Turnover among Mathematics and Physical Science educators in the Vaal Triangle

By

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Dedicated to

My late father Ambrose

And

My mother
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ABSTRACT

The purpose of this research was to determine the intrinsic and extrinsic motivators of Mathematics and Physical Science educators and the general satisfaction level of Mathematics and Physical Science educators for each of the 20 dimensions of the profession as measured by the Minnesota Satisfaction Questionnnaire, and to suggest ways in which schools and the Department of Education can create motivating working conditions for Mathematics and Physical Science educators in order to reduce the high turnover.

The study revealed that Mathematics and Physical Science educators who formed the sample of this research are dissatisfied with the following dimensions of their work as itemized in the MSQ:

- The absence of opportunities to work alone on the job
- Being forced to do things that go against their conscience
- The uncertainty concerning their jobs providing steady employment
- The lack of opportunities to do things for other people

They also revealed dissatisfaction with their salaries and the amount of work they do.
These are all intrinsic factors of the MSQ.

The study recommends that schools should devise motivating organizational climates and programmes/practices aimed at satisfying emerging or unmet needs of these educators who possess indispensable and invaluable scarce skills needed for the development of learners' latent scientific and technological abilities. The unmet needs of the educators in question could spark off job dissatisfaction and high turnover.

OPSOMMING

Die doelwit van hierdie navorsing was om die intrinsieke en ekstrinsieke motiveerders van opvoeders in Wiskunde en Natuur- en Skeikunde en die algemene tevredenheidsvlak van sodanige opvoeders te bepaal vir elk van die 20 dimensies van die professie, soos gemeet deur die Minnesota Satisfaction Questionnaire, en om maniere voor te stel waarop skole en die Departement van Onderwys motiverende werksomstandighede vir sodanige opvoeders kan skep om hoë arbeidsomset te verminder.

Die studie het onthul dat opvoeders in Wiskunde en Natuur- en Skeikunde wat die steekproef vir hierdie navorsing uitgemaak het, ontevrede is oor die volgende dimensies van hul werk soos in die MSQ gespesifiseer:

- Die gebrek aan geleenthede om alleen te werk
- Die verpligting om goed te doen wat teen hul gewete is
- Die onsekerheid of hul werk bestendige indiensneming sal verseker
- Die gebrek aan geleenthede om ander mense by te staan

Hulle het ook ontevredenheid getoon met hul salarisse en die hoeveelheid werk wat hulle doen.
Hierdie sake is almal intrinsieke faktore van die MSQ.

Die studie beveel aan dat skole motiverende organisatoriese omstandighede en programme/praktyke bedink wat gemik is op die bevrediging van sigbaarwordende of onbevredigde behoeftes van dié opvoeders wat beskik oor seldsame onontbeerlike en waardevolle vaardighede wat nodig is vir die onwikkeling van leerders se latente wetenskaplike en tegnologiese vermoeëns. Die onbevredigde behoeftes van die tersake opvoeders kan moontlik werksontevredenheid en hoë arbeidsomset uitlok.

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Chapter 1

Orientation

1.1 Introduction and problem statement

For some time educational policy analysts have been predicting that shortfalls of educators resulting primarily from increases in learner enrolment and educator retirements will make it very difficult for schools to find qualified educators and, in turn, will hurt school performance (Kok & Van der Westhuizen, 2003:68; Smith & Rollo, 1999:99). Moreover, analysts have argued that shortages will be worse for fields such as Mathematics and Physical Science because of difficulties in recruiting qualified candidates. Special education, Mathematics and Physical Science in particular have usually been identified as fields with especially high turnover and those predicted most likely to suffer shortages (Hean, 1999:35; Kendall, O'Neill & Murphy, 2002:49). As a result, over the past decade the inability of schools to adequately staff classrooms with qualified educators in Mathematics and Physical Science has increasingly been recognised as a major social problem and has received widespread coverage in the international and national media (Wevers, 2000:92; Sonpal-Valias, 2002:1008) and has been the target of a growing number of educational transformation and policy initiatives (Ottati, Rhoads & Graesser, 1999:691; Nemangwele, 1999:82).

In this regard, the South African government has earmarked R600-million to drastically increase the salaries of Mathematics and Science educators in under-resourced schools. This scarce-skills incentive is aimed at encouraging Mathematics and Science educators to remain in the profession as there is a major shortage of skills in these fields. There are 44 000 Mathematics and Science educators in South Africa, with an educator who has nine or 10 years' experience taking home between R94 000 and R95 500 annually in South Africa (Hindle, 2004:in press).

This intervention comes amid a deepening crisis in Mathematics and Science education in South Africa. Research has shown that South African learners' test scores in numeracy are among the worst in the world (Surty, 2004: in press). Other interventions the Education Department has planned to improve Mathematics and Science learning include (Pandor, 2004: in press):

- increasing the number of specialised Mathematics and Science centres such as the Dinaledi schools from 102 to 1000 in the next five years;
- identifying and nurturing talented Mathematics and science pupils from Grade One;
- reintroducing youth camps for Mathematics and science; and
- examining the role of the Mathematics Olympiads and science expos in improving the quality of passes in Mathematics and science

The foregoing paragraphs highlight the great need to keep motivated and satisfied Mathematics and Physical Science educators in South Africa. This research is undertaken in order to investigate whether South Africa is doing enough to keep those educators who are already in their employment satisfied and prevent turnover. Research has indicated that there is a relationship between job satisfaction and turnover. Educator turnover in this research refers to the movement of educators out of the school or profession or any permanent departure of educators out of the boundaries of the education service (cf. Croasmun, Hampton & Herrmann, 2002:1)

Hean (1999:261) states that the correlation between job satisfaction and turnover is stronger than what was found for absenteeism. If the economy is good and the unemployment figures are low, people will look for better opportunities in other companies, which obviously means an increase in the turnover in personnel. High job satisfaction is said to positively influence the turnover rate in the workplace (Carson, Roe, Birkenmeier & Phillis, 1999:8).

The study of job satisfaction among Mathematics and Physical Science educators is important for these are educators who offer schools scarce skills and strategically contribute to the production of learners with scientific and technological skills necessary for the development of the South African economy. It is therefore necessary to investigate which aspects of the teaching job are highly attractive and lead to satisfaction and aspects of the very same teaching job are unattractive and lead to dissatisfaction, and consequently lead to turnover. Literature review reveals that positive aspects for educators, including Mathematics and Science educators include the opportunity to work with the school management team, that is, heads of departments, deputy principals and principals and other staff members to accomplish common goals, developing school culture and the ability to work with learners (Malone, Sharp & Walter, 2001:121).

It is important to identify which factors contribute to job satisfaction as well as those that may lead to job dissatisfaction and the resultant educator turnover so as to assure that the Mathematics and Physical Science jobs are attractive to potential and aspirant candidates as well as those that are already in the teaching field. There are many variables that have been hypothesised to be a result of job satisfaction or dissatisfaction, including variables of job performance.

The results of the study are helpful to practicing aspirant Mathematics and Physical Science educators, and the Department of Education in the following ways:

- Firstly, it validates or refutes the previous research on job satisfaction among Mathematics and Physical Science educators. While much of the research has been completed in other countries this research will attempt to draw comparisons to the overall job satisfaction of Mathematics and Physical Science educators in the Vaal Triangle area of the Gauteng province. To date no study has been focused on turnover among Mathematics and Physical Science educators in the Vaal Triangle area,

thus this study will be the first to study variables that lead to turnover among this group.

- Secondly, it assists current and future managers of education in making decisions regarding working conditions of these educators who possess scarce skills that are significant for the development of South Africa's economy, technology and the latent potentialities of learners interested in Mathematical and Scientific careers. Many educators each year complete the degrees and diplomas to be Mathematics and Physical Science educators, but many are unsure of the benefits of being an educator. This study will assist these potential and aspirant candidates in determining which variables to consider when looking for a job as Mathematics and Physical Science educators (Johnson, 2004:24; Chan, KO, Boey, 2000:1418).

The 20 dimensions of the Minnesota Satisfaction Questionnaire will be used individually as a measure of the Mathematics and Physical Science educators' job satisfaction (see Chapter 3).

1.2 **Research questions**

The purpose of this research was to investigate job satisfaction among Mathematics and Physical Science educators as one of the causes of educator turnover. The questions that guided this study were:

- What are the intrinsic and extrinsic motivators of Mathematics and Physical Science educators?
- What is the general satisfaction level of Mathematics and Physical Science educators for each of the 20 dimensions of the job as measured by the MSQ?

- Which ways can be suggested for schools and the Department of Education to create motivating working conditions for Mathematics and Physical Science educators in order to reduce turnover?

The answers to these questions can be used by schools to develop and design motivating human resource management programmes and on organisational climate which increase Mathematics and Physical Science educators' job satisfaction, and possibly recruit more of these educators and retain current ones, thus ensuring low turnover. The knowledge gained could be used to improve the working conditions of Mathematics and Physical Science educators and lead to follow up research in the field of job satisfaction and turnover among Mathematics and Physical Science educators. By improving the working conditions of Mathematics and Physical Science educators, individual schools and communities will be better served by the knowledge of these highly needed skilled educators whose expertise in developing future engineers, Mathematicians and Scientists is indispensable and invaluable.

1.3 **Purposes of research**

The purposes of this research emanated from the research questions mentioned in paragraph 1.2 above. They were to determine the:

- intrinsic and extrinsic motivators of Mathematics and Physical Science educators;
- general satisfaction level of Mathematics and Physical Science educators for each of the 20 dimensions of the job as measured by the MSQ; and
- to suggest ways in which schools and the Department of Education can create motivating working conditions for Mathematics and Physical Science educators with an aim of reducing turnover.

1.4 Methods of research

Literature review and empirical research methods were used in this investigation.

1.3.1 Literature Review

Current international and national journals, papers presented at professional meetings, dissertations by graduate students, and reports written by school and university researchers which provide information on how far research on motivation and job satisfaction has progressed were consulted and serve as primary sources. Books on job satisfaction serve as secondary sources.

1.3.2 Empirical Research

In addition to the literature study, data were collected by means of The Minnesota Satisfaction Questionnaire (MSQ) (1977 revision). The data was then analysed and interpreted (see Chapter 4).

The research was conducted as follows:

The authorities of district 7 and 8 in the Vereeniging and Vanderbijlpark areas respectively were requested permission to conduct this research using a sample of both primary and secondary schools educators under their jurisdiction. The researcher personally visited these schools to deliver and collect the questionnaires.

1.3.2.1 Measuring instrument

The Minnesota Satisfactions Questionnaire (MSQ) (1977 revision) was used to collect empirical data for this study. The MSQ is a classic research tool in job satisfaction research and has been used in many research studies (Newby,

1999; Smith, 2001; Strauss, 1999:87). These studies began in 1957 and had the following two objectives:

- the development of diagnostic tools for assessing the work adjustment "potential" of applicants for vocational rehabilitation; and
- the evaluation of work adjustment outcomes (Davis & Wisson, 2000:353).

The MSQ is based on the Theory of Work Adjustment that uses the correspondence between the work personality and work environment as the principal reason or explanation for observed work adjustment satisfaction (Brogan 2003:48; Deci, 1999:65).

The authors utilised the original instrument to collect normative data for 21 MQS scales for 25 occupations including, among others, bookkeepers, labourers, typist, engineers, managers, and educators (Davis & Wison, 2000:350).

The MSQ (1977 revision) is designed to measure a level of 20 needs dimensions. The instrument contains 100 items with five comprising each of 20 different sub-scales and is self-administered in 15 to 20 minutes. The items appear in blocks of 20 scales, so that items for each sub-scale appear at 20-item intervals. The MSQ scales, which represent 20 dimensions of the job, are described below (Davis & Wison, 2000; 352):

- Ability utilisation: The chance to do something that makes use of abilities.
- Achievement: The feeling of accomplishment one gets from the job
- Activity: Being able to keep busy all the time
- Advancement: The chances for advancement on this job
- Authority: The chance to tell people what to do
- Organization policies and procedures: The way organization policies are implemented

- Compensation: Feelings about pay in contrast to the amount of work completed
- Co-workers: How one gets along with co-workers
- Creativity: The opportunity to try one's own method
- Independence: The opportunity to work autonomously
- Moral values: The opportunity to do things that do not run counter to one's beliefs
- Recognition: Being recognised for a job well done
- Responsibility: The freedom to implement one's judgement
- Security: The way a job provides for steady employment
- Social service: Being able to do things as a service to others
- Social Status: Having respect for the community
- Supervision: The relationship between supervisors and employees
- Supervision-technical: The technical quality of supervision
- Variety: The opportunity to do different things
- Working Conditions: Physical aspects of one's place of employment

The MSQ is used to measure relative satisfaction to select job characteristics.

1.3.2.2 **Target population**

All Mathematics and Physical Science educators in the Gauteng Province were initially considered the target population.

1.3.2.3 **Accessible population**

Because of the large number of public schools in the Gauteng Province, which would have taken long to visit and the huge financial implications this would have had, the researcher and the supervisor decided to limit the target population to the township schools in the Vaal Triangle area of the Gauteng Province.

1.3.2.4 **Sample**

A randomly selected sample (n=220) of Mathematics and Physical Science educators in the Vaal-Triangle area was drawn. These educators were supplied with the MSQ to complete.

1.3.2.5 **Statistical techniques**

Data obtained from the target population were analysed using the SPSS programme by the Statistical Consultation Services of the North-West University (Vaal Triangle Campus) in order to determine the intrinsic and extrinsic motivators of Mathematics and Physical Science educators, their general satisfaction level for each of the 20 dimensions of the job as measured by the MSQ` and to eventually suggest ways in which schools and the Department of Education can adopt in creating motivating working conditions for Mathematics and Physical Science educators with an aim of reducing turnover of these scarce skills possessing educators.

1.4 **Programme of study**

Chapter 1 is primarily an orientation chapter preparing the reader for the subsequent chapters.

Chapter 2 presents the literature review on job satisfaction and motivation.

Chapter 3 motivates the empirical design of this research. The purpose of the research, method of research, the choice of the target group, and the development of the MSQ are discussed.

Chapter 4 analyses and interprets the research results.

Chapter 5 provides a concluding chapter presenting summaries of findings from the literature study and the empirical design. Recommendations for further research and for practical implementation are also presented in this chapter.

1.5 Conclusion

In Chapter 1 the orientation of the research, in the form of the introduction and statement of the problem, the aims of the research, the methods of research and the programme of research were presented.

In Chapter 2 the literature review on job satisfaction will be presented.

