have to be met at any given time

It emerges from the respondents that the sciences HODs do not have training on leading the departments. But, they gather confidence through participation in seminars and workshops organized by the subject coordinators (EOs). In trying to defend the position that the HODs are exposed to some kind of training, HOD5 asserts that

we used to have handbooks outlining what the job of the HOD entails. The workshops were significant because topics lined up for discussions help us get along with the most appropriate procedures in the organization and running of science departments. It is also obvious from our context that there is no formal training for HODs, like there is none for school heads.

4.4.2.4 Effective teaching and learning

Informants revealed that for effective teaching and learning to take place, the following roles are identified with science HODs:

- Giving guidelines to educators on teaching strategies
- Supervising teachers through lesson observation and inspection of text and exercise books, schemes of work, learners' notes and test exercise books
- Assessment of smooth running of department on day-to-day basis to ensure adequate syllabus coverage
- Assessment of teacher performance during execution of their duties

Given that teaching and learning processes are viewed from different perspectives, informants indicated that we learn from mistakes made by others. In simpler terms, they claimed that experience is the best teacher. SPs 1, 2, & 3 purport that the roles of the HODs should encompass the following:

- to instill confidence in the staff
- supervise schemes on a fortnightly basis
- observe teachers' records of marks and ensure that learners are given adequate notes and tests which are marked
- staff develop members of the department once every term.

SP1 and HOD4 concurs with Siyakwazi and Siyakwazi (1999: v) in the assertion that a teacher is a learner but a learner who sees through the teachers' eye. They have a strong belief that knowledge changes and hence educators should follow up trends of development in content changes in their respective area of specialization. HOD7 explains

what I can identify as core instructional roles of the science HODs include the following: Keeping abreast with the most recent developments in subject content and updating the subject teachers about the changes in the subject,. Setting targets for both teachers and learners on termly basis so that they make it a point that adequate content coverage is done and if there are problems identified, time should be created to make up for the gaps, and scrutinizes test samples for learners for corrections, soundness before they are typed.

4.4.2.5 Development of resources

The following roles were identified as core in as much as resource development and provision are concerned:

Procurement of resources - laboratory equipment, textbooks, chemicals and storage of departmental assets

Class allocation

Evaluation through analysis of mid and end of year results

Counsel and advice to learners.

Conducting staff development sessions

The pertinent issue raised is that the HODs should be placed at the most appropriate position in the mainstream school administrative structures, so that they facilitate the production of good learning outcomes at "O" level. Furthermore, SP8 reiterates that

the HOD conducts meetings with fellow colleagues and solve problems that may arise in the department. He gives advice to the head on essential requirements for the smooth functioning of the department.

From this point of view, literature has revealed that

...when teachers have chosen their settings, and have been active in designing their own school's programme, they will be more committed to implementing those programmes effectively...

(Chubb & More 1990 as in Leithwood 2003:37).

This concurs with what was revealed by the respondents who claim that the HODs attend workshops that focus on issues related to management of the department so that they are empowered to lead effectively. As the subject leader, all that obtains in the subject department is taken care of by the HOD. The communication that exists in the department illustrates that the subject leaders keep encouraging members of the department to work towards achieving the best out of the available resources.

The question that addresses HODs walking a tight rope was addressed by their role as link persons between learners and educators, learners and school administration, educators and school administration, learners and community and school administration and the community on matters that concern the science department.

SP1 takes this matter further and maintains that

the HOD should have knowledge of recent resources for the smooth running of the science department. He should have knowledge of the capabilities of the teachers in the department... how school runs

HOD3 follows up the above and had this to say

there is no hard and fast rule that instructs school administration to tabulate the instructional roles of subject leaders. What exists at this school is that the middle manager is appointed by the school administration by virtue of his or her subject expertise, merit, resourcefulness and commitment to school work. The assumption being that s/he is well versed in teaching of the subject and therefore can assist members of the department as well as the administration when need arises. In all honesties, the trust bestowed in the HOD is done in the hope that the school would witness an improvement in the students' results.

The HOD is the department chairperson but is not empowered to make available all the resources necessary for total achievement of learning outcomes at "O" level. In this repertoire of respondents' responses, it appears true that one key role of the HODs entail the following: "...transmit the vision on through the organization, articulate it in practical terms, and work with colleagues to turn it into reality" (Bennett 1995:18 in Middlewood and Lumby 2002:149). Effectively, as an advisor to the school principal, they (SPs) tend to rely heavily on them (HODs) in order to get information of what goes on at the "chalk face" and to highlight them on learning barriers and opportunities. Therefore, the roles of the subject leader should focus on development of his or her field of expertise taking cognisance of material and human resources at his or her disposal.

Most HODs are involved in helping to shape school strategic plans, primarily by developing their own department plans and commenting on drafts of the institutional plan (Middlewood and Lumby 2002:155). There is some degree of sameness on the job specification of the science HODs. The informants alluded to the fact that the

HOD has a key role in tirelessly developing his department. This is done through liaising with his colleagues and communicating whatever obtains in the department to the school principal. This aspect provides answers to the second research question on assessment of colleagues. In agreement, Pain (1990:677) as in Walberg *et al* (1993:669) referring to Chinese teachers allude that

working together constitutes the circumstances or environment in which Chinese teachers work, like the air in which we live, it seems to be too common and too customary for people to notice its existence

Although the instructional roles of science HODs may not be tabulated or formally stipulated, the assumption is that they can lead the department using their experience. Naturally, one acquires a wider experiential horizon with age in the service. Given that the HODs will have taught for several years, teaching experience will be tapped to inform, direct and redirect the efforts of the team in order to achieve good learning outcomes at "O" level

On checking the HOD profile, there is evidence that the middle managers are senior civil servants with the prerequisite professional qualifications. What baffles is that the "O" level results are very poor. In this study, one of the roles identified was "*to conscientize learners on the importance of science*". This aspect seems absurd as evidenced by poor "O" level results. Learners readily process the information they value and later stores it permanently for future use. Educators can design learning strategies to ensure that what they teach draws learners' attention so that information learnt is not forgotten. For instance, HOD3 mentioned that the educators have to be careful when carrying out laboratory experiments. Emphasis was made

on "observing stringent measures in the laboratory in order to avoid unwarranted accidents". Therefore, it may not be appropriate to say that the process of conscientization is fruitful given the poor learning outcomes at "O" level.

One of the critical questions in this study was concerned with the role conflict between the school principal and the science HODs. This question's answer is provided for by lack of support from the school administration in the procurement of materials for use in experiments. The school principals characterised the budget for the science department as of a billionaire for only a millionaire's budget. HOD4 illustrates this point,

I have known no supervisor except discipline, commitment to school work and above all having learners' interest at heart. The only disheartening situation is lack of administration support in purchase of materials for experiments

The HOD prepares departmental budget but this is subject to censorship by the SPs. HODs orders materials and equipment for experiments but SPs sometimes take it to be a waste of school resources. HOD3 highlight that

you ask the school management team to employ a laboratory assistant. What you see is that the head takes long to respond to the request. You keep appealing to the school principal until one day you are summoned to his office to be introduced to the laboratory assistant who has absolutely no clue on identifying chemicals, preparing them before experiments and so on. It is then that the teachers do it for themselves and as a result it defeats the purpose of which the assistant was employed

As a follow up to the above observation, HOD5 commented thus

... in instances of this nature, even if chemicals are available, the educators just theorise and then the learners do not gain much

By closely focusing on this assertion, one is compelled to assert that there are science educators who do not have learners' interests at heart. This kind of attitude

is detrimental to learner progress and as a result poor results are realized at "O" level.

In essence, the HODs should strike a balance between their resource base and the learner expectations. The preparations they do should be matched with the necessary administrative support so that if qualified teachers are employed, apparatus, chemicals and qualified laboratory assistants are available, then, the desired learning outcomes will be attained. The SPs who lack focus on the significant influence the hands-on experience has on learning are not supportive in as far as purchase of laboratory equipment is concerned.

