



「MINING TRENDS REPORT 2018」



Executive summary

In On Africa (IOA) and Managing Transformation Solutions (MTS) partnered in 2016 to provide insights into the emerging trends of various government and private sector initiatives by assessing sample data drawn from the MTS Insite platform over 2012 and 2017, and covering 45 mining (inclusive of core contractor) companies in the country. The analysis compared the data across factors such as number of employed, key core positions, gender representation, age distribution, Paterson bands, and FET, GET and HET education levels.

A core aspect behind the drive to conduct the study emerged from the consistent downturn that the mining industry in South Africa has experienced since the start of the decade. The drop-in commodities demand placed considerable pressure on companies operating in the market to initiate employee and spending cutbacks. This in turn impacted the stability of production with labour holding recurrent strikes to demand wage increases.

Coupled with the global trends in demand, local pressure was also exerted on the industry in the form of government requirements to increase local community beneficiation, shareholding, and stringent requirements for health and safety, as well as education and training to increase. This placed the industry in a tough position to remain both relevant and competitive while still adhering to government policy.

Notably, private sector companies along with government entities such as the Mining Qualifications Authority (MQA), have moved forward in terms of education and training of the mining labour force, while also looking toward providing better quality of life for labour-sending communities and those residing in close proximity to mining operations.

In an analysis of core mining positions, the top ten core mining positions accounted for a considerable portion of total core mining positions. During the period under review, the representation of the top ten core mining

positions has shown a significant increase from 18% in 2012 to 40% in 2017, suggesting that a concentration of skills in core mining positions has taken place.

Gender proportional representation within the sample has increased by 3% over the period under assessment – 17% share in 2012 and 20% in 2017. There has been a similar increase in women participation within core positions – up from 12% in 2012 to 16% in 2017, as well as in the top 10 core positions – 11% to 14%.

Looking at Paterson grading, despite the stagnant total sample size for the two periods, Paterson A and B grades accounted for the bulk of personnel with the proportional share of these two grades increasing by 9% from 2012 (67%) to 2016 (76%). The proportional share of Paterson D-F personnel has conversely decreased.

Educational distribution has similarly clustered in two main bands – those with GET education, and those with an FET level of education. The number of designated males and females with education has increased over 2012-2017, though more could be done to increase the proportion of both designated males and females at an HET education level. Similarly, though the literacy rate has increased overall, it has dropped slightly among designated females.

A sharp increase was noted in the number of development opportunities offered through learnerships, internships, bursaries and graduate development programmes. African males remain the most dominant group in the development programmes, with a significant shift noted towards an increased representation of African females across all the development programmes.



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Mining Trend Report Infographic 2018



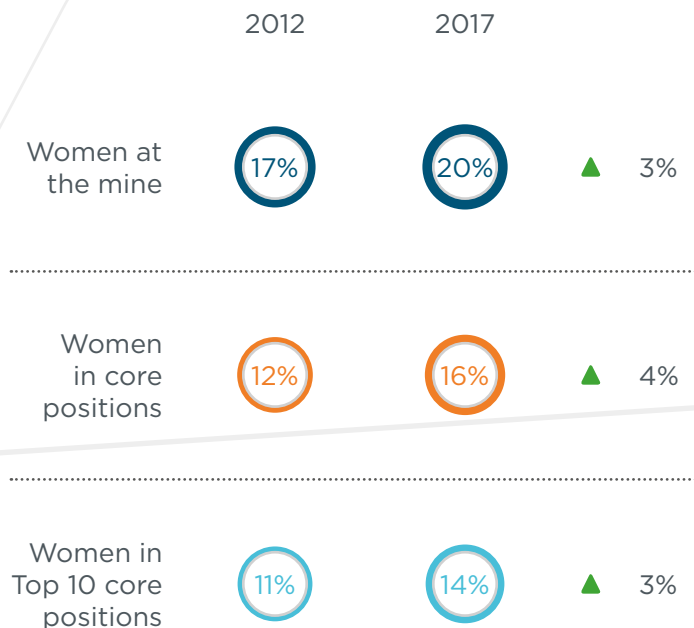
Employment Indicators: % change (2012 vs 2017)

Youth employment	▼	4%
Women employment	▲	3%
Local employment	▲	19%

Top ten core positions share of all mining positions: % change (2012 vs 2017)



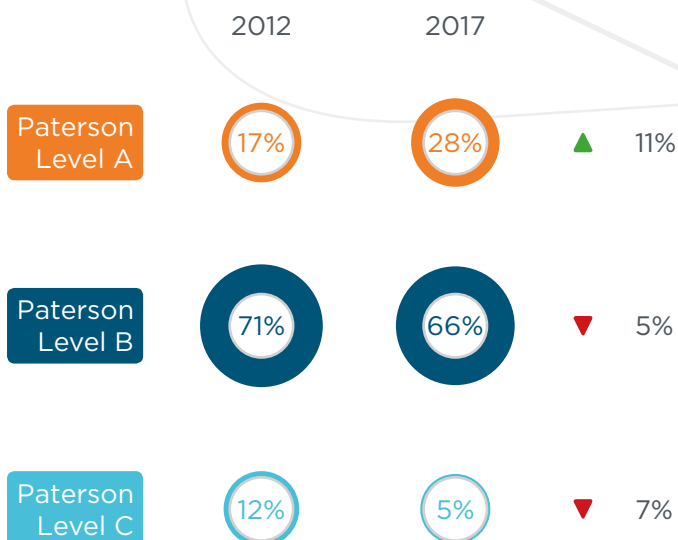
Female representation in mining positions: % change (2012 vs 2017)



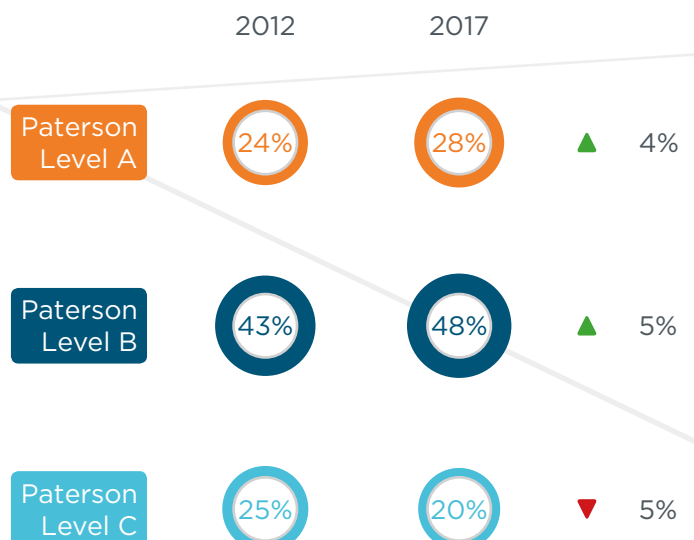
Youth employment share in Top ten core positions: % change (2012 vs 2017)



Top ten core positions Paterson grading share by level: % change (2012 vs 2017)



Paterson grading share by level: % change (2012 vs 2017)

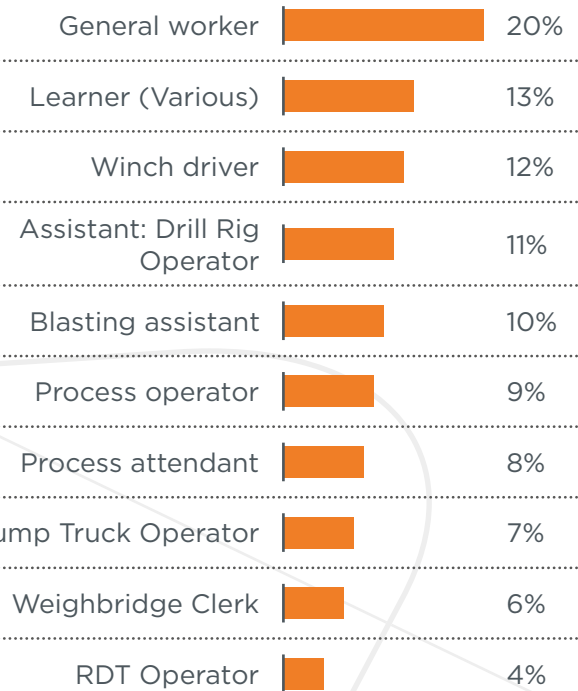


95% of all women in core positions are employed in the top 10 core positions

Top ten core positions for Women within sample: % change (2012 vs 2017)



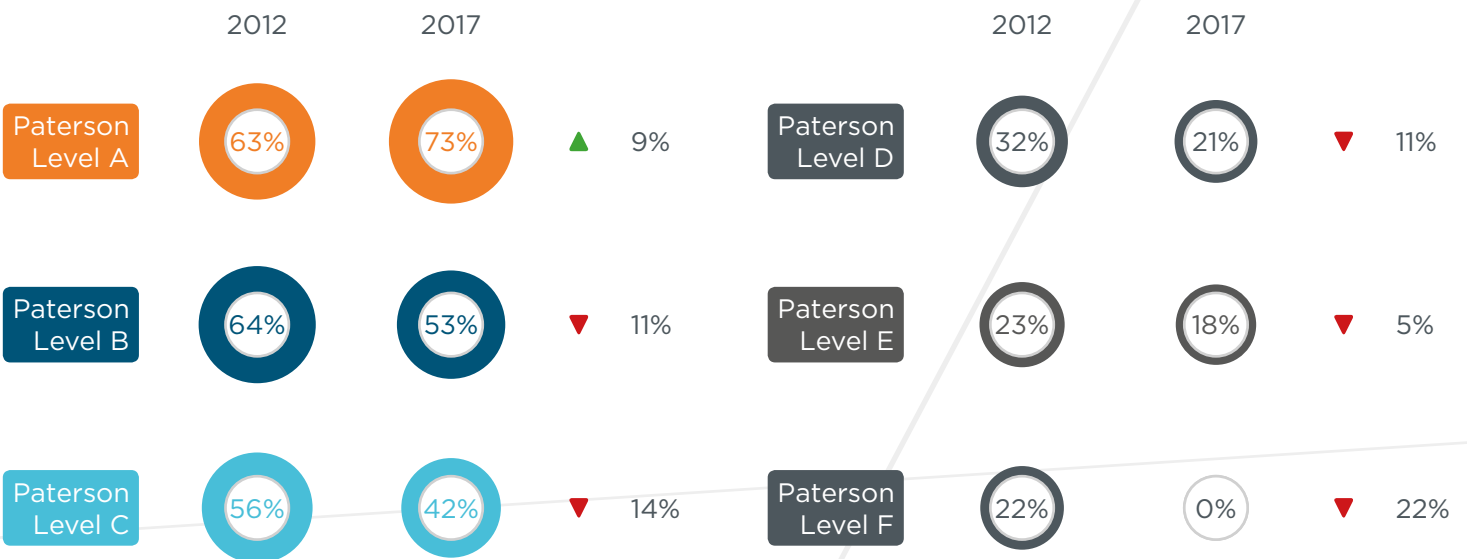
Top ten core positions for Women within sample: % share (2017)



Female representation for Top ten core positions for Women within sample: % change (2012 vs 2017)



% Youth employment within sample by Paterson level (2012 vs 2017)



Education and training of men and women within sample (2012 vs 2017)

