

**Citation:** Kajongwe, C; Bhiri, T & Denga, T. S. (2020). Dynamics of Human Resources Development (HRD) on Performance of Mining Sector in Zimbabwe. *Journal of Popular Education in Africa*. 4(5), 42 – 57.

## **Dynamics of Human Resources Development (HRD) on Performance of Mining Sector in Zimbabwe**

By

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### **Abstract**

This study sought to establish how Human Resources Development (HRD) impact on the performance of the mining sector in Mashonaland West Province in Zimbabwe. The contention of this study is that providing the right quality human capital and ensuring its proper administration is essential to ensure efficient market operation to any industry. Although mining organisations operate with a finite resource, often in remote locations, require specialised skills, with high capital intensity and are subject to political, social and environmental global issues, human capital act as a pillar for their effective operations. Mining is a peculiar sector of the economy and its proper function is determined by competence of its human resources. The human resource is the only competence that competitors cannot replicate. Positivism research Philosophy guided this quantitative research study. The study adopted cross sectional research design. Convenient sampling was used to select a sample of 338 managerial and senior mining employees in this study. Self-administered questionnaires were research instrument used to collect data. Data was uploaded on Statistical Package for Social Sciences (SPSS) and analysed using Chi-Square Test of Independence and AMOS. The data was presented in form of tables and figures. Findings from the study revealed that training and development, communication and information sharing, health, safety and welfare, incentives and compensation and job security factors are very significant in bringing about performance within the mining industry in Zimbabwe. The research brings to the fore the value of HRD to equip human capital in the mining sector in Zimbabwe with peculiar skills and knowledge and ultimately improves the retention of core employees and improves on performance. The study recommends the need for mining sector to concentrate among other factors with training and development, health, safety and welfare factors, incentives and compensation as well as job security factors to improve on performance and retain rare skills. The Ministry of Industry and Mining Development in Zimbabwe need to be privy of factors contributing to ineffectiveness of the mining sector to produce hence to be supportive to spearhead operational objectives. Studies need to be done on the safety, health and welfare of mining employees to retain unique skills for performance to be realised in the mining sector in Zimbabwe.

**Key words:** Human Resources Development, Performance, Mining Sector, Zimbabwe

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### **Introduction and Background of the Study**

Mining could become the lead growth sector in post crisis economy although this will depend on global commodity market conditions as well as the macro-economic, fiscal and industry governance strategies pursued by the authorities. The combination of deteriorating macroeconomic situation, the exodus of skills, infrastructure bottlenecks and policy unpredictability and uncertainty, ensured the investment in exploration and development has been minimal. The need for human resource managers to keep up with effective management of employees in the mining industry cannot be overemphasized. It is thus incumbent on the mining industry to manage, develop and maintain the workforce in order to meet the new demand. A primary task in the industry is therefore to bring about a climate favourable for management, workforce and resources to combine effectively all directed towards achieving the organizational goals and objectives while also providing high reward for those involved.

Human resource development (HRD) can be defined as a set of systematic and planned activities designed by an organization to provide its members with the opportunities to learn necessary skills to meet current and future job demands (Burgess, 2005). Wylie (2005) argue that HRD seeks to develop people's knowledge, expertise, productivity, and satisfaction, whether for personal or group or team gain, or for the benefit of an organization, community, nation, or, ultimately, the whole of humanity. Sullivan (2009) was of the assertion that HRD activities should begin when an employee joins an organization and continue throughout his or her career, regardless of whether that employee is an executive or a worker on an assembly line. Sullivan (2009) argue that HRD programs must respond to job changes and integrate the long-term plans and strategies of the organization to ensure the efficient and effective use of resources. In short, while training and development activities (T& D) constitutes a major part of human resource development, activities such as coaching, career development, team building, and organization development also are aspects of human resource development (Sullivan, 2009).