The problem at this point lies in knowing what a standard science department looks like. It only takes a subject specialist to appreciate the development of the department. A non-specialist may not be convinced that there is need to link theory and practice in all practical subjects. HOD1 mentioned problems that have to do with inability of learners to abstract concepts taught, shortage of educational media and this results in poor performance and hence "*you can take a horse to the river but you can not make it drink*". In one-way or the other, the HODs are failing in their responsibility because it is their role to be able to staff develop educators on most appropriate methods of instruction together with the most advantageous learning environments (Hornby *et al* 1995:16 in Field *et al* 2000:39). In addition, learners fail to achieve the best results because of the task being badly presented, the reward for

achievement being unrewarding or because of the task being too difficult (Farrell in Field *et al* 2000:39).

Furthermore, HODs are encouraged to plan work that ensure that the learning process is seen in terms of the need to modify teaching strategies in a non-threatening way, rather than as an indication of the innate disability of the child (Farrell in Field *et al* 2000:54). The TTA (1998) in Field *et al* (2000:79) adds that the core purpose of the subject leader is

...to provide leadership and direction for the subject and ensure that it is managed and organised to meet the aims and objectives of the school and the subject...

The other important role of the middle manager is assessment of fellow colleagues in the department. Some teachers view this aspect with suspicion. For instance, assessment would imply a process of shaping the area of weakness in the department. On the other hand it would mean fault finding and later on victimization of members of the department. Now, as a measure to find out how much would have been covered on the objectives, assessment becomes a useful tool to rectify areas of weaknesses and subsequently leads to achievement of good results. The moment it has negative connotations, the whole system becomes unhealthy and this gives rise to poor learning outcomes.

It is necessary to agree that the classroom observation is not about doing it the right way or doing it the wrong way - it is more about what can be learnt from each other, and what learning can come from mistakes (Gold 2000:102).

SFGP7 highlighted that some educators just teach referring to a textbook in class. This shows lack of preparation. As such, it does not make sense attending lessons of this nature; instead learners suggested a situation where they are allowed to opt-out of the classes in order to carry out their research in the library.

4.5 Motivation of learners in sciences

It is very important to draw learners' attention to issues of substance in science to pave way for purposeful engagement in educational activities. The respondents identified a variety of ways in which they can motivate learners to develop scientific knowledge and skills. The following constitutes the ways and means by which interest is generated by science educators:

4.5.1 Organising field trips

Learners enjoy outings with a scientific bearing. HOD1 emphasized that

field trips to industries with a scientific orientation triggers a lot of interest on the part of our pupils. Parents do not hesitate to make contributions towards transport costs and other administrative costs. They are quite aware that in the long run, their children will learn a wide range of manufacturing processes at the visited sites. Visits to places like the Sable Chemical Industry and the Zimbabwe Iron and Steel Industry (ZISCO), both in Kwekwe exposes the students to real life experiences. Equipped with authentic information, when we teach topics related to manufacturing, the students would quickly attach meaning to the concepts taught.

He went on to say

we ...visit places like the water works, sewerage tanks to enable learners to be on familiar terms with relationships between science and our day-to-day life experiences

As a follow up to the above, HOD3 had to say

knowledge of science in agriculture illustrates to the learners how plants grow and the necessary prerequisite requirements which boost the yields. In this respect application principles would assist pupils after leaving school

In essence, science as a practical subject should involve learners so that when confronted with a problem that calls for a scientific solution, this can be solved applying the principles learnt at school. So, the emphasis placed on the practicality of the subject requires a deeper understanding on the part of the administrators. They need to support the science HODs when they organise trips and when ordering chemicals and equipment for use in laboratories. HOD4 goes further to say

when you are teaching them, you discover that there will be 100 % participation because what you will be teaching will be reality that they go through on daily basis. The good part is that science does not isolate students from their living but lets them see the reality of what they do in life and what is being taught in the subject

4.5.2 Exposure to career guidance

HODs 3, 4 & 6 presented career guidance as an important influence in increasing awareness on candidates to enhance the percentage pass rate. Their arguments are based on Albert Bandura's model of social learning. In this context, learning is through observation and modeling certain types of behaviour. The HODs point out that learners like any other human being are gregarious in nature. They have the potential to imitate what others do and hence exposing them to a multiplicity of careers which have high regard for scientific development enables them to build intrinsic motivation. This builds in them an impetus to read widely and question those aspects not clear in their science syllabus. The learners learn socially the lifestyles of professional personalities engaged in scientifically related fields so that they take to reading seriously for them to join these fields in future.

4.5.3 Use of laboratory experiments

The most popular way identified by the HODs and the learners is the most frequently favoured and convenient way to capture learners' interest in science. The use of the laboratory at the school is very important to a scientifically oriented teacher or learner. However, the laboratories could just be empty structures without the capacity to support experiments. The materials are difficult to come by as it stands now. SP4 asserts that

we have no experiments carried out at this school. There are "lab holes" (structures without the materials for use) because honestly speaking, there is nothing in terms of chemicals and equipment

Laboratory experiments prepared and carried out successfully naturally generate a lot of interest to learners. And, in turn, the learners would reciprocate by passing the examinations. Teachers, as was indicated earlier on, are overloaded with work since the laboratory assistants are either available but without the prerequisite knowledge or not there at all. This emanates from the schools' inability to design projects which generate a lot of income to boost science accounts.

Much as the science HODs would like to have learners enjoy the laboratory experiments, it is beyond their control to avail the materials for use. HODs were frustrated because of the shortages since the community shoulders blame on them in an event that learners fail the examinations. HOD8 indicated that

there are insufficient text books, equipment and chemicals for experiments so much so that we theorise... chemicals and apparatus are very expensive and the levies paid are

very little to cater for the requirements of the department. Up to now, we have gone for years without apparatus. The administration tries by all means to acquire apparatus which are in most cases inadequate for our requirements

HOD 7 went further upholding that

it is difficult to teach science because the chemicals are out of reach. The administration used to give us necessary support in the purchase of laboratory equipments but now because of economic hardships which are rampant within our country, prices of all the things are skyrocketing, prices of chemicals, apparatus and other laboratory equipment are skyrocketing... thus why it is difficult too teach science nowadays. We just have chemicals for examination purposes but for day-to-day experiments it's becoming impossible especially for the junior classes.

HOD5 adds

...Normally, we are just surviving because money is not available, we would want to buy chemicals but they are out of reach..., we try to improvise materials for experiments but you can imagine the kind of teachers we have these days. Those who do not have the student at heart. They theorise everything and you can't expect miracles for students at the end of the year. The forms 1s and 2s do not benefit from the teaching, the time they will be doing "O" level; there is no science for them"

HOD6 reiterates

if we want to develop the nation technologically, we are going to miss out somewhere in-between. Students are leaving school without science at all... They have skeleton staff...there is no flesh at all and more especially that the syllabus is too long and does not cater for important aspects which I feel are essential for generating scientific orientation in our learners.

Focus groups claim that science without experiments does not appeal to their minds.

They call for a situation in which they are involved in preparing the chemicals and

carrying out experiments. SFGP1 suggested the following

the science HOD has to ask our parents to pay additional science levy. This can be possible if he convinces parents that science is important in our lives. He has to demonstrate this by citing practical examples where this is true and by identifying with good "O" level results

The issue at stake is that science HODs have a great role to play by virtue of their subject specialization. Every other person looks forward to seeing the HODs

performing miracles by way of ensuring that "O" level students excel in their examinations. For instance SP 4 strongly believed that

it is the HOD's role to ensure that the "O" level students pass the examinations. It is thrust upon him to make it a point that "O" level pupils sail through in final examinations. No matter what it takes, the pupils should pass with flying colours

The scenario is different when one goes on to consult with the HODs. They present their budget requirements to the school management team. First, they shop around for quotations for prizes of commodities from at least three service providers for each product. They then select from the cheapest, durable and available product.