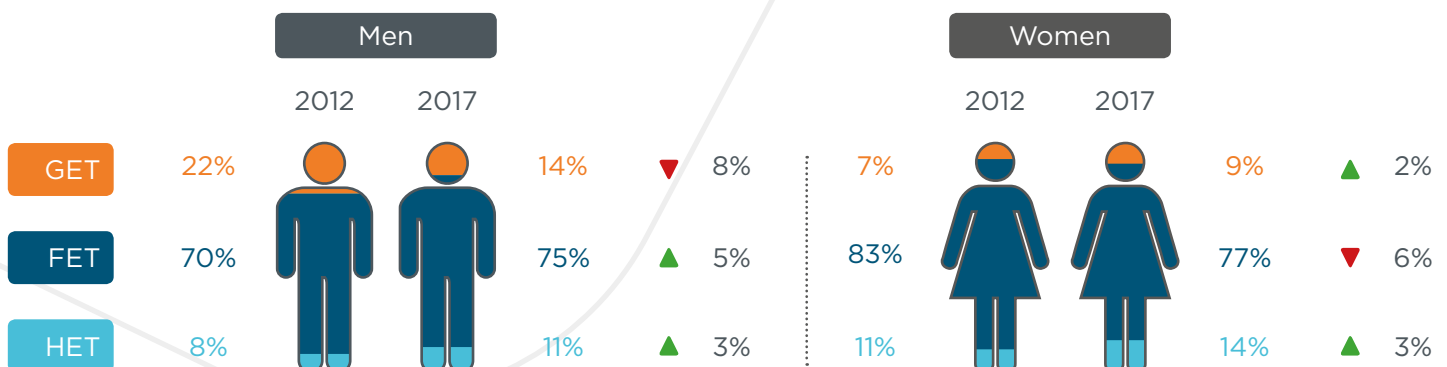


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2. Scope of the study

In mid-2016, In On Africa (IOA) and Managing Transformation Solutions (MTS) partnered to produce a first of its kind report that sought to establish the promulgation and effectiveness of education and training within South Africa's mining sector.

The partnership sought to provide fully-informed insights and strategic recommendations that were aimed at positively impacting and influencing, the growth and development of the mining sector. The present report delved into developing ground-breaking thought leadership that encompassed diversity, education and localisation as has been experienced within the South African context.

The study was carried out between October 2016 and December 2017 and included a number of key focus areas for analysis such as:

- An overview of the current state of the mining sector in South Africa

- Various government policies and initiatives regarding mining sector education and training
- Programmes and initiatives implemented within the sector and their effectiveness
- The way forward for education and training in South African mining

The research sample of the study comprised of a number of elements with data drawn from the MTS Insite technology that included:

- A total sample size of over 12,000
- An assessment of over 45 mining and core contractor companies as part of the research sample
- Gender and race distribution within the research sample
- Education levels within the research sample across GET, FET and HET
- Data comparison from the years 2012 and 2017

3. Key findings of study

Absolute employment numbers within the research sample have remained steady over the 2012-2017 period, but have noted a slight dip overall – down from 6,630 to 6,398. The proportion of youth employed in the sample has dropped somewhat as well from 59% to 55% share, while women's representation has conversely increased from 17% to 20%. Local employment too has risen considerably from 43% to 62% over the period 2012-2017.

The top ten core positions account for larger portions of the workforce in 2017 with 40% representation, versus the 27% noted in 2012. A similar trend is evident among women with their representation in both core positions, as well as the top ten core mining positions, having increased 4% and 3%, respectively. They do however appear to be clustered in low-skilled positions such as that of 'General Worker'. This is also in line with the overarching trend of the position's proportional share among top ten core positions rising from 7% in 2012, to 21% in 2017. Their representation has however dropped among the top ten positions that have been designated for women – down by 4% from 2012-2017.

Though the percentage of youth represented in the sample has dropped from 2012 to 2017, the representation of those aged 35-45 has increased slightly. Youth representation is higher among the top ten core positions in terms of proportion than when looking at all core positions, however here too their representation has decreased overall by 6% from 2012 to 2017 – down from 66% to 60%.

Similar to the earlier trend, those aged 35-45 have increased in representation within the top ten core positions over the period – 17% in 2012, to 24% in 2017. Youth are most visible in the role of 'Apprentice' or 'Learner (various)' over both periods, and though they were well-represented in the role of 'Process Operator' in 2012, this was not the case in 2017 with 35-45 year olds forming a greater portion of employees in this position. Youth are also most represented among the Paterson A and B bands, and have increased their representation overall among these Paterson bands in the period 2012-2017. Youth and those 35-45 at a Paterson F band have however disappeared entirely in 2017.

When looking at Paterson bands alone, employee representation in Paterson bands A-B, has increased from 67% in 2012, to 76% in 2017. Within the top ten core

positions, more alarming is the fact that the proportional share of Paterson A employees has increased from 17% to 28%, while the inverse is the case with Paterson B employees who have decreased by 5% from 71% in 2012, to 66% in 2017. Though greater numbers of 'white' employees represented the Paterson bands overall in 2012, their share has decreased considerably across all Paterson bands, and especially in Paterson bands C-F.

In terms of education, the picture has improved somewhat in the period under assessment. Larger portions of both designated males and females are represented across GET, FET and HET education levels from 2012 to 2017. The overall literacy rate too has increased from 81% to 89% in the period, however it has dropped slightly among designated females – down by 2% from 95%-93%. Among the top ten core positions, the proportional share of those at GET level have decreased from 2012 to 2017, to make room for more employees at a FET level of education.

Though training interventions are evident within the

sample, they are primarily clustered in 'core business skills' development. Even here however, the share of employees enrolling in such programmes has decreased by a substantial 18% from 95% in 2012, to 77% in 2017. The proportion of employees looking to secure 'portable skills', has on the other hand increased from 0% in 2012 to 11% in 2017. A slight increase was also noted in those undertaking learnerships, though their share still remains very small – 3% in 2012 versus 4% in 2017. In terms of race, African males and white males dominate learnership programmes, with the same being evident among those undertaking internships. More African women are however looking to gain access to learnerships, internships, bursaries and graduate development programmes holding a steady share of around a third in 2017 when they were barely visible in 2012.

4. Overview of the current state of the mining sector

Decline within South African mining

Over the last decade the South African mining industry has gone through a consistent decline in terms of production output as well as stability within the sector. This is due to a number of intertwined factors including the unstable supply in electricity that has plagued the country since the rolling blackout crises of 2008 and 2014; the global financial crisis which plunged developed markets into a recession thus decreasing demand; as well as the gradual slow-down in the Chinese economy – one of the largest consumers of raw materials in the world.

Despite the ability of South Africa to have a top global ranking in terms of auditing and reporting standards, regulation of security exchanges, efficacy of corporate brands, and the soundness of banks, the country is struggling to maintain the investor confidence in the production output of the mining sector. Certain aspects including the lack in flexibility to negotiate wages, the provision of a strong primary education base, the cost of crime to businesses, and the overwhelming burden of government regulation, have been some of the larger contributing factors that have internally crippled growth. Companies operating in the sector are in effect struggling to attract investment and raise the necessary capital to stay in business.

The contribution made by the mining sector to South Africa's GDP has consistently declined in the last two decades dropping by more than half from nearly 15% in 1993, to 8% in 2016. The knock-on effects are hardest felt in adjacent sector which the mining industry procures from, especially the transportation sector which is responsible for moving bulk commodities around the country. March 2016 alone registered one of the largest drops in production in South Africa's history – a massive 18%.

Considerable job losses due to cost-cutting and prolonged strikes

The downturn in global commodity demand and lower prices for materials have had a significant impact on job numbers in the South African mining sector. Cuts in employment were necessary in order for companies to survive the downturn until demand rose again. Over the period Jan 2012 to Dec 2015, close to 60,000 jobs were lost in the mining sector due to the financial pressures exerted by weak global commodities demand. In early 2016 the South African government and industry experts warned of further job losses in the range of 30,000-50,000 in the back of slowing economic growth in China – the world's largest consumer of metals. Q2 2017 data from StatsSA did however note a slight increase in the

number of employed with 8,000 new workers being added to the mining labour force.

The result of steady job losses in the last 5 years and stagnant salaries also led to many of the least educated mining employees to strike for better wages. These strikes intensified in nature until the August 2012 tragic deaths of 34 miners at the hands of the South African Police Service (SAPS) due to striking at the Marikana platinum mine operated by Lonmin. As with many such strikes, the main aspect of contention was the need to raise salaries for mining workers to a minimum of R12,500 – a sum which was unfeasible for mining companies given the consistent downturn in commodity demand and costs of operating a mine. However, many of the least educated employees at mine shafts receive a meagre salary of R4,500-R5,000 per month which needs to support multiple family members with the bare necessities to survive.



Miners sit while being addressed by President Zuma in the aftermath of the Marikana massacre at Lonmin platinum mine in Limpopo. Going forward government has moved to be more proactively involved in the country's mining sector to avoid a repeat situation.

Photo courtesy – GovernmentZA/Flickr

Despite efforts made by industry to put in place reasonable salary increases, employees within the industry have continued to motion for higher wages, which has in effect also strained investor confidence within the sector given the unstable labour environment. This has in effect strained the growth of the mining industry and plunged it further into recession.

Industry moving toward mechanisation

The rivalry that has emerged between two of the largest unions that represent the mining workforce – the Association of Mineworkers and Construction Union (AMCU) and the National Union of Mineworkers (NUM) – has made it that much more difficult for business and labour to come to negotiated agreements that suit both sides. The crippling strikes that have taken place over the last few years have also slowly but surely pushed mining companies toward implementing mechanisation on a larger scale to improve cost efficiency and remain globally competitive.

The platinum and gold sectors, which are the most labour intensive, have moved toward this option to both go around strike action, but also due to the financial viability of implementing mechanisation. Given the age of the South African gold and platinum mining industries, it has become more and more difficult to extract quality resources from existing mines. Having to dig deeper has also meant that mining companies have needed to institute greater health, safety and environmental measures for mine workers operating at such depths. Given the need for companies to dig deeper to secure raw materials, implementing mechanisation at such mines is proving more feasible in terms of costs, but also in terms of bypassing more stringent safety regulations.



Mineral Resource Minister, Mosebenzi Zwane, visited Harmony Gold's Doornkop mine in 2015 as part of an effort for government to be more involved in assessing mine health and safety measures.

Photo courtesy – GovernmentZA/Flickr

One of the larger misconceptions in the mechanisation process is that mining companies can do away with labour entirely. Despite this drive, there will still be an intrinsic need to involve the human factor in operations. Chamber of Mines VP and Sibanye Gold CEO, Neal Froneman, indicated in early 2017 that unless the gold industry in particular takes strong steps toward mechanisation to increase productivity and efficiency, the sector would die out by 2033 with an estimated 200,000 jobs lost. In effect, 'modernisation' within the mining industry is the next most feasible step. In this scenario, more technically advanced machinery will need to be integrated into mining operations to increase efficiency and productivity.

At the same time, however, the labour force will need to be

better equipped and skilled to carry out their duties which in essence will require that labour is more educated and able to operate such sophisticated machines. Workers will be transitioned away from labour-intensive areas of the industry, into other skilled areas such as machine maintenance and operation. Within the coal mining sector this has already taken place which has made it more competitive in relation to other coal mining industries across the world. Resultantly, education and training programs within the mining industry need to be better integrated into the needs of the sector as well as workers going forward.