Human capital has long been held to be a critical resource in most firms. Companies are now trying to add value to their human resources and human resource (HR) department has been set up to manage their human capital (Dainty et al., 2000). Stavrou (2005) also argues that the effective human resource management can be the main factor for the success of a firm. Langford et al, (1995) noted that most mining and construction firms ignore human resource management practices within the industry. Kululanga et al., (1999) and Ford et. al., (2000) suggested that one possible reason for the low commitment to human resource management issues is the predominance of an engineering culture that focuses on technology instead of people. Loosemore et al, (2003) suggested further that the low investment in people stems from the assumption that

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HRM issues are time consuming and expensive. They also noted that developing employees will make them more attractive to other companies and competitors in the mining industry.

Lee and Lee, (2007) asserted that training and development, teamwork, compensation or incentives, HR planning, performance appraisal and employee security help improve firms' business performance including employee's productivity, product quality and firm's flexibility. Sullivan (2009) asserted that the fast-growth firms used training programs to achieve their objectives and emphasized employee development to a significantly greater extent than their slow-growth counterparts. Burgess (2005) confirmed that good orientation of the newly hired employee was an important factor in determining employee retention. Therefore, as a mining organisation's human resource (HR) function is about people management, its HRM division has the ability and responsibility to make a significant contribution to the organisation's success at strategic, management and functional levels.

Wylie (2005) argues that the mining industry is among the most technologically advanced of all heavy industries. Nevertheless, it relies on both employees and contractors people to drive, create and shape the operations and technologies that sustain production (Wylie, 2005). Research by the Canadian Mining Industry Training and Adjustment Council (MITAC) identified that, although the workforce has fluctuated over the past decade, productivity has continuously increased. Furthermore, their research indicates that a worker in today's mining industry must be more versatile, better educated and better trained than ever before.

Burgess, (2005) was of the opinion that mining organisations must identify and retain the talent within the firm whilst also training and developing that talent to lead the firm into the next boom. Lee and Lee, (2007) avers that in a downturn economy, HR practitioners need to be emphasising to their organisations that it is necessary to do the right thing for the long-term value and sustainability of the business. This includes recognising the link between leadership and performance, and hence ensuring that leadership talent is retained, developed and, most importantly, allowed to lead through the tough times (Lee & Lee, 2007)). Mining organisations must manage their human capital to create a competitive advantage. Therefore, a goal for HR during troubled times is to harness corporate intelligence, to ensure that mining organisations do not just downsize but they are actually right sizing (Burgess, 2005).

Kanopko (2012) asserted that mining companies can only succeed in the long-term if they recruit and motivate people who are able to respond to and shape the challenges of the future. Kanopko (2012) argue that these are the individuals with the capacity to create competitive advantage from the opportunities presented by changing markets, with the desire to learn from customers, consumers, suppliers and colleagues, and who possess the ability to build and influence long-lasting and effective partnerships. Kowal and Podobinska (2012) posit that the recruitment of new employees in the mining sector helps to demonstrate a company's aspirations, highlighting the skills and attitudes to which it attaches the highest priority. The choice also provides a major opportunity to communicate the values and successes of the organisation to explain why the company offers the most attractive place for a person to develop their career (Kowal & Podobinska, 2012). A sustainable development mindset through HRD pushes employees to be better and encouraged a focus on performance, a consistent eagerness to improve and continual learning (Cwik, 2011).

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The Zimbabwe Geological Survey (1990) identifies more than 500 individual deposits of base metal and industrial minerals in Zimbabwe. It describes Zimbabwe as 'an important producer' of gold, chrome, lithium asbestos and caesium, as well as high-quality emeralds. Modern mining began in 1892 and by 1990 over 40 minerals were being exploited. Over the first 100 years of modern mining activity, the two most valuable products by far were gold and asbestos but this has changed with the emergence of nickel and ferrochrome as major exports and, very recently, the exploitation of platinum group metals – platinum, palladium and rhodium. Most mineral production is from the ancient Archaean core of the country where most deposits are concentrated in the greenstone belts that contain gold, copper, tungsten, antimony and arsenic. Nickel with its by-products of copper and cobalt is also mined in the greenstone belts, while asbestos deposits are found in the serpentinized ultramafic intrusions. There are known huge resources of chromite and platinum along the Great Dyke that runs through the centre of the country from northeast to south-west.