It is from this homework then that you find the admin telling you that there is no money. The school is unable to buy lab equipment and chemicals and yet they expect good results. This dampens the workmanship spirit and the zeal to produce the best in the district or even the cluster
explained HOD 5.

School principals argue that learner failure should be shouldered by the HODs. In order to promote and improve school performance, there needs to be greater research interest at department level (Harries et al 1995 in White 2004:3). While this stands to be correct, HODs are prepared for this responsibility if they are given the necessary administrative support.

SP 2 shares a different experience by suggesting that

the Ministry of Education, Sport and Culture introduced automatic promotion in schools for no apparent reason. The factors related to pupils' prior attainment before entering secondary school, student background factors, gender, age, ethnicity are not considered. Our school is a government school in which the doors are open for every school going child to enroll. This stretches the little resources too far. It also brings to mind the issue of hot sitting. Therefore, with these problems, surely, no matter how hard or how effective the teachers work, the results are still poor.

SP5 compliments the above by reiterating that "you can take a horse to the river but you cannot make it drink". The learners who lack focus are difficult to turn their eyes from darkness to light. The community has to be an informed one that is prepared to

face the challenges at the school. Such communities would be prepared to provide workable solutions to enable learners to succeed in their studies. This view was also raised by President Lynden B. Johnson of USA in 1965 when he said

it is not enough just to open the gates of opportunities when some of the citizens have inabilities which prevent them from walking through these gates and it is unfair to ask one group to begin running from the starting point when the other group has gone for some miles in the track
(Sowell 1994:46).

The salient point is that it is true that learners come from different backgrounds. They have different experiences and so have unequal capacities in assimilation and accommodation of data. Given that there are shortages of important materials for use in schools, the learners find it very difficult to come to grips with the content. The educators indicated that there is hot sitting (a situation were one group of learners study from the morning to midday and the other group begins in the midday to the late afternoon) because the educator-learner ratio is high in schools and as such educators cannot attend to individual learners' needs. They also demonstrated that there is high learner-book ratio ranging from 4:1 to 7:1.

It takes long for a learner to have access to a textbook. Whilst the above has been observed, literature points to the fact that teachers have a hand in student failure. Brighthouse and Moon 1990 as in Field *et al* (2000:26) claim that Osborn's assertion that "...schools... and determined teachers in their privacy, of their classrooms manage to violate numerous regulations and traditions (Osborn 1972:14) still stands true". HODs are the people on the ground as they mingle with both learners and

teachers on a daily basis. They make observations of what transpires in the classroom on a regular basis. Failure by learners can be overcome

...if all that successful teachers have to do, it seems, is to apply "good teaching" in a way that failure is replaced by a sense of achievement...
(Gulliford 1995:22 as in Field *et al* 2000:37)

4.6 Assessment of educators and student progress

Monitoring the progress made at any institution at any given time is the essence of evaluation. HODs and SPs uphold this role in order to maintain good learning outcomes and achieve the goals set by the stakeholders. The mission statement of the Ministry of Education, Sport and Culture is fulfilled by conducting inspection of schemes of work; mark lists, registers, learners' notes and test exercise books as well as observing educators teaching.

4.6.1 Self-evaluation assessment appraisal system

The Ministry of Education, Sport and Culture gave an impetus on individual performance by introducing a self-evaluation assessment appraisal system.

The appraisal system introduced by the Republic of Zimbabwe in January 1996 was a well-calculated programme to ensure that people work with vision. In the appraisal system, the appraiser and the appraisee set detailed work plans on precisely what is expected of the subordinate during the period under review. The reviews are done on a quarterly basis so that each review period assesses the progress made in achieving the Key Result Areas (KRAs). KRAs are those

elements in the job description that are critical to accomplishing one's job. If the KRAs are met or not met, both the appraiser and the appraisee would agree or disagree on the rating score. It is important to provide feedback on performance of subordinates to acknowledge good performance and help to develop them for improved performance. Feedback should therefore contain both praise and suggestions for areas that need improvement.

Suppose evidence points to the fact that the KRAs are not met or are met, both appraiser and appraisee suggest a score rated out of 5 and agree upon it. The score determines whether or not the appraisee will be upgraded in the system. Essentially, upward mobility in the system is the most ideal situation and thus all other things being equal, the momentum set by the appraisal system generates high workmanship spirits for educators.

Objectives set out by the appraisee must be specific, measurable, achievable, focused on results and time framed (SMART) specifying the exact date by which the objectives will be achieved, (as an example December 31st 2005). Action plans follows from these objectives. These are physical means of achieving the objectives. The more comprehensive and more detailed the action plan, the greater the likelihood of the objectives being achieved.

HOD 3 explains

... evaluation of teaching performance is done once every term. This is done at the end of the term when at the same time comments from learners are invited. Work of learners is checked by parents and guardians on consultation days. The science educator who teaches the learners will explain to the parents the learning pattern that emerge for the learner. Mention of participation in co-curricular activities will be done. Areas of learner

strength and weaknesses will be highlighted and both the educator and the parent will make a plan to improve the learner's performance.

4.6.2 Evidence of learners' progress

There was evidence of assessment of learners' progress in science. HOD 5 maintained that

learners' exercise and note books are checked by the school principal and the HOD once every term

This was evidenced by comments made in the learners' notes and tests books. On the sample of the learners' books seen by the researcher, school stamps were used to stamp checked learners' work and the accompanying signature and comments of the school principal were seen. Progress of learners was also shown by the number of written exercises and tests at the time the researcher visited the schools.

4.6.3 Observation critiques

The research established that both the SPs and HODs do assessment of what obtains in the classrooms. They produced to the researcher lesson observation critiques filed and had on them comments for the particular lessons. The same critiques would also appear in the departmental file signed by the educator and stamped by the SP. The same was true in respect to the critiques for HOD assessment.

For assessment to be fruitful, SP1 suggested that the HOD should manage by "roaming". He went further to maintain that

in lesson observation sessions, HODs should be able to identify gaps. Gaps are those areas of weakness that derail learners' progress. Once these gaps have been identified, necessary corrective measures should be put in place to rectify the situation. The same area of concern should be communicated to the HOD so that a much more conducive learning environment is created.

SP3 went further to illustrate how management by roaming works out.

Now, to make sure that the suggested areas of improvement have been put in place, the head manages by roaming. You can move outside the classroom whilst the educator is in the process of lesson delivery. You can pretend to pick up papers or weed the flower beds... to find out if there is progress in the manner in which the lessons are presented

In a sense, the assessment procedure appears as if it is some kind of witch-hunting. The educator would be unaware that someone is listening to what will be happening in the class from outside. This assessment from outside will be used as a basis for argument on the progress of the lesson. This practice in a way stresses the educators because they will be called to the SPs office to explain some of the practices. This is an inappropriate method of assessment because it clearly demonstrates that an atmosphere of mistrust obtains.

Not all school principals buy this form of assessment. SP5 & 6 offered a different and directly opposite form of assessment to the above.

You set objectives as a team. Once this has been done, everyone develops a sense of ownership of the process. There is no good reason for you to keep rescheduling lesson observation sessions. This defeat the purpose for which team objectives are designed since the individual educators would be in a position to evaluate themselves periodically referring to the criteria set. If standard test exercises are set, then performance levels will prove whether there is significant progress taking place in the sciences or not.

In other words this is what they referred to as management by going away. The educators are given leeway to keep referring to their KRAs. A sense of individual

autonomy is achieved and the results will tell whether the educators are working or not.

