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**Skills Shortages and Job Satisfaction – Insights  
from the Gold-Mining Sector of South Africa**

**Dr Freda van der Walt\***

*Central University of Technology, Free State  
PO Box 1881, Welkom, 9459  
fvdwalt@cut.ac.za*

**Mr M.E. Thasi**

*Central University of Technology, Free State  
PO Box 1881, Welkom, 9459  
Tel.: 057 910 3500  
mthasi@cut.ac.za*

**Dr P. Jonck**

*The National School of Government  
Private Bag X759, Pretoria, 0001  
Tel.: 071 299 5162  
petrojonck@hotmail.com*

**Prof. C. Chipunza**

*Central University of Technology, Free State  
Private Bag X20539, Bloemfontein, 9300  
Tel.: 051 507 3218  
cchipunza@cut.ac.za*

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**\*Corresponding author**

**Abstract**

The article reports on the levels of job satisfaction of mining-sector employees, as well as the perceived influence of skills shortages on the job satisfaction of these employees. The findings emanating from the study indicate that the respondents did experience job satisfaction, and that perceived skills shortages in two core occupational categories did not influence job satisfaction. The study

has augmented the body of knowledge vis-à-vis the relationship between perceived skills shortages and job satisfaction. This is particularly important, since the mining industry remains a key driver of economic growth in South Africa, despite the negative perceptions that have beset the sector following the Marikana massacre of 2012.

**Keywords:** *job satisfaction, skills shortages, the South African gold mining industry, artisan, engineer*

## **Introduction**

South Africa has the world's largest reserves of platinum-group metals (87.7%), manganese (80%), gold (80%), and chromium (72.4%) (SA, 2008:17). This rich supply of minerals has led to the South African mining industry making a substantial contribution not only to the national economy of the country, but also to the economy of the African continent (Chamber of Mines of South Africa, 2013). It is estimated that in 2012, South Africa's total mineral endowment was US\$4.71 trillion, accounting for approximately 8% of the country's GDP, and sustaining one million jobs (Technology Innovation Agency, 2012). Coal sales increased by 23% from 2010, to an amount of R87.8 billion (Mining Qualifications Authority, 2014), and gold contributed R20 billion (\$246 million) to the South African economy in 2013, accounting for 18% of exports (Mungai and Bloomberg, 2015). Regrettably, the golden era of the South African gold-mining industry appears to be over, since the industry is currently plagued by falling commodity prices, escalating labour disputes, and increased production costs (Wexler, 2015). This has compelled many large-scale mines to reduce their workforce, which has negatively impacted on some mine-dependent communities, as well as the economic capacity of these mines (Nhlengetwa and Hein, 2015).

In light of the above discussion, it would appear that the mining industry is in crisis insofar as production and obstacles to human capital are concerned. Regarding human capital, the two main concerns are the current skills shortages in core occupational categories and the increased dissatisfaction among workers. The current skills shortages in the mining industry are being exacerbated by severe job losses induced by the obstacles associated with production. As such, the National Union of Mineworkers (NUM) has given the following estimates of numbers of jobs lost: 35,000 jobs in the platinum sector, 10,000 jobs in the gold sector, 2,235 jobs in the iron-ore industry, and 1,399 jobs in the chrome industry (Anonymous, 2016).

## Literature Review

### *Core occupational categories included in the study*

The core occupational categories included in this study are those of artisan and engineer, respectively. The reason for this choice is that most critical-skills shortages are being experienced in these two occupational categories, which form part of the core business of the South African gold-mining industry (Khalane, 2011; Oberholzer, 2010). The term “engineer” refers to a person who has obtained either a degree or a technical diploma in engineering (all disciplines) at any accredited tertiary-education college, university of technology, or university (Du Toit and Roodt, 2009). It is estimated that there are currently only 500 practising mining engineers in the country, where the average age is 47 (Khalane, 2011), which indicates a massive shortage of engineers in this industry.

The term “artisan” is derived from the Latin word *artire*, which means “to instruct through arts” (Erasmus and Breier,

2009). An artisan is regarded as a person who does skilled work with their hands (Doku, 2007). It is estimated that South Africa needs 12,500 artisans per year, while only 3,000 are passing the trade test annually (Jordaan and Barry, cited in Van Rooyen, Du Toit, Botha and Rothmann, 2010). Several reasons have been offered to explain the current critical-skills shortages that South Africa is experiencing with regard to artisans. Some of the reasons cited are poor training, emigration, the country's high crime rate, affirmative action measures, a lack of good-quality mathematics and science matriculants, and "poaching" by companies which offer artisans lucrative salaries abroad (Motau, 2012). The skills shortages of artisans are concerning, since it is crucial to have sufficient artisans, so as to enable infrastructure development, economic growth, and wealth creation (Van Rooyen, Du Toit, Botha and Rothmann, 2010).