Initially mining in Zimbabwe centred on the exploration and exploitation of gold deposits almost all of which were known from ancient workings. Subsequently, world class deposits of chromite and chrysotile asbestos were developed, along with Hwange coal. The Zimbabwe Iron and Steel Co (ZISCO) (as it is now known) was built to produce iron, steel and coke, while two major ferrochrome projects were developed, Zimbabwe Alloys, producing low carbon ferrochrome and ZIMASCO, which manufactures high carbon ferrochrome. Subsequently, an ammonium nitrate plant was opened at ZISCO to produce oxygen-refined steel, while a large open-cast coal mine was developed at Hwange for coking coal and for steam coal to fire the Hwange Thermal Power Station.

Copper deposits were exploited by MTD Mangula and the Empress nickel deposit, discovered in 1956, was brought into production along with other nickel properties (Trojan, Shangani, Epoch and Madziwa in the 1960s and early 1970s). Two nickel deposits at Hunters Road and Damba-Silwane remain dormant. The Empress Nickel mine has closed but the refinery still operates for toll treatment of matte from the BCL mine in Botswana. Small open-cast mines were opened at Buchwa and Ripple Creek for iron ore, and at Dorowa for phosphate, along with a number of open-cast gold mines using extraction by heap-leaching.

Since 2000 however, a number of mines have closed, including the copper producers at Mangula, Alaska and Sanyati and the Epoch and Madziwa nickel mines. The Railway Block high-grade chromite mine has closed as well as the Dalny Venice-What Cheer group of gold producers and the smaller Gaika, Motapa and Royal Family gold mines. The original BHP Platinum mine at Selous, which opened in the late 1990s, was closed when the Australian mining company disinvested. The plant was subsequently restructured for the open-cast mining at Ngezi, while most recently diamond pipes at Murowa (the Rio Tinto group) and River Ranch have been mined on a small scale along with alluvial diamonds at Marange. All existing mines operate under constraints – most notably the exchange rate, which has decimated gold production, and shortages of power, skills, ore and low sulphur coal required by the ferrochrome sector. Major expansion potential exists in the platinum industry with new underground mines at Unki (Anglo American), Ngesi (Impala Platinum) and Mimosa. The Geological Map of Zimbabwe is presented below.

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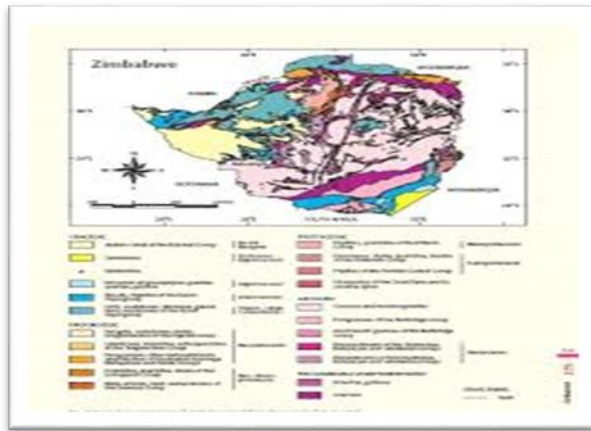


Figure 1: Geological Map of Zimbabwe

Source: Survey (2020)

The need for human resource managers to keep up with effective management of employees in the mining industry cannot be overemphasized. However it is against this background that this study seeks to assess how HRD impact on mining performance in the context of Zimbabwe.