5. Government policy and initiatives regarding mining sector education and training

Minerals and mining policy of South Africa

The Minerals and Mining policy of South Africa White Paper has been one of the pivotal pieces that government developed to guide the trajectory of the mining sector in the late 1990s. It sought to clearly delineate the need to outline how the sector would develop going forward notably in the areas of mineral development and the business climate working conditions; participation in ownership and management; tackling issues that centred around people including mine health and safety, human resource development, and housing and living conditions; look to instil regional cooperation; adhere to proper environmental management laws; and ensure that there is a strong level of governance.

The need for human resource development has been a core focus of the industry given the desire of government to effectively transform the industry to make it more inclusive and less racialised. Access to quality education and training opportunities is at the fore of this transformation as many of the workers on mine sites lack basic literacy skills. To this end, the government has aimed to "encourage, support and facilitate human resource development" within the mining industry. Government's primary responsibility in this regard is to ensure that the country provides a high quality secondary and tertiary education standards that are geared toward meeting the industry's needs in a way that is cost-effective and impactful.

Further responsibility resting in the hands of government relates to an emphasis on Adult Education and Training (AET), as well as training in health and safety across all

areas of the industry. The aim of the AET training relates to a number of factors:

- Provide workers with a base of education and training for further learning and advancing their careers
- Build up the need for strong health and safety standards in the workplace
- Develop the skills and understanding that workers have with an aim to enable them to participate more meaningfully and more regularly in the process of transformation within the workplace and their respective communities
- Aid in the removal of discriminatory practices in the industry, especially those that have a racial nature

An additional requirement that government will necessitate that all learner achievements in the industry are registered on the National Qualifications Network (NQF). This will enable workers to make progress in learning throughout their lives. The main aim of government through the implementation of the above policy proposals is to provide those that work in the minerals and mining industry the opportunity to access quality education and training, with an objective to secure the necessary knowledge and skills needed to work and improve their standard of living.

Mining Charter

As part of its core objective, the Mining Charter of the South African mining industry, has allotted considerable scope and focus on the beneficiation of the country's mineral resources toward previously disadvantaged South Africans. Among other aspects, the Charter seeks to:

- Promote equity in access to the nation's mineral resources

- Expand opportunities for black people to enter the mining and minerals industry and benefit from the industry
- Utilise and expand the existing skills base of black people
- Promote employment and advance the economic and social welfare of mine communities
- Promote beneficiation of South Africa's mineral commodities

The Charter also makes some provision for the development of core and critical skills that are essential pre-requisites to working in the industry. The Mining Charter notes that mining rights holders need to ensure that at least 40% of a company's core and critical skills are filled by black people. As part of this notion, mining rights holders need to "a) identify and fast track existing pools for core and critical skills, and b) do so in a proportional manner that is representative of the workforce".

In terms of human resource development, the Charter notes that the mining industry needs to invest 5% of the annual payroll toward skills development activities including:

- Artisanal
- Bursaries
- Literacy and numeracy
- And that they should be reflective of the proportional representation, but exclude the mandatory skills levy

As part of the 5% to be invested in the above, funds need to be directed toward South African-based academic institutions, and research and development initiatives that are geared toward developing appropriate solutions in exploration, mining, processing, technology efficiency, beneficiation, and environmental conservation and rehabilitation. Though

noteworthy in terms of bringing about a more educated workforce with university education, this clause provides little insight as to what must be done in terms of skills development for workers that are already entrenched in the mining system.

Revisions to the Mining Charter proposed by Mineral Resources Minister, Mosebenzi Zwane, in mid-2017 sent further shockwaves throughout the industry and global investors in the sector. The proposed revisions have placed considerable pressure on mining companies especially in the areas of ownership with the new targets being set at 30% BEE shareholding. Additional pressure is also being exerted with regard to employment equity, procurement and beneficiation. An appeal made by the Chamber of Mines was set to be heard in court in December 2017, but has been postponed until February 2018.

Framework agreement for a sustainable mining industry

The Marikana massacre in 2012 promulgated the development of the 'Framework Agreement for a Sustainable Mining Industry' in 2013. This agreement was a joint collaborative effort between government, labour and business, and aimed to ensure the sustained and improved production in the sector by 1) bringing an end to violence and conflict in the industry by promulgating law and order; 2) bring about the necessary changes that are pre-requisite to peaceful and sustainable development; 3) adjust the trajectory of the mining industry to make it attractive to investors once again; and 4) look to respond to the current economic situation that faces the country.



President Zuma attends a Mining Sector Consultative Forum on the progress made regarding the Framework Agreement for a Sustainable Mining Industry in 2015. Photo courtesy – GovernmentZA/Flickr

The core aims of the Agreement relate more toward instilling the need for peaceful resolutions in conflict situations. At the same time, the Framework Agreement is committed to providing short-term and medium-term sector measures that provide support to the industry, and ensure that legislative and regulatory measures provide a degree of predictability and certainty.

Long-term measures on the other hand are aimed at supporting growth and stability which includes an annual assessment of the progress made in line with the Mining Charter. This also involves the necessary participation of stakeholders in supporting strategies that are necessary for the re-skilling of workers with an aim to increase the industry's competitiveness, sustainable growth and transformation.

6. Education and Training Programs in the Mining Sector

Mining Qualifications Authority

The Mining and Qualifications Authority (MQA) was formulated in terms of the Mine Health and Safety Act (1996), and is a registered Sector Education and Training Authority (SETA) in terms of the Skills Development Act (1997). The MQA is required to develop unit standards and qualifications for the mining sector as mandated by the NQF, and is further enabled to act as an Education and Training Quality Assurance (ETQA) body. The MQA is in support of the objectives as outlined in the Mining Charter.

As part of its responsibility, the MQA is tasked with administering various skills development initiatives. Such skills development programmes for both artisanal and non-artisanal learnerships are aimed at developing a skilled and educated workforce, which aim to ensure that the mining sector is sufficiently staffed with skilled individuals that will improve health and safety, employment equity and a rise in productivity. To this end, a number of programmes are provided by the MQA including:

- **Learnerships** – artisanal and non-artisanal learning programmes consisting of a structured learning component that also includes practical work experience. Employed learners of various companies can contact their Human Resource departments to access learnerships, while unemployed learners need to register with the Department of Labour by completing a registration form and indicating areas of interest.
- **Skills Programmes** – These are programmes that are occupationally-based, presented by an accredited institution, and upon completion provide credits toward an approved qualification that is accredited by the NQF. Employees need to contact their Skills Development Facilitators (SDFs) within their company, and request for formal training in an area that is directly relevant to their work.

- **Adult Education and Training (AET)** – The MQA provides considerable resources toward AET learning programmes within the mining sector, and have further developed targeted interventions that are aimed at filling the need for AET within the industry. Incentives in the form of grants have been provided to employers who offer AET learning programmes to their employees.

Private sector mining industry involvement

Though many may see the mining industry as only providing jobs, they are also heavily involved in upskilling their employees through various initiatives. Considerable investments are made in line with the Mining Charter's requirement of 5% of a company's annual payroll. The Chamber of Mines – which is an agglomerated entity that represents mining companies as a whole – reported that mining companies had invested R5 billion into education and training in 2015 alone. Between 2011 and 2015, in excess of 18,000 tertiary education students have been funded through the provision of bursaries and workplace experience. The highest grant allocations in 2015 included:

- Artisan development – R220 million
- Bursaries and work experience – R197 million
- Graduate training programmes – R160 million
- Learnerships and skills development – R69 million



The Sol Plaatje University in Kimberley will over time address education challenges that will aid students to be better prepared to participate in the mining industry in the Northern Cape province.
Photo courtesy – Flowcomm/Flickr

The industry has also made a concerted effort to increase the participation of women in the mining sector, while similarly upskilling them through education and training programs designed to better integrate them into the mining

workforce. The number of women working in the mining sector has increased from 11,400 in 2002 to around 57,800 in 2015, and represent over 13% of all those employed within the industry.

% of women in the workforce by commodity, 2015	
Gold	11%
Platinum Group Metals (PGMs)	12%
Diamonds	19%
Coal	17%
Cement, lime aggregates and sand	19%

Source: Chamber of Mines

The Chamber further indicated that the majority of women employed within the mining industry were skilled as of 2015.

- 15% of top management
- 16% of senior management
- 22% of professionally qualified employees
- 18% of employees in the skilled and technical area

Impact of various education and training programs

Through the considerable funding that various companies operating in the mining sector have committed there has been evident impacts in the industry as a whole. In 2014 alone over 3,000 bursaries were funded with the highest number going toward mining engineering (791) and mechanical engineering (698). Electrical engineering, metallurgy, and other engineering and engineering technology all received over 300 bursaries each, while geology and chemical

engineering registered in excess of 200 bursaries a piece. In terms of AET training, between 2013-2015, over 17,500 workers completed such courses with the number declining year on year with skills levels notably improving over this period. Since 2003, the mining industry has also been able to train over 11,000 artisans at an average cost of R300,000 per artisan. This level of investment in education and training within the sector will have a considerable impact in coming years as the industry looks to modernise and utilise mechanisation considerably more in terms of increasing productivity and efficiency. By 2015, over R5 billion has been invested in skills development, with 18,000 learners being supported by the sector from 2011-2015.

Role	Trained
Diesel mechanics	1,237
Electricians	3,261
Fitters (including machining)	2,106
Fitters and turners	456
Millwrights	1,047
Rigger/ropes men	254
Instrument mechanics	558
Plater/boilermakers	543
Plater/welders	769
Goldsmiths	44
Auto electricians	3
Engineering maintenance	1,116
Total qualified artisans	11,394

Source: Chamber of Mines



Staff getting ready for their first day on at the De Beers Venetia underground mine in Musina, Limpopo. Upskilling new and existing workers will ensure that as new mines come online personnel are well prepared to integrate into operations. **Photo courtesy - GovernmentZA/Flickr**

7. Findings within research sample

When reflecting on the challenges within the mining sector, it is of critical importance to position the employment trends within the larger context of societal needs and the requirements to improve on the social impact through the various development initiatives implemented within the sector. Of key consideration with respect to social impact, skills development and the move toward modernisation of the industry within the South African context are:

- Core and critical skills in the mining industry,
- The employment of women & youth,
- Local recruitment from mining host communities.