### ***Skills shortages***

Skills shortages are a global phenomenon, which is affecting several countries, employers, professions, and industries (Mateus, Allen-Ile and Iwu, 2014). In South Africa, the economy has been crippled by severe skills shortages (Rasool and Botha, 2011), particularly in the mining industry. The Mining Qualifications Authority (2014) identified 149 occupations in which skills shortages are being experienced, which are affecting 3,054 positions. The occupational categories that are severely affected are, among others, those of mining engineer, rock engineer, surveyor, geologist, and mechanical engineer. Stanz (2009) states that 41% of the scarce- and critical-skills shortages in the country have been experienced in engineering categories, including but not limited to the categories of technician and artisan, respectively.

Against this background, Stanz (2009) indicates that employee retention is becoming critical, due to skills shortages (that is, unavailability of new employee options), high vacancy rates, increased costs associated with hiring new talent, and changes in employee attitudes. Jamrog (2004) asserts that the combination of job dissatisfaction, skills shortages, and a decrease in knowledge workers underscores the importance of employee retention. Competition for scarce skills has resulted in employee attraction and retention being regarded as the greatest challenge in human capital management (Terera and Ngirande, 2014). Mbah and Ikemefuna (2012) explain that the extent to which an organisation can retain employees depends on the level of job satisfaction of the employees. Therefore, the argument can be made that the mining industry should ensure that current employees employed in occupational categories where skills shortages exist are experiencing job satisfaction, in order to ensure retention of qualified employees. The reasoning behind this is that retention of employees would seem to be an important challenge for organisations generally, which are operating in a world of work that is characterised by unprecedented levels of talent mobility, as employees seek to satisfy their own individual needs (Lumley, Coetzee, Tladinyane and Ferreira, 2011).

Furthermore, it can be postulated that skills shortages could lead to an increase in the workload of residual employees, thus impacting negatively on organisational effectiveness (Mabuza and Gerwel, 2014), which may influence job satisfaction and intention to leave the organisation. Thus, the aim of this study was to determine the job satisfaction of employees affected by skills shortages, and their perceptions of the impact of skills shortages on their experience of job satisfaction.

## ***Job satisfaction***

Over the years, job satisfaction has been studied extensively, mainly from three different perspectives, namely the dispositional perspective, also referred to as the generic components model, the situational perspective, and the person-environment (P-E) fit perspective. Although cognisance is taken of the P-E fit perspective, which suggests that job satisfaction is influenced by both personality factors and the environment, the two theories that are most appropriate to this study are the dispositional theory and the situational theory.

The dispositional approach came to be a notable explanation for job satisfaction, in the light of evidence that job satisfaction tends to be stable over time, and across careers and jobs (Buchanan and Bryman, 2009). This theory may be regarded as a general theory of job satisfaction, which suggests that people have innate dispositions which cause them to have tendencies towards a certain level of satisfaction, regardless of their job (Saari and Judge, 2004). According to this perspective, job satisfaction is influenced by an individual's disposition to be happy regardless of the work situation, and by what an employee brings to the organisation, such as personality traits (Van der Walt and De Klerk, 2014). Although contradictory findings have been reported regarding the relationship between generic components, or dispositions, and job satisfaction, a number of South African studies have found that some sociodemographic variables are statistically significantly related to job satisfaction, namely gender (Lamberts, 2011), race (Luddy, 2005), and tenure (Lamberts, 2011).

From the dispositional perspective of job satisfaction, Van der Walt and De Klerk (2014) argue that job satisfaction is, to

a large extent, a manifestation of life satisfaction and life meaning, and thus a manifestation of spirituality. This implies that job satisfaction is a fairly stable disposition which employees hold, regardless of whether favourable work-related factors are present (Van der Walt and De Klerk, 2014). Due to the high incidence of poverty, crime, and violence in South Africa, which are indicative of an absence of meaning in life and life satisfaction, it is likely that job dissatisfaction will manifest in the context of the workplace. This argument is supported by research that indicates a positive relationship between life satisfaction and job satisfaction (Orpen, 1978; Sawatzky, Ratner and Chiu, 2005), as well as skills shortages that are contributing to phenomena which may suggest an absence of general life satisfaction, such as poverty, crime, and violence (Mateus et al., 2014).

Because contemporary employees are increasingly emphasising aspects such as being associated with an ethical organisation, having interesting work, and finding meaning and purpose in one's work, it is possible that job satisfaction has a spiritual basis, rather than just a non-essential "materialistic" basis (Van der Walt and De Klerk, 2014). Furthermore, if organisations create workplaces that promote spiritual values, it is likely that job satisfaction will manifest (Van der Walt and De Klerk, 2014). This implies that spiritually based values should be incorporated into organisational cultures and business practices and strategies, and should be authentically lived out by organisational leaders, in order to create job satisfaction and well-being.