Chapter 2

Literature review on job satisfaction

2.1 Introduction

This chapter provides a literature review on several historic theories of motivation and job satisfaction.

Concepts which relate to motivation and job satisfaction are also clarified.

2.2 Definition of concepts

The following concepts that are used in this study need clarification so that they can be understood in the context of their definitions in this study:

2.2.1 Job satisfaction

Job satisfaction means and relates to:

- fulfilment through work of a person's security, affiliation, self esteem, autonomy, and self-actualisation needs (Cote & Morgan, 2002:949);
- positive attitudes and beliefs towards several aspects of the job or the profession (Monohan, 2002:143);
- the condition of contentment with one's work and environment, denoting a positive attitude (Murray, 1999:87);
- the difference between the amount of rewards employees receive and the amount they believe they should receive (Abraham, R.2000)
- an attitude that employees have about their jobs that results from their perception of their job based on factors of the work environment

(Grandey, 2000:98; Mcmanus & Kauffman,1999:250; Shannon, Robson & Sale, 2001:320).

- the emotional response of an employee within his work environment is often determined by how well outcomes meet or exceed expectations.(Andrews, M. & Kacmar, K. M. 2001)
- a pleasurable or positive affective or emotional state resulting from the appraisal and perception of one's job or job experience as fulfiling or allowing the fulfilment of one's important job values, provided that these values are compatible with one's needs; and (Barry, D. A.2002)
- positive or negative attitude that individuals have about their supervisory style, support, challenge, pay benefits.(Brady, D. B.)

These definitions show that job satisfaction transcends the extent to which a given employee is prepared to continue in his current job, and specifically, the extent to which employee turnover takes place. It basically entails the extent to which an employee enjoys his job and as a result experiences pleasure and fulfilment. This can be described as an overall impression about one's job in terms of specific aspects of the job, for example, compensation, autonomy, and relationships with colleagues and it can be connected to specific results like productivity (Laktoff, Johnson & Kim, 2001:1). This means that if the employee is rewarded equitably to allow him to fulfil his most important needs, the employee will have a positive emotional response towards the job. Such a state of affairs contributes to a high level of productivity, commitment and continuance in such employment for a significant period (Figart, Mutari & Power, 2002:147).

The attitudes described in this definition are linked to perceptions, personality, and motivation of employees, which can then positively or negatively, influence their feeling towards the job. These feelings can also be influenced by the immediate work environment conditions (Blau, 1999:689; Embemsvag & Bras, 2001:153; McManus & Kauffman, 1999:248) and as such, reflect employees' attitudes and perceptions regarding, among others, reward systems and how

fairly they are implemented. If these systems are perceived to be rewarding employees equitably, they will have a positive influence on their job satisfaction.

In their studies, Figart, Mutari and Power (2002:27), Hanushek, Kain and Rivkin (1999:47), Mertler (2001:79) and Campbell (1999:74) highlighted that job satisfaction for the individual employee exists when the perceived benefits of the work exceed the perceived cost by a margin deemed by the employee to be adequate under the circumstances. This implies a function of whether the employee is more concerned with the work as a means to provide fulfilment outside the job or finds the work itself fulfilling. There are many facets of work, some of which are perceived to be more acceptable and satisfying than others at the time. The perceived costs and benefits described are not necessarily measured financially.

From the foregoing exposition and for the purposes of this research, job satisfaction is seen as employees` affective (emotional) response to their current job conditions (Bachiochi, Stanton, Robbie, Perz & Smith, 1998:28). Job satisfaction is also distinguished from its consequences such as a desire to stay with an organisation, which is not a symptom of job satisfaction but also a consequence of job satisfaction. As an independent factor, desire to stay is also affected by other factors such as employees` job security, expectations about their future success in the organisation (Endrews, Kacmar, 2001:350).

2.2.2 **Self-efficacy**

Self efficacy refers to a person's perceived expectation of proceeding at a task or obtaining a valued outcome through personal effort (Schunk & Parajes, 2002:28). For educators, efficacy is based on their perceived ability to affect students' learning (Dollard, & Winefied, 2001:160) and (Strauser, Kerts & Kiem, 2002:23,). Several authors have suggested that self-efficacy concept can also be applied to teams (Boggler, 1999:73; Hanushek, Kain & Rivkin, 1999:145) and defined

collective efficacy as "each individual's assessment of their teams' collective ability to perform job–related behaviours".

2.2.3 Needs

Needs are regarded as physiological or psychological deficiencies that arouse behaviour. They can be strong or weak and are influenced by environmental factors. Thus, human needs vary over time and place. Two popular need theories are Maslow's need hierarchy theory and McClelland's need theories attempt to pinpoint internal factors that energise behaviour (Pritchett, L. & Filmer, D. 1999)

2.2.4 Job Design

Job design refers to any set of activities that involves the alteration of specific jobs or interdependent systems of jobs with the intent of improving the quality of employee job experience and their on-the-job productivity (Bunett, 2001:43; Irving, 2003:97). There are two very different routes that can be taken when deciding how to design jobs and each of these routes is based on a different assumption about people:

- The first route entails *fitting people to jobs*. It is based on the assumption that people will gradually adjust and adapt to any work situation. Thus, employee attitudes toward the job are ignored, and jobs are designed to produce maximum economic and technological efficiency. This approach uses the principles of scientific management and work simplification (Armstrong, 2001:49).
- In contrast, the second route involves *fitting jobs to people*. It assumes that people are under-utilised at work and that they desire more challenges and responsibility. Techniques such as job enlargement, job rotation, job enrichment, and job characteristics are used when designing jobs according to this second alternative (Blau, 1999:106).

2.2.5 Autonomy

Autonomy refers *to t*he extent to which the job enables an individual to experience freedom, independence, and discretion in both scheduling and determining the procedures used in completing the job (French, 2000:132).

2.2.6 Feedback

Feedback refers to the extent to which an individual receives direct and clear information about how effectively he or she is performing the job (Buss, 2001:98).

2.3 Conceptual foundations of the construct of job satisfaction

There is more to a job than simply drawing a salary on a regular basis. It, therefore, follows that there is need for an employee to have the necessary skills, knowledge, and professionalism to perform competently in the career he has chosen, and for him to experience some measure of fulfilment, enjoyment, and satisfaction in his job (Barrett, 1999:45).

Job satisfaction transcends the extent to which an employee is prepared to continue in his current job. It basically entails the extent to which an employee enjoys his job and as a result experiences pleasure and fulfilment. This is the reason that has lead many researchers to regard job satisfaction as:

- a pleasurable or positive affective or emotional state resulting from the appraisal and perception of the employee's job or job experience as fulfilling or allowing the fulfilment of his/her important job values, provided that these values are compatible with his/her needs (Blau, 1999:688; Brewer & Clippard, 2002:172; Steyn, 2002:87; Kim, 2001:1);

- an overall impression about employee's job in terms of specific aspects of the job (for example, compensation, autonomy, colleagues) and it can be connected with specific results such as productivity (Kim,2001:15);
- an attitude that employees have about their jobs that results from perception of their job based on factors of the work environment (Callaghan, Tak-Ting & Wyatt, 2000: 1519; Chen, 2000:123) and the attitude described here is linked to perception, personality, and motivation of the employee which can then positively or negatively influence their feeling towards the job which can also be influenced by the immediate work environment conditions; the difference between the amount of rewards employees receive and the amount they believe they should receive (Stanton, Balzer, Smith, Parra, Ironson, 2001:868; Lowry, 2004:142) and this is a clear reflection of the employees` attitude and perception regarding the reward system and how fairly it is implemented and if this system is perceived to be rewarding the employee equitably, it will have a positive influence on his job satisfaction;
- existing when the perceived benefits of the work exceed the perceived cost by a margin deemed by the employee to be adequate under the circumstances (McCann, 2002:67; Newby, 1999:75; Davis & Wilson, 2000:352; Eichinger, 2000:401).

From these researchers' views it is clear that job satisfaction depends on whether the employee is more concerned with work as a means to provide fulfilment outside the job or finds the work itself fulfilling. There are many facets to work, some of which are, at the time, perceived to be more acceptable and satisfying than others. The perceived costs and benefits described are not necessarily measured financially. Job satisfaction, in most cases, relates to the emotional response of an employee within his work environment and is often determined by how well outcomes meet or exceed expectations. This means that if the employee is rewarded equitably to allow him to fulfil his most important needs, the employee will have a positive emotional response towards the job. Such a state of affairs contributes to a high level of productivity, commitment and

continuance in such employment for a significant period (Eisenberg, Bowman & Foster, 2001:452).

Researchers have explored the extent to which employees experience job satisfaction. Buss (2001:46) saw job satisfaction as an individual's attitude about work roles and the relationship to worker motivation. The job satisfaction/job dissatisfaction theory is the basis of Herzberg's job satisfaction study of accountants and engineers (Herzberg, Bernard & Bloch, 2002:68). Herzberg's (2002:39) concept of job satisfaction distinguished two separate groups of factors influencing individual job satisfaction and dissatisfaction. The first group called "motivators" leads to job satisfaction; the second group, called "hygiene" reduce job dissatisfaction. According to Herzberg, Bernard and Bloch (2002:15) motivator factors of job satisfaction include:

- achievement;
- chances for personal growth and promotion opportunities;
- the work itself and the intrinsic interest of the job (Herzberg, 2002:114).

Hygiene factors of the job include:

- pay;
- job security;
- working conditions;
- policy and administration; and
- relationships with peers and supervisors (Herzberg, 2002:46; Herzberg, Bernard, &, Bloch, 2002:14).

Herzberg (2002:46) referred to motivators as "intrinsic factors" and hygiene as "extrinsic factors."

Gerstein, Keating, Yovanoff and Hamiss (2001:75) proposed five "core" dimensions for evaluating the immediate work environment constituting the Job

Diagnostic Survey UDS. These core dimensions turned out to be associated significantly with job satisfaction and a high sense of workers' motivation. That is, the work environment source consisted of five dimensions, namely those of:

- skill variety;
- task identity;
- task significance;
- autonomy; and
- feedback (Clapton & Kendall, 2002:899).

The most important characteristic that receives huge attention in Gersten, etal (2001:552) study is the meaningfulness of the work which means the extent to which the individual perceives the work that significant and important. Job meaningfulness can be defined as the product of:

- skill variety (activities that challenge skills and abilities);
- task identity (the extent to which the job requires completion of a "whole", identifiable peace of work); and
- task significance (how substantially the job has impacts on other people's lives) (Blau, 1999:1110).

Job satisfaction literature provides additional support for personal characteristics influencing work and job satisfaction (McManus & Kauffman, 1999:249; Leung, Siu & Spector, 2000:123). The literature supporting job satisfaction and age has indicated that overall job satisfaction increases as employees mature (Schulze & Stein, 2003:139). Cobb (1998:232), Pease and Camilleri (2001:78), Blau (2001:470), Eichinger (2000:402), and Dollard and Winefield (2001:351) found that male employees were more satisfied with their jobs than female employees. Conversely, Blau (2001:469) and Kok and Van der Westhuizen (2003:66) found that female employees have increased job satisfaction over males. The literature supporting job satisfaction and years of experience in the job has indicated that no relationship was found between job satisfaction and years of experience in the job (Brock & Grady, 2001:75). However, research done by Davis & Wilson *(2000:352)*, Bachiochi, Stanton, Robie, Perz and Smith (1998:98), Leibowitz

(2003:14) and Judge (2002:38) found that overall job satisfaction increased as the years of experience in the job increased.

Another common demographic variable studied is the educational level. Most of the researches on the relationship between education level and job satisfaction yield consistent findings. Reiner and Zhao (1999:7) found that employees with a higher educational level tended to be more satisfied with their job than employees with a lower educational level. The other identified variable in the research on demographic characteristics is the job assignment of an employee. Employees have many different interests, and these are sometimes satisfied on the job. However, the more employees find that they can fulfil their interests while on the job, the more satisfied they will be with those jobs. For example, Laktoff and Johnson (2003:156) found that university graduates were more satisfied with their jobs when these were consistent with their University majors than when these fell outside their fields of interest (Darboe 2003:72).

Some of the more important elements and factors contributing towards job satisfaction are:

- The work itself: The actual content of the work itself influences job satisfaction in that it should be interesting and challenging, not boring, and must provide status. To ensure that an employee's work is mentally more challenging, he must be able to apply his skills, abilities and qualifications. A job with too little challenges can create boredom, whereas too many challenges can create a feeling of failure or frustration. Jobs that offer a variety of tasks, freedom and opportunities for feedback on how well the employee is doing are the more preferred jobs (Kendall, Murphy, O'Neill & Bursnall, 2000:452; Amick & Kasl, 2000:390).
- Working conditions: This is another factor which according to Eisenberg, Bowman and Foster (2001:451) has a modest effect on job satisfaction. Employees are generally concerned with their working environment. A clean, safe, and attractive working environment will positively influence the worker's attitude, whereas a noisy, insufficiently lit or too hot environment will be

perceived as poor working conditions and negatively impact the worker's ability to perform the job (Reiner & Zhao, 1999:7; Chu, Breucker, Harris & Stitzel, 2000:2).

- Reward systems: According to Freeman (2003:33) wages play a significant role in job satisfaction, Money assists people to attain their basic needs but it also assists in providing upper-level need satisfaction. Fringe benefits are not as influential as most employees do not even know how much they are receiving in benefits. Kenny and Judge (2002:46) see reward systems taking the form of wage systems and promotion policies that are perceived by the employees as being just, clear and in line with their expectations. Wages are perceived as fair when they are based on job demands, individual skill levels and community pay standards. Money is not the only reward, many employees will prefer to work in a specific location, prefer a less stressful job, or prefer specific working hours. Promotions based on performance provide for more job satisfaction than promotions based on seniority. Promotions lead to personal growth and development opportunities, increased responsibility and increased social status (Hanushek, Kain & Rivkin, 1999:4).
- Supervision: This is seen by George England (2001:51) as another moderate source of job satisfaction. There appears to be two dimensions of supervisory styles that can affect job satisfaction. The first is the employee centred supervisory style, which is measured by the degree to which a supervisor takes a personal interest in the employee's welfare. The second dimension is participation or influence, as portrayed by managers who allow their people to participate in decisions that affect their own jobs. This approach, in most cases, results in higher job satisfaction (Quinn, 2002:19).
- Work group: The nature of the work group plays a modest role in job satisfaction (Steyn & Van Wyk, 1999:40). Friendly, cooperative co-workers provide a source of job satisfaction to individual employees. The work group serves as a source of comfort, advice, support, and assistance to the individual worker and also fulfils his need for social interaction. A so-called "good" work group makes the job more enjoyable but this factor is not perceived as essential for job satisfaction. If the opposite, namely a "bad"

work group exists, then this can negatively affect job satisfaction. Dipaola and Tschannen-Moran (2003:44) and Bogler (1999;50) state that an employee's satisfaction is increased when the immediate supervisor:

- is understanding and friendly;
- offers praise for good performance;
- listens to the employee's opinions; and
- shows personal interest in his employee's.