4.7 Significance of staff development

Staff development was presented as an important theme that helps educators keep abreast with current trends in science. The informants identified the following as benefits derived from staff development sessions:

- Sharing ideas on appropriate methods of instruction in imparting knowledge or discussing challenging topics and sourcing resources.
- Updating colleagues on content changes and current developments in policies.
- Fora for feedback on meetings organised at cluster, district or provincial levels.
- Educators are afforded an opportunity to voice their concerns.
- Induction of teachers joining the profession from institutions of higher learning.
- Help to highlight and or identify strengths and weaknesses of the departments and therefore pave way for improvement.
- Fora for improving working relations in the department and encouraging teachers to work as a team.
- Organise strategies to increase the percentage pass rate of learners at O level.

SP5 pointed out that the departmental meetings are encouraged at their school. The HOD chairs the meetings and after every session a secretary compiles the minutes for onward transmission to the school principal. SP5 says

Every department identifies free slots on the timetable. These free slots are used for staff development sessions. The HOD and his team identify those areas which are critical. The science members of the department staff develop each other and after every session, minutes signed by the HOD are forwarded to me. Many a times when I realise that this department is overzealous. Their budget exceeds what is allocated to them. Our school is a government school and as such, fees paid by learners are controlled by the government and are very low We can not manage to buy microscopes for example because the school budget does not support this ...

The essence of staff development sessions is to improve the educators and learners' performance. Notable advantages of departmental meetings include participation by staff in matters that enhance achievement of their KRAs.

The respondents upheld development opportunities that emanate from professional development provision. SPs and HODs made it clear that the educators must use whatever opportunity that there is to upgrade their professional qualifications. Staff development sessions organised by HODs and subject Eos foster a sense of responsibility on educators and therefore gives an impetus on educators to produce the best they can for students. SPs make effort to invite guests to present lectures on topical issues in the respective subjects. It is these resource persons that keep educators aware of latest developments in science. The HODs are placed at the centre to urge their colleagues in the departments to participate in subject associations and most importantly to strive for higher professional qualifications.

SPs maintained that staff development breeds an atmosphere where ideas are shared on the most appropriate methods of instruction especially those that relate to teaching on challenging topics. In support of the above, HOD4 maintains that

If I do my part well ... staff develop, assess colleagues ... it means that they are going to push on what we will have discussed in the department ... for example this is what we want our things to be done, we want so many exercises, this is how we want our books to be marked, ... we will actually achieve objectives...

As a follow up for staff development, SPs say

Our school development committee (SDC) supports staff development. All workshops, seminars scheduled for sciences from the cluster to the national level are represented. If we feel the meeting is useful to the science department, the HOD and her team are funded to attend.

The assumption is that the science team would enrich their resource files so that whatever it takes, the learners will benefit from the way they present their lessons.

Ball as in Gorton (1983:263) maintain that

... educators know their subject matter, they know how to teach, they know a great deal about learner behaviour and motivation, and are in the best sense professionals. Many teachers today know a great deal more about their jobs than even the best principal can, and its been long time coming for principals to recognise that fact.

On the other hand participative decision-making is crucial for educators since

“all staff members have the right to be heard, to have their views considered, to express feelings, to offer knowledge and information” (Ball as in Gorton 1993:263) and “it is only if people are involved in the process of decision-making that they will own the decision taken” claims Udjombala (2002:49).

For all intents and purposes, staff development is directed at assisting teachers to expand their range of teaching strategies. In light of the above, therefore, skill acquisition and ability to transfer vertically to a range of situations requires on-the-job support if learners are to benefit.

4.8 Constraints faced by science HODs

The informants identified factors which they considered as major drawbacks on both their recognition and subsequent poor learner performance in science. Some of the science educators may be highly committed to their job as evidenced by some of them sacrificing their time with learners and improvising local materials for use to demonstrate important concepts in experiments.

The following are learning barriers identified by science HODs:

- Lack of participation in decision-making
- Inadequate time
- Shortage of materials
- Automatic promotion

4.8.1 Lack of participation in decision-making

Informants pointed out that they are not involved in many of the important aspects of the school life that directly affects them. The study sought to establish why HODs instructional roles are abandoned and neglected. The literature supports a link between participation in decision-making and the potential to execute tasks

thereof. Educators in science would be in high spirits to make an input in curricular innovation so that they teach content they would have helped put in place.

HOD6 highlighted that workshops are important in as much as they address the problems that they face in teaching science. What surprises the respondent is that after making suggestions on what to include and what to leave out, the final syllabus design rests with the Curriculum Depth Unit (CDU).

Our inputs are not taken seriously because we suggest content which is left out. What they bring forward in the document is not detailed at all. For example I teach Human and Social Biology, the topic on diversity of organisms covers introduction to organisms, classifying them that this is a mammal, a reptile... just naming them... What we would have wanted is to identify them and reclassify them... this detail is left out ...we teach the skeleton.

The HODs seem to sound that the syllabus is too long and that they cannot finish it. It is necessary to take cognisance of stakeholders because the nation should benefit from the final product. Those people who would have mastered the scientific concept can contribute to the development of the economy of the country in one way or the other.

On recruitment and selection of educators, HODs do not have a say. They are just given educators from the district offices. The whole essence of teaching is to enable learners to establish patterns of behaviour that allow them to succeed.

"We have certain qualities of science teachers that we look forward to seeing suppose we were given a chance to recruit" claims HOD3. In support of the above, HOD 6 asserted that

what we would have wanted is a situation where the following criteria apply for recruitment and selection in this department: highly qualified science educators with

knowledge of the subject, well focused educators with sound personality, a well behaved and committed educator who has learners' achievement as his or her priority number one and finally, a person with a zeal to achieve good results and above all a good leader.

In this respect, the HODs are left with no option except to induct whoever would have been deployed from the District Offices. A team of the department is formed this way. The learning outcomes are affected as it takes times to build good working terms with new teachers.

4.8.2 Inadequate time

HODs are the subject leaders in that they have to demonstrate the skills of the trade. They work towards improvement of their professional qualifications, they strive to encourage both educators and learners to work hard and they link the department to the senior administrative staff. Although supervision was overemphasized in their instructional role, the HODs claim that time is a limiting factor because they also have a full teaching load, like any other educator. They claim that they have inadequate time to carry-out all the instructional roles expected of them. "Supervision of colleagues, learners, designing staff development programmes, marking and teaching amongst others stresses" indicated HOD2.

At times I try to go out of my way to observe lessons for colleagues, discuss with them and make recommendations. You need to follow-up on all areas of weakness identified handiti? (Chishona for are you in agreement). I prepare chemicals for experiments, if they are available... I mark learners' notes on what I would have done with them and also what others would have taught...really there is no time to rest...
explained HOD5.

4.8.3 Shortage of materials

Informants identified shortage of materials for practical experiments as a stumbling block in their quest for effective teaching and learning. This problem bedevils their effort to achieve good learning outcomes. The focus is centred on learner-centred approaches to teaching so that all participate in the process. The learners learn by seeing. Once learners see things happen, or help in preparing and carrying out the experiments, there is a high rate of retention.

School A had no laboratory. SP1 indicated to the researcher that priority number one was to erect houses to accommodate the educators and in the long run budgets for the construction of the laboratory. This situation appears absurd but even at those schools with laboratories; experiments are carried out for examination classes only or not at all.

There are no apparatus and chemicals for use in experiments. Much as one can be innovative, science educators have been witnessed going out of their way to hunt for laboratory equipment and chemicals to carry out experiments. What we have are lab holes because there is virtually nothing to show
Explained SP4.

SP2 stressed the difficulties science educators face in teaching science. Educators try to improvise apparatus for use but not all of them are in this practice. The majorities of them theorise and leaves out everything for the learners.