The theoretical relationship between skills shortages and job satisfaction can also be explained from a situational perspective. The situational model of job satisfaction suggests that job satisfaction is derived from job characteristics (Franěk and Večeřa, 2008). In this regard, Hackman and Oldham

(1975) developed the Job Characteristics Model, which identifies situational variables that may influence job satisfaction, namely autonomy, skill variety, task significance, task identity, and feedback (Ali, Said, Yunus, Kader, Latif and Munap, 2014). One year later, Locke (1976) identified the following work dimensions which contribute to, or may influence, job satisfaction: the work itself, promotional opportunities, supervision, co-workers, and remuneration. In later years, researchers started to view job satisfaction as a two-dimensional construct, and they categorised the above work dimensions into intrinsic job satisfaction dimensions and extrinsic job satisfaction dimensions. Intrinsic job satisfaction refers to the individual's satisfaction with the work itself, including aspects such as autonomy, recognition, responsibility, skill or ability utilisation, achievement, and variety of work (Warr, Cook and Wall, 1979). By contrast, extrinsic job satisfaction refers to the individual's satisfaction with aspects which have little to do with the work itself, such as promotional opportunities, supervision, co-workers, and remuneration (Man, Modrak, Dima and Pachura, 2011).

Van der Walt (2007) asserts that the situational model encompasses more than just taking into consideration job characteristics, or work dimensions; rather, the situational approach attempts to explain job satisfaction by referring to the different factors of an individual's work, as well as the work environment. Thus, a series of conditions related to an individual's work and working environment should be met for the individual to experience a certain level of job satisfaction. For the purposes of this study, job satisfaction is regarded as "a pleasurable or positive emotional state resulting from the appraisal of one's job or job experiences" (Locke, 1976). Because job satisfaction is an emotional state, it influences many different areas of an individual's life, such as their



physical health, their longevity, their mental health, and their social life (Locke, 1976). In addition, job satisfaction has been found to be positively related to work-related outcomes, such as organisational commitment (Susanty and Miradipta, 2013) and organisational citizenship behaviour (Robbins and Judge, 2010), hence the continued interest in job satisfaction.

### ***Job satisfaction and skills shortages***

Job satisfaction may be regarded as an incentive for an employee to continue to carry out assigned tasks, thus contributing to organisational effectiveness (Ali et al., 2014). For this reason, the importance of job satisfaction cannot be overemphasised. Scholars have postulated that skills shortages have major implications for the levels of job satisfaction and well-being of employees (Callan and Lawrence, 2009). Empirical research focusing on job satisfaction and skills shortages is very limited. However, some research has been conducted on the relationship between skills shortages and job satisfaction. For example, Allen and Van der Velden (2001) investigated the effect of education and skill mismatches on job satisfaction for an international sample consisting of 11 European countries and Japan, and found that a skill mismatch is a predictor of job satisfaction. They report that skill underutilisation, or a poor match between available skills and required skills, has a strong negative impact on job satisfaction (Allen and Van der Velden, 2001). This, in turn, may cause workers to search for other work that is better suited to their abilities (Allen and Van der Velden, 2001). The findings of this study emphasise the importance of matching the skills of employees with their work, in order to create job satisfaction and employee retention. They also confirm that mining companies cannot employ in core occupational

categories, such as those of engineer and artisan, individuals that do not have the required skills. Mining companies also need to proactively plan to ensure that sufficient and properly skilled and educated people are available to fill core occupational categories where skills shortages currently exist.

Most previous research studies investigating skills shortages and their relation to organisational outcomes have focused on establishing a relationship between skills shortages and productivity (Daniels, 2007; Erasmus and Breier, 2009; John, 2006; Sebusi, 2007). In a study by Bennett and McGuinness (2009), it was found that high-productivity companies were more likely to experience skills shortages, and that skills shortages can completely eliminate the productivity advantage of high-performing organisations. Although these studies do not make reference to job satisfaction, the natural assumption is that satisfied employees should be productive employees. Although a large body of research reports that job satisfaction has a positive effect on productivity, this correlation seems to be rather modest (Kreitner and Kinicki, 2013; Robbins, 2005). Oudejans (2007) postulated that some employees who are satisfied with their work are poor performers; conversely, there may be employees who are not satisfied, but who are excellent performers. However, more recent studies (e.g. Chen and Silverthorne, 2008; Zimmerman and Todd, 2009) have shown that job satisfaction is related to performance. It is also possible that productivity will lead to satisfaction (Robbins and Judge, 2010). Hence, if employees are productive, it can possibly lead to an increase in rewards, a higher level of remuneration, and promotion, which are all dimensions of job satisfaction.

Samples from occupational categories affected by skills shortages have up to now not been included in job satisfaction research. Furthermore, although job satisfaction has been

researched thoroughly in other contexts, there is a lack of research on job satisfaction in the mining sector (Masvaure, Ruggunan and Maharaj, 2014). This shows that there is a need for more empirical research to be conducted in this sector. The purpose of this study is to explore and describe the levels of job satisfaction of certain core occupational categories, with specific reference to gold mines in the Lejweleputswa district of the Free State province in South Africa. Specifically, the article will report on the findings pertaining to two research questions, namely (a) “What is the general job satisfaction of employees employed in core occupational categories affected by skills shortages?” and (b) “What are the perceptions of the selected core occupational categories regarding the impact of skills shortages on their experience of job satisfaction?”