It is socially and professionally acceptable that job satisfaction is a favourable outcome. It is important for organisations to understand the value and impact that job satisfaction has on the overall health and effectiveness of an organisation. The outcomes of job satisfaction are:

- **Productivity:** According to Narayaman, Menon and Spector (1999:193) most people assume that there is a strong relationship between job satisfaction and productivity. However, research over the years has only shown a weak relationship (Van Voorhis, 2003:449; Hayward, 2003:41; Fox & Spector, 1999:925). Satisfied workers are not necessarily the most productive workers. There is also an on-going debate whether satisfaction leads to performance or whether performance leads to satisfaction. Prussa*k* (2001:1003) points out that management have, at long last, discovered that there is greater production and greater profit when workers are satisfied with their jobs. If the morale of employees is high, there will be greater and improved production in the organisation.
- **Absenteeism**: Hung and Lui (1999:159) found a low correlation between job satisfaction and absenteeism. Other influencing factors were that organisations providing liberal sick leave benefits are encouraging their employees, including the highly satisfied, to take days off. According to Yong (1995:7) absenteeism tends to be low when job satisfaction is high and vice versa. He also postulates that high job satisfaction will not necessarily mean lower absenteeism but that low job satisfaction will most likely bring about high absenteeism.

- **Safety**: Reiner and Zhao (1999:6) and (Carson, Roe, Birkenmeier & Phillis, 1999:8) highlight that not too many studies have been done to determine any relationship between job satisfaction and safety. Research done by O'Donnell (2000:80) and Emblemsvag and Bras (2000:127) found a higher incident of accidents among workers who had been moved from a job that they perceived to be good, to a job which they considered to be poorer or less prestigious. This research also indicated that where good relationships were present, the ratio between a number of workers and a number of accidents was significantly lower than where a poor relationship existed. Other supporting evidence provided by Peterson (2001:178) showed that under the examined circumstances, the majority of accidents occurred more often when the possibility for advancement was limited.
- **Life satisfaction:** Bond and Bunce (2003:1059) and Bruck, Allen and Spector etal. (2002:340) indicate that job satisfaction or dissatisfaction is not inseparable from satisfaction or dissatisfaction with life. A dissatisfied employee is likely to be more dissatisfied with both his work conditions and his life. Stressful events in his life will also be reflected in his attitude towards his work (Abel & Sewell, 1999:288).
- **Stress**: According to Edward, Burnard, Coyle, Fothergill and Hannigan (2001:810) there comes a time when stress is equated not merely with reduction in satisfaction, but also generates dissatisfaction. There is no upper limit to absolute satisfaction, while the lower limit merges indistinguishably into dissatisfaction. They also highlights that it is unlikely that if the defined dissatisfiers were minimised and the satisfiers were maximised, the state of job satisfaction would persist (Hart & Cooper, 2002:92).

Edward, Burnard, Coyle, Fothergill and Hannigan (2001:808) posit that employees with a high level of job satisfaction:

- show better physical and mental health;
- learn job related tasks quicker;
- are less involved in on-the-job accidents; and

- file fewer grievances.

They are also more likely to exhibit pro-social type behaviours and activities such as helping co-workers, helping customers and being more co-operative (Kop, Euwema & Schauefli, 1999:329). It can, therefore, be re-emphasised that the experiencing of job satisfaction amongst the employees in an organisation will positively benefit the organisation.

2.4 The influence of motivation on job satisfaction

This research is conducted within the perspective of motivation and organisational behaviour. The term motivation derives from the Latin word *movere,* meaning "to move". In this research, motivation represents those psychological processes that cause behaviour, that is, the arousal, direction, and present of voluntary actions that are goal directed in school organisations. Educational managers need to understand these psychological processes if they are to successfully guide employees, that is, educators toward accomplishing school organisational objectives.

Steyn and Van Wyk (1999:144) posit that individual inputs and job context influence motivation. Employees bring ability, job knowledge, dispositions and traits, emotions, moods, beliefs, and values to the work setting (Brogan, 2003:49). The job context includes the physical environment, the tasks one completes, the organisation's approach to re-organisation and rewards, the adequacy of supervisory support and coaching, and the organisation's culture (Brock & Grady, 2001:79). These two categories of factors influence each other as well as the motivational processes of arousal, direction, and persistence. Employees are more likely to be motivated when they believe that their performance will be recognised and rewarded with outcomes they value (Carson, Roe, Bikkeier & Phillis, 1999:8). The model further reveals that motivated behaviours are directly affected by an individual's ability and job knowledge (skills), motivation, and a combination of enabling and limiting job context factors. For instance, it would be difficult to persist on a project if Mathematics and Science educators were working with defective raw materials or broken

equipment (Darboe, 2003:43). In contrast, motivated behaviours are likely to be enhanced when educational managers supply employees with adequate resources to get job done and provide effective coaching. This coaching might entail furnishing employees with successful role models, showing employees how to complete complex tasks, and helping them maintain high self-efficacy and self-esteem. Performance is, in turn, influenced by motivated behaviour (Steyn, 2002:85).

This model highlights that motivation is different from behaviour. Motivation involves a host of psychological processes that culminate in an individual or organisation's desire and intentions to behave in a particular way. Behaviour reflects something that can be seen or heard (Gordon, 1999:79). The outcomes of motivation are generally assessed in terms of the behaviours actually exhibited, the amount of effort exerted, or the most direct behavioural outcomes of motivation. Actual effort or persistence is the most direct behavioural outcomes of motivation. Behaviour is influenced by more than just motivation (Hart & Cooper, 2002:130). For example, the amount of time one spends studying for one's next exam (behaviour) is influenced by one's motivation in combination with one's ability and personal goals (individual inputs) and the quality of one's lecture notes (enabling/limiting job context variable) (Hean,1999:3). This example illustrates that behaviour is due to a combination of factors rather than simply to just motivation.

Behaviour is different from performance. Performance represents an accumulation of behaviours that occur over time and across contexts and people. Performance also reflects an external standard that is typically set by the organisation and assessed by an employee's manager (Hayward, 2003:9). Consider that a final grade student might receive for accumulating a final course an average of 88%. While this average is based on behaviours exhibited over an entire class, the student's final grade or performance might range from an A to B. The final grade depends on the specific professor's standards and the grade

distribution of the class under consideration. Motivation is a necessity but insufficient contributor to job performance. (Theall & Franklin, 1999:98)

This reveals that performance problems are due to a combination of individual inputs, job context factors, motivation, and appropriate motivated behaviours. Drawing a distinction between motivation and performance has its advantages (Ingersoll, 1999:29).

The implication is that there probably are some jobs for which trying to influence motivation will be irrelevant for performance. These circumstances can occur in a variety of ways. There may be situations in which ability factors or role expectation factors are simply more important than motivation. (Nemangwele, 1999:76) For example, the best predictor of high school grades typically is intellectual endowment, not hours spent studying.

Another circumstance may occur in which performance is controlled by technological factors. (Smithson, 2000:143). For example, on an assembly line, given that minimally competent and attentive people are there to do the job, performance may not vary from individual to individual. Exerting effort may be irrelevant for performance.

Educational managers are better able to identify and correct performance problems when they recognise that poor performance is not due solely to inadequate motivation. This awareness can foster better interpersonal relations in the workplace.

2.4.1 **Historical roots of modern motivation theories**

Various researchers have identified the following five methods of explaining goal-directed human behaviour to jobs: needs, reinforcement, cognition, job characteristics, and feelings/emotions. Needs theories are based on the premise that individuals are motivated by unsatisfied needs. Dissatisfaction with one's

social life, for example, should motivate one to participate in more social activities. Henry Murray, a 1930s psychologist, was the first behavioural scientist to propose a list of needs thought to underlie goal-directed behaviour (Gerstein, Keating, Yovanoff & Hamiss, 2001:123). From Murray's work sprang a wide variety of need theories, some of which remain influential today. Recognized need theories of motivation are the following:

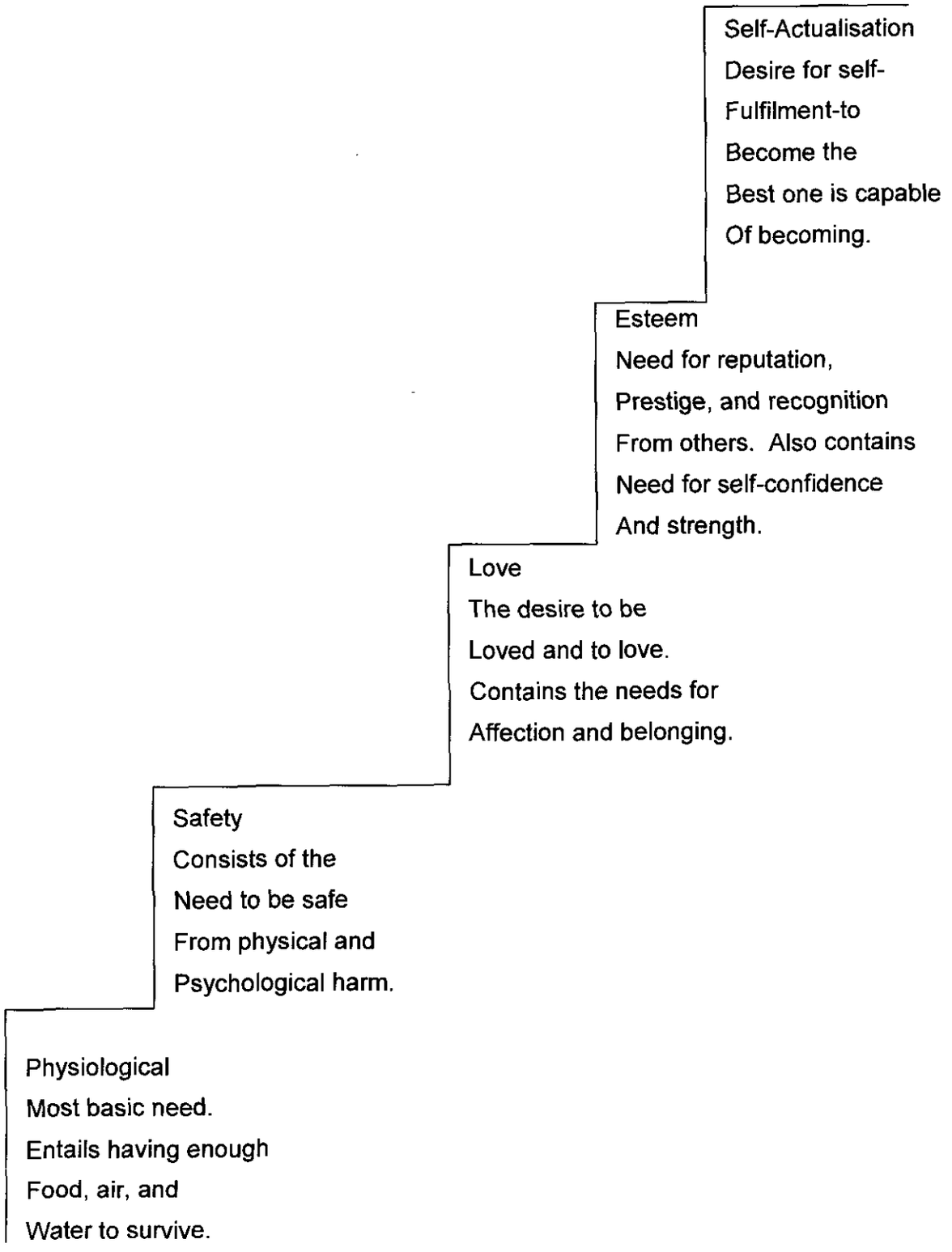
2.4.1.1 **Maslow's Need Hierarchy Theory**

Maslow's need hierarchy theory of motivation was first based on his clinical observation of a few neurotic individuals, but now it has subsequently been used to explain the entire spectrum of human behaviour. Maslow proposed that motivation is a function of five basic needs that is:

- physiological;
- safety;
- love;
- esteem; and
- self-actualization (Miller, Brownell & Smith, 1999:209).

Maslow postulated that these five need categories are arranged in a pre-potent hierarchy. In other words, he believed human needs generally emerge in a predictable stair-step fashion. Accordingly, when one's physiological needs are relatively satisfied, one's safety needs emerge, and so on up to the need hierarchy, one step at a time. Once a need is satisfied it activates the next higher need in the hierarchy. This process continues until the need for self-actualisation is activated (Gipson-Jones, 2002:142 & Herzberg, Bernard, Bloch, 2002:121). Maslow's theory of needs can be schematically represented as follows:

Figure 2.1 **Maslow's need hierarchy**



Maslow's theory remains very popular among researchers and theorists of organizational behaviour, although there are still very few studies that can legitimately confirm or refute it (Ottati, Rhoads & Graesser, 1999:690; Raja & Ntatianis, 2004:39). It may be that the dynamics implied by Maslow's theory of needs are too complex to be operational as confirmed by scientific research. This makes it difficult to be able to determine how valid the theory is, or, more precisely, to determine which aspects of the theory are valid and which are not (Shannon, Robson & Sale, 2001:338).

The implications of Maslow's theory are that a satisfied need may lose its motivational potential. In the case of this research, it is therefore important that School Management Teams motivate educators, including Mathematics and Physical Science educators who are the focus of this study, by devising motivating programmes or practices aimed at satisfying emerging or unmet needs. The unmet needs could be a spark for job dissatisfaction and turnover.

2.4.1.2 **McClelland's Need Theory**

McClelland, a well-known psychologist, studied the relationship between needs and behaviour, although he is most recognized for his research on the needs for affiliation and power (Grissmer & Kirby, 1999:114). Before discussing each of these needs, it is imperative to consider the typical approach used to measure the strength of an individual's needs.

- **Measuring Need Strength**

  The Thematic Apperception Test (TAT) is frequently used to measure an individual's motivation to satisfy various needs. In completing TAT, people are asked to write stories about ambiguous pictures. These descriptions are then scored to the extent to which they contain achievement, power, and affiliation imagery. A Meta analysis of 105 studies demonstrated that TAT is a valid measure of the need for achievement.