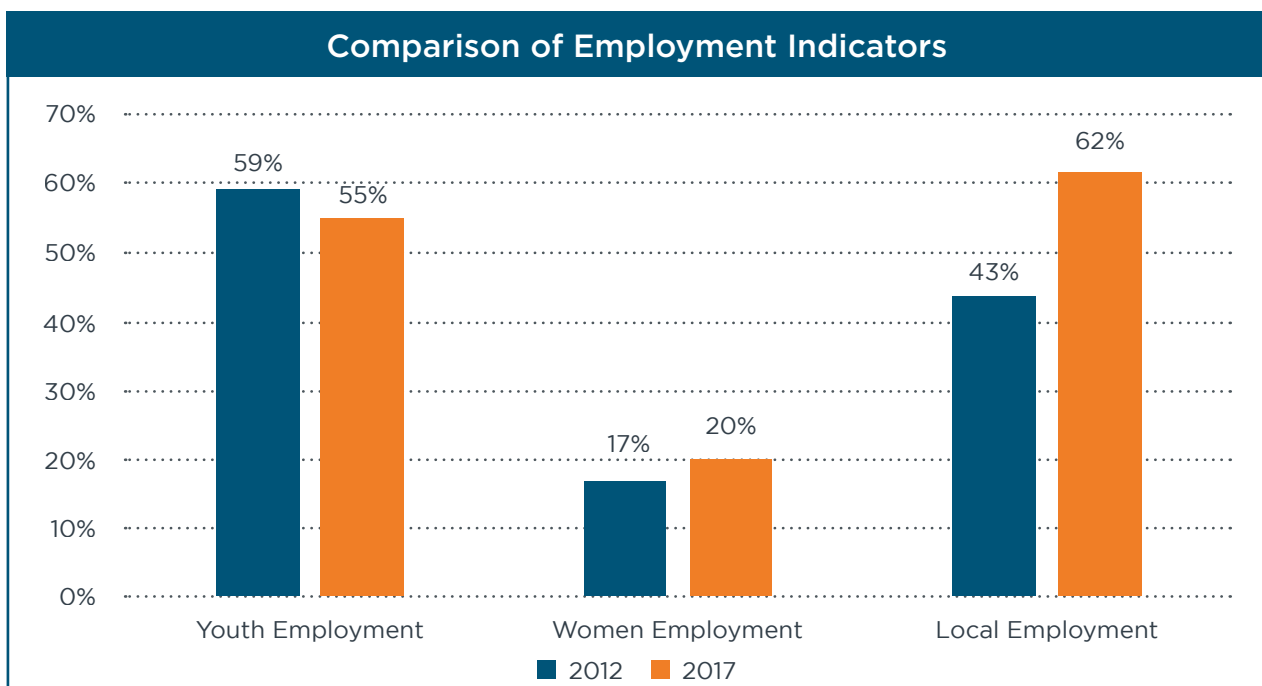
This report presents the various employment indicators in respect of core and critical skills, gender representation, age distribution as well as a more thorough understanding of occupational levels through the Paterson Grading

system. It will additionally delve deeper into the distribution of educational levels by gender and race as well as the various training interventions most often reported.

7.1 Employment indicators within the sample:

The total sample size utilised from the data hosted by the MTS Insite Platform for 2012 and 2017 does not differ significantly, with a sample size of 6,630 employees (inclusive of non-permanent employees) in 2012 data and 6,398 employees represented in 2017.

In an overview of the data presented, it is of significant interest to note the increase in impactful employment over this period, most notably with regards to local recruitment, with women employment showing a slight increase overall. However, a very slight decrease of 4% was noted in the percentage of youth employment in the sample.



On average, core mining positions represent over 80% of all employees at a mine and a deeper understanding with respect to the skill levels as well as racial and gender composition of these

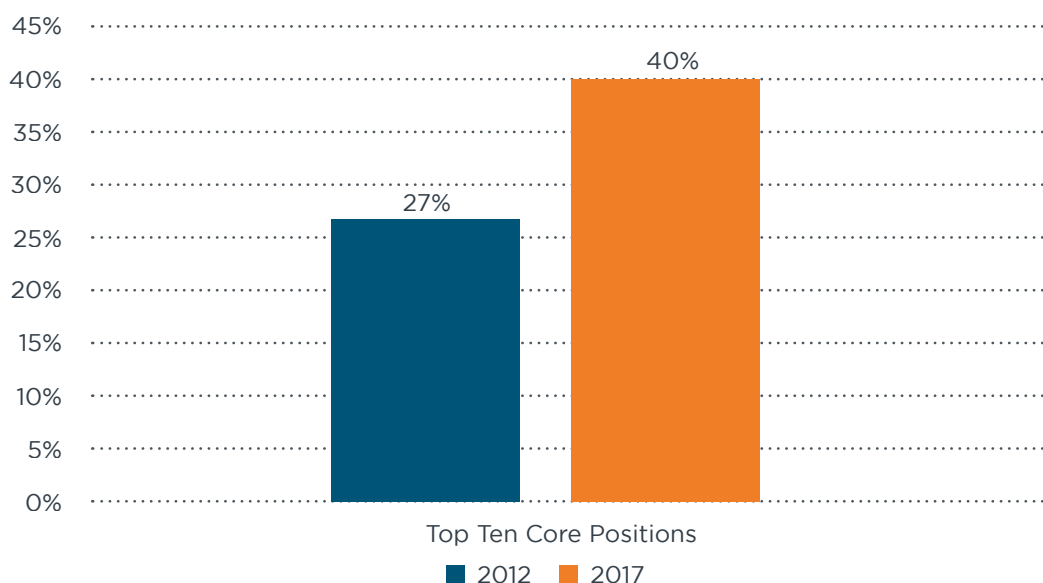
positions will shed light on the potential impact significant changes to the requirements for critical and core skills in the industry will have.

7.2 Representation of critical and core positions:

The study identified and compared the ten (10) core positions with the highest number of employees recorded over the period under review. The number of employees in the top ten core positions proportionate to the number of employees in all core positions: has increased significantly.

when compared to the 2012 results. In 2012, 27% of all core mining employees were employed in the top ten core positions compared to 40% in 2017. The evidence would suggest that the skills and expertise within core mining positions has become more concentrated over the five-year period under review.

Top Ten Core Positions:



Some significant changes were noted in the representation of various positions recorded within the top ten core mining positions. Of interest is the much higher proportion of 'general workers' recorded in 2017 (21%), when compared to 2012 (7%). Furthermore, the sharp decrease in the number of team leaders in 2017, per volume of core mining workers are of interest to note and it would be valuable to explore through further

research to gain a better understanding as to why this is the case.

A number of new positions were reported in 2017, most notably that of a 'Dump Truck Driver', 'Learner', 'Artisan' and 'Drill Rig Operator'. These new positions replaced the position of 'Excavator Operator', 'Process Attendant', 'Apprentice' and 'Fitter' initially reported in the 2012 data.

Top 10 Core Positions - Within Sample: 2012 vs 2017

		2012		2017	
	Position	Representative Employment	Position	Representative Employment	Position Movement: From 2012 to 2017
1	RDT Operator	22%	General Worker	21%	↑
2	Team Leader	12%	Winch Driver	18%	↑
3	Winch Driver	12%	RDT Operator	15%	↓
4	Apprentice:	9%	Dump Truck Operator	11%	Not Previously listed
5	Process Operator	9%	Team Leader	8%	↓
6	Excavator Operator	9%	Process Operator	8%	↓
7	General Worker:	7%	Learner (Various)	6%	Not Previously listed
8	Boilermaker	7%	Artisan	5%	Not Previously listed
9	Process Attendant	7%	Boilermaker	4%	↓
10	Fitter	5%	Drill Rig Operator	4%	Not Previously listed

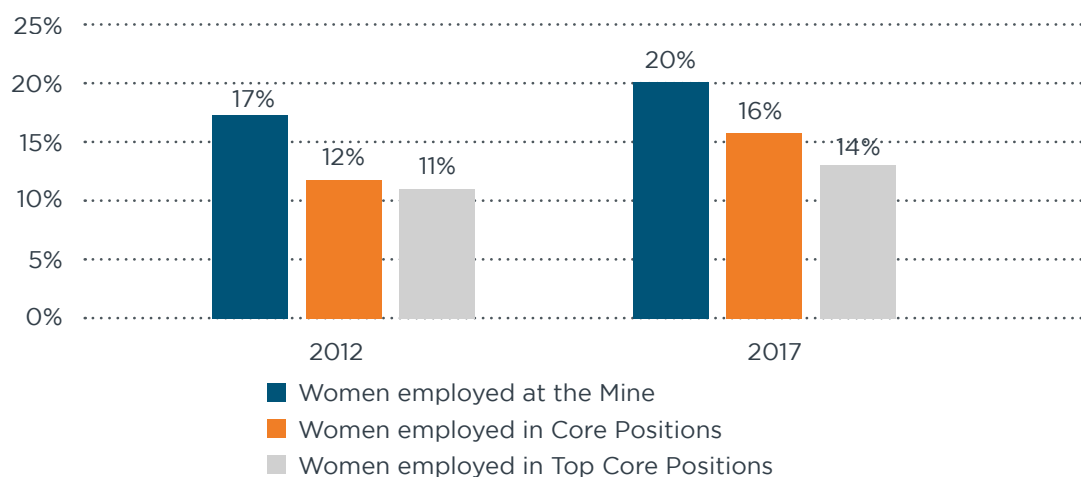
As indicated previously, there has been a slight increase of women representation in all positions noted in the sample – up from 17% in 2012 to 20% in 2017. This increase in representation of female

workers is further reflected in the trend in core mining positions where women representation increased from 12% to 16% in all core mining positions, while their representation in top ten core

mining positions also increased from 11% to 14%. However, despite the marginal increase of women representation noted, women remain under

represented in the sample group when compared to the Economically Active Population (EAP) of South Africa.

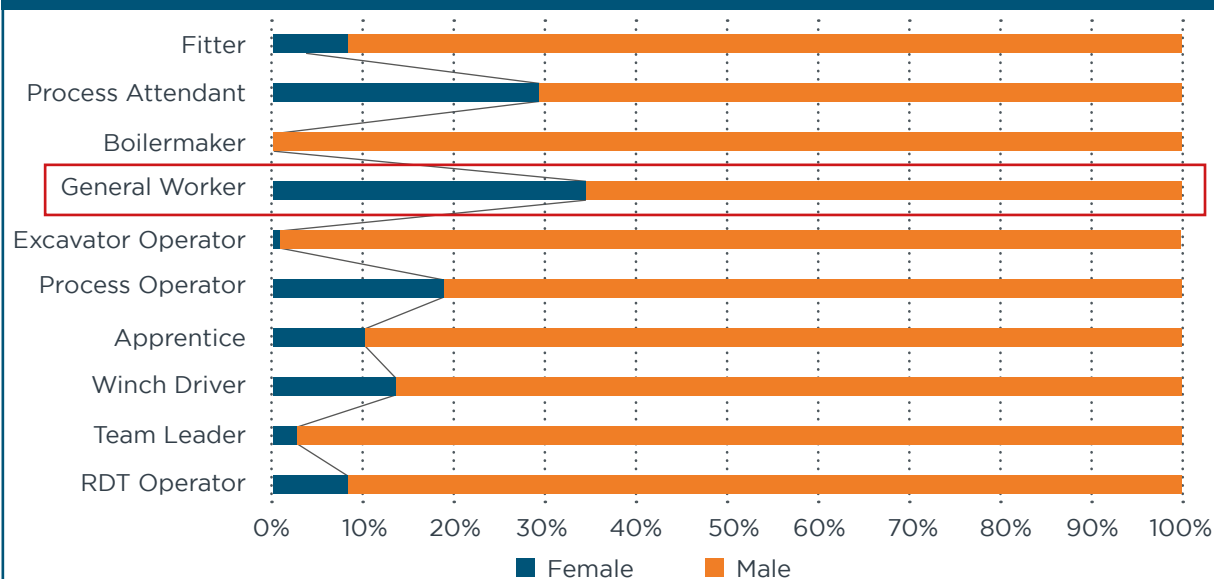
Female Representation in Mining Positions



A more detailed analysis of the top ten core mining positions to determine female representation within the positions listed, further reveals that certain core mining positions have a much higher gender representation than others. The position of 'General Worker' shows the highest female

representation in 2012 closely followed by the post of 'Process Attendant'. No women were found to occupy the position of 'Boilermaker', while a very small portion of women were noted in the positions of 'Excavator Operator' and 'Team Leader'.