## **Research Methodology**

### ***Approach***

A cross-sectional embedded research design was used. Firstly, the study can be classified as cross-sectional, since the research was carried out at a specific point in time on a sample of two organisations, without repeat measures. Secondly, the research design under discussion can be seen as an embedded design, as a questionnaire was used to quantify respondents’ overall job satisfaction, their intrinsic job satisfaction, and their extrinsic job satisfaction. An open-ended question was included to gain insight into respondents’ perceptions of the impact of skills shortages on perceived job satisfaction. This question allowed respondents to articulate their perceptions regarding the aforementioned, using narrative responses.

## ***Respondent Selection & Profile***

The South African mining industry is regarded as one of the largest employers in the Free State province of South Africa (National African Federated Chamber of Commerce and Industry, 2014). Out of the total of 13.1 million South Africans that were employed in 2011 (approximately 26% of the total population), an estimated 503,000 individuals were employed in the mining sector (SA, 2011). The Free State province in particular has 12 gold mines, producing 30% of the country's output, making it the fifth-largest producer of gold in the world (SA. Government Communication and Information System, 2013). The population of this study consisted of two core mining-sector occupational categories that are severely affected by skills shortages, namely those of artisan and engineer, respectively. The two gold-mining companies that are operating in the Lejweleputswa district of the Free State province participated in the study. The study focused specifically on gold mines in the Lejweleputswa district, as this is South Africa's largest gold-mining complex, with an area of 330 km<sup>2</sup> (SA. Government Communication and Information System, 2013). In total, the sample consisted of 188 participants, mainly artisans (85.2%). Even though the sample is skewed towards the occupational category of artisan, the sample remained representative of the population.

The final sample consisted mostly of male respondents (86.7%). In terms of racial distribution, the sample consisted of 59% black African respondents, 39% white respondents, and 2% Coloured respondents. The age distribution was similarly skewed to include two main categories, namely the age groups of 20–39 years (54.8%) and 40–59 years (45.2%). Most of the respondents had worked 1–15 years at the current organisation (58.9%), while 25.8% had worked 16–30 years at

the current organisation, and only 5.3% had more than 30 years of service. The biographical data for total number of years worked followed the same pattern, where 58.9% of respondents had worked 1–15 years, and 26.3% of respondents had worked 16–30 years, while 2.9% had worked 31–45 years. The biographical data for highest academic qualification were almost evenly distributed between the various categories, with 28.1% of respondents holding a Grade 12 certificate, 22.5% holding a post-matric qualification, 19.6% having a national diploma or degree, and 19.1% holding a Grade 10 or Grade 11 qualification.

### ***Measuring instrument***

For the purposes of this study, primary data was collected by means of self-administered questionnaires, which consisted of three sections. Section 1 consisted of biographical questions, which were used to determine whether job satisfaction was influenced by any of the biographical variables, and to describe the sample. Section 2 enquired about respondents' job satisfaction. Job satisfaction (that is, general job satisfaction, intrinsic job satisfaction, and extrinsic job satisfaction) was measured using the short version of the Minnesota Satisfaction Questionnaire (MSQ), which was developed by Weiss, Dawis, England and Lofquist (1967). The scale consists of 20 items with Likert-type scaling, with response options ranging from "very dissatisfied" (1) to "very satisfied" (5). A typical question included in this section is "In my present job, this is how I feel about my pay and the amount of work I do". Section 3 enquired about the perceptions of respondents regarding the impact of skills shortages on their experience of job satisfaction, and it consisted of two questions. The first question was a closed-ended question, namely "How would

you describe the impact of skills shortages on your experience of job satisfaction?” Responses were indicated on a three-point Likert-type scale, with response options ranging from “positive” (1) to “negative” (3). The second question was an open-ended question, namely “How would you describe the impact of skills shortages on your experience of job satisfaction?”

First, the internal consistency of the measuring instrument was confirmed for the sample, by determining a Cronbach’s alpha coefficient. The Cronbach’s alpha coefficient was 0.93, which is consistent with the findings of previous South African research conducted by Van der Walt and De Klerk (2014), who reported a Cronbach’s alpha coefficient of 0.93 for the MSQ. This shows that the MSQ may be regarded as a reliable instrument for measuring job satisfaction in the current sample. The data was collected by means of a survey. The questionnaire was distributed to the sample at central points at the participating organisations. An introductory letter was attached to the questionnaire, in which the aims and objectives of the study were clearly stated. In addition, respondents were informed that participation was voluntary, and that they could withdraw from the study at any stage. Respondents were also assured that they could complete the questionnaire anonymously, and that information would be kept confidential.

### ***Statistical analysis***

Quantitative data was analysed by an independent research psychologist, using the SPSS statistical package. Descriptive statistical analyses were performed to determine the measures of central tendency, including the mean, the standard deviation, and minimum and maximum scores. Inferential

analysis included Spearman rank-order correlation coefficients, which were determined to establish the relationship between general (or global, or overall) job satisfaction, intrinsic job satisfaction, and extrinsic job satisfaction. Mann-Whitney U tests were used to determine whether gender, age, and position were statistically significantly related to job satisfaction, and a Kruskal-Wallis test was performed to determine whether organisation, race, tenure, and qualification were statistically significantly related to job satisfaction. The open-ended question posed was premised on the principles of phenomenography, which enabled the researcher to categorise responses into themes and subthemes.