Science is a practical subject, learners tend to commit to memory those things they would have seen, handled and heard. We theorise a lot of content which learners fail to abstract and therefore the percentage pass rates witnessed justify these shortages. We last had a donation of apparatus and chemicals in the late 1980s, now, due to rising costs of materials, coupled with financial constraints, the school just can not help out
added SP3.

4.8.4 Automatic promotion

Notwithstanding all the constraints identified in the previous sections, school principals sounded that automatic promotion of learners contribute to low percentage pass rate at "O" level. Learners who would have failed Grade 7 proceed to Forms 1 and 2. Some of them fail the Zimbabwe Junior Certificate (ZJC) but continue with their studies up to "O" level. The learners are allowed to proceed to the next higher grades without a fuller understanding of concepts at the lower level. Learners are supposed to adjust to the spiral nature of the syllabi in that content gets difficult as they climb the academic ladder. If their knowledge base at the bottom is weaker, there is no way they can pass at "O" level. SPs were very much worried by the poor results at "O" level. They attributed poor learning outcomes to automatic promotion of learners. As such, this gives rise to hot sitting as there are many learners. SP5 had this to say

our school is a government school. The government policy is that we enroll every learner despite his or her background. By law, no child can be excluded from this school even if the parents can't afford to pay school fees. At the end of it all, we have large classes and the teacher to learner ratio is invariably in the range of 1:50-70. Given this kind of scenario, teachers cannot give individual attention to learners.

The informants pointed out that the Ministry of Education, Sport and Culture pegs fees so much so that in terms of purchase of supportive resources, the school fails to cope. Whilst HODs have a powerful influence over classroom practices, and are important gatekeepers to change and development within the subject (Busher and Harries as in Wise 2000:1), they lack administrative support to take full control of their instructional roles.

The SFGPs raise complaints about the way they are allocated to classrooms and subjects. Subject choice is not by individual choice but educators decide for them. They find themselves in classes where some of the subjects offered in the curriculum are not done. What the researcher was made to understand is that the educators and HODs use previous learners' subject gradings to allocate them in classes.

This in a way assists the educators in providing the necessary assistance to learners who are below average. They are given extra work in some schools. In others, perhaps, it is the responsibility of the concerned parent/guardian to arrange extra lessons outside the school hours but at an additional fee.

4.8.5. Unqualified educators

The recruitment and selection of educators is done at the District Education Offices. Informants indicated that there is a shortage of science educators in the country because educators shun the poor salary scales offered by the Ministry of Education Sport and Culture. The science educators are attracted by better salaries in the industrial sector and leave the schools.

SFGP complained of the ineffective teaching approaches used by teachers awaiting training. HODs and SPs echoed the same sentiments when they sounded that it is possible to go for the whole term without a science educator.

In such circumstances, the learners will be at the mercy of the situation. In this instance, the HODs induct the newly qualified educators and those awaiting training so that they are on better working terms with the stakeholders' expectations.

4.8.6 Conclusion

This chapter was mainly preoccupied with data presentation, analysis and discussion. The data from the informants who are directly involved in the learning and teaching processes was presented. What they put forward and what the researcher has inferred from the data will be summed-up in the next chapter. The researcher will also make recommendations and suggest areas for further study.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

While the previous chapter was concerned with data presentation, discussion and analysis, this chapter concerns itself with the summary, conclusions and recommendations of the study. In this study, focus was on the instructional roles of science HODs and the learning outcome of "O" level students in Kadoma District in

Zimbabwe. The following statement serves to justify the purpose for which schools are established.

All learners want to learn and must be encouraged to do so, all learners have the ability to learn and the aim must be to continually improve their performance and self esteem: Positive achievements must be recognised and rewarded, teachers in the classroom are facilitators of learning, not merely managers, supervisors or instructors (Greenwood & Gaunt (1994:62) as in Steyn (2001:116).

5.2 Summary

This study was prompted by the inconsistencies in the provision of education in Zimbabwe. Whilst the mission statement provided for by the Ministry of Education Sport and Culture aims at provision of quality and relevant education, the results at "O" level are poor.

The political and subjective models of educational management were employed to inform this study. This was useful because the researcher intended to get what obtains in the science department from the school principals, science HODs, science educators and science learners.

The involvement of these informants prompted the researcher to adopt the qualitative method. The instruments used included the semi-structured interviews, the focus group interviews and questionnaires. In respect of the instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe these research instruments unearthed that:

Science HODs' instructional roles are abandoned and neglected. In addition, it demonstrated that there is also scarcity of literature and that there is prevalence of poor learning outcomes at "O" level in Zimbabwe.

HODs are an underutilized source of instructional leadership because they are not empowered by the education system.

The science HODs have a minimal role in participating towards the design of the science syllabus. This situation translates into poor learning outcomes at "O" level. The picture elicited by the study concurs with the observation made by HOD 3 who alluded that

If you give a man a fish, he will eat only once but if you teach him how to fish, he will eat the whole of his life

SP3 quoting a Chinese proverb.

This is in agreement with the provisions of education with production, which in this case is not well provided for by the Ministry of Education Sport and Culture.

Further, the research revealed that HODs are the link between educators and senior administration in a role that requires considerable skill, but possesses only limited formal authority. The HODs are supposed to be accountable for learning and teaching processes in a system which sidelines them when it comes to participation in decision-making.

- The science HODs and their team are supposed to take an active role in syllabi design. This emerges from the fact that they interpret it, implement it and accordingly, they should make sense out of it during the process of teaching. In essence, "... feelings of empowerment among teachers contribute to ownership of and increase commitment and motivation to work" (Sergiovanni 2001:69).

- Knowledge of the instructional roles of HODs is hazy. Informants proposed a system in which educators are fully aware of their working parameters in the instructional leadership roles. This system breeds a sense of confidence in dealing with teaching and learning processes so that concerted efforts will be made to improve the learning outcomes at "O" level.
- Educators are aware of learning activities which motivate the learners. Teaching and learning processes take place in environments that give room to exploration. Learners need to be exposed to situations where they explore the environment in order to discover certain patterns that emerge from manipulating the environment. Use of field trips, career guidance and most of all laboratory experiments enhance learners' knowledge and skills and hence should be encouraged in secondary departments.

This study revealed that staff development is very crucial for an effective department. The science members of department engage in workshops and seminars where many programmes for staff development for the educators will be designed. These sessions go hand in hand with the country's upgrading programmes for science and technology. In order to promote and improve school performance, there needs to be greater research interest at department level (Harries *et al* 1995 as in White 2004:3). Educators may be willing to upgrade their professional courses but they are restricted by lack of funding to have access to

university education, suffice to say inadequacy in funding personal socio-economic needs.

The informants disclosed that assessment of both educators and learners' progress is important to ensure that goals set are achieved within the specified time frame. The appraisal system gives educators enough time to prepare their KRAs whose objectives should be SMART. There was evidence that evaluation of performance takes place and educators and learners are drawn back by certain constraints in their desire to achieve good results. The constraints which bedevil attainment of good learning outcomes include the following: lack of participation by those who implement syllabi in decision-making at school level for instance the recruitment of educators which is restricted to the District Offices. Science HODs revealed that they do not have adequate time to carry out their instructional roles. They are expected to teach a full load, supervise colleagues, breakdown the national syllabi into school syllabi, design staff development sessions, chair the departmental meetings and link the science department to the administration amongst other things.

The respondents revealed that there are quite a number of factors that derail their progress in the processes of teaching and learning. For instance, they highlighted shortage of textbooks as one of the serious problems they encounter. They indicated that the learner-text book ratio is high and that the teacher learner ratio is

high as well. This gives the educators a very difficult time in trying to raise the quality of education they offer.

Focusing on the high learner to educator ratios, the Ministry of Education, Sport and Culture introduced automatic promotion in an effort to endorse the United Nations' principle of education for all. This programme witnessed children and adults going to school. This had serious logistical problems in that there were too many learners, too little a resource base to support the enrolment, and far less qualified educators to manage the learning and teaching processes.