Female Representation: Top Ten Core Positions 2012



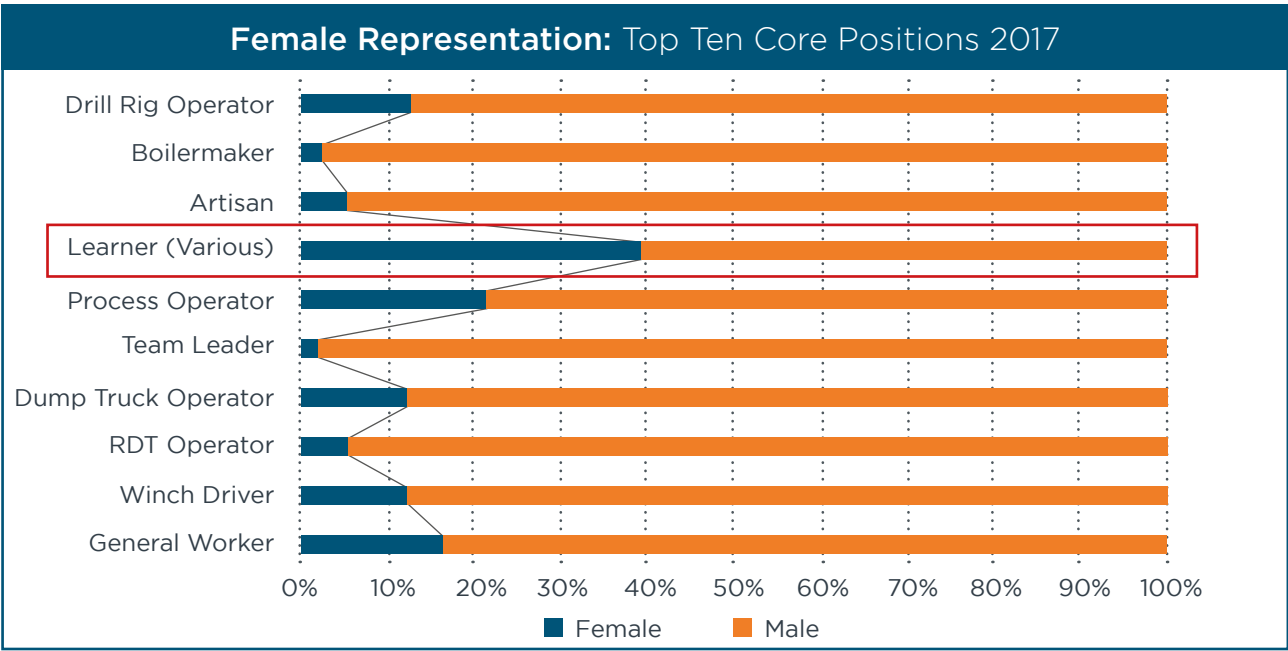
¹ Kindly note that the percentage reported in this table is not the % of women in the position (proportionate to men), it is rather the percentage representation of a job category for all women reported in the top ten core positions.

The position of 'Process Attendant' was reported as a key core mining position for women in 2012, however the position does not appear in the top ten core positions for the 2017 data set. The position of

'Learner (various) ' was reported with the highest representation of women in 2017, followed by the position 'Process Operator'.

Even though the position of 'General Worker' was noted as a key core position for 2017, the representation of women in this job category decreased over the period under review – down from 34% in 2012 to 17% in 2017. Of interest to note is the representation of female boilermakers in

the 2017 data, a job category with no females reported in 2012. Further, the high number of learner positions filled by females might be indicative of training programmes with a focus on the recruitment and development of women into core mining positions.



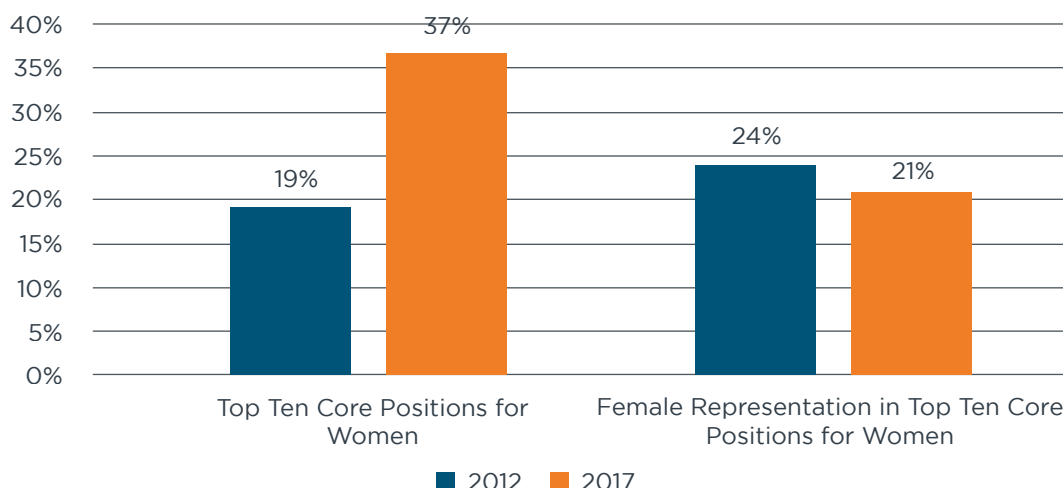
To understand women in mining and the type of core mining positions most often filled by women in the sample, a more in-depth analysis of core mining positions and female representation was conducted.

7.3 Gender representation within sample

In an analysis to determine the top ten core mining positions where women are most often employed at the mine, a similar concentration of skills and experience was found

to have taken place during the period under review. The representation of the top ten core positions for women as a percentage of all core positions for women, has increased from a total of 19% reported in 2012, to 37% in 2017. This increased representation of women in a relatively small number of job titles, suggests that a concentration of skills and experience associated with female workers has occurred within the sample.

Top Ten Core Positions for Women: Female Representation



Of interest to note is that although women representation overall has shown a considerable increase, the representation of women in the top ten core positions where women are most often employed, has shown a slight decrease over the same period - from 24% in 2012 to 21% in 2017. The table below presents the top ten core mining positions where the most women are employed. The table is structured to indicate the % representation of all women employees in core mining positions, of which the top ten core mining positions where women are most often employed has been listed².

The job title wherein the most women are employed in core mining remains that of 'General Worker', with this trend noted in both 2012 and 2017. Further, the positions of 'Process Attendant', 'Winch Driver' and 'Process Operator' remain key positions for women in core mining positions across both periods. 'Learner (Various)' and 'Assistant Drill Operator' were two new key positions reported in 2017, replacing the positions of 'Belt Sweeper' and 'Laboratory Operator' reported in 2012.

Top 10 core positions for women within sample: 2012 vs 2017

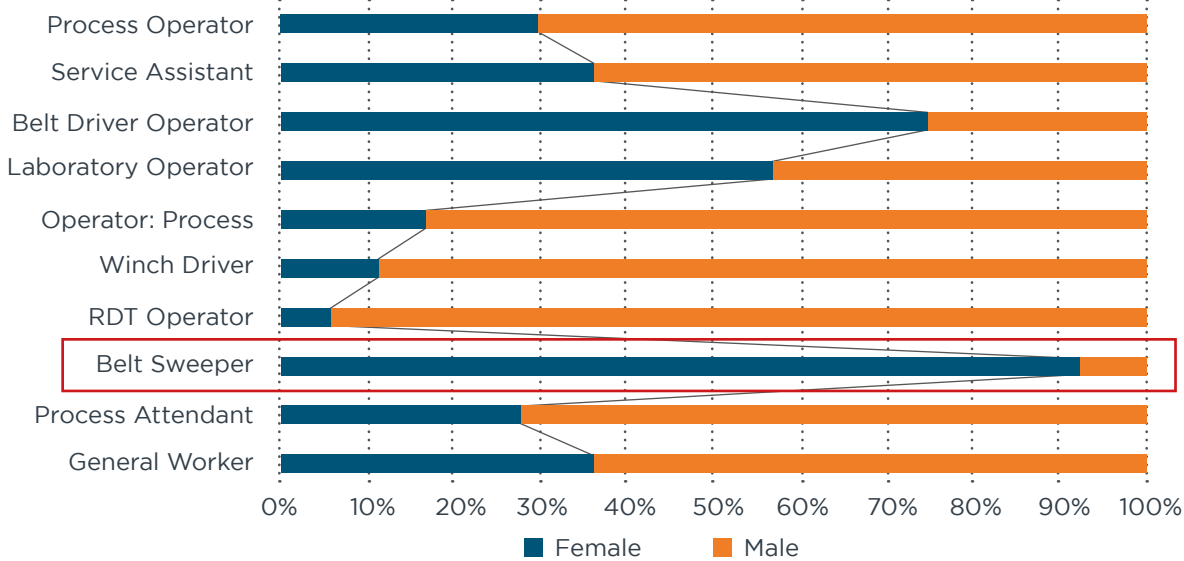
2012			2017	
	Position	Representative Employment	Position	Representative Employment
1	General Worker	15%	General Worker	20%
2	Process Attendant	12%	Learner (Various)	13%
3	Belt Sweeper	12%	Winch Driver	12%
4	RDT Operator	11%	Assistant: Drill Rig Operator	11%
5	Winch Driver	10%	Blasting Assistant	10%
6	Process Operator	10%	Process Operator	9%
7	Laboratory Operator	8%	Process Attendant	8%
8	Belt Driver Operator	8%	Dump Truck Operator	7%
9	Service Assistant	7%	Weighbridge Clerk	6%
10	Process Operator	7%	RDT Operator	4%

² Kindly note that the percentage reported in this table is not the % of women in the position (proportionate to men), it is rather the percentage representation of a job category for all women reported in the top ten core positions.