## **Findings**

The aim of the study was twofold, namely (a) to measure the general job satisfaction, intrinsic job satisfaction, and extrinsic job satisfaction of employees affected by skills shortages, and (b) to determine the perceptions of employees affected by skills shortages with regard to the impact of skills shortages on their experience of job satisfaction. In order to establish whether any of the sociodemographic variables were significantly associated with job satisfaction, Mann-Whitney U tests and a Kruskal-Wallis test were used. The results are presented in tables 1 and 2.

**Table 1** Mann-Whitney U test results for sociodemographic variables and job satisfaction

<b>Variable</b>	<b>Mann-Whitney U</b>	<b>Z-score</b>	<b>p</b>
Gender	1,910.000	-0.504	0.614
Age	4,373.500	-0.011	0.991
Position	727.500	-0.972	0.331

According to table 1, none of the independent variables (that is, gender, age, and position) had a statistically significant influence on the dependent variable, namely job satisfaction.

**Table 2 Kruskal-Wallis test results for sociodemographic variables and job satisfaction**

Variable	Chi-square	df	P
Organisation	8.895	5	0.113
Race	2.000	2	0.368
Number of years in the job	2.340	2	0.310
Total number of years at organisation	0.631	1	0.427
Qualification	0.118	3	0.990

The Kruskal-Wallis test results presented in table 2 reveal that none of the sociodemographic variables included in the table had a statistically significant influence on job satisfaction. From the results presented in tables 1 and 2, it is evident that none of the sociodemographic variables measured showed statistically significant associations with job satisfaction. It may thus be concluded that job satisfaction is independent of sociodemographic-type variables. Next, the measures of central tendency for the respondents in the current sample will be presented. The means, standard deviations, and maximum and minimum scores of the respondents on the three variables, namely general job satisfaction, intrinsic job satisfaction, and extrinsic job satisfaction, are depicted in table 3.

**Table 3 Measures of central tendency for job satisfaction**

Variable	Minimum	Maximum	Mean	SD
Intrinsic job satisfaction	2.08	5	3.91	0.658
Extrinsic job satisfaction	1.33	5	3.54	0.890
General job satisfaction	1.95	5	3.77	0.677



As is evident from table 3, respondents reported to be satisfied with their jobs (mean = 3.77; SD = 0.677). Conflicting results have been reported regarding job satisfaction for various samples within the South African context. Van der Walt and De Klerk (2014) report that their South African sample was mostly dissatisfied with their jobs, while Lumley et al. (2011) reported job satisfaction for an information-technology sample, and Visser, Mackenzie and Marais (2012) reported that individuals in their South African health-sector sample were generally satisfied with their jobs.

With regard to the intrinsic and the extrinsic job satisfaction of the respondents, they seem more satisfied with aspects related to the job itself (mean = 3.91; SD = 0.658), and less satisfied with aspects related to external factors (mean = 3.54; SD = 0.890). Questions regarding intrinsic job satisfaction relate to the job itself, and include the feelings of respondents regarding various different issues, such as autonomy, freedom and variety, meaningfulness, and the utilisation of skills (Martin and Proença, 2012). External job satisfaction relates to the feelings of respondents concerning remuneration, supervision, relations with co-workers, advancement, and rewards (Martin and Proença, 2012). One explanation for the higher level of intrinsic job satisfaction observed relative to extrinsic job satisfaction could be that although artisans and engineers enjoy the work that they do, it is possible that they are not being remunerated and rewarded adequately. Due to the skills shortages that exist in these occupational categories, it is postulated that employees working in these categories are increasingly doing more work, but that they are not necessarily being remunerated or rewarded for the extra work that they are doing.

Consistent with the findings of the current study, Robbins (2005) asserts that employees prefer jobs that afford them the

opportunity to apply their skills and abilities, that offer them variety and freedom, and that provide them with constant feedback on their performance. Furthermore, employees that find their work interesting are likely to be more satisfied and motivated than employees that do not enjoy their jobs. For this reason, it is important that gold-mining companies ensure that engineers and artisans are rewarded and remunerated adequately, and that good relations exist between these employees and their supervisors and co-workers, to prevent these employees from being “poached” by international mining companies, thereby exacerbating the current skills shortages in these occupational categories.

Through Spearman rank-order correlation coefficients, the relationships between general job satisfaction, intrinsic job satisfaction, and extrinsic job satisfaction were determined. The intercorrelations are indicated in table 4. The Spearman rank-order correlations shown in table 4 indicate that there is a statistically significant positive relationship between general job satisfaction and intrinsic and extrinsic job satisfaction ( $p \leq 0.01$ ), as well as between intrinsic and extrinsic job satisfaction ( $p \leq 0.01$ ). The intercorrelations between intrinsic and extrinsic job satisfaction and general job satisfaction are very strong ( $r = 0.931$  for intrinsic job satisfaction, and  $r = 0.885$  for extrinsic job satisfaction). The intercorrelation between intrinsic and extrinsic job satisfaction is strong ( $r = 0.697$ ). These findings are consistent with those of Buitendach and De Witte (2005), who reported similar findings for a study conducted on maintenance workers in a South African parastatal.