- **The Need for Achievement**

Achievement theories propose that motivation and performance vary according to the strength of one's need for achievement. For example, a field study of 222 life insurance brokers found a positive correlation between the number of policies sold and the brokers' need for achievement. McClelland's research supported an analogous relationship for societies as a whole. His results revealed that a country's level of economic development was positively related to its overall achievement motivation (Spector; Cooper & Aguilar-Vefaie 2002:450). The need for achievement is defined by the following desires:

- ❖ To accomplish something difficult.
- ❖ To master, manipulate, or organise physical objects, human beings or ideas.
- ❖ To master, manipulate, or organize physical objects, human beings or ideas as rapidly and as independently as possible.
- ❖ To overcome obstacles and attain a high standard.
- ❖ To excel in one's self.
- ❖ To revelry and surpass others.
- ❖ To increase self-regard by the successful exercise of talent.
- ❖ This definition reveals that the need for achievement overlaps Maslow's higher order needs of esteem and self-actualisation. One does not have to be a famous athlete, executive or personality to display high achievements. Achievement-motivated people share two common characteristics:
- ❖ One is a preference for working on tasks of moderate difficulty, for example, when high achievers are asked to stand wherever they like while tossing rings at a peg on the floor, they tend to stand about 10 to 20 meters from the peg. This distance presents the ring tosser with a challenging, but not impossible task. People with a low need for

achievement, in contrast, tend to either walk up to the peg or drop the rings to gamble on a lucky shot from a distance. The high achievers' preference for moderately difficult task reinforces achievement behaviour by reducing the frequency of failure and increasing the satisfaction associated with successfully completing challenging tasks. Achievers also thrive on situations where their performance is due to their own efforts rather than depending on other factors, such as luck.

- A second identifying characteristic of high achievers is that they desire more feedback on their successes and failures than low achievers. Given these characteristics, McClelland proposed that high achievers are more likely to be successful entrepreneurs and a recent review of research on the 'entrepreneurial" personality supported this conclusion. Entrepreneurs were found to have a higher need for achievement than non-entrepreneurs (Sindell, 2001:11; Taris, Peeters, Le Blanc, Schreurs & Schaufeli, 2001:313).

- **The need for Affiliation**

This is the desire to spend time in social relationships and activities. Research reveals that people possess a basic desire to form and maintain a few lasting, positive, and important interpersonal relationships. The researchers noted that both psychological and physical health problems are higher among people who lack social attachments. Just the same, not everyone has a high need for affiliation. People with a high need for affiliation prefer to spend more time:

- maintaining social relationships;
- joining groups; and
- wanting to be loved.

Such individuals are not the most effective performers because they have a hard time making difficult decisions without worrying about being disliked (Boggler, 1999:231).

- **The Need for Power**

The need for power reflects on an individual's desire to influence, coach, teach, or encourage others to achieve. People with a high need for power like to work and are concerned with discipline and self-respect. There is a positive and negative side to this need. The negative face of power is characterised by an "if I win, you lose" mentality. In contrast, people with a positive orientation to power focus on accomplishing group goals and helping employees obtain the feeling of competence. Because effective performers must positively influence others, McClelland believes that individuals with high achievement motivation are not best suited for top management positions. Several studies support these propositions (Atkinson, 2000:52).

Given the fact that adults can be trained to increase their achievement motivation, schools should consider the benefits of providing achievement training for educators. Moreover, achievement, affiliation, and power needs can be considered during the selection process, for better placement. Many studies reveal that individuals' need for achievement affected their preference to work in different organizations (Theall & Franklin, 1999:102). People with a high need for achievement were more attracted to organizations that had a pay-for-performance environment than were those with a low achievement motivation. In the case of this research, it is advisable that School Management Teams should create challenging task assignments or goals because the need for achievement is positively correlated with goal commitment, which, in turn, influences performance. Moreover, challenging goals should be accompanied with a more autonomous work environment and educator empowerment to capitalise on the characteristics of high achievers (Bussing & Glaser, 2000:333 & Dinham & Scott, 2000:382)

2.4.1.3 **Reinforcement**

Reinforcement theorists, such as Edward, Burnard, Coyle, and Fothergill (2001:806) proposed that behaviour is controlled by its consequences, not by the result of hypothetical internal states such as instincts, drives, or needs. This proposition is based on research data demonstrating that people repeat behaviours followed by favourable consequences and avoid behaviours resulting in unfavourable consequences. Few would argue with the statement that organisational rewards have a motivational impact on job behaviour. However, behaviourists and cognitive theorists do disagree over the role of internal states and processes in motivation (Hayward, 2003:175).

2.4.1.4 **Cognitions**

Uncomfortable with the idea that behaviour is shaped completely by environmental consequences; cognitive motivation theorists contend that behaviour is a function of beliefs, expectations, values, and other mental cognitions. Behaviour is therefore viewed as the result of rational and conscious choices among alternative courses of action (Leibowitz, 2003:97).

2.4.1.5 **Job Characteristics**

This theory is based on the idea that the task itself is the key to employee motivation. Specifically, a boring and monotonous job stifles motivation to perform well, whereas a challenging job enhances motivation. Three ingredients of a more challenging job are:

- Variety;
- Autonomy; and
- decision authority.

Two popular ways of adding variety and challenge to routine jobs are job enrichment or job redesign and job rotation (Leung, Siu & Spector, 2000:143).

2.5. **Feelings/emotions**

This addition to the evolution of the motivation theory is based on the idea that workers are whole people who pursue goals outside of becoming a high performer (Blau, Allen & Spector, 2002:127). For example, a person may want to be an A student, a loving boyfriend or girlfriend, a caring parent, a good friend, a responsible citizen, or a happy person. Work motivation is thus thought to be a function of ones feelings and emotions toward the multitude of interests and goals that one has. A person is likely to study long and hard if one's only interest in life is to enter a university faculty of education and become an educator. In contrast, a highly motivated educator is likely to quit teaching and dismiss class upon receiving a message that his or her child was seriously hurt in an accident.

Motivation theories present School Management Teams with alternative explanations and recommendations on job satisfaction. There is not a single motivation theory that is appropriate in all situations. Rather, School Management Teams need to use a contingency framework to pick and choose the motivational techniques best suited to the people and situation involved (Blau, 1999:94) (a).

2.6 **The job characteristics approach to job design**

Jobs are highly specialised and standardised when they are re-designed according to the principles of scientific management (Blau, Allen & Spector, 2002:146). Designing jobs according to the principles of scientific management has both positive and negative consequences. Positively, employee efficiency and productivity are increased. On the other hand, research reveals that simplified, repetitive jobs also lead to job dissatisfaction, poor mental health, higher levels of stress, and low sense of accomplishment and personal growth. Further, the principles of scientific management do not apply to professional "knowledge" workers, and they are not consistent with the trend to empower both employees and

work teams. These negative consequences paved the way for the development of other job designs (Monahan, 2002:87, Moyle & Parkes, 1999:24).

Newer approaches such as those mentioned below attempt to design intrinsically satisfying jobs:

2.6.1. Job Enlargement

This technique was first used in the late 1940s in response to complaints about tedious and overspecialised jobs. Job enlargement involves putting more variety into a worker's job by combining specialised tasks of comparable difficulty. Some call this horizontally loading the job. Proponents of job enlargement claim it can improve employee satisfaction, motivation and quality of production (Murray, 1999: 97). Researchers recommend using job enlargement as part of a broader approach that uses multiple job design techniques.

2.6.2 Job Rotation

As with job enlargement, job rotation's purpose is to give employees greater variety in their work. Job rotation calls for moving employees from one specialised job to another. Rather than performing only one job, workers are trained and given the opportunity to perform two or more separate jobs on a rotating basis. By rotating employees from job to job, managers believe they can stimulate interest and motivation while providing employees with a broader perspective of the organisation (Davis & Wison, 2000:59).

Other proposed advantages of job rotation include increased worker flexibility and easier scheduling because employees are cross-trained to perform different jobs. In turn, this cross-training requires employees to learn new skills, which can assist them in upward or offer lateral mobility. The promised benefits associated with job rotation programmes have not been adequately researched. It is thus difficult to draw any empirical conclusions about their effectiveness (Dinham & Scott, 2000:158).

2.6.3 **Job Enrichment**

Job enrichment, which means building achievement, recognition, stimulating work, responsibility, and advancement into *a job,* is the practical application of Frederick Herzberg's motivator-hygiene theory of job satisfaction (Silveste; Anderson-Gough; Anderson & Mohamed 2002:64). The legacy of Herzberg's Motivator-Hygiene Theory:

- Herzberg's theory is based on a landmark study in which he interviewed 203 accountants and engineers. These interviews sought to determine the factors responsible for job satisfaction and dissatisfaction. Herzberg found separate and distinct clusters of factors associated with achievement, recognition, and characteristics of the work, responsibility, and advancement. These factors were all related to outcomes associated with the content of the task being performed. Herzberg labeled these factor motivators because each was associated with strong effort and good performance. He hypothesised that motives cause a person to move from a state of no satisfaction to satisfaction. Therefore, Herzberg's theory predicts managers can motivate individuals by incorporating "motivators" into an individual's job (Herzberg, Bernard & Bloch, 2002:142).
- Herzberg found job dissatisfaction to be associated primarily with factors in the work context or environment. Specifically, organization policy and administration, technical supervision, salary, interpersonal relations with one's supervisor, and working conditions were most frequently mentioned by employees expressing job dissatisfaction. Herzberg labeled this second cluster of factors hygiene factors. He further proposed that they were not motivational. At best, according to Herzerg's interpretation, an individual will experience no job dissatisfaction when she/he has no grievances about hygiene factors (Kendall, Murphy, O'Neil, Bursnall, 2000: 78).

The key to adequately understanding Herzberg's motivator-hygiene theory is recognising that he believes that satisfaction is not the opposite of dissatisfaction.

Herzberg concludes that "the opposite of job satisfaction is not job dissatisfaction, but rather no job satisfaction, and similarly, the opposite of job dissatisfaction is not job satisfaction, but no dissatisfaction." Herzberg thus asserts that the dissatisfaction – satisfaction continuum contains a zero mid-point at which dissatisfaction and satisfaction are absent. Conceivably, an organisation member who has good supervision, pay, and working conditions but a tedious and unchallenging task with little chance of advancement would be at the zero midpoints. That person would have no dissatisfaction (because of good hygiene factors) and no satisfaction (because of a lack of motivators) (Deci, 1998:49).

Herzberg warns managers that it takes more than good pay and good working conditions to motivate today's employees. It takes an "enriched job" that offers the individual opportunity for achievement and recognition, stimulation, responsibility, and advancement. Unfortunately, a study of 600 educational managers and 900 workers indicated that organisations might not be currently heeding Herzberg's advice. Results revealed that only 33% felt that their educational managers knew what motivated them, and 60% concluded that they did not receive any sort of recognition or rewards for their work (Herzberg & Snyderman, 2002:99).

Research on the Motivator-Hygiene Theory, Herzberg's theory, has generated a great deal of research and controversy. The controversy revolved around whether studies supporting the theory were flawed, and thus invalid. A motivation scholar, Kenny (2000:64) attempted to sort out the controversy by concluding: In balance, when we combine all of the evidence with all of the allegations that the theory has been misinterpreted, and that its major concepts have not been assessed properly, one is left, more than 20 years later, not really knowing whether to take the theory seriously, let alone whether it should be put into practice in organisational settings. There is support for many of the implications the theory has for enriching jobs to make them more motivating. But the two-factor aspect of the theory, the feature that makes it unique, is not really a necessary element in the use of the theory for designing jobs, *per se.*

From the foregoing paragraph it is clear that job enrichment entails modifying a job such that an employee has the opportunity to experience achievement, recognition, stimulating work, responsibility, and advancement. These characteristics are incorporated into a job through vertical loading. Rather than giving employees additional tasks of similar difficulty (horizontal loading), vertical loading consists of giving workers more responsibility. In other words, employees take on chores normally performed by their supervisors.

In the case of this study, School Management Teams are advised to adhere to the following principles when vertically loading jobs (Schulze & Steyn, 2003:1004).

Principle	Motivators Involved
A. Removing some controls while retaining accountability	Responsibility and personal achievement
B. Increasing the accountability of individuals for their own work	Responsibility and recognition
C. Giving a person a complete natural unit of and work (module, division, area, and so on)	Responsibility, achievement, recognition
D. Granting additional authority to an employee and in his activity, job freedom	Responsibility, achievement, recognition
E. Making periodic reports directly available to the worker himself rather than to the supervisor	Internal recognition
F. Introducing new and more difficult tasks not previously handled	Growth and learning
G. Assigning individuals specific or specialised tasks, enabling them to become experts'	Responsibility, growth, and advancement