Despite the slight overall decline in female representation in the top ten core mining positions for women for the period under review, women representation in the individual job categories listed under the top ten core positions for women is on average significantly higher than the percentage reported for women in mining. In 2012,

the highest % women representation recorded was for the position of 'Belt Sweeper', followed by the positions of 'Belt Driver Operator' and 'Laboratory Operator'. Only the positions of 'Operator: Process', 'Winch Driver' and 'RDT Operator' recorded female representation of lower than 20%

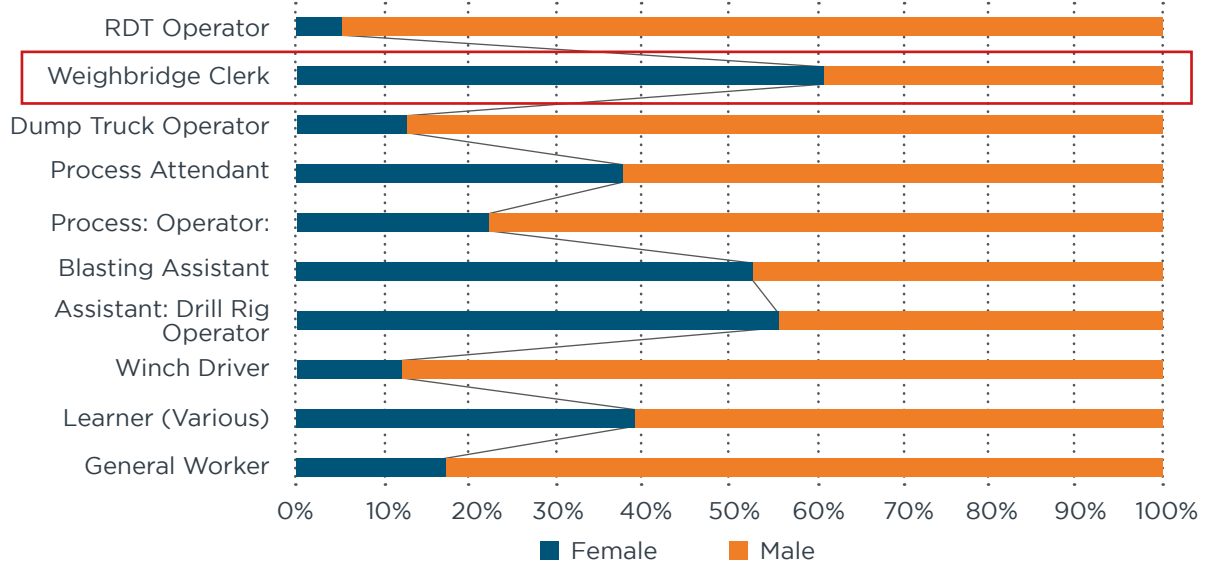
Top Ten Positions for Women in Core Mining: Female Representation - 2012



It is important to note that even though 'General Worker' remained a key job category for women in mining, the representation of women within this job category has declined over the period under review. Further, the position of 'Belt Sweeper' which had the highest representation of women in

2012, is not present at all in the 2017 dataset. The following three new top ten positions were awarded the highest levels of female representation in 2017 - 'Weighbridge Clerks' and 'Assistants Drill Rig Operators', closely followed by 'Blasting assistants'.

Top Ten Positions for Women in Core Mining: Female Representation - 2017



With the original 10% women in mining targets broadly met across the mining sector, the more recent requirements for female diversity are for the employable active population (EAP) of the region in which a mine operates, to be better represented

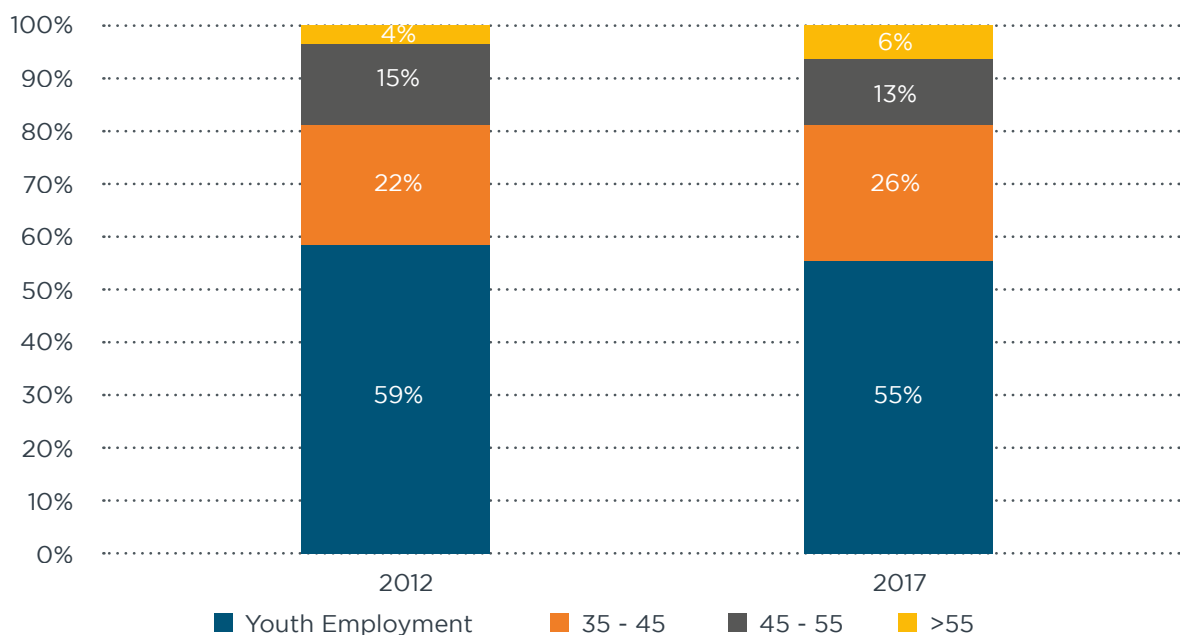
across the Paterson Bands. Within South Africa, the majority the mining operations are situated within semi urban or rural settings where women represent approximately 51% of the population.

7.4 Age distribution

Overall, youth employment has remained representative of the largest portion of workers within the sample under analysis, followed by 35-45-year olds.

This is indicative of the relatively young age of mine workers with 81% of employees being under the age of 45 years in the 2017 data.

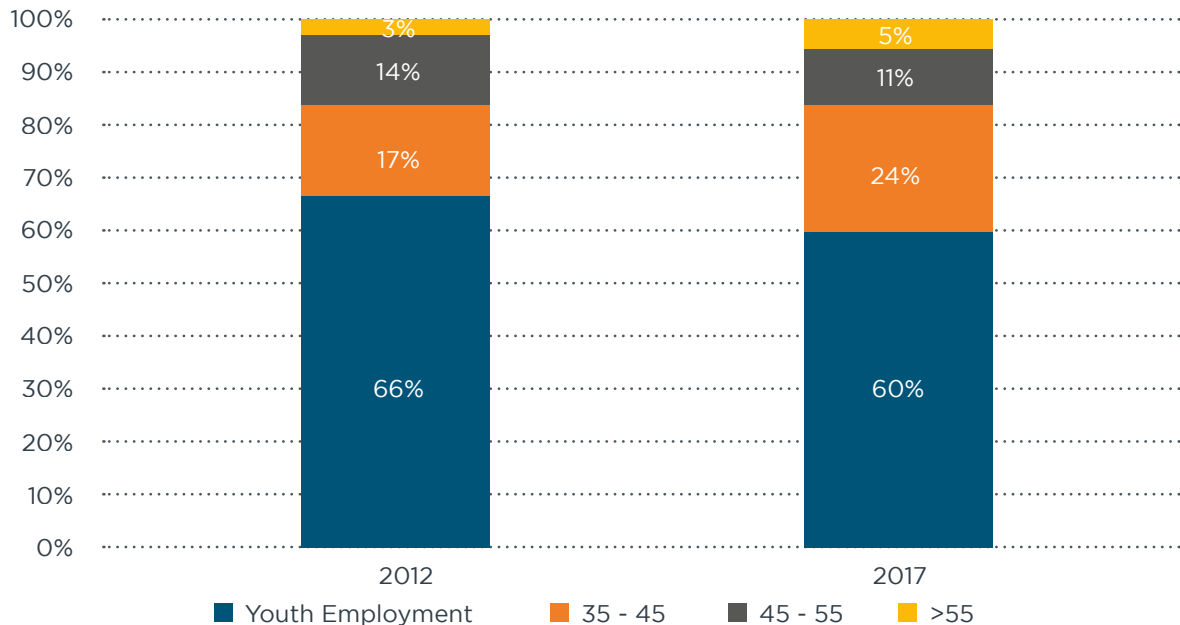
Comparative Age Profile: All Employees



In a comparison of age categories for the Top Ten Core positions the trend continues, wherein 84% of employees in the sample (2017) are below 45 years of age; 60% are younger than 35 years. Of interest is

the slight movement in the age categories from 2012 to 2017, where representation of the under 35 year category decreased by 6%, whilst the over 35 year category increased by 7% over the period under review.

Age Profile of Top Ten Core Positions

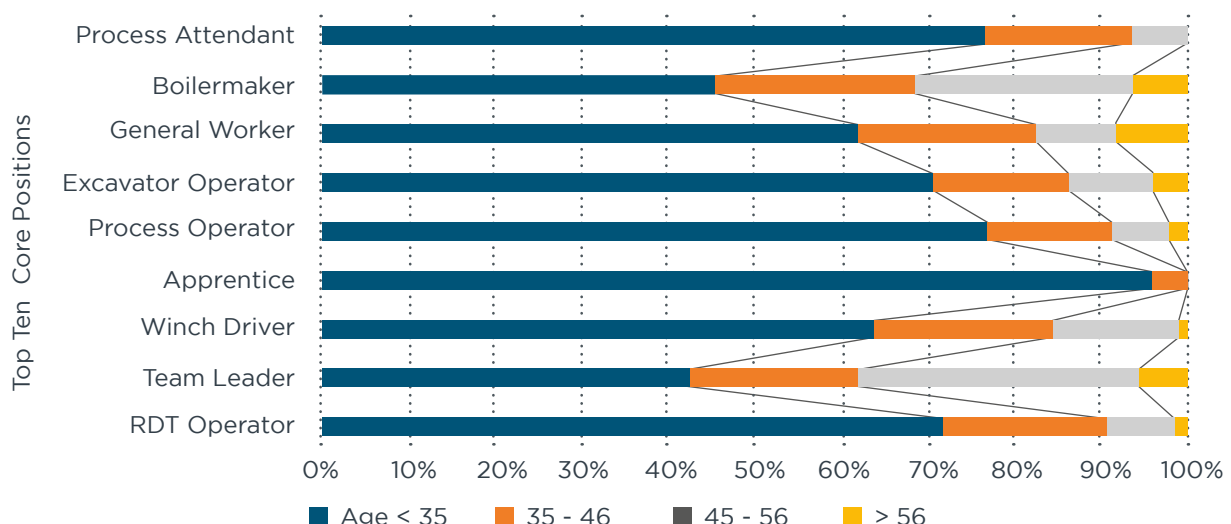


Within the top 10 core positions for 2012, there are notable trends pertaining to the age makeup of the cohort. Notably, all the positions are overwhelmingly filled by employees younger than 35 years.

The employees with the youngest age profile were the positions of 'Apprentice', 'Process Operator', 'Process Attendant' and 'RDT Operator'.

Personnel over the age of 45 are most present in the higher skilled positions such as 'Team Leader' and 'Boilermaker' (in both time periods) and account for a smaller portion of all top 10 core positions. The over 55 age group generally represents very small portions within top 10 core positions. They are most evident in the positions of 'General Worker', 'Boilermaker' and 'Team leader' in both time periods.