**Table 4 Spearman rank-order correlations**

<b>Variable</b>	<b>General job satisfaction</b>	<b>Intrinsic job satisfaction</b>	<b>Extrinsic job satisfaction</b>
<b>General job satisfaction</b>	1		
<b>Intrinsic job satisfaction</b>	0.931** 0.000	1	
<b>Extrinsic job satisfaction</b>	0.885** 0.000	0.697** 0.000	1

\*\*  $p \leq 0.01$

The second objective of the study was to determine the perceptions of employees employed in core occupational categories regarding the impact of skills shortages on their experience of job satisfaction. Hence the question “How would you describe the impact of skills shortages on your job satisfaction?” The responses to this question reveal that 21% (n=40) of the respondents perceived skills shortages to have had an impact on their current job satisfaction, 41% (n=78) indicated that skills shortages had not had an impact on their current experience of job satisfaction, and 34% (n=63) indicated neither a positive nor a negative response. Therefore, one may conclude that many of the artisans and engineers included in the sample felt that skills shortages had not had an impact on their level of job satisfaction, while some (21%) indicated that skills shortages had had an impact on their level of job satisfaction.

From the data collected from the open-ended question regarding the impact of skills shortages on job satisfaction, the following themes emerged: training and development, remuneration, and staff shortages. In terms of training and

development, respondents articulated the importance of training. Some of the responses were:

*“Artisans have to be given the chance to further their studies”, “I think organisations should [...] train young stars to develop them to [have] [...] higher level skills”, “Our assistants need to be well trained”, and “Superiors must take people to the training because they don’t have too many skills”.*

These responses clearly indicate that more education and training, that is, development opportunities, should be made available to employees. Training offered should be appropriate and effective, which will ensure that employees have the right skills to execute their tasks effectively. This will not only prevent unnecessary accidents from occurring in this highly regulated industry, but it may also mean that employees can be promoted. Promotional opportunities are regarded as one of the factors that influence the level of job satisfaction of employees (Man et al., 2011). Furthermore, development is not just concerned with satisfying current needs of individuals; it also aims to develop individuals’ skills, experience, and attitudes, so that these individuals remain successful over the long term (Nel, Werner, Du Plessis, Ngalo, Poisat and Sono, 2011). Kleynhans (2007) argues that artisans do not merely want to be better workers; they also desire opportunities to develop as people. It is argued that being provided with such opportunities should have a positive impact on the general life satisfaction of employees, which may possibly reduce the incidence of industrial action in the mining industry, and will facilitate retention of artisans and engineers.

The second theme that emerged from the data collected was that of remuneration. The respondents mentioned that they are not being adequately remunerated for their input. Examples of observations made are the following:

*“Increase the pay”, “There is a shortage of artisans because [...] the remuneration is low compared to other jobs”, and “Maybe our management can check into better salaries to try and make people more positive”.*

From the responses, it is evident that those respondents who indicated that skills shortages did have a negative impact on their experience of job satisfaction are generally dissatisfied with their remuneration. However, Van Rooyen et al. (2010) postulate that retention strategies, such as offering more competitive salaries or bonuses, have generally been unsuccessful.

In recent wage negotiations in South Africa’s gold-mining industry, skilled workers (including artisans) were offered a wage increase of 4.5% at Harmony, 5% at Sibanye Gold, and 6% at AngloGold Ashanti (Steyn, 2015). These wage increases were negotiated through centralised bargaining. The rationale behind this choice of bargaining system was that decentralised bargaining is still regarded by some experts as complicated and dangerous (Steyn, 2015). Others maintain that in a free-market economy such as that of South Africa, differential wages for similar jobs is the norm, and should be encouraged (Steyn, 2015). It has been suggested that gold-mining houses should consider remunerating differential wages for occupational categories where skills shortages exist, since in these occupational categories employee demand is increasing, while supply is decreasing. This will allow mining companies to address individual concerns regarding dissatisfaction with remuneration. The third theme that emerged from the data collected was that there is currently a paucity of employees or assistants to execute tasks. Examples of observations made are the following:

*“Need more helpers”*

*“It will help everyone to get help”*

*“We need more people to do the work”*

*“We need more people to do the work in a better way”.*

Thus, the respondents indicated that currently there is a need for more workers in these occupational categories. A shortage of staff can easily lead to work overload. Respondents indicated both quantitative and qualitative dimensions of work overload in their responses. With regard to quantitative overload, it was indicated that employees have too many duties to do at any given time. Qualitative overload was suggested by responses that stated that work should be done more effectively, thus implying that some form of skill, knowledge, or ability is required. A negative relationship has been established between workload and job satisfaction (Coverman, cited in Pienaar, Sieberhagen and Mostert, 2007). This suggests that for job satisfaction to improve, workload should be decreased to an optimal level. Therefore, it seems necessary that mining houses should be sensitive to the amount of work employees are given in occupational categories where skills shortages exist. Furthermore, it is advisable that workload should be managed, so that it is at an optimal level, “where work is challenging and demanding enough of employees’ time, skills and abilities to keep them engaged, committed and satisfied, but not so high as to be demotivating” (Pienaar et al., 2007). This will not only reduce workplace stress and possible burnout, but will also decrease the incidence of unnecessary accidents in the workplace, as well as the rate of employee turnover.