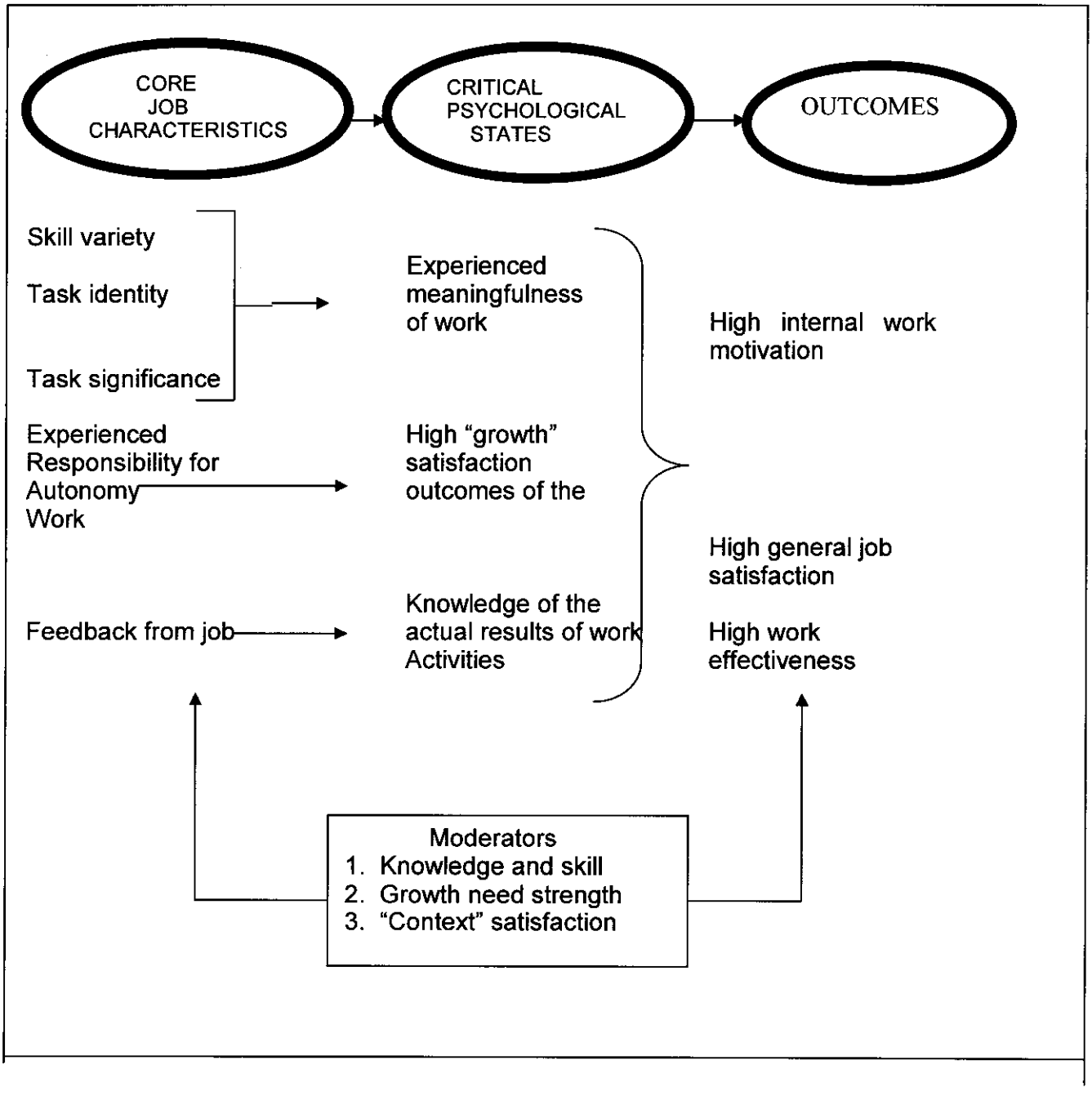
2.6.4 Job Characteristics

The job characteristics model is a more recent approach to job design. It is a direct out growth of job enrichment and attempts to pinpoint those situations and those individuals for which job designs are most effective. In this regard, the job characteristics model represents a contingency approach.

In their research, Gerstein, Keating, Yovanoff and Hamiss (2001:175) determined how work can be structured so that employees are internally (or intrinsically) motivated. Internal motivation occurs when an individual is 'turned on to ones work because of the positive internal feelings that are generated by doing well, rather than being dependent on external factors (such as incentive, pay or compliments from the boss) for the motivation to work effectively. These positive feelings power a self-

perpetuating cycle of motivation. As shown by the job characteristics model below, internal work motivation is determined by three psychological states. In turn, these psychological states are fostered by the presence of five core job dimensions. The job characteristics model objective is to promote high internal motivation by designing jobs that possess the five core job characteristics.

The job characteristics model



The conditions under which individuals experience the three critical psychological states have been described as follows (Leung, Sui, & Spector, 2000:98):

- **An experience of meaningfulness:** Is feeling that one's job is important and worthwhile. The individual must perceive his/her work as worthwhile or important by some system of value she accepts.
- **An experience of responsibility:** Believing that one is accountable for work outcomes. He/she must believe that s/he personally is accountable for the outcomes of his/her efforts.
- **Knowledge of results:** Feedback about work outcomes. He/She must be able to determine, on some fairly regular basis, whether or not the outcomes of his/her work are satisfactory.

These psychological states generate internal work motivation. Moreover, they encourage job satisfaction and perseverance because they are self-reinforcing. If one of the three psychological states is short-changed, motivation diminishes.

2.6.5 **Core Job Dimensions** (Job characteristics found to various degrees in all jobs)

In general terms, *core job dimensions* are common characteristics found to a varying degree in all jobs (Lowry, 2004:56). Once again, five core job characteristics elicit the three psychological states. Three job characteristics combine to determine experienced meaningfulness of work. They are:

- *Skill variety.* The extent to which the job requires an individual to perform a variety of tasks that requires him/her to use different skills and abilities.
- *Task identity.* The extent to which the job requires an individual to perform a whole or completely identifiable piece of work. In words, task identity is high when a person works on a product or project from beginning to end and sees a tangible result.

- *Task significance*. The extent to which the job affects the lives of other people within or outside the organisation.

Experienced responsibility is elicited by the job characteristic of autonomy and feedback (Prusak, 2001:1003).

Gerstein, Keating, Yovanoff and Hamiss (2001:84) devised a self-report instrument to assess the extent to which a specific job possesses the five core job characteristics. With this instrument, it is possible to calculate a motivating potential score (MPS) for a job. The motivating potential score (MPS) is a summary index that represents the extent to which the job characteristics foster internal work motivation. Low scores indicate that an individual will not experience high internal work motivation from the job. Such a job is a prime candidate for job redesign. High scores reveal that the job is capable of stimulating internal motivation.

The **MPS** is computed as follows:

$$MPS = \frac{\text{Skill variety} + \text{Task identity} + \text{Task Significance}}{3} \times \text{Autonomy} \times \text{Feedback}$$

Gersten, Keating, Yovanoff and Hamiss incorporated the conclusion that not all people may want enriched work into their model by identifying three attributes that are concerned with the individual's response to jobs with a high MPS. These attributes are concerned with the individual's knowledge and skill, growth need strength (representing the desire to grow and develop as an individual), and context satisfactions. Context satisfactions represent the extent to which employees are satisfied with various aspects of their job, such as satisfaction with pay, co-workers, or supervision. Gersten, Keating, Yovanoff and Hamiss (2001:552) proposed that people will respond positively to jobs with a high MPS when:

- they have the knowledge and skills necessary to do the job;
- they have high growth needs; and

- they are satisfied with various aspects of the work context, such as pay and co-workers.

The model worked equally well for employees with high and low growth needs and context satisfaction.

The following three major steps should be followed when applying the Gersten, Keating, Yovanoff and Hamiss's (2001:90) model. Since the model seeks to increase employee motivation and satisfaction:

- The first step consists of diagnosing the work environment to determine if a problem exists. Gersten, Keating, Yovanoff and Hamiss developed a self-report instrument for educational managers to use, which they called the *Job Diagnostic Survey* (JDS). Diagnosis begins by determining if motivation and satisfaction are lower than desired. If they are, an educational manager then assesses the MPS of the jobs being examined. National norms are used to determine whether the MPS is low or high. National norms represent the average scores for the MPS and the individual job characteristics based on administering the DJS to numerous samples throughout the country. If the MPS is low, an attempt is made to determine which of the core job characteristics is causing the problem. If the MPS is high, educational managers need to look for other factors eroding motivation and satisfaction.
- Step two consists of determining whether job redesign is appropriate for a given group of employees. Job redesign is most likely to work in a participative environment in which employees have the necessary knowledge and skills.
- In the third step, educational managers need to consider how to redesign the job. The focus of this effort is to increase those core job characteristics that are lower than national norms. Managers must gain employees' input during this step.

The practical implications of the job characteristics model are that the manager may want to use this model to increase employee job satisfaction. Research overwhelmingly demonstrates a moderately strong relationship between job characteristics and job satisfaction. A recent study of employees from a glass manufacturing organization also indirectly supported the job characteristics model. The organization re-designed the work environment by increasing employees' self-efficacy to carry out a broader and more proactive role 18 months later (Shannon, Robson & Sale,:2001:350). Job redesign resulted in higher self-efficacy. Unfortunately, job redesign appears to reduce the quantity of output just as often as it has a positive impact. Caution and situational appropriateness are advised. For example one study demonstrated that job redesign work better in less complex organisations (small plants or companies). Nonetheless, educational managers are likely to find noticeable increases in the quality of performance after a job redesign programme. Results from 21 experimental studies revealed that job redesign resulted in a median increase of 28% in the quality of performance (Smith & Stonton, 1999:374). Moreover, two separate meta-analyses support the practice of using the job characteristics model to help educational managers reduce absenteeism and turnover, and job characteristics were found to predict absenteeism over a six-year period. This later result is very encouraging because it suggests that job redesign can have long-lasting positive effects on employee behaviour.

Job characteristics research also underscores an additional implication for companies undergoing reengineering. Reengineering potentially leads to negative work outcomes because it increases job characteristics beyond reasonable levels (Strumpfer & Benade., 1999:170). This occurs for two reasons:

- re-engineering requires employees to use a wider variety of skills to perform their jobs; and
- re-engineering typically results in downsizing and short-term periods of understaffing.

The unfortunate catch is that understaffing was found to produce lower levels of group performance, and jobs with either overly low or high levels of job characteristics were associated with higher stress. (Stonton, Balzer, Smith, Parra & Ironson, 2001:870).

2.7 The Causes of Job Satisfaction

From the definition of the concept job satisfaction (cf. paragraph 2.2 above) it is clear that job satisfaction is an affective or emotional response to one's job and that satisfaction is not a unitary concept. Rather, a person can be relatively satisfied with one aspect of his or her job and dissatisfied with one or more other aspects. For example, researchers at Sussex University at Brighton developed the Job Descriptive Index (JDI) to assess one's satisfaction with the following job dimensions: work, pay, promotions, co-workers, and supervision. Researchers at the University of Minnesota concluded there are 20 different dimensions underlying job satisfaction. Therefore selected Minnesota Satisfaction Questionnaire (MSQ) items measuring satisfaction with recognition, compensation, and supervision are:

- Need fulfilment model which proposes that satisfaction is determined by the extent to which the characteristics of a job allow an individual to fulfil his or her needs. For example, a recent survey of 30 Massachusetts law-firms revealed that 35% to 50% of law-firm associates left their employers within three years of starting because the firms did not accommodate family needs (Grandey, 2000:69). This example illustrates that unmet needs can affect both satisfaction and turnover. Although these models generated a great degree of controversy, it is generally accepted that the need for fulfilment is correlated with satisfaction (Cote & Morgan, 2002:949).
- Discrepancies model, which proposes that satisfaction, is a result of met expectations. Met expectations represent the difference between what an individual expects to receive from a job, such as good pay and promotional opportunities, and what he/she actually receives. When expectations are greater than what is received, a person will be dissatisfied. In contrast, this

model predicts the individual will be satisfied when he/she attains outcomes above and beyond expectations. A meta-analysis of 31 studies that included 17 241 people demonstrated that met expectations were significantly related to job satisfaction (Ma, 1999:43; Monahan, 2002:54).

- Value Attainment: The idea underlying value attainment is that satisfaction results from the perception that a job allows for fulfillment of an individual's important work values. In general, research consistently supports the prediction that value fulfilment is positively related to job satisfaction. Managers can thus enhance employee satisfaction by structuring the work environment and its associated rewards and recognition to reinforce employees' values (French, 2003:42).
- Equity: In this model, satisfaction is a function of how "fairly" an individual is treated at work. Satisfaction results from one's perception that work outcomes, relative to inputs, compare favorably with a significant other's outcomes/inputs. A meta-analysis involving data from 30 different organisations and 12 979 people supported this model. Employees perceived that fairness of pay and promotions were significantly correlated with job satisfaction (French, 2003:42).
- Dispositional/Genetic Components: Specifically, the dispositional/genetic model is based on the belief that job satisfaction is partly a function of both personal traits and genetic factors. As such, this model implies that stable individual differences are just as important in explaining job satisfaction with the characteristics of the work environment. Although only a few studies have tested these propositions, results support a positive, significant relationship between personal traits and job satisfaction over time periods ranging from two to 50 years. Genetic factors also were found to significantly predict life satisfaction, well-being, and general job satisfaction (Franco, Bennett, Kanfer & Stubblebine, 2004:345).

2.8 **The Consequences of Job Satisfaction**

The key correlates of job satisfaction are:

- **Motivation:** A recent meta-analysis of nine studies and 2 237 workers revealed a significant positive relationship between motivation and job satisfaction. Because satisfaction with supervision also was significantly correlated with motivation, educational managers are advised to consider how their behaviour affects employee satisfaction. Managers can potentially enhance employees' motivation through various attempts to increase job satisfaction (Davis & Wison, 2000:351).

Correlates of Job Satisfaction

Variable Related With Satisfaction	Direction of Relationship	Strength of Relationship
Motivation	Positive	Moderate
Job involvement	Positive	Moderate
Organisational citizenship behaviour	Positive	Moderate
Organisational commitment	Positive	Strong
Absenteeism	Negative	Weak
Tardiness	Negative	Weak
Turnover	Negative	Moderate
Heart disease	Negative	Moderate
Perceived stress	Negative	Strong
Pro-union voting	Negative	Moderate
Job performance	Positive	Weak
Life satisfaction	Positive	Moderate
Mental health	Positive	Moderate

- **Job Involvement:** Job involvement represents the extent to which an individual is personally involved with his/her work role. A meta-analysis involving 27 925 individuals from 87 different studies demonstrated that job

involvement was moderately related with job satisfaction. Educational managers are thus encouraged to foster satisfying work environments in order to fuel employees' job involvement (Grandey, 2000:98; Eisenberg, Bowman & Foster, 2001:129).

- **Organisational Citizenship Behaviour:** Organisational citizenship behaviors consist of employee behaviours that are beyond the call of duty (Callaghan, Tak-Ting & Wyatt, 2000:1522). Examples include "such gestures as constructive statements about the department, expression of personal interest in the work of other, suggestions for improvement, training new people, respect for the spirit as well as the letter of housekeeping rules, care for organisational property, and punctuality and attendance well beyond standard or enforceable levels." Educational managers 6 746 people and 28 separate studies revealed a significant and moderately positive correlation between organisational citizenship behaviours and job satisfaction. Moreover, additional research demonstrated that employees' citizenship behaviours were determined more by leadership and characteristics of the work environment than by an employee's personality. It thus appears that educational managerial behaviour significantly influences an employee's willingness to exhibit citizenship behaviours. This relationship is important to recognise because organisational citizenship behaviors were positively correlated with performance ratings (Cobb, 1998:117).

- **Organisational Commitment:** Organisational commitment reflects the extent to which an individual identifies with an organisation and is committed to its goals. A meta-analysis of 68 studies and 35 282 individuals uncovered a significant and strong relationship between organisational commitment and satisfaction. Educational managers are advised to increase job satisfaction in order to elicit higher levels of commitment. In turn higher commitment can facilitate higher productivity (Davis & Wison, 2000:352).