Top Ten Core Mining Positions: Age Analysis 2012

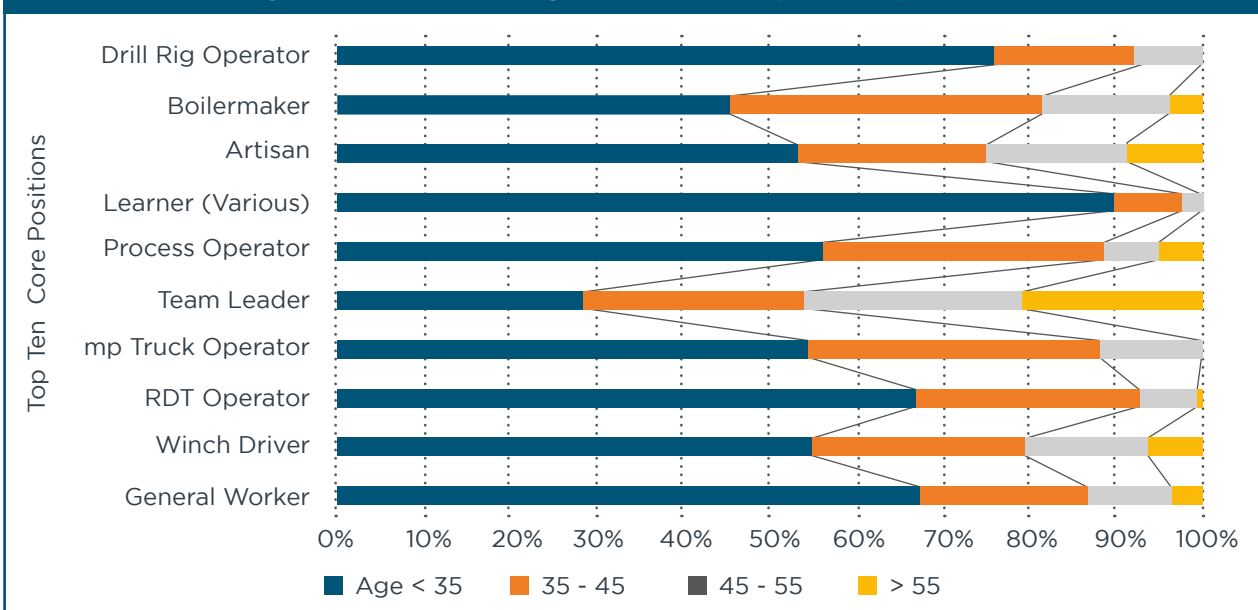


The 2017 results support the trend reported in 2012, whereby the majority of employees were under the age group of 35. The positions with the highest percentages of youth reported were those of 'Learner (various)', 'Drill Rig Operator', 'RDT Operator' and 'General Worker'. The 35 -45 age group were mostly represented in the positions of 'Boilermaker', 'Process Operator' and 'Dump Truck Operator'; and least represented in 'Learner (various)' and 'Drill Rig Operator' positions. Employees 45-56 years were most often employed as 'Team Leaders',

'Boilermakers' and 'Artisan', whereas employees over the age of 56 represent the smallest age group and are most often found in positions such as 'Team Leader', 'Artisan' and 'Winch Driver'.

Of interest to note is the relatively equal distribution across the various age categories noted for the 'Team Leader' position in 2017. When compared to the 2012 data, it could indicate that the position has a high degree of longevity with employees moving through the age categories whilst employed at the mine.

Top Ten Core Mining Positions: Age Analysis 2017

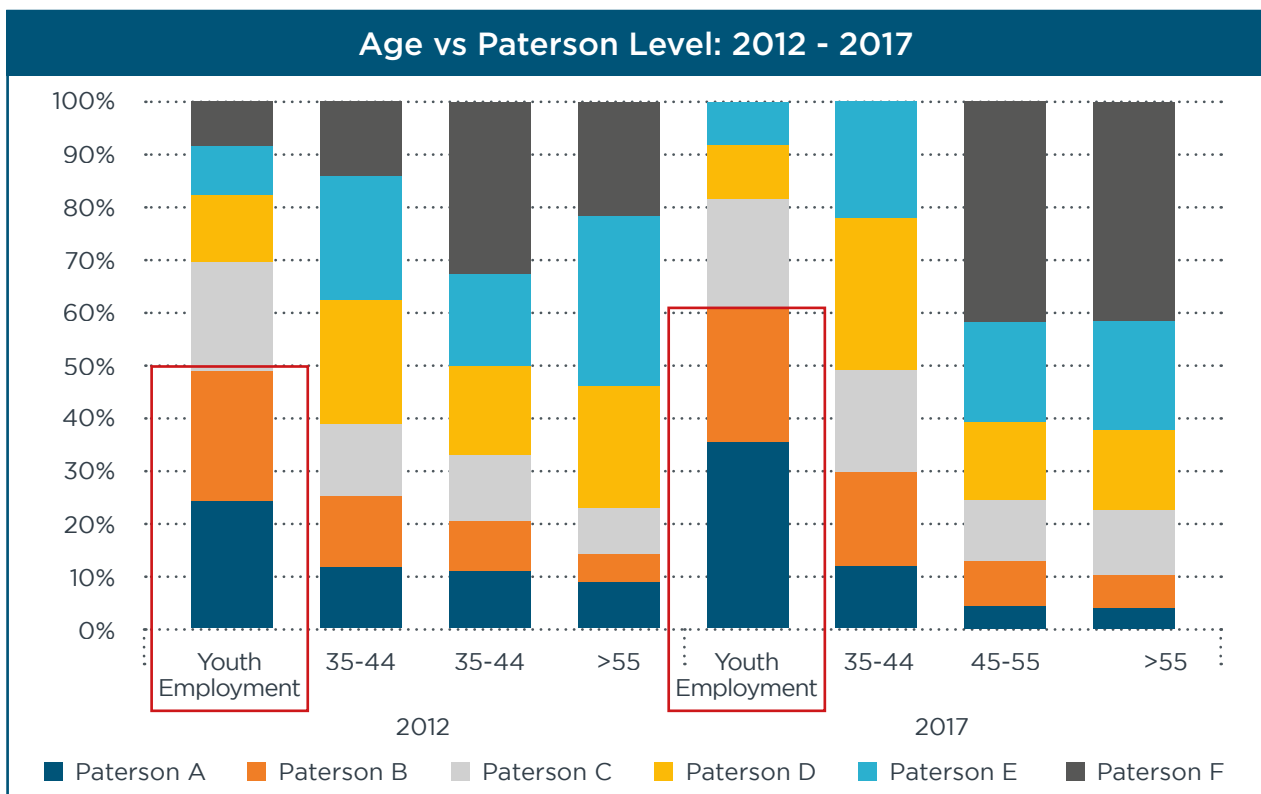


On the whole, the top 10 core positions are accounted for by predominantly under 35 and up to 45 year olds across both periods reported. Similar to the 2012 data, far greater portions of posts are accounted for by under 35 personnel. With the exception of the positions of 'Team Leader' and 'Boilermaker', under 35 personnel accounted for more than 50% of staff overall across the top 10 core positions in both time periods. Conversely, over 55 personnel held smaller portions of top 10 positions in 2017 as compared to 2012 – 3% versus 5%.

In a comparison of age categories per Paterson level reported for the top ten core mining positions it is of interest to note that a significantly larger portion of youth are employed in Paterson A band positions in 2017 than was

reported in 2012. Further, in the 2017 data it was reported that the majority of positions filled by the youth are in the Paterson A and B bands which represent unskilled and semi-skilled labour. A much lower representation of youth was reported in the Paterson C and higher bands. In the 2012 data, youth were spread across the various Paterson bands with greater representation in senior management positions (Paterson E and F) when compared to the 2017 data.

The age group 35 – 45 is most represented in professionally skilled and management positions with the majority of senior management being accounted for in the age group 45 and above.



The polarising of youth employment in unskilled and semi-skilled positions within the sample is a serious concern and should be investigated

to determine whether it is representative of the broader mining industry.

7.5 Paterson grading

Since inception of the Paterson grading system in the late 1960's, it has allowed entities in the mining sector to evaluate their staff based on the level of decision-making that they are able to hold in their respective positions – commonly referred to as 'bands'. Paterson A refers to personnel that are unskilled and would only be able to perform labour-related tasks while Paterson F grading refers to personnel that are decision-makers in their respective companies with titles such as President or Managing Director, and are responsible for overseeing company operations.

Within the sample under analysis some clear trends emerged from the data. For one, absolute numbers have increased among Paterson A -B personnel, while those in Paterson C-F, have declined. The most significant decline was noted in the 5% drop of Paterson C band employees, from 25% reported in 2012 to 20% in 2017. The Paterson C band most often represents junior management and professionally qualified employees, which comprise the talent pool for the development of qualified employees into more experienced management positions.

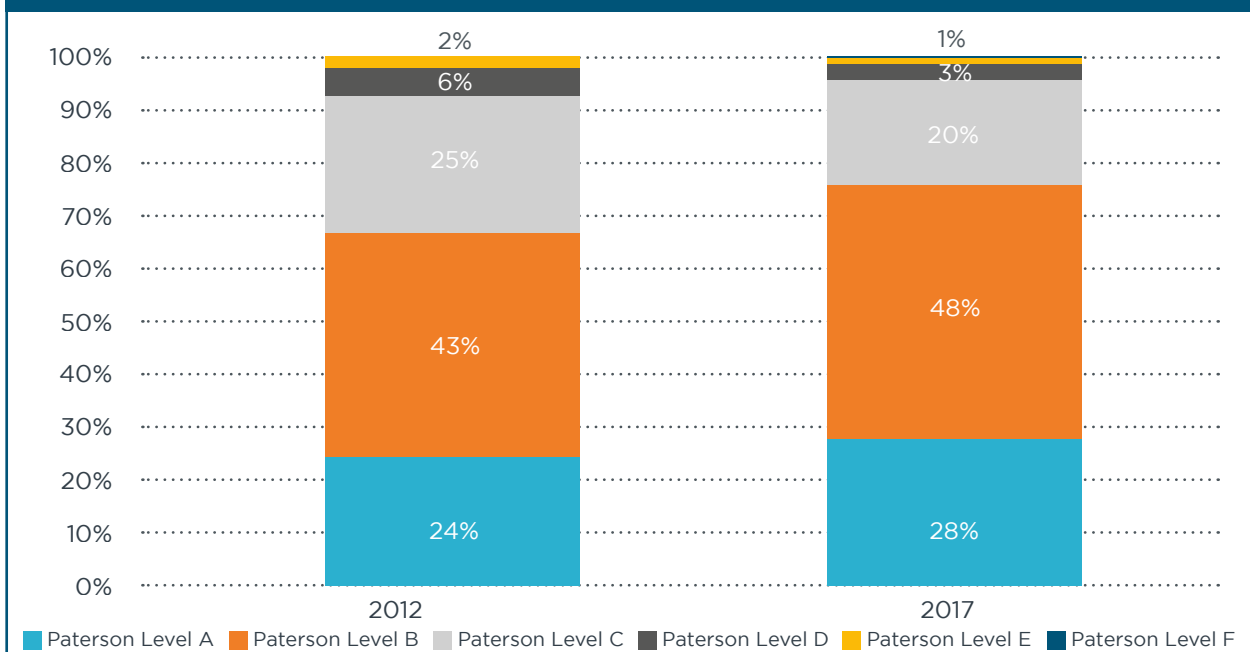
Overarchingly, Paterson A-B personnel account for between 67% and 74% of the total workforce within the current sample for the periods 2012 and 2017. Paterson D-F consequently constitute for between 3%-4% of the sample workforce.

More importantly, though a slight increase was reported in the number of employed, a significant drop-off (46%) was recorded in the number of employed from Paterson D band and above when the two periods were compared.