## Discussion

The findings of this study show that employees working in occupational categories affected by skills shortages are, on average, very satisfied with their jobs. Furthermore, respondents perceived skills shortages not to have had an effect on their job satisfaction. From a dispositional perspective, it has been suggested that people have innate dispositions that cause them to have tendencies towards a certain level of satisfaction, regardless of their job (Saari and Judge, 2004). Thus, according to this perspective, job satisfaction is not affected by the employer (Crow and Hartmann, cited in Matutoane, 2009), but rather is a factor of personality, and is thus genetically determined (Staw and Ross, cited in Matutoane, 2009). However, none of the sociodemographic factors measured in this study, namely gender, age, position, organisation, race, tenure, and qualifications, showed a statistically significant relationship with job satisfaction.

In line with the dispositional perspective, it has been argued that job satisfaction is determined by a person's general life satisfaction, which, in the context of the South African mining industry, can be assumed to be somewhat negative, if one takes into consideration the incidence and nature of industrial action in this industry. Therefore, the finding that the respondents in this study are generally satisfied with their jobs is unexpected for the mining industry, since union members have increasingly been voicing their dissatisfaction through industrial action. In this regard, Bryson, Cappellari and Lucifora (2003) assert that unions provide workers with the opportunity to voice their grievances, thus it is the *reporting* of dissatisfaction that increases, not actual job dissatisfaction. This increased reporting of job dissatisfaction seems to be a

tactic used by unions to increase their bargaining power (Bryson, Cappellari and Lucifora, 2007), rather than a strategy to improve actual working conditions, and consequently job satisfaction.

It is possible that the employees working at gold mines may be generally dissatisfied with institutional matters, but not necessarily with their jobs. An alternative explanation is that since the sample consisted of artisans and engineers, who form part of the core business of the mining industry, it is possible that these occupational categories have more interesting and challenging work than other occupational categories, such as rock drill operators, who have expressed their dissatisfaction through strikes. Apart from skills shortages, the mining industry is also being negatively affected by escalating labour unrest. Recent incidents, such as protracted and violent strike actions, are symptomatic of the dissatisfaction among employees. For instance, during the Marikana strike of 2012, which has been labelled as the longest and deadliest strike in the world, 44 people were fatally injured, when 3,000 rock drill operators engaged in a work stoppage, with the objective of negotiating a monthly wage increase from ZAR5,400 (US\$648) to ZAR12,500 (\$1,500) per month. The aforementioned strike was followed by several other strike actions in the same year, and, as a result, the mining industry lost 16 million working hours from 99 strikes, 45 of which were unprotected (Odendaal, 2014). It has been found that these strikes, particularly in the platinum sector, have harmed investor confidence, which has added to the long-term economic impact of the strikes. This is cause for concern, considering that internationally South Africa is regarded as one of the most significant role players in the mining industry (MBendi Information Services, 2014:1; Osaе, 2010:45; Osman, 2012).



However, it is important that mining companies continue to provide artisans and engineers with opportunities to satisfy their need for achievement, recognition, personal growth, and autonomy, which have been identified as factors that influence the motivation of employees (Kumar and Singh, 2011). Furthermore, in line with the findings of Kumar and Singh's (2011) study, mining companies should focus on increasing intrinsic job satisfaction, through task significance, task variety, and autonomy, since job satisfaction plays an important role in retaining engineers, and a lack of job satisfaction can lead to increased employee turnover (Stanz, 2009).

The findings indicate that the respondents are experiencing more intrinsic job satisfaction than extrinsic job satisfaction. This finding is expected, since mining-industry workers are continually expressing their dissatisfaction with aspects related to external job satisfaction, such as remuneration and poor working conditions. This finding can be interpreted from the situational perspective of job satisfaction, which suggests that job satisfaction is derived from job characteristics (Franěk and Večeřa, 2008). Job characteristics that are often associated with job dissatisfaction are remuneration and working conditions. Based on the findings of this research, it is suggested that to ensure higher levels of extrinsic job satisfaction among employees in core occupational categories where skills shortages are being experienced, mines should carefully consider the structuring of remuneration packages, and occupational health and safety should continually be emphasised. This may be achieved through the establishment of workplace forums, or consultation with trade union representatives, since the mining industry continues to be highly unionised. This will not only increase employees' extrinsic job satisfaction, and ultimately their general job satisfaction, but it can also have a positive effect on the

retention of these employees, which may prevent further skills shortages.