- **Absenteeism:** Absenteeism is costly, and managers are constantly on the lookout for ways to reduce it. One recommendation has been to increase job satisfaction. If this is a valid recommendation, there should be a strong negative relationship [or negative correlation] between satisfaction and absenteeism, in other words, as satisfaction increases absenteeism should decrease. A researcher tracked this prediction by synthesizing three separate meta-analyses containing a total of 74 studies. Results revealed a weak negative relationship between satisfaction and absenteeism. It is therefore unlikely that those managers will realise any significant decrease in absenteeism by increasing job satisfaction (Bond & Bunce, 2003:1062).

- **Turnover:** Turnover is important to managers because it disrupts the organisation continuity and is very costly. A meta-analysis of 78 studies covering 27 543 people demonstrated a moderate negative relationship, between satisfaction and turnover. Given the strength of this relationship, managers would be well advised to try to reduce turnover by increasing employee job satisfaction (Bureau of National Affairs, 1998 & Hughes, 2001:293).

- **Perceived stress:** Can have very negative effects on organisational behaviour and an individuals health stress is positively related to absenteeism, turnover, coronary heart disease and viral infections. According to (Michaelowa 2001(b):75) stock, director of the National Institute for Occupational Safety and Health, stress at work has been increasing because of the widespread downsizing of corporate America in recent years. She believes that 25% to 33% of the workforce is under extreme high stress and is drained and virtually used up by the end of a workday. In addition people are working more hours for example the average number of hours Americans work (47 hours per week) has increased by 8% between 1998 and 1999. Of the workforce works at least 49 hours per week (Chan, Kop & Boey, 2000:1418). Based on a meta-analysis of seven studies covering 2 659 individuals, it reveals that perceived stress has a strong, negative relationship

with job satisfaction. It is hoped that educational managers would attempt to reduce the negative effects of stress by improving job satisfaction (Herzberg, Bernard & Bloch, 2002:249).

- **Job Performance:** Is one of the biggest controversies within organisational research caters on the relationship between satisfaction and job performance. Some researchers, such as Herzberg, argue that satisfaction leads to higher performance while others contend that high performance was examined for 12 192 people. It was discovered that there was small positive relationship between satisfaction and performance (Herzberg, Bernard & Bloch, 2002:245).

Researchers (Herzberg, Bernard & Bloch, 2002:240) have identified two key reasons why this result is misleading and understates the true relationship between satisfaction and performance.

- First, job satisfaction is not theoretically expected to have a strong influence on behaviour (e.g. performance and turnover). Rather, a satisfaction is hypothesised to indirectly affect performance through an employee's intentions or effort (Blau, 2001:87). Note how job satisfaction, which is represented by the term "affect" in the individual input box, is at the far left of the model and that performance is on the far right. Performance is expected to be more strongly influenced by the boxes in between individual inputs and performance, namely motivational processes and motivated behaviors. A recent meta-analysis supported this conclusion. If performance ratings do not reflect the actual interactions and interdependencies to work, weak meta-analytic results are partially due to incomplete measures of individual–level performance (Hung & Lui, 1999:10).
- Examining the relationship between aggregate measures of job satisfaction and organisational performance is one solution to correct this problem. In support of these ideas, a recent study found a significant, positive correlation between organisational performance and employee satisfaction according to

Stefani, (1999:17) data collected from 298 schools and 13 808 educators (Eichinger, 2000:405). Thus, it appears that managers can positively affect performance by increasing employee job satisfaction.

2.9 Research on educators and job satisfaction

The six job dimensions and 10 hygiene factors theorised by Herzberg, (2002:422) have been commonly used in educators' job satisfaction research. A study conducted by Chen, Cheng and Garret (1999) suggested that an employee can be satisfied and unsatisfied within a specific job. They conducted a study using 53 men and 48 women comprising of Mathematics and Science educators at the University of Victoria (Canada). The authors used the Manifest Needs Questionnaire (MNQ) developed by Steers and Braunstein (1976) to measure achievement, autonomy, affiliation, and dominance that Mathematics and Science educators express in the job and the current satisfaction that they experience in the job. The data collected from the MNQ indicates interrelationships amongst the four need subscales and a collection of job characteristics (i.e. job performance, work attitudes, organisational attachment, leadership attributes). Obtaining satisfactory levels of internal and external consistency have made the MNQ a productive instrument for both overall personality and specific need expression of the job.

Chen (2000:153) and Cheng (2000:121) used correlations to measure the interrelationships between subscales on the MNQ and sex, age, years of teaching experience, and 23 characteristics present in the job. Not surprisingly, the authors found no significant differences (3.15 up to 3.46), $0.10<-p<0.15$, in the sub-scales of gender, age, years of teaching experience. The interesting part of the survey was that the authors reported that this group indicated an overall satisfaction most highly related to security, freedom, and variety on the job, $p<0.05$. This would be a good study to compare to a survey of Mathematics and Science educators in Virginia. Since the study was done with a very homogenous

group, it would be interesting to see if a repeat of the study with a diverse group would provide different results.

Using the Minnesota Satisfaction Questionnaire as her research instrument, Newby (1999) randomly selected 188 middle school Mathematics and Science educators in Virginia to answer the survey on job satisfaction. Newby was attempting to answer three questions:

- What was the general level of satisfaction among Mathematics and Science educators?
- What is the satisfaction level for each of the 20 dimensions measured by the Minnesota Satisfaction Questionnaire? and
- What is the satisfaction for each dimension according to the demographic variables: gender, age, degree, and years of experience, school location, and school size?

One criticism of the Newby study was the selection method used and the lack of follow-up to gain data from non-respondents. The author compiled data on only those surveys that were voluntarily returned. She reported that 70% of the surveys were returned, which is good for a mailed survey, however, the author gave no induction of an attempt to get back the 30% of non-returns. Newby seemed satisfied to draw the conclusions based on those who responded. The 30% who failed to return the survey may have made a difference in the final totals. Newby could have conducted a random sample and a phone follow-up to collect data from non-respondents. Then the data for non-respondents could be compared to the other group to see if theirs differed significantly.

A second criticism of this study was the small number distributions in some areas of demographics. These small numbers may have led to false significance as a result of unbalanced cells in the running of the ANOVA. For example, Newby reported that the youngest group of Mathematics and Science educators surveyed obtained the highest mean and that general satisfaction began to

decline as Mathematics and Science educators reached the middle age groups. She further reports that after age 55, satisfaction began to increase again. Upon closer inspection, the youngest respondents numbered 43, and the oldest respondents numbered 10, while the middle-aged group numbered 82. Newby reported this information as significant without giving any consideration that the significance can be attributed to artefact error created by unbalanced cells and not actual significance.

Leibowitz (2003:12) conducted a study of 632 secondary Mathematics and Science educators employed in Ohio during the 2003-2004 school years, using the Minnesota Satisfaction Questionnaire. Leibowitz found that Mathematics and Science educators who believed they were accomplishing much on the job reported higher level of satisfaction compared to Mathematics and Science educators who believed they were accomplishing less. Leibowitz also found that Mathematics and Science educators who believed there would be opportunities for advancement within their school system were found to have significantly higher, $p=0.01$, levels of job satisfaction compared to those who didn't believe those opportunities existed. Also, Mathematics and Science educators who felt their talents and skills were being utilised in their jobs had a higher level of job satisfaction than those who did not hold this belief. Finally, Leibowitz reported that Mathematics and Science educators who wanted to be promoted were found to have significantly higher, $p=0.01$, levels of job satisfaction compared to those Mathematics and Science educators who did not aspire to be promoted.

In 2000, Kuei-Lung Chen conducted a study using the MSQ in which he studied 245 Mathematics and Science educators in Mississippi to determine the degree of general, intrinsic, and extrinsic job satisfaction among high school Mathematics and Science educators. Chen mailed a survey to the subjects and used the results to conduct a series of ANOVA. His results showed a high degree of general, intrinsic, and extrinsic job satisfaction among the Mathematics and Science educators. Compensation and workload were the only factors

receiving less than 50% satisfaction rating. Chen also reported no significant relationship in the following two specific variables examined in the study:

- length of time worked as a Mathematics and Science educator, and
- school size in terms of learner enrolment.

(Bjeregaard, 2004:110) conducted a study that tested the relationship between locus of control and job satisfaction of Appalachian Mathematics and Science educators with predominantly internal loci of control will have significantly high levels of job satisfaction than those Mathematics and Science educators with external locust of control. Bjeregaard (2004:91) also hypothesised that these same Mathematics and Science educators with predominantly internal locust of control would have significantly higher levels of extrinsic job satisfaction than those same Mathematics and Science educators with external loci of control.

To test these hypotheses Bjeregaard (2004:92) took a random sample (N=333) of the population (N=2.649) and administered the Adult Nowicki-Strickland Internal External Scale (ANSIE) to measure locus of control and the Mohrman-Cooke-Mohramn Job Satisfaction Scale. The author then used an ANOVA to test the two-directional hypotheses that guided his study. Bjeregaard (2004:104) found a statistically significant relationship between internal loci of control and intrinsic job satisfaction of Appalachian Mathematics and Science educators in the states of West Virginia, Virginia, Kentucky, and Tennessee. Bjeregaard (2004:106) also reported that female Mathematics and Science educators of the Appalachia countries experienced significantly higher levels of intrinsic job satisfaction than their male colleagues. He also reported that those same Mathematics and Science educators who made in excess of $40,000 annually experience significantly higher levels of intrinsic job satisfaction.

The main limitation of this study is the inherent weakness of using an Internal/External locus of control (I/E) instrument. Also, Bjeregaard (2004:104) chose only to correlate gender and salaries with me /E instrument. He failed to

look at age, years experience or schools size. Also, Bjeregaard (2004:103) grouped all Mathematics and Science educators together. He also made no differentiation in his results regarding elementary or high school. With a high concentration of female Mathematics and Science educators in the elementary school he should have reported gender as well as school level. This would have given the study a clearer picture on gender. Although this was the design of the study, it is also a limitation since it limits the inferences that can be drawn from sample to populations other than the rural population.

Smith (2001:1106) studied job satisfaction of Connecticut public senior high school Mathematics and Science educators as related to school location and school size. Smith's purpose for this study was to determine the level of job satisfaction among current Connecticut Public Senior High School mathematics and science educators to determine if job satisfaction of these educators differed according to location or size of school, and to see if certain personal demographic variables could be used as predictors of mathematics and science educators' job satisfaction.

For his study, Smith used the Minnesota Satisfaction Questionnaire (Long Form, Adapted) and a demographic data sheet to survey 143 senior high school Mathematics and Science educators of which 93% responded (N=133). Smith found that Connecticut public school senior high Mathematics and Science educators could be described as very satisfied with their jobs (M=77.5, in a range of 0-100). Smith also reported that with regards to school size these same Mathematics and Science educators could be described as very satisfied with their overall job situations regardless of school size (Large school M=78.088, medium school M=78.062, and small school M=79.147). Smith's results showed that all groups of Mathematics and Science educators unanimously ranked social service, moral values, activity, and achievement at the high end of the satisfaction continuum.

The main limitation of Smith's study was in the design itself. By limiting the study to school size had little relative to job satisfaction, Smith discovered a high level of job satisfaction and had little left to report. Additionally, when one looks at the data of 2000, the Mathematics and Science educators surveyed were a highly homogeneous group, 97% male, 95% married, 98% white, 50% age 40 to 49, 57% Catholic. A replication of this study today probably would reveal drastically different demographic data.

Evans (2001:174) studied job satisfaction among secondary school Mathematics and Science educators in California. Evans sent 97 secondary school Mathematics and Science educators a questionnaire. She reported that the majority of the Mathematics and Science educators (87%) were satisfied with their job, 10% were extremely satisfied with their jobs and 3% were less than satisfied. Evans also reported no significant difference for job satisfaction as related to nine independent variables: orientation, age gender, and ethnicity, and salary, years as a secondary principal, schools structure, school population and district size.

The main limitation of the Evans study was the homogeneous group in which she researched. His sample was too small and homogeneous making it difficult to draw conclusive results: 82% male, 92% white, and 61% in the age range of 45 to 54.

2.10 **Conclusion**

This chapter reviewed literature explaining several historic theories of job satisfaction and, finally, various studies conducted with regard to Mathematics and Science educators' job satisfaction were analyzed.

The next chapter presents the empirical design of this research.

Chapter 3

Empirical design

3.1 Introduction

Chapter 3 of this research contains the problem statement, research questions, a description of the population, the procedure for data collection, the instrumentation and the proposed data analysis. The research design of this research is descriptive. Descriptive statistics (see chapter 4) are used to describe the sample and look for the variability among this data and to determine how closely the data are related (Boreen & Niday, 2000:155).

3.2 Research questions

The purpose of this research was to investigate job satisfaction among Mathematics and Physical Science educators as one of the causes of educator turnover.

With the Mathematics and Science educators' shortage in mind, the research questions for this descriptive study are:

- What are the intrinsic and extrinsic motivators of Mathematics and Physical Science educators?
- What is the general satisfaction level of Mathematics and Physical Science educators for each of the 20 dimensions of the job as measured by the MSQ?
- Which ways can be suggested for schools and the Department of Education to create motivating working conditions for Mathematics and Physical Science educators in order to reduce turnover?

3.3 Purposes of research

The purposes of this research emanated from the research questions mentioned in paragraph 1.2 above. They were to determine the:

- intrinsic and extrinsic motivators of Mathematics and Physical Science educators;
- general satisfaction level of Mathematics and Physical Science educators for each of the 20 dimensions of the job as measured by the MSQ; and
- to suggest ways in which schools and the Department of Education can create motivating working conditions for Mathematics and Physical Science educators with an aim of reducing turnover.

3.4 Empirical research

An literature review and empirical research methods were used in this investigation. A literature review (see chapters 1 and 2) was conducted in order to obtain a theoretical foundation and framework for this study. In addition to the literature study, data were collected by means of the MSQ. Empirical research was conducted in order to answer the questions (see 1.2 and 3.2 above) and for motivating the purposes of this research as mentioned in paragraphs 1.3 and 3.3 above.

3.5 Procedure

The authorities of districts 7 and 8 in the Vereeniging and Vanderbijlpark areas of the GDE were requested for permission to conduct this research in a sample of Mathematics and Physical Science educators teaching at secondary schools under their jurisdiction. The researcher personally visited these schools to deliver and collect the questionnaires.