### Statement of the Problem

In the current competitive global economic environment in which business is operating in, employees and the way they are managed are becoming increasingly important. The mining industry across the globe has always made use of large stock of labour to achieve organisational objectives. The mining industry is not sustainable and productive as hoped by Sustainable Development Goals (SDG) especially SDG 8 (promote inclusive and sustainable economic growth, employment and decent work) and SDG 9 (improve sustainable industrialisation and fostering innovation) all of which are not easily realised. This need has become even stronger as organizations grapple with the challenges presented by a fast-paced, highly dynamic, and increasingly global economy.

To compete and thrive, many organizations are including employee education, training, and development as an essential part of their organizational strategy. The American Society for Training and Development (ASTD) estimates that U.S. organizations spent \$134.1 billion on employee learning and development in 2008, and \$125.9 billion in 2009 to achieve sustainable development. However, the labour market in Zimbabwe is currently characterised by shortage of skilled and experienced employees needed to meet market demands. This state of affairs has not spared the mining sector which has seen many mines operating on shoe string budgets and therefore failing to attract quality labour force. This uncanny situation has left human resources managers in the mining industry in Zimbabwe groping for the best methods to retain skilled personnel they have. This study therefore seeks to establish how human resources development impact on performance of the mining sector in Zimbabwe to achieve sustainable industrialisation.

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**Objectives**

- 1. To assess the impact of HRD on performance of mining sector in Zimbabwe

**Hypotheses**

- H<sub>1</sub>:** Employee involvement positively improves quality of service delivery of mining sector in Zimbabwe.
- H<sub>2</sub>:** Training and Development positively improves productivity of the mining sector in Zimbabwe.
- H<sub>3</sub>:** Career Development positively improves motivation of employees in the mining sector in Zimbabwe.

**Conceptual Framework**

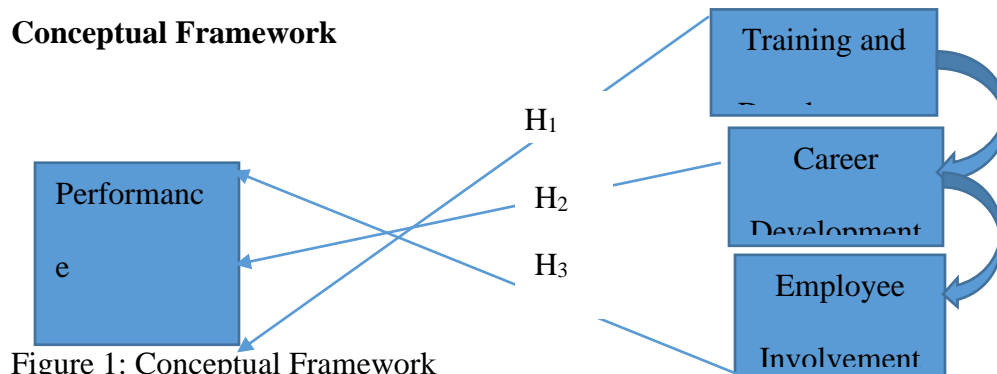


Figure 1: Conceptual Framework  
Source: Survey (2020)

**Theoretical Framework**

This study is guided by Social Learning Theory by Bandura. Bandura developed a third cognitive theory of motivation known as social learning theory. Bandura proposes that outcome and self-efficacy expectations affect individual performance. An outcome expectation (similar to the concept of “instrumentality” in expectancy theory) is a person’s belief that performing a given behaviour will lead to a given outcome. Bandura argued that unless people believe they can produce desired effects by their actions they have little incentive to act or to perform in the face of difficulties. Self-efficacy beliefs are malleable and can be influenced by one’s accomplishments, observations of others, verbal persuasion, and physiological states.