5.3 Recommendations of the study

The study has established that the instructional roles of science HODs are abandoned and neglected. Coupled with this are poor learning outcomes at "O" level. The following are the recommendations that the stakeholders can take on board in order to both empower the HODs and improve learners' performance at "O" level.

- HODs should participate in curriculum innovation.
- Science department's budget should be higher than other departments.
- The science department or school should run fund raising projects to boost their budget allocation.

- The Government through the Ministry of Education, Sport and Culture should negotiate with the suppliers of equipment and chemicals necessary for experiments so that they sell these products to schools at an affordable cost.
- HODs should be trained and acquainted with both supervision skills and instructional roles.
- The HODs should have a say on the recruitment and selection of science educators.
- More science educators should be trained in institutions of higher learning.
- HODs should have adequate time to carry-out supervisory roles.
- The parents and guardians should cooperate in funding the science department to cushion prices of materials which are skyrocketing.
- The school should provide a challenging learning atmosphere where learners are free to explore and carry out experiments and discover patterns which emerge.

5.4 Conclusion

This study entitled the instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe revealed that HODs' instructional roles are abandoned and neglected. This spills over into poor learning outcomes at "O" level.

Respondents feel that if the Ministry of Education, Sport and Culture involve them in decision-making processes especially those that concerns their respective subject areas, then the stakeholders would expect more on learning outcomes at "O" level.

5.5 Further Research Questions

Having identified the problems experienced by informants in science departments in Kadoma district secondary schools in Zimbabwe, the researcher has identified some areas to be investigated further. The following are areas which should be singled out and given a thorough understanding:

- Professional representation in decision-making in secondary schools in Mashonaland Province, Zimbabwe.
- A critical analysis of educators' job satisfaction in the context of learners' progress in science.
- Factors affecting effective learning and teaching of science in secondary schools in Kadoma District in Zimbabwe.
- Managing the implementation of curricular innovation in science departments in secondary schools.

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APPENDICES

Appendix :A

FACULTY OF EDUCATION

PRIVATE BAG Xn14 ALICE 5700

PROVINCE OF THE EASTERN CAPE - SOUTH AFRICA

TELEPHONE 040 - 6022075/ 6022412/ 6531943

CELL: 082 200 3369

0860 103 626

E-mail: blindeque@ufh.ac.za or benlindeae@urocoffiU.co.za

University of Fort Hare

Together in Excellence

9 June 2004

The Permanent Secretary
Ministry of Education, Sport and Culture
Ambassador House
Harare
Zimbabwe

Dear Sir/Madam,

M Ed CANDIDATE: MR. F. CHAGONDA

Please be advised that Mr. F. Chagonda has been accepted by the Faculty of Education, University of Fort Hare, South Africa to read for an M Ed degree. He will be involved in certain research activities in Zimbabwe to gain information on his topic. If necessary, he will be researching documents and texts that are related to his topic. It would be greatly appreciated if he could be provided with the necessary assistance and permission to gain the required information.

Sincerely,



B R G Lindeque

Professor and Acting Dean



University of Fort Hare
Together in Excellence

9 June 2004

The Permanent Secretary
Ministry of Education, Sport and Culture
Ambassador House
Harare
Zimbabwe

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Sincerely,

B R G Lindeque
Professor and Acting Dean

FACULTY OF EDUCATION

PRIVATE BAG X1314 ALICE 5700
PROVINCE OF THE EASTERN CAPE – SOUTH AFRICA
TELEPHONE 040 – 6022075/ 6022412/ 6531943
CELL: 082 200 3369
0860 103 626
E-mail: blindeque@ufh.ac.za or benlindeque@procomp.co.za

Appendix B

Ngezi Barracks Secondary School
P Bag 8004
Kwekwe
Zimbabwe Tel: 055: 70485 (H)
E Mail: francischagonda @ yahoo .co. uk

The District Education Officer
Ministry of Education Sport and Culture
Kadoma District
Zimbabwe

Dear Sir

PERMISSION TO CONDUCT RESEARCH

I am a Master of Education student with the University of Fort Hare (student number 200437291) currently engaged in research. For this research to be successful, I need to have access to secondary school heads, science heads of departments, science teachers and any relevant documents. The purpose of this letter is to inform you of my research interest and gain your permission for me to carry out the field work during the first term of the academic year 2005.

The focus of my research is the instructional roles of science head of departments and the learning outcome of "O" level students in Zimbabwe. It is my wish to explore the roles of science HODs and the 'O' level students' achievement. I hope to administer an interview with school heads and 8 HODs and a questionnaire to 16 subject teachers.

Your attention is brought to the fact that this is an academic research and the information obtained shall be used for the research purpose only and strict confidentiality shall be observed.

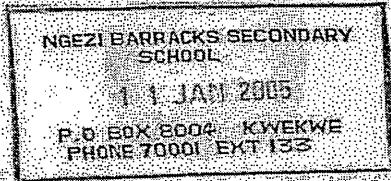
The study is likely to produce findings that may be of great value to academics and professionals in the field of education. I therefore ask that you help to 'open doors' for me by granting permission to approach school.

Attached is a letter from my supervisor

Thank you in advance

Francis Chagonda.

Appendix C



Ngezi Barracks Sec School
P Bag 8004
Kwekwe
Zimbabwe

Tel: 055: 70485 (H)
055: 70001 (W)

Cell: 091 957 072

E Mail: francischagonda @ yahoo .co. uk

The District Education Officer
Ministry of Education Sport and Culture
Kadoma District
Zimbabwe

Dear Sir

PERMISSION TO CONDUCT RESEARCH (EDUCATION LEADERSHIP AND MANAGEMENT)

I am a Master of Education student with the University of Fort Hare (student number 200437291) currently engaged in research. For this research to be successful, I need to have access to secondary school heads, science heads of departments, science teachers and any relevant documents. The purpose of this letter is to inform you of my research interest and gain your permission for me to carry out the field work during the first term of the academic year 2005.

The focus of my research is the instructional roles of science heads of departments in school management and their impact on students' achievement at 'O' level. It is my wish to establish the roles of science HODs and their effect on 'O' level students' outcomes. I hope to administer an interview with school heads and 8 HODs and a questionnaire to 16 subject teachers.

Your attention is brought to the fact that this is an academic research and the information obtained shall be used for the research purpose only and strict confidentiality shall be observed.

The study is likely to produce findings that may be of great value to academics and professionals in the field of education. I therefore ask that you help to 'open doors' for me by granting permission to approach schools.

Attached is a letter from my supervisor

Thank you in advance

Francis Chagonda

Francis Chagonda

*Permission is granted
Heads of schools please
assist as much as you can
A.C. Vankase
Kadoma*

MINISTRY OF EDUCATION AND CULTURE
KADOMA DIST. OFFICE
13 JAN 2005
WEST REGION
P.O. BOX 43, KADOMA

Appendix D

Ngezi B Secondary School
P Bag 8004
Kwekwe, Zimbabwe
Tel: 055:70001

Science Educator

.....

Dear Sir/ Madam

Letter of transmittal

Attached is the questionnaire concerned with the instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe.

The results of this study will help to establish the explore the HODs' instructional roles on "O" level candidates, examine areas of role conflict between the science HODs and school heads and to explore science HODs' professional development provision and how they influence the performance of "O" level students.

I am particularly desirous of obtaining your responses because your wealth of experience as a senior educator will expose a true picture of what obtains in schools. It will be appreciated if you complete the attached questionnaire prior to and return it to the school heads' office.

Your comments are welcome concerning ways and means of improving the instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe.

I will be pleased to send you a summary of the survey results if you desire. Thank you for your cooperation.

Sincerely

Francis Chagonda
M Ed Student: University of Fort Hare.