3.6 Instrumentation

The instrumentation for this study was the Minnesota Satisfaction Questionnaire (MSQ) long form. Sample questions from the MSQ can be found in Appendix A. The MSQ (1977 revision) is a classic research tool in job satisfaction research and has been used in many research studies (Newby, 1999, Smith, 1976, Sutter, 1994). The work Adjustment Project of the Industrial Relations Centre at the University of Minnesota developed the MSQ. The MSQ was based on the theory of work adjustment that began in 1957 and first published in 1964 by George England, Rene Dawis, and Lloyd Lofquist (Davis & Wisson, 2000:121). These studies that began in 1957 had two objectives, namely:

- the development of diagnostic tools for assessing the work adjustment "potential" of applicants for vocational rehabilitation; and
- the evaluation of work adjustment outcomes (Davis, Wisson 2000).

The authors utilised the original instrument to collect normative data for 21 MQS scales for 25 occupations including bookkeepers, labourers, typist, engineers, managers, and teachers (Davis & Wison, 2000:350).

The Minnesota Satisfaction Questionnaire (MSQ), Vocational Psychology Research, the University of Minnesota, 1977 is designed to measure a level of 20 needs dimensions. The instrument contains 100 items with five comprising each of 20 different sub-scales and is self-administered in 15 to 20 minutes. The items appear in blocks of 20 scales and so that items for each sub-scale appear at 20 item intervals. The MSQ scales, which represent twenty dimensions of the job, are described below (Carson, Roe, Birkenmeier & Phillis, 1999:7):

- Ability utilisation: The chance to do something that makes use of abilities
- Achievement: The feeling of accomplishment one gets from the job
- Activity: Being able to keep busy all the time
- Advancement: The chances for advancement on this job
- Authority: The chance to tell people what to do
- Organization policies and procedures: The way organization policies are implemented

- Compensation: Feelings about pay in contrast to the amount of work completed
- Co workers: How one gets along with co workers
- Creativity: The opportunity to try one's own method
- Independence: The opportunity to work autonomously
- Moral values: The opportunity to do things that do not run counter to the one's beliefs
- Recognition: Being recognized for a job well done
- Responsibility: The freedom to implement one's judgement
- Security: The way a job provides for steady employment
- Social service: Being able to do things in a service to others
- Social Status: Having respect for the community
- Supervision: The relationship between supervisors and employees
- Supervision-technical: The technical quality of supervision
- Variety: The opportunity to do different things
- Working Conditions: Physical aspects of one's place of employment

The MSQ is used to measure relative satisfaction to selected job characteristics. The respondents were given the choice, "On my present job, this is how I feel about..." And responded: Not satisfied, only slightly satisfied, satisfied, very satisfied, or extremely satisfied (Davis & Wilson, 2000:350). A five point Likert format was used to record responses. In addition, a total satisfaction score for the instrument was computed.

3.6.1 **Reliability**

The Minnesota Satisfaction Questionnaire has undergone extensive analysis and has been found to be a reliable measure of general satisfaction (Gipson-Jones, 2002: 76). Reliability is the measure to determine that if the same MQS is applied to the same individual in the same manner, then it should yield the same value from moment to moment, provided that nothing has changed in the meantime (Irving & Coleman, 2003:99). Two measures of reliability were used, that is, internal consistency and stability. Internal consistency was measured by using Hoyt's method of analysis of

variance, which showed a reliability coefficient for 83% of scales have internal consistency reliability (Moyle & Parkes, 1999:627).

3.6.2 **Validity**

Evidence for the validity of the MQS is derived mainly from its performing according to expectations, or its construct validity. Construct validity is the extent to which an instrument can be shown to measure the construct being studied (Gall, Gall & Borg, 2003). Evidence of concurrent validity of the MQS was collected from 25 occupational groups (N=2 955). The analysis revealed group differences were statistically significant for at 0, 001 levels for both means and variances on all 20 dimensions of the MQS (Rich & Ginsburg, 1999: 372).

3.7 **Statistical techniques**

To determine the intrinsic and extrinsic motivators of Mathematics and Physical Science educators; their general satisfaction level for each of the 20 dimensions of the job as measured by the MSQ; and to eventually suggest ways which schools and the Department of Education can adopt in creating motivating working conditions for Mathematics and Physical Science educators with an aim of reducing turnover of these scarce skills possessing educators, data obtained from the target population were analysed using the SPSS programme by the Statistical Consultation Services of the North-West University (Vaal Triangle Campus).

3.8 **Conclusion**

This chapter presented the empirical design of this research. The next chapter presents the analysis and interpretation of the results of the empirical research.

Chapter 4

Analysis and interpretation

4.1 Introduction

The aims of this research were to determine:

- the intrinsic and extrinsic motivators of Mathematics and Physical Science educators;
- the general satisfaction level of Mathematics and Physical Science educators for each of the 20 dimensions of the job as measured by the MSQ; and
- suggest ways which schools and the Department of Education can adopt in creating motivating working conditions for Mathematics and Physical Science educators in order to reduce turnover.

This chapter presents the analysis and interpretation of results of the empirical research.

4.2 MSQ Scale Reliability Analysis

The Minnesota Satisfaction Questionnaire (MSQ) contains 100 items that measures 20 specific dimensions of job satisfaction. The MSQ allows the researcher to measure general satisfaction by using an item from each of the 20 dimensions of the MSQ. For each statement on the MSQ, respondents were asked their level of satisfaction according to a 5-point Likert Scale:

- Very Dissatisfied (VDS): means I am very dissatisfied with this aspect of my job
- Dissatisfied (DS): means I am dissatisfied with this aspect of my job

- Neutral (N): means I cannot decide whether I am satisfied or not with this aspect of my job
- Satisfied (S): means I am satisfied with this aspect of my job
- Very Satisfied (VS): means I am very satisfied with this aspect of my job

The Manual for the Minnesota Satisfaction Questionnaire (Davis & Wison, 2000:350) suggested that an internal consistency reliability coefficient be computed for samples on which the MSQ is used. Using SPSS, Chronbach's alpha (Ary *et al.*, 2002) the total scale was calculated to be at 0.97. The Intrinsic alpha is 0.86 and the extrinsic alpha is 0.88. This alpha suggests that the data collected from the MSQ for this sample has high internal consistency and reliability with this sample. This coefficient is typical of other studies where the MSQ was used (Chen, 2000).

4.3 Descriptive data analysis

This section presents tables identifying the results of the findings. Tables 4.1 to 4.3 present measures of job satisfaction (Minnesota University scales-1967) (short-form) as reflected in the Minnesota Satisfaction Questionnaire. There are 20 questions that are permitted to verify the satisfaction of employees. Twelve of these questions (Q1, Q2, Q3, Q4, Q7, Q8, Q9, Q10, Q11, Q15, Q16, Q20) combined reflect the intrinsic portion of satisfaction and six (Q5, Q6, Q12, Q13, Q14, Q19) of them explain the extrinsic satisfaction. Two questions among the 20, that is, questions 17 and 18 are not included in either intrinsic or extrinsic.

4.3.1 Intrinsic variables of the MSQ

According to Herzberg these are motivators which lead to job satisfaction (see paragraph 2.3).

Table 4.1

Intrinsic job satisfaction	VDS	%	DS	%	N	%	S	%	VS	%
Being able to keep busy all time.	59	26.82	38	17.27	70	31.82	33	15.00	20	9.09
The chance to work alone on the job.	79	35.91	46	20.91	49	22.27	22	10.00	24	10.91
The chance to do different things from time to time.	43	19.55	40	18.18	47	32.73	31	14.09	34	15.45
The chance to be "somebody" in the community.	28	12.73	18	8.18	54	24.55	53	24.09	67	30.45
Being able to do things that don't go against my conscience.	98	44.55	44	20.00	34	15.46	26	11.82	18	8.18
The way job provides for steady employment.	61	27.73	40	18.18	50	22.73	43	19.55	26	11.82
The chance to do things for other people.	75	34.09	42	19.09	37	16.82	36	16.36	30	13.64
The chance to tell people what to do.	32	14.55	38	17.27	68	30.91	43	19.55	39	17.73

The chance to do something that makes use of my abilities.	16	7.27	17	7.73	69	31.36	51	23.18	67	30.45
The freedom to use my own judgment.	50	22.73	40	18.18	53	24.09	43	19.55	34	15.45
The chance to try my own methods of doing the job.	33	15.00	23	10.45	81	36.82	49	22.27	34	15.45
The feeling of accomplishment I get from the job.	28	12.73	23	10.45	59	26.82	52	23.64	58	26.36

4.1.1 **Analysis and interpretation**

- For the item "being able to keep busy all time," the majority of the respondents revealed that they cannot decide whether they are satisfied or not with this aspect of the job. This suggests that the Mathematics and Physical Science educators who participated in this research are unsure and cannot say unequivocally that the activities at their schools keep them active all the time. It could be said that these educators are neither satisfied nor dissatisfied about the way their schools involve them in school activities. Schools could not be using them in committees and projects that make use of their scientific and mathematical skills.
- For item "the chance to work alone on the job," the majority of the respondents revealed that they are very dissatisfied. This is an indication that schools are not providing Mathematics and Physical Science educators the chance to do their work independently. This could be caused by the fact that Outcomes Based Education, as practiced in South Africa, emphasises group work at the expense of individual and independent performers which could be a great source of demotivation for people who enjoy working alone without supervision, especially Mathematics and Physical Science educators who enjoy working on

projects and delivering results. Mathematics and Science educators may be seeing schools to be stifling their independence and consequently resourcefulness.

- For item "the chance to do different things from time to time," the majority of the respondents revealed that they cannot decide whether they are satisfied or not. It could be said that the majority of these educators are neither satisfied nor dissatisfied with the variety of challenges and opportunities that encourage and promote creativity in their schools.
- For item "the chance to be "somebody" in the community," the majority of the respondents revealed that they are very satisfied. It is interesting to note that Physical Science and Mathematics educators are happy with the social recognition they get from their communities. This could be the result of the value that is attached to these educators who possess scarce knowledge and skills which contribute in producing learners with technological and scientific skills which this country so need (see paragraph 1.1)
- For item "being able to do things that don't go against my conscience," the majority of the respondents revealed that they are very dissatisfied. This is an indication that these educators are very unhappy with the way their job provides for respect of moral values. They may be regarding some aspects of their jobs to be against what they believe in their principles.
- For item "the way job provides for steady employment," the majority of the respondents revealed that they are very dissatisfied. This suggests that these educators are very unhappy with the way their jobs provide job security and continuous career planning. This could be caused by the fact that the Department of Education is presently busy with the process of redeploying educators to schools without taking into consideration the scarce and strategic skills that these educators possess.
- For item "the chance to do things for other people," the majority of the respondents revealed that they are very dissatisfied. Physical Science and Mathematics educators who participated in this research are very unhappy with the way their jobs provide opportunities for them to be of service to

other people. These are people who were trained to work on projects and research for the development of knowledge geared for the development of people and they may not be afforded such opportunities at schools.

- For item "the chance to tell people what to do," the majority of the respondents revealed that they cannot decide whether they are satisfied or not. This is an indication that that these educators are neither satisfied nor dissatisfied with the opportunities for exercising authority that schools give them. This could be related to opportunities for promotion.
- For item "the chance to do something that makes use of my abilities," the majority of the respondents revealed that they cannot decide whether they are satisfied or not. This suggests that these educators are neither satisfied nor dissatisfied about the way schools utilize their latent and scarce skills abilities. Schools could be in this regard not utilizing their scarce skills in some activities where they feel they are fully qualified and capable of acting such as project management and acting in committees that utilize the scientific and mathematical skills.
- For item "the freedom to use my own judgment," the majority of the respondents revealed that they cannot decide whether they are satisfied or not. This is another indication that these educators are unsure whether to express satisfaction or dissatisfaction about the way schools offer them opportunity to be independent and self-regulated. There is a possibility that schools may not be doing enough to provide these educators with sufficient motivating organizational climate to express their independence and self-regulation.
- For item "the chance to try my own methods of doing the job," the majority of the respondents revealed that they cannot decide whether they are satisfied or not. This is another suggestion that schools may not be giving these educators enough room to be creative, resourceful, independent, original, self-regulated and self-responsible for their actions at their workplace.
- For item "the feeling of accomplishment I get from the job," the majority of the respondents revealed that they cannot decide whether they are

satisfied or not. This is another expression of being unsure whether schools provide these educators sufficient room for self-actualization and achievement.

4.3.2 The extrinsic factors of the MSQ

According to Herzberg (2002:46), these are hygiene factors. These are factors which lead to job dissatisfaction (see paragraph 2.3).

Table 4.2

Extrinsic job satisfaction	**VDS**	**%**	**DS**	**%**	**N**	**%**	**S**	**%**	**VS**	**%**
(M5) The competence of my supervisor in making decisions.	53	24.09	44	20.00	58	26.36	28	12.73	37	16.82
(M6) The way my boss handles his/her workers.	46	20.91	53	24.09	63	28.64	33	15.00	25	11.36
(M12) The way my organization policies are put into practice.	39	17.73	43	19.55	74	33.64	40	18.18	24	10.91
(M13) My pay and the amount of work I do.	62	28.18	38	17.27	44	20.00	42	19.09	34	15.45
(M14) The chances for advancement on this job.	31	14.09	32	14.55	67	30.45	45	20.45	45	20.45
(M17) My working condition	42	19.09	45	20.45	66	30.00	38	17.27	29	13.18
(M18) The way my co-workers get along	50	22.73	35	15.91	80	36.36	31	14.09	24	10.91

with each other.										
(M19) The praise I get from doing a good job.	33	15.00	21	9.55	43	19.55	58	26.36	65	29.55

4.2.1 Analysis and interpretation

- For item "the competence of my supervisor in making decisions," the majority of the respondents revealed that they cannot decide whether they are satisfied or not. This is a suggestion that these educators are not sure whether their School Management Teams lead and manage well when it comes to decision making. They could perceive their supervisors not to be decisive enough when it comes to finalizing matters of their schools.
- For item "The way my boss handles his/her workers," the majority of the respondents revealed that they cannot decide whether they are satisfied or not. This is an indication that these educators are not sure whether the relationships with their colleagues could be said to be collegial or not. There could be a possibility that schools do not promote effective team work and enough emotional involvement of educators.
- For item "the way my organization policies are put into practice" the majority of the respondents revealed that they cannot decide whether they are satisfied or not. This is another indication that these educators are not sure whether their School Management Teams, including School Governing Bodies, are implementing the school policies and procedures efficiently and effectively. There could be a possibility that schools may not be doing enough to involve these educators in the development, design and implementation of school policies and procedures. This may also be linked to the indecisiveness of their supervisors they revealed above.
- For item "my pay and the amount of work I do," the majority of the respondents revealed that they are very dissatisfied. As expected, this is an indication that these educators are not at all satisfied with the way the Department of Education remunerates them. These are educators who could be thinking that because of the scarce and strategic skills they

possess, they are supposed to be paid competitive salaries which are in line with the private sector.