Bandura argues that people who have high self-efficacy for a particular task focus their attention on the challenges of a situation and use greater effort in mastering them, thus increasing the chances of successful performance. Conversely, people who have low self-efficacy for a particular task focus their thoughts on obstacles and shortcomings, and as a result, reduce their chances of successful performance. Research shows that self-efficacy is strongly related to task performance. Furthermore, research also shows that self-efficacy can predict performance in training programs. Clearly, self-efficacy has direct relevance for success in HRD. If employees have low self-efficacy expectations, it is unlikely that they will attempt to improve performance.

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If they do try to improve performance, they will not put forth the same effort as persons with high self-efficacy. Therefore, trainers and supervisors should behave in ways that increase the trainees' positive judgments of their self-efficacy, as well as their outcome expectations. A scale measuring organizational efficacy has been developed by Bohn.

Of particular relevance to HRD, social learning theory also proposes that most behaviour is learned by observing others, a process called modelling. Research suggests that through observing behaviour and its consequences in others, individuals learn new behaviours and make decisions about whether to perform a particular behaviour themselves. Modelling has also been applied to HRD with great success in a training approach known as behaviour modelling (also called "demonstration-based training"). In behaviour modelling training, a trainee is told the components of the behaviour to be learned (for instance, firing a poor performer) and shown a film or videotape in which an actor (the model) demonstrates how to perform the behaviour. Then the trainee practices the behaviour with feedback from others and finally receives social reinforcement for performing the behaviour.

## **Literature Review**

### **1. The effects of HRD on performance of the mining sector**

Jiang, Lepak, Hu, and Baer (2012) asserted that the overarching goal of Human Resource Development (HRD) interventions is to assist employees and organizations in attaining their goals. Jiang, Lepak, Hu, and Baer (2012) argues that while this might, at first glance, seem relatively straightforward and uncontroversial, the working out of a multiple stakeholder approach is not easy, and it is definitely not without controversy. Johnson (2014) posit that HRD professionals can help employees meet their personal goals by providing programs and interventions that promote individual development, for example, career development activities, mentoring, and formal training and educational opportunities. Johnson (2014) was of the opinion that the ultimate objective of most, if not all, HRD programs is to improve organizational performance.

Kaufman and Miller (2011) avers that HRD efforts are certainly not the only contributors to organizational performance; however, they are increasingly recognized as a critical component of organizational success. Kaufman and Miller (2011) added that a major focus of most HRD interventions is an effort to change employee behaviour. That is, the hope is that providing employees with the skills and behaviours they need to perform successfully should lead to the greatest accomplishment of both employee and organizational goals (Kaufman & Miller, 2011). Thus, the field of HRD has always had a strong focus on employee behaviour. However, Jiang, Lepak, Hu, and Baer (2012) suggested that to change any behaviour, management must understand the factors that cause employees to behave the way they do. Armed with this knowledge, management may accurately diagnose performance problems, understand what makes effective performance possible, and design HRD programs to foster the behaviour they want inclined to organisational culture (Jiang, Lepak, Hu, & Baer, 2012). It is assumed if this is taken into consideration HRD enhance performance output in the mining sector in Zimbabwe.

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The transfer of training to the job situation is critically important to the success of HRD efforts in the mining sector. Katou (2015) asserted that transfer can take different forms. Positive transfer occurs when job performance improves as a result of training. Zero transfer occurs when there is no change in job performance as a result of training. Negative transfer occurs when job performance worsens as a result of training. Negative transfer may seem unlikely, but recall the detrimental effects interference can have on learning and performance (Katou, 2015). Training and development (T & D) may be related to firm performance in many ways. Gonzalez, Quesada and Monge (2012) posit that training programmes increase the firm specificity of employee skills, which, in turn, increases employee productivity and reduces job dissatisfaction that results in employee turnover. Kalkurn (2013) avers that training and developing internal personnel reduces the cost and risk of selecting, hiring, and internalising people from external labour markets, which again increases employee productivity and reduces turnover. Training and development focus on changing or improving the knowledge, skills, and attitudes of individuals. Training typically involves providing employees the knowledge and skills needed to do a particular task or job, though attitude change may also be attempted (Katou, 2015). Developmental activities, in contrast, have a longer-term focus on preparing for future work responsibilities while also increasing the capacities of employees to perform their current jobs. T&D activities begin when a new employee enters the organization, usually in the form of employee orientation and skills training. Nevertheless, if T & D is initiated in the organisation, it is believed would be of value addition to the mining sector through orienting and equipping requisite skills and increases productivity and innovation.