## **Conclusion**

The mining industry has always been a key driver of the South African economy, and this existing state of affairs seems likely to continue, as adding value to mineral wealth forms part of the national government's nine-point plan aimed at growing the South African economy and creating jobs. Notwithstanding the critical role that the mining industry plays within the South African economy, lower commodity prices have influenced the trade dynamics of commodity-exporting countries, such as South Africa. Even though the value of global trade is declining as a result of a decline in commodity prices, the volume of trade is showing some persistence (United Nations, 2016). Skills shortages could, however, decrease the volume of trade, which could severely impact South Africa's trade account. As it stands, 149 occupational categories are experiencing skills shortages, which affect 3,054 occupations. As such, skills shortages impact on the level of economic productivity which is evident within the mining industry. Should mining companies choose to ignore the current volatile state of affairs in which operations are taking place, they may experience an increase in employee turnover (in the form of skilled labour exiting the industry in response to lucrative offers from international mining companies, which is the trend currently). This may compromise the future of South Africa's gold-mining industry, and ultimately the economic well-being of the country.

## **Study limitations and policy implications**

This study has mainly four limitations. Firstly, the study was limited to mining engineers and artisans employed at gold mines in the Lejweleputswa district of the Free State province in South Africa. Although the ideal would have been to include a random sample of employees occupied in core occupational categories where skills shortages exist in the South African mining industry, this was not possible due to time and financial constraints. This means that the findings of the current study cannot be generalised to other populations, provinces, or countries. Secondly, the sample was not representative of the population in terms of race or gender, which influenced the external validity of the findings. Thirdly, the fact that the study was restricted to the mining industry means that the findings are not generalisable to employees in other industries where skills shortages are being experienced, due to prevailing dissimilar conditions, which could yield different findings from those of this study. Fourthly, the study made use of a cross-sectional research design. It would be interesting to conduct a longitudinal study, to determine whether job satisfaction in these occupational categories will change over time or fluctuate according to environmental influences.

Despite the aforementioned limitations, the study has some implications – both theoretically and in terms of policy implications. Firstly, the findings of the study contribute to the job satisfaction literature, by providing new insights into the experience of job satisfaction in occupational categories where skills shortages exists. Despite the South African mining sector being plagued by employee-related problems and violent strike actions, the respondents in this study reported to be satisfied with their jobs. This contradicts the findings of previous

research on job satisfaction conducted on South African samples, which indicated that respondents were generally dissatisfied with their jobs (Van der Walt and De Klerk, 2014). It further emerged from the findings that the respondents did not perceive skills shortages to have had an effect on their job satisfaction. This also contradicts the findings of other scholars, who have reported that skills shortages have a significant effect on employees' levels of job satisfaction and well-being (Callan and Lawrence, 2009).

Even though the respondents experienced intrinsic job satisfaction, it is a well-known fact that when the supply of skilled labour decreases and the demand increases, a concomitant increase in the price of skilled labour occurs (Stanz, 2009), which will have policy implications for the mining sector. Thus, apart from the theoretical implications of the study, there are policy implications that should be taken into consideration. As such, the proposed amendments to the Mineral and Petroleum Resources Development Act, Act 28 of 2002, with specific reference to provisions aimed at stimulating local beneficiation, should be underscored, to ensure that more national stakeholders benefit from the country's mineral wealth. For this reason, the Department of Trade and Industry is in the process of developing the Mineral Beneficiation Action Plan, as part of the departments' 2015/2016 strategic plan, in order to incorporate this into the Industrial Action Policy Plan (SA, 2015). Similarly, Rasool and Botha (2011) noted that improving industrial policies may address current skills shortages. Notwithstanding this possibility, there is also a case to be made for utilising foreign skilled labour in sectors that are struggling to find local expertise, such as the mining sector. This could provide short-term benefits (such as enhancing productivity) and long-term benefits (such as skills transfer). This idea was supported by

Rasool and Botha (2011), who asserted that developing a more robust skills immigration policy may alleviate skills shortages. Mateus et al. (2014) proposed that government should create a programme aimed at improving available information on skills shortages, with the argument that such a programme could potentially assist with monitoring job vacancies that are advertised for selected skilled occupations experiencing shortages. The Technology Innovation Agency (2012), supported by the Department of Science and Technology, has proposed supporting innovation in mining. Thus, training and resource development programmes need to build innovation process skills as a core competency in the sector. Consequently, a tiered innovation skills programme has been recommended. This idea is aimed at fostering the required skills, in order to reduce skills shortages.

It will be valuable to extend this study to employees in other sectors, with specific reference to occupational categories where skills shortages exist. It is proposed that work values, motivation, stress, and other work-related attitudes, such as organisational commitment, job involvement, perceived organisational support, and well-being, be investigated in these occupational categories where skills shortages exist, so as to obtain a more comprehensive understanding of the work experiences of these employees. This information will be of use to the South African mining industry in improving the happiness of its employees, which will hold many positive outcomes for mining companies.

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