Appendix E

Science Educators

The focus of this study is the instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe. This is an academic research and the information obtained shall be used for the research purpose only and strict confidentiality shall be observed.

- 1 How are you involved in the design of the science syllabus?
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.....
- 2 In which way do you demonstrate to students the significance of science?
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.....
.....
- 3 Can you identify the most crucial roles of the science HOD
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.....
.....
- 3 What, in your opinion triggers low percentage pass rates in sciences at "O" level?
.....
.....
.....
- 4 Can you explain the significance of departmental meetings.
.....
.....
.....
- 5 What is the departmental policy on professional development provision?
.....
.....
.....
- 6 How does the science HOD assess the progress of science learners?
.....
.....
.....
- 7 What do you see as the next step in improving the students' learning outcomes at "O" level in science
.....
.....

Appendix F

For the school principal / headmaster

The focus of this study is the instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe. This is an academic research and the information obtained shall be used for the research purpose only and strict confidentiality shall be observed

- 1 How is the science HOD involved in the design of the science syllabus?
- 2 Given the nature of demand in the development of science and technology in Zimbabwe, how do you recruit and select science educators?
- 3 Are science HODs exposed to some kind of training on leadership or management so that they are well conversant with their instructional roles?
- 4 How does that link up with the students' outcomes at "O" level?
- 5 In terms of professional development, what challenges are science educators taking to upgrade themselves?
- 6 How often do you witness staff development seminars oriented towards the developments of science?
- 7 What is your role in the evaluation of the teaching performance of the science HOD?
- 8 How does that reflect on the "O" level students' outcomes?
- 9 In what way do you assist the science department in sourcing the laboratory requirements?
- 10 What problems do you think the science HOD is facing in the management of the department
- 11 What criteria are used to appoint science HODs?
- 12 How do you set standards for the amount of written work and other tasks?
- 13 What methods do you use to identify school needs and in particular the needs of the science department?
- 14 Can you list the key roles of the science HODs?

Appendix G

Interview Schedule for the Science HOD

The focus of this study is the instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe. This is an academic research and the information obtained shall be used for the research purpose only and strict confidentiality shall be observed

- 1 How are you involved in the design of the national science syllabus?
- 2 Given the kind of demand in development of science and technology in the country, how do you recruit, select and orient the science teachers?
- 3 As science HOD, how do you acquaint yourself with your instructional roles?
- 4 Can you identify the key instructional roles of the science HOD?
- 5 How does that relate to the "O" level students' outcomes?
- 6 What systems are in place to monitor departmental work and problem solving?
- 7 On average how many times do you have departmental meetings per term?
- 8 How do you arrive at the items of agenda?
- 9 How do you encourage members of the science department to undertake upgrading courses in science?
- 10 Does the science department sometimes participate in staff development seminars?
- 11 How do you get involved in the evaluation of teaching performance of your colleagues?
- 12 Can you explain to me the most suitable method of instruction in science and how this method is encouraged to the members of the department?
- 13 Are the "O" level students' outcomes commensurate with the methods you employ?
- 14 What do you think contribute to the low percentage pass rate at "O" level?
- 15 How are assessment tests set in your department?
- 16 Does the school management team support you in your endeavors to achieve better students' outcomes through say resource acquisition?
- 17 How many science educators are "O" level examiners?
- 18 What is your department's policy on homework?
- 19 How were you appointed as HOD? Is that in line with the ministerial set procedures?
- 20 How do you determine the candidates seating for science at "O" level?
- 21 What criteria are used by the MOE to appoint science HODs?
- 22 How often do you check for students' work in your department?
- 23 Can you identify potential strategies to improve or sustain improvement in your department?

Appendix H

For the "O" level science focus groups

The focus of this study is the instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe. This is an academic research and the information obtained shall be used for the research purpose only and strict confidentiality shall be observed

- 1 What benefits do you derive from doing science?
- 2 How did you choose to do science?
- 3 Do you foresee any factors that may hold back your progress in science?
- 4 In which way do the science teachers assist you to improve in science?
- 5 How often do you witness your science teachers being assessed by the HOD?
- 6 Do you think the time allocated for science is adequate to cover the syllabus?
- 7 Does your laboratory equipment support the theory you will have learnt through carrying out experiments?
- 8 How often do you write tests per month?
- 9 How often are you given homework?
- 10 Does the HOD assess your note and tests exercise books?
- 11 Do you sometimes witness your teachers teaching as a team?

Appendix I**For the Science Education Officer**

The focus of this study is the instructional roles of science HODs and the learning outcome of "O" level students in Zimbabwe. This is an academic research and the information obtained shall be used for the research purpose only and strict confidentiality shall be observed

- 1 How are sciences HODs involved in the design of the science curriculum?
- 2 Given the demand in the development of science and technology in the country today, what mechanisms are in place to keep up-dating the science HODs about latest developments in science?
- 3 What do you see as the major drawback in student's low outcomes at O level?
- 4 How do you assist the science HODs in sourcing the laboratory equipment and chemicals given the rising costs for these?
- 5 What criteria are used to appoint the HODs?
- 6 How do you determine the effectiveness of science HODs?
- 7 What is the department's policy on conduct hours per week?
- 8 Are there structures in science that are responsible for maintaining quality of work in the department?
- 9 What do you see as the next step in trying to improve student's learning outcomes?

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Table	4.2...Science HODs Profiles
Table	4.3..."O" level science pass rate from 1999 to 2003

EXTRACTS FROM THE INTERVIEWS**FOR THE SCHOOL PRINCIPAL**

Sir, how are the science HODs involved in the design of the science syllabus at national level?

We have got what we call SET which is the programme for science teachers. The headquarters in Chinhoyi High school, we interact with our teachers then we discuss issues, we interact with our teachers then we discuss issues pertaining to teaching of the subject, technology required for example. And it is at such for a where science HODs have an input in the innovation of the content they teach.

Given the nature of demand in the development of science and technology in Zimbabwe, how do you recruit and select science educators?

If a vacancy arises in any department, we advertise the post so that who ever qualifies to take up the post will submit his /her application letter to the district offices. The district office does the recruitment and selection of teacher and as such we do not play any role in this respect.

Are science HODs exposed to some kind of training on leadership or management so that they are well conversant with their instructional roles?

At this school, the School development Committee makes sure that if there is any professional development workshop, they support our teachers financially .If there is

need depending on the significance attached to the seminar; the whole department is funded to attend.

How does that link up with the students' outcomes at "O" level?

Our students derive a lot of benefit from their teachers' experiences. Teachers at this school meet on regular basis to map out strategies to improve instruction and possibly assist one another in lesson delivery. Our pupils have always done us proud because they pass their examinations well. We have weak students as well but in the majority of cases, the record set by the science department is impressive.

In what way do you assist the science HODs in the procurement the chemicals used in the department?

What happens is that all HODs are required to submit their requirements for the academic year and once we have done that the head seats down and work with the school development association (SDA) staff and looks forward for suppliers who then make quotations and once suppliers have been identified, then equipment is purchased through SDA. The problem is that at times the SDA doesn't have sufficient funds to buy equipment and chemicals for the science department the reason being that every year the examination requirement is different. It does not allow for schools to build stocks so that at times a particular chemical is required or scale is or something required and at the same time the school does not have sufficient funds to do that and when that has happened the HOD has to be proactive. We are fortunate that our HOD science in this school is quite a creative individual I remember we

had some equipment donated by friendly organisations such as Rio Tinto which gave us the scales , Dairy Board Zimbabwe also assisted and as I indicate earlier on the HOD has got to do the running around and then the head of school approaches such individuals when the need arises .We also have a science levy for the lower and upper sixth sciences where practicals are done weekly and we also have practical examinations These levies goes towards the purchase of basic equipment required for the laboratories and experiments.

Now given the wide array of constraints that the HOD faces in which way does the administrative staff support the HOD to improve the academic record?