High involvement management of employees in the mining sector is believed to be significant in steering performance. This approach involves treating employees as partners in the management and leadership of organisations whose interests are respected by top management. The aim is to create a climate in which a continuing dialogue between managers and the members of their teams takes place in order to define expectations and share information on the organization 's mission, values and objectives (Armstrong, 2005; Boxall, 1996; Guest, 1987). This establishes a common understanding of what is to be achieved and a framework for managing and developing people to ensure that it will be achieved. MacDuffie, (1995) and Osterman, (1994), points to focused on the use of formal work teams, employee involvement groups, job rotation, quality circles, product-related suggestions made and implemented by employees, the use of job rotation within and across teams, and carrying out quality tasks as examples of employee involvement in the management of organisations. This increases employees' productivity, commitment, and lowers turnover.

### **Methodology**

The study was guided by the positivism research philosophy, which embraces the adoption of pluralistic approaches in research (Cresswell et al., 2003). The cross-sectional survey research design was adopted. Therefore, quantitative research method was adopted. The study's population was made up of managerial and senior employees in 20 established mines in Mashonaland West Province in Zimbabwe. Mashonaland West Province is a hub of established mines in Zimbabwe (Finscope, 2015). Convenient sampling techniques were used to select 338



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managerial and senior employees. A structured questionnaire was used to collect quantitative data. Data was uploaded on Statistical Package for Social Sciences (SPSS) and analysed using Chi-Square Test of Independence and AMOS. The data collected was presented in the form of tables and numbers.

**Sample Size**

The sample size for the study was determined based on the Krejcie and Morgan's sample size calculation formula for sample size calculation based on p = 0.05 where the probability of committing type I error is less than 5% orp <0.05. The use of the formula was also necessitated by budgetary constraints since it is costly to draw a larger sample size.

Equation: Sample Size Calculation

$$S = \frac{X^2NP(1-P)}{d^2(N-1)} + X^2P(1-P)$$

- Where: S – Required Sample Size
- X<sup>2</sup> – Value for 95% confidence level (1.96)
- N – Population size
- P – Population proportion (assumed to be .50 since this will provide be the maximum sample size)
- d – Degree of accuracy expressed as a proportion (0.05) this is the margin of error

$$\begin{aligned}
 S &= \frac{1.96^2(2.755*0.5)(1-0.5)}{0.05^2(2.755-1) + 1.96^2*(0.5)(1-0.5)} \\
 &= 338.03 \\
 &= \underline{338}
 \end{aligned}$$

Therefore, the research sample size was 338 comprising managerial and senior employees in 20 mines in Mashonaland West Province in Zimbabwe.

**Results and Discussion**

**Respond rate analysis**

**Table 1: Response rate analysis**

Description	Questionnaires administered	Questionnaires administered and not returned	Questionnaires administered & returned	Percentage of response rate
Respondents	328	115 (35%)	213 (70%)	70%

Source: Survey, (2020)

The study results indicate that (35%) respondents failed to administer the questionnaires distributed while (70%) respondents administered to the questionnaire. In this study (35%) employees failed to respond to the questionnaire due to various reasons as some cited fear of victimisation even though there were confidentiality guidelines of not including names on the

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questionnaire. The success of high rate of respondents was attributed to self-administering of questionnaires by the researcher. This implies that respondents were much willing to articulate to issues of HRD with the assumption that it improves their welfare performance standards at the workplace in the mining sector in Zimbabwe. Table 2 show demographic characteristics of job positions of respondents.