- For item "the chances for advancement on this job," the majority of the respondents revealed that they cannot decide whether they are satisfied or not. This shows that these educators are not sure whether their jobs provide enough prospects for promotion and career advancement. Schools are not providing enough personal discussions and not creating more promotional posts for these educators to channel their career advancement path.
- For item "my working condition," the majority of the respondents revealed that they cannot decide whether they are satisfied. This shows that Physical Science and Mathematics educators are not sure if their working conditions are satisfying or not. The Department of Education and schools may not be providing enough incentives to keep these educators satisfied. It is interesting to note that the Department of Education is already doing something to incentivise the Mathematics and Physical Science teaching posts (see paragraph 1.1).
- For item "the way my co-workers get along with each other," the majority of the respondents revealed that they cannot decide whether they are satisfied or not. This suggests that these educators are unsure about the social relationships and the way their colleagues get along with one another. They perceive their work place to be unwelcoming and not promoting collegial teamwork. Their schools may not be promoting cordial emotional involvement of their staff enough to keep all educators motivated and satisfied.
- For item "the praise I get from doing a good job," the majority of the respondents revealed that they are very satisfied. It is interesting to note that most of these educators expressed satisfaction with the recognition they get with their doing a good job. This could be linked to the social status that these educators enjoy because of the scarce and strategic skills they possess.

4.3.3 Rank Order of Satisfaction Scores for each MSQ Dimension (n = 183)

Table 4.3

VARIABLE	MEAN	STD DEV.
1. (M7) Being able to do things that don't go against my conscience.	56,12	11,11
2. (M2) The chance to work alone on the job.	55,92	11,10
3. (M9) The chance to do things for other people.	55,75	11,16
4. (M1) Being able to keep busy all time.	55,69	11,17
5. (M8) The way job provides for steady employment.	55,61	11,12
6. (M6) The competence of my supervisor in making decisions.	55,59	10,79
7. (M18) The way my co-workers get along with each other.	55,56	10,85
8. (M13) My pay and the amount of work I do.	55,55	10,74
9. (M5) The way my boss handles his/her workers.	55,53	10,70
10. (M17) My working condition.	55,46	10,72
11. (M12) The way my organization policies are put into practice.	55,46	11,02
12. (M15) The freedom to use my own judgment.	55,44	10,76
13. (M3) The chance to do different things from time to time.	55,43	10,95
14. (M10) The chance to tell people what to do.	55,22	10,82
15. (M16) The chance to try my own methods of doing the job.	55,18	10,85
16. (M14) The chances for advancement on this job.	55,12	10,73
17. (M20) The feeling of accomplishment I get from the job	54,91	10,63
18. (M19) The praise I get from doing a good job.	54,85	10,68
19. (M4) The chance to be "somebody" in the community.	54,80	10,01
20. (M11) The chance to do something that makes use 55,75of my abilities.	54,69	10,85

4.3.1 Analysis and interpretation

When all the variables of the MSQ were ranked, the Mathematics and Physical

Science educators who participated in this research ranked their dissatisfaction and satisfaction with each variable of the MSQ as follows:

1. Being able to do things that don't go against their conscience as a cause of job satisfaction (M=56, 12). This suggests that the educators in question regard moral values such as the opportunity to do things that do not run counter to one's beliefs as the main cause of job dissatisfaction among them in their schools.
2. The chance to work alone on the job as a cause of job satisfaction (M=55, 92). This is an indication that the educators in question are dissatisfied with the way schools allow them to work independently and autonomously in making use of their abilities.
3. The chance to do things for other people as a cause of job satisfaction (M=55, 75). This implies that the educators in question are dissatisfied with the way their present jobs offer them sufficient opportunity for social service, that is, being able to do things in a service of others.
4. Being able to keep busy all the time is a cause of job satisfaction (M=55, 61). This is an indication that the educators in question are dissatisfied with the way their school keep them active, that is, being able to keep busy all the time.
5. The way job provides for steady employment as a cause of job satisfaction (M=55, 61). This suggests that the educators in question are dissatisfied with the way their present jobs provide for security and career development.
6. The way my co-workers get along with each other as a cause of job satisfaction (M=55, 59). This suggests that the educators in question are dissatisfied with how they get along with their colleagues at work.
7. The competence of their supervisor in making decisions as a cause of job satisfaction (M=55, 56). This suggests that the educators in question are dissatisfied with the technical quality of supervision at their schools.
8. Their pay and the amount of work they do as a cause of job satisfaction (M=55, 55). This suggests that the educators in question are dissatisfied with the monetary compensation of their job.

9. The way their bosses handle their workers as cause of job satisfaction (M=55, 53). This suggests that the educators in question are dissatisfied with the relationship between supervisors and employees at their schools.

10 Their working condition as a cause of job satisfaction (M=55, 46). This suggests that educators in question are dissatisfied with the physical aspects of their place of employment.

11. The way their organization policies are put into practice is a cause of job satisfaction (M=55, 46). This suggests that educators in question are dissatisfied with the way organization policies are implemented at their schools.
12. The freedom to use their own judgment as a cause of job satisfaction (M=55, 44). This is an indication that educators in question are dissatisfied with the way schools give them responsibility and freedom to implement their judgement at work.
13. The chance to do different things from time to time as a cause of job satisfaction (M=55, 43). This is an indication that the educators in question are dissatisfied with the way schools afford them opportunities to utilise their abilities, that is, the chance to do something that makes use of their scientific and mathematical abilities.
14. The chance to tell people what to do as a cause of job satisfaction (M=55, 22). This is an indication that educators in question perceive their schools as not giving them authority and the chance to tell people what to do.
15. The chance to try their own methods of doing the job as a cause of job satisfaction (M=55, 18). This suggests that educators in question regard their job as not giving them the opportunity of being creative and to try their own methods.
16. The chances for advancement on this job as a cause of job satisfaction (M=55, 12). This is an indication that educators in question perceive their schools as not providing them with opportunities and chances for advancement and promotion.
17. The feeling of accomplishment they get from the job as a cause of job satisfaction (M=54, 91). This suggests that educators perceive schools as

not providing them with the feeling of accomplishment one gets from the job.

18. The praise they get from doing a good job as a cause of job satisfaction (M=54, 91). This is an indication that educators are satisfied with the recognition they get for a job well done.
19. The chance to be "somebody" in the community as a cause of job satisfaction (M=54, 80). Social Status: Having respect for the community.
20. The chance to do something that makes use of their abilities as a cause of job satisfaction (M=54, 69). Ability utilisation: The chance to do something that makes use of abilities.

4.4 Conclusion

This chapter presented the results of the empirical research. The responses to the items on the MSQ were analysed and interpreted.

The next chapter presents a summary, recommendations and conclusion.

Chapter 5

Summary, Findings and Recommendations

5.1 Introduction

The purpose of this research was to determine:

- the intrinsic and extrinsic motivators of Mathematics and Physical Science educators;
- the general satisfaction level of Mathematics and Physical Science educators for each of the 20 dimensions of the job as measured by the MSQ; and
- on the basis of both the literature review and empirical research, make suggestions which schools and the Department of Education can use in creating motivating working conditions for Mathematics and Physical Science educators in order to reduce turnover.

In this chapter, a summary of the four preceding chapters is presented. Firstly, the summary of the findings from literature review which were highlighted in Chapters 1 and 2 are presented; followed by the summary of the statement of the problem, purpose and methods of research as highlighted in chapters 1 and 3; and lastly the summary of the findings of the empirical research as revealed in chapter 4 is presented. The summaries of the literature findings and empirical research chapters will enable the researcher to formulate recommendations for schools to develop motivating programmes of satisfying educators teaching Mathematics and Physical Science at Secondary Schools.

5.2 **Summary and conclusions**

This section provides the summaries of both the literature review and empirical research findings.

5.2.1 **Findings and conclusions from the literature study** (cf. chapters 1 and 2)

The review of literature revealed that there is more to a job than simply drawing a salary on a regular basis. This implies that there is need for an employee to have the necessary skills, knowledge, and professionalism to perform competently in the career he has chosen, and for him to experience some measure of fulfilment, enjoyment, and satisfaction in his job. Job satisfaction transcends the extent to which an employee is prepared to continue in his current job. It basically entails the extent to which an employee enjoys his job and as a result experiences pleasure and fulfilment (cf.paragraph1.1).

The literature review also revealed that some of the more important elements and factors contributing towards job satisfaction are:

- The work itself. The actual content of the work itself influences job satisfaction in that it should be interesting and challenging, not boring, and must provide status. To ensure that an employee's work is mentally more challenging, he must be able to apply his skills, abilities and qualifications. A job with too little challenges can create boredom, whereas too many challenges can create a feeling of failure or frustration. Jobs that offer a variety of tasks, freedom and opportunities for feedback on how well the employee is doing are the more preferred jobs (cf. paragraph 2.3).
- Working conditions. This is another factor, according to Eisenberg, Bowman and Foster (2001:451), that has a modest effect on job satisfaction. Employees are generally concerned with their working environment. A clean, safe, and attractive working environment will positively influence the worker's attitude, whereas a noisy, insufficiently light or too hot environment will be perceived as poor working conditions and negatively impact on the worker's ability to perform the job (cf. paragraph 2.3).

- Reward systems. According to Freeman (2003:33) wages play a significant role in job satisfaction, Money assists people to attain their basic needs but it also assists in providing upper-level need satisfaction. Fringe benefits are not as influential as most employees do not even know how much they are receiving in benefits. Kenny and Judge (2002:46) see reward systems taking the form of wage systems and promotion policies that are perceived by the employees as being just, clear and in line with their expectations. Wages are perceived as fair when they are based on job demands, individual skill levels and community pay standards. Money is not the only reward, many employees will prefer to work in a specific location, prefer a less stressful job, or prefer specific working hours. Promotions based on performance provide for more job satisfaction than promotions based on seniority. Promotions lead to personal growth and development opportunities, increased responsibility and increased social status (cf. paragraph 2.3).
- Supervision. This is seen by George England (2001:51) as another moderate source of job satisfaction. There appears to be two dimensions of supervisory styles that can affect job satisfaction. The first is the employee centred supervisory style, which is measured by the degree to which a supervisor takes a personal interest in the employee's welfare. The second dimension is participation or influence, as portrayed by managers who allow their people to participate in decisions that affect their own jobs. This approach, in most cases, results in higher job satisfaction (cf. paragraph 2.3).
- Workgroup. The nature of the work group plays a modest role in job satisfaction. Friendly, cooperative co-workers provide a source of job satisfaction to individual employees. The work group serves as a source of comfort, advice, support, and assistance to the individual worker and also fulfills his need for social interaction. A so-called "good" work group makes the job more enjoyable but this factor is not perceived as essential for job satisfaction. If the opposite, namely a "bad" work group exists, then this can negatively affect job satisfaction. Dipaola and Tschannen-Moran (2003:48) and Bogler (1999:44) state that an employee's satisfaction is increased when the immediate supervisor is understanding and friendly, offers praise for good

performance, listens to the employee's opinions and shows personal interest in his employee's (cf. paragraph 2.3).

2.5.2. **Findings and conclusion from the empirical investigation**

The empirical research revealed that Mathematics and Physical Science educators who participated in this study are dissatisfied with the following dimensions of their work as itemized in the MSQ:

- The chance to work alone on the job.
- Being able to do things that don't go against my conscience.
- The way job provides for steady employment.
- The chance to do things for other people (see Table 4.1).

These are all intrinsic factors of the MSQ.

They also revealed dissatisfaction with:

- My pay and the amount of work I do (see Table 4.2).

This is the extrinsic factor of the MSQ.

5.3 **RECOMMENDATIONS**

This research would have produced better results had it used interviews instead of a questionnaire. Most educators are not familiar with the completion of questionnaires. Consequently, a questionnaire seems to evoke suspicion so that teachers seem to be on guard lest their responses be used against them by authorities (some teachers expressed doubts as to the anonymity of the questionnaire and felt one way or another their responses would get to the authorities in spite of the assurances of anonymity). In future, more attention needs to be paid to the research measuring instruments that will elicit more realistic and genuine responses in as far as educator job satisfaction is concerned. Interviews could probably better serve this purpose.

Much of the literature on teacher job satisfaction is of USA origin which means it is reflective of the American society. South Africa is unique regarding its population, socio-cultural-economic status and education system therefore there is a need for more literature that reflects this uniqueness and context of the South African situation in a more scientific manner. The MSQ is also a product of the USA and could not be applicable to the South African situation and context. Researchers need to develop questionnaires and interview checklists which can effectively measure motivational and job satisfaction of South African educators within the context of transforming workplaces with a plethora of demotivating factors which in most cases lead to job satisfaction as revealed in the empirical research findings of this study.

This research also recommends that schools should begin to conduct research on factors that motivate and demotivate their Mathematics and Physical Science educators. The findings of such research should be used to create motivating school organizational climates which promotes respect for their employees' moral values, giving them opportunities and chances to work alone on projects such as the development of Mathematics and Physical Science curriculam, guaranteeing their job security, and the chance to be involved in social activities that enable these educators to do things for other people. It will also be highly appreciated if the South African government can effectively implement their incentivization programme of Mathematics and Science educators so that they cannot continue perceiving their compensation for the work they do to be incompatible with the amount of work they do. By so doing both schools and the Department of Education shall be encapsulating intrinsic and extrinsic factors of motivation in their attempt to change their organizational climate to accommodate and include the scarce and strategic skills that the Mathematics and Physical Science educators possess.

5.4 Conclusion

This research investigated the intrinsic and extrinsic motivators of Mathematics and Physical Science educators and their general satisfaction level for each of the 20 dimensions of the job as measured by the MSQ by means of both literature review and empirical research. On the basis of both the literature review and empirical research findings, ways in which schools and the Department of Education can create motivating working conditions for Mathematics and Physical Science educators with an aim of reducing turnover were suggested.

The researcher believes that this study will go a long way in contributing to the debate on factors that demotivate Mathematics and Physical Science educators and thereby lead to them leaving the school system for better workplaces that accommodate and include those motivators and hygiene factors which satisfy them.

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