I believe the head and the school can play a very important role by maybe making sure that the two offices that handle funds in the school stick to their budgets and avoid a situation whereby money set aside for subjects such as science are not diverted towards other projects so that equipment can be bought when it is needed .The problem I often see is one of maybe funds not being available yet they will have been budgeted for maybe people think such and such purchases will be done we would have raised enough money to purchase equipment so I think whatever is budgeted for by sciences for any activity at school should not be touched

in the school If it is equipment that has to be shared by two or three, then that ratio should be maintained so when we enroll our children then we look at that.

Can you identify the key roles of the HOD in science?

Right, of course to make sure that effective teaching takes place and I believe the HOD makes sure that the teachers plan for the lessons, they go to the classroom to conduct lessons and the HOD makes sure that the teachers have relevant reference materials for use together with children, they also make sure that the instruments used for testing are procured and that exercises are marked and positive feedback is given so the school assists the HOD in that manner.

Are these roles tabulated or given from the administration to the department or they get to know about their instructional roles from the seminars or workshops as mentioned earlier on?

Right, they are discussed with the HODs who sit with the administration, duties of the HODs are discussed once a member has been appointed and I am sure you are aware of the performance management system that is KRAs. From these KRAs the HOD and teachers in the department discuss how they are going to carry out their duties. Each one of them identifies Key Result Areas and discusses them with the supervisor at the end of the day the HOD and the teacher know exactly what they are going to work towards in

same area. So the teacher actually participates in identifying the KRAs and their target group.

FOR THE HOD

Sir, how are you involved in the design of science syllabi at national level?

Aahhh, at national level, we are not involved because we are only given the national syllabus.

Suppose there are topics which are challenging or which are demanding for the level of learners you are teaching at "O" level?

What we only do now is we have the ZIAMES (Zimbabwe Association of Science Teachers) we have seminars of science teachers where we discuss these or further give them information on the curriculum before the syllabus is printed.

Now, given the kind of demand that there is in the development of science and technology in the country today, , how do you recruit and select the science teachers?

Those who come to teach at this school! Normally we are just given teachers from the District Offices but we prefer trained teachers from Teachers Colleges, from Universities to come and teach who are qualified to teach sciences.

Now, are you given some kind of leadership training or management training as HOD or actually to actually acquaint yourself with the instructional roles as HOD?

We are given normally what the Education Officers does we always have seminars of developmental workshops. Sometimes we are involved in setting examinations

Can you identify the key roles of the science HOD?

The duties of the science HODs are to supervise teachers, to ensure that the school syllabus is drafted and followed, observe lessons, assist teachers, induct new teachers in the department, formulate together with colleagues in the department the departmental policy, interact within the department and the and the admin requirements that may needed

Given the wide array of roles for the science HOD how does that relate to "O" level student learning outcomes?

That is the actual thing which is important to the "O" level because staff that is taught by the teacher has to be supervised and the HOD must see to it that quality is delivered to the students look at schemes, look at the marking, and questions set should be challenging questions which can actually help students and ensure that they are typical examination type questions

What systems are put in place to monitor the work of the HOD or the problems that may arise in the department?

We have what is known as, I am sure you are aware of the Key Result areas, we work with targets for the departments, certain amount of exercises are given per term, a certain amount of tests must be given per term and these tests have to be actual tests typical of examination which must be passed.

How many times do you have departmental meetings per term?

We have normally when we open, then mid-term we have departmental meetings and at the end of the term also

How do you identify the items of agenda for the departmental meetings?

We inform the members of the departmental so that if there is something they want to raise they include it and it is taken as an item of agenda

Does the administration give you items of agenda?

The administration give us their expectations in terms of work and we disseminate this information to teachers in addition to what we will have as a department

Does the department sometimes do staff development?

Sometimes... but now sometimes not

How do you encourage the members of the department to take challenging professional courses to upgrade themselves?

We have quite a number of programmes that can be taken but the unfortunate art is there are no part time for example Zimbabwe Open University is not offering programmes in science, you find out that they offer degrees in social science, so if a teacher intents to take up such programmes of course there is what they call block release which are now being offered by Midlands State University so we always have a chance to take up upgrading courses.

How are you involved in the teaching performance of teachers?

We normally invite each other during the process of lesson delivery. We have designed our syllabus in such a way that one who would have specialized in a specific discipline takes the subject especially at "O" and Advanced levels

Do you sometimes do what is called team teaching?

Not to a large extent, but we have had cases where one teacher would teach perhaps when other observe

What would you recommend as the most appropriate method of instruction in science?

The most appropriate one is one that involves the kids, the problem that we have now is we don't have adequate supplies, most of the chemicals are outdated, the kids are not involved because of limited resources, of course the teacher has to be innovative but people that we have are fed up.

Are you saying it doesn't yield the actual outcomes?

No the actual outcomes but if we had enough resources, kids would have experiments where they can actually handle chemicals on their own, and observe processes, the kind of situation where we have student centred activities

How does the school management team assist you procure those essential chemicals?

The school allocates some money for us to buy the required materials and chemicals; sometimes they allow the department to go to Zimbabwe Schools Examination Council in Harare

How often do you check for the progress of your department, for instance learners' progress in written exercises?

What we do is that we have termly programmes we start by inspecting the schemes of work on the opening day, then we go on to observe the exercises, the marking, check the amount of work given and observe the teacher when s/he teaches

What criteria are used to appoint science HODs?

The criteria that is used is qualification and experience

Can you identify potential strategies that can be used to improve or sustain you department given that there are constraints faced in the endeavour to achieve good student learning outcomes?

There is quite a lot that can be done, the structure of our syllabus allow quite a number of ways of creating apparatus which can actually be school based, instead of using beaker we can actually ask pupils to bring empty bottles of peanut butter, empty shoe polish containers as evaporation dishes, use past examination question papers , but the problem that in papers 2 and 3 pupils answer on the question papers and very few papers remain so you find out that instead of us showing kids the question papers sometimes we remain with one or two copies so we find a place to photocopy this paper so kid s benefit and we encourage teachers to give examination -oriented questions

What is your policy on homework?

The kinds of kids we have do not do homework. They prefer absconding lessons or absenting themselves. We ended up agreeing as staff that tests should be given and written in class under the supervision of the teacher. We have a shortage of

textbooks so that if we give them exercises they are limited because the pupil-book ratio is high. So questions are given and the pupils give answers as notes.

FOR THE SCIENCE FOCUS GROUP**What benefits do you derive from doing science?**

Quite a number of them. We have some practical aspects related to our day-to-day socio-economic lives. Things we learn in science are important for example how the brain functions, science in industry, science in agriculture, we can manage our environment well. We learn about electricity,

How did you choose to do science?

We were not given a choice at this school. They used our grades in the junior classes as the basis for subject combinations. So, we just found ourselves doing Biology even if one had wanted to do something else.

Do you foresee any factors that may hold back your progress in science?

Unqualified teachers bring textbooks in class and read out for us to take down notes, the rate at which teachers transfer is high such that we can go for a term without a teacher, there are no experiments carried out and there are shortages of textbooks as well as lack of encouragement

In which way do the science teachers assist you to improve in science?

We have extra lessons. We pay for example two hundred thousand dollars per subject for two weeks.

Does your laboratory equipment support the theory you will have learnt through carrying out experiments?

We have insufficient equipment for use in carrying out experiments. We go to the lab for theoretical lessons and not for experiments. We talk about chemicals we do not have a clue what they; look like, their colours, smell, shape ,size, name it.

How often do you write tests per month?

After every topic or after every week

How often are you given homework?

WE are given project as a group but this does not occur regularly.

Does the HOD assess your note and tests exercise books?

Once in blue moon, there are many students such that the HOD does not cope

Do you sometimes witness your teachers teaching as a team?

Teacher do not teach as a team