**Table 2: Demographic Characteristics of Job Position of Respondents**

Description	Managerial employees	Non managerial employees
Respondents	53(25%)	160(75%)

Source: Survey (2015)

The study results indicate that (25%) incumbents were in the managerial positions while (75%) respondents were in the non-managerial category. Impliedly this reflects a hybrid of respondents who were directly involved in the HRD pyramid in the mining sector in Zimbabwe.

### **Descriptive statistics**

#### **Test for Sample Adequacy**

The study first utilized the Kaiser-Meyer-Olkin (KMO) to measure sampling adequacy and whether the partial correlations among variables are small. The Bartlett's test of sphericity was used to determine whether the correlation matrix would be an identity matrix. According to Bryman and Bell (2011) KMO measures the sampling adequacy and should be greater than 0.5 for a satisfactory factor analysis to proceed. Likewise, if any pair of variables has a value less than this; it is advised to consider dropping one of them from the analysis. The IBM Statistical Package for Social Science (version 24) statistical software was used to analyze the data. The results are tabulated in Table 3.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.861
Bartlett's Test of Sphericity	Approx. Chi-Square	977.87
	Df	4
	Sig.	261
		.000

Source: Survey (2020)

From Table 3, the Kaiser-Meyer-Olkin measure of sampling adequacy was 0.861 and this was satisfactory for proceeding factor analysis. Bartlett's test of Sphericity was also conducted and p value of 0.000 shows that it was possible to continue with the factor analysis of HRD

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performance of mining sector in Zimbabwe. Table 4 shows descriptive statistics of HRD factors in mining industry in Zimbabwe.

**Table 4: Descriptive Statistics of HRD factors in mining industry in Zimbabwe**

Factor	Number	Minimum	Maximum	Mean	Std. Deviation
Training and development	213	2	5	3.65	.895
Employee involvement	213	2	5	3.84	.875
Career Development	213	1	5	3.74	.873
Valid N (Listwise)	213				

Source: Survey (2020)

The study sought to assess how HRD impact on performance of mining sector in Zimbabwe. The results obtained show that the mining sector improved quality of service through the adoption of employee involvement and participation and had a mean of 3.65 and standard deviation of 0.895. The results also show that training and development impact positively on productivity of the mining sector in Zimbabwe and had a mean of 3.84 and standard deviation of 0.875. In addition, the study also indicate that career development had an impact on employee motivation which positively improves performance and had a mean of 3.74 and standard deviation of 0.873 respectively. Impliedly a motivated workforce is committed to be an inclusive workforce hence are innovative and steer the organisational objectives for to performance to be realised. Table 5 show the descriptive statistics for performance.

**Table 5: Descriptive Statistics for Performance of mining sector in Zimbabwe**

Item Code	Item Description	Mean score	Mean response	SD
PERF1	There has been an increase in quality of service delivery in the mining sector	3.87	Agree	0.869
PERF2	The mining sector improved on productivity	4.43	Agree	0.916
PERF4	The mining sector motivated employees and improved on innovation	3.89	Agree	0.868
	Overall	3.65	Agree	0.628

Source: Survey Data (2020)

The mean score in this study was computed and it averaged (overall mean = 3.65; SD = 0.628) agree out of a possible score of 3 (strongly agree). This implies that mining companies agreed that they were performing well through HRD as indicated by their productivity, quality of

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service delivery and retention of skilled personnel since they remained a motivated workforce who remained innovative as they inclined themselves with the organisation of choice (Refer to Table 5). Table 6 show standardized factor loadings for the items in the study.

**Table 6: Constructs, Items,  $\lambda$ , CR and  $\alpha$  reliability**

Constructs	Items	$\lambda$	CR
AUT	AUT1	0.677	-
	AUT2	0.915	14.224***
	AUT3	0.820	13.210***
	AUT4	0.826	13.278***
DEM	DEM1	0.621	-
	DEM2	0.627	7.789***
	DEM3	0.667	7.455***
TCT	TCT1	0.823	-
	TCT2	0.742	11.525***
	TCT3	0.676	10.919***

Notes: – CR is fixed; \*\*\*  $p < 0.001$

Source: Survey (2020)

As presented in Table 6, all standardized factor loadings for the items were higher than the required minimum cut-off point of 0.6 (Bagozzi & Yi, 1988). Equally, the critical ratios (CRs) were also satisfactorily large and significant at  $p < 0.001$ . Additionally, all AVEs for all the constructs measured were greater than the required 0.5 (Fornell and Larcker 1981) as shown in Table 6. Thus, the prerequisites for convergent validity were achieved in this study.

### **Discriminant Validity**

Discriminant validity is the extent to which items of an underlying construct are strongly correlated with other measures of the same variable though different with other items of another construct to which it is unrelated (Cable and DeRue 2002). To determine discriminant validity, average variance extracted (AVE) was compared against squared inter-construct correlations (SICCs) (Brackett and Mayer 2003; Henseler, Ringle, and Sarstedt 2014). Discriminant validity is attained when AVEs are greater than the squared inter-construct correlations. Table 7 show that conditions for discriminant validity were achieved since all AVEs were higher than corresponding SICCs (Fornell and Larcker 1981). Table 7 show AVES and SICCs derived in this study.

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**Table 7: AVEs and SICCs**

Construct	AUT	DEM	TCT	TFM	LAI	PERF
AUT	<b>0.620</b>					
DEM	0.041	<b>0.704</b>				
TCT	0.027	0.060	<b>0.623</b>			
TFM	0.051	0.202	0.022	<b>0.850</b>		
LAI	0.006	0.061	0.021	0.014	<b>0.601</b>	
PERF	0.001	0.073	0.003	0.052	0.044	<b>0.710</b>

Note: Diagonal elements in bold represent AVEs

Source: Survey (2020)

The findings in Table 7 show that conditions for discriminant validity were attained in this study because all the AVEs shown in bold were greater than 0.5 and higher than corresponding SICCs (Fornell and Larcker 1981). The data was therefore validated.

### Testing of Research Hypotheses (H<sub>1</sub>, H<sub>2</sub>, H<sub>3</sub>)

Research hypotheses were tested using structural equation modelling in AMOS.

The structural model displayed suitable model fit indices ( $\chi^2/Df= 2.989$ ; GFI= 0.847; AGFI= 0.831; NFI= 0.931; TLI= 0.941; CFI= 0.940 and RMSEA= 0.052). The results presented in the study indicated that H<sub>1</sub>, H<sub>2</sub> and H<sub>3</sub> were all supported, thus employee involvement positively improves quality of service delivery of the mining sector in Zimbabwe, training and development positively improves productivity of the mining sector in Zimbabwe and career development positively improved motivation of employees in the mining sector in Zimbabwe.

### Conclusions and Recommendations

Study results shows that HRD positively impact on performance of the mining sector in Zimbabwe. In this regard all Hypotheses were supported significantly, thus employee involvement positively improves quality of service delivery of the mining sector in Zimbabwe, training and development positively improves productivity of the mining sector in Zimbabwe and career development positively improved motivation of employees in the mining sector in Zimbabwe. Therefore, in the turbulent economic environment in which mines are operating in Zimbabwe, there is a need for firms to continually acquire, develop and update their resources and capabilities in order to remain both efficient and competitive. The HR managers in the study are seen as having a number of ways of organising miners in order to get the most out of them. Further research should look at impact of mining activities on inhabitants of mining centres. This

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will help stakeholders to ascertain the appropriate ways of improving the lives of individuals who are negatively affected by mining activities in Zimbabwe as a whole.

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