Proportionally, the number of Paterson A and B personnel have marginally increased by 4% and 5%, respectively, as a share of all personnel within the sample. The numbers could suggest that the industry has looked to bring in more new personnel in these grades with an aim to upskill less skilled portions of the workforce. Further, the link between the significant increase in local recruitment, from 43% - 62% reported, and the increase in semi-skilled/ unskilled youth employment should be further researched to gain a better understanding of the variables and potential long-term impact.

Paterson C and D personnel account for fewer personnel in 2017 than in 2012 – down by 5% and 3%, respectively, in their total percentage share. This trend suggests that personnel in middle and senior management could have looked to leave the industry with no adequate workforce being available to replace them. Further to the decrease in Paterson C and D personnel is the percentage share of Paterson E-F personnel that has declined from 2% to 1% of the overall work force.

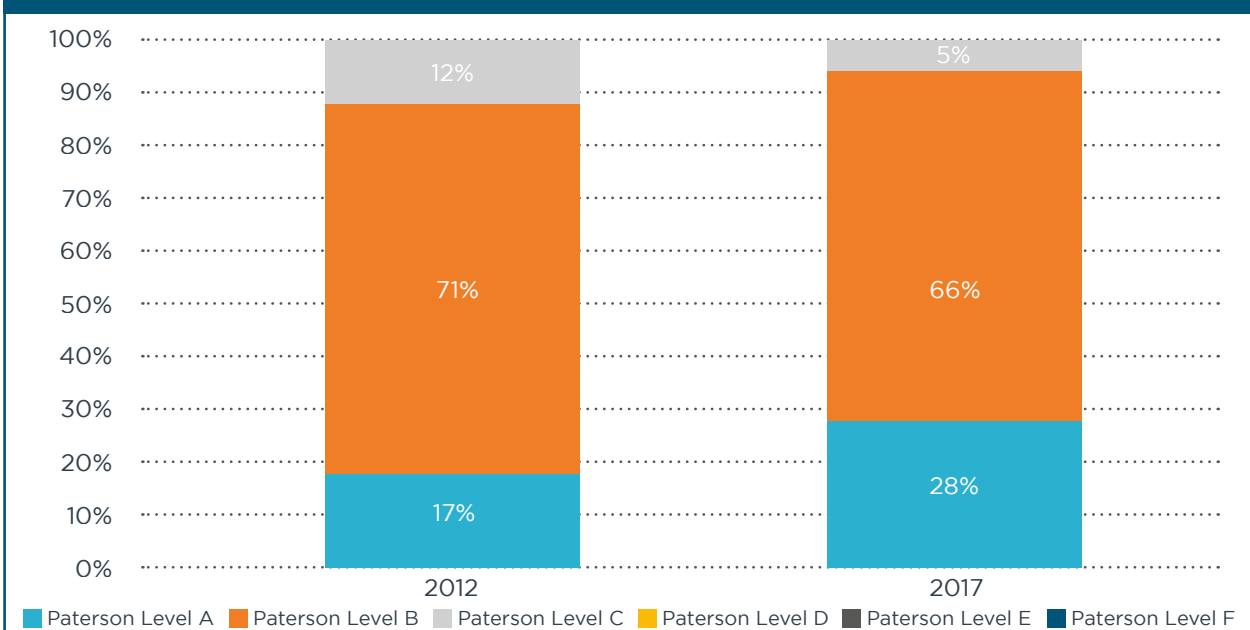
Comparative Paterson Levels: All Employees



In an analysis of the representation of the various Paterson Bands represented in the Top Ten Core Positions, the significant increase (11%) of Paterson A band employees in 2017 is clear. This result supports the previous trend wherein the increase of the number of 'General workers' within the top ten core positions was noted.

Further to the significant increase of Paterson A band employees is the 7% decrease of Paterson C band employees over the same period of time. These changes suggest a polarisation of semi-skilled and professionally skilled and experienced employees in the mining industry, which will result in an increase in the inequality gap in the sector.

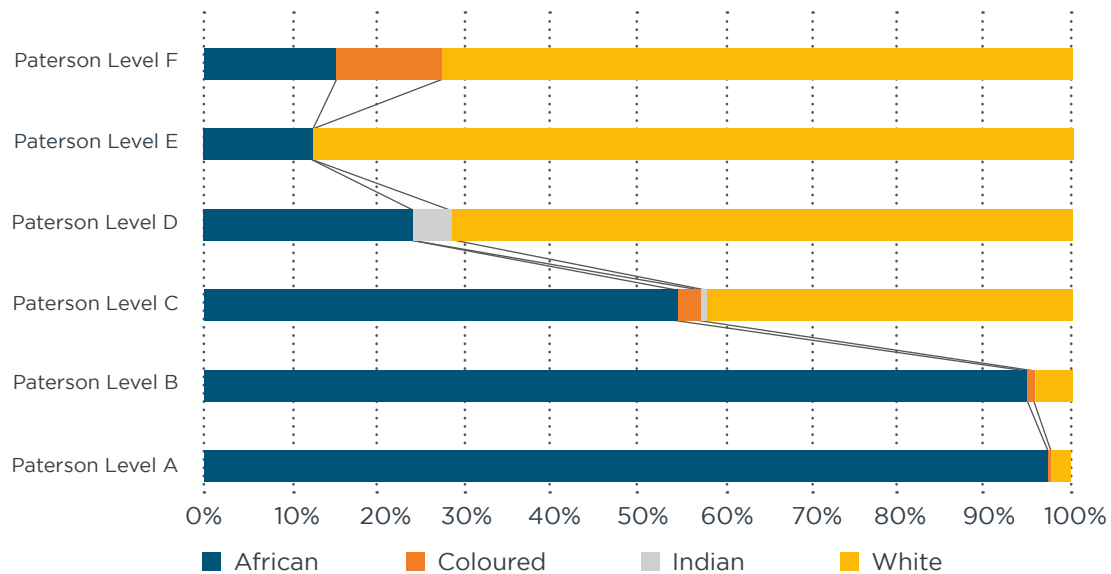
Top Ten Core Positions: Representation of Paterson Levels



Within the South African socio-political context, it is important to understand inequality within a racial context. From the below graphs the evidence suggests that despite the polarisation of the mining industry between skilled and unskilled

employees, the representation of Africans in skilled and management positions has shown a significant increase from an average of between 20%-30% in 2012 to an average of between 40%-60% in 2017.

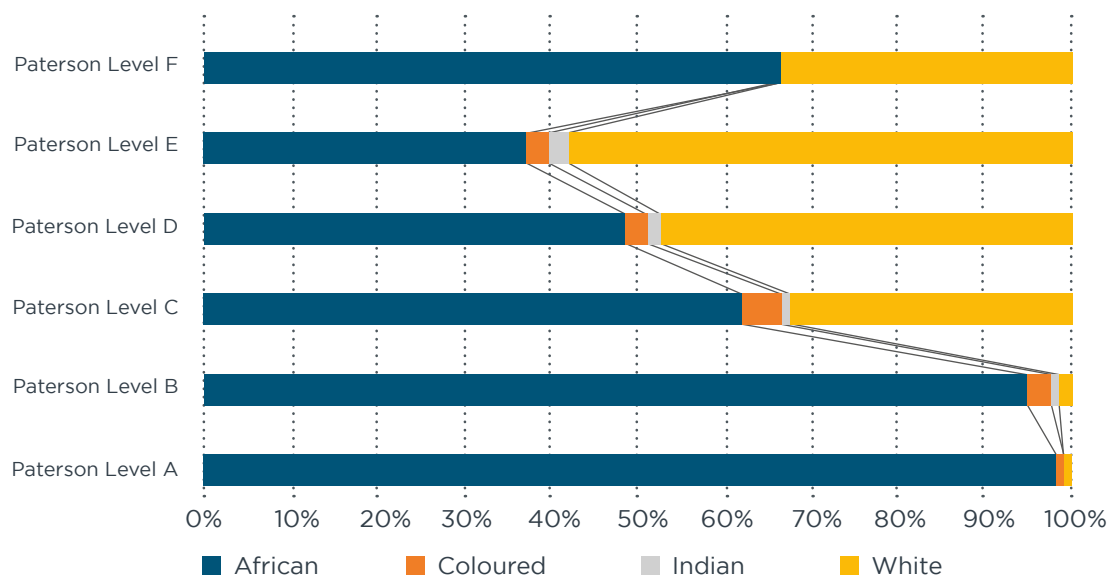
Race and Paterson Levels: All Employees 2012



Further to the increase in the representation of African employees in management positions is the entry of a larger portion of Coloured and Indian employees across Paterson Bands B-E, with the most significant increase noted in Indian employees represented in Paterson Band E.

With the representation of Black people within management positions in the mining industry being a key target in the Mining Charter scorecard, this increase in representation within the sample suggests that the participants in the study have been exposed to measures put in place to address the issue of management representation.

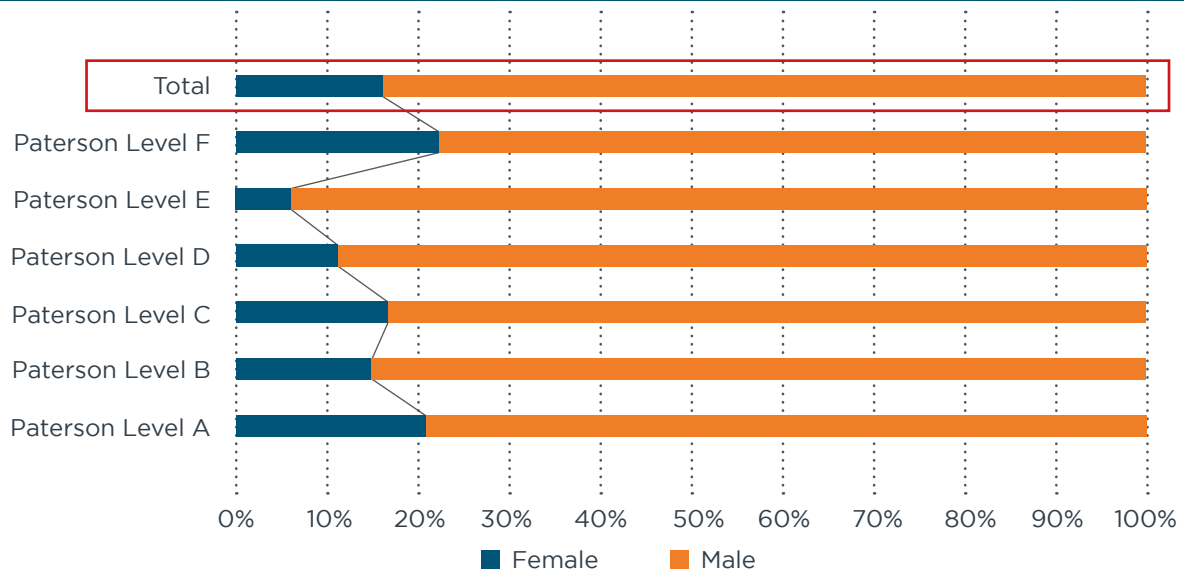
Race and Paterson Levels: All Employees 2017



A further key aspect in the development of a more diverse and inclusive mining sector is female representation across the various Paterson

bands. Notably, overall female representation has increased by a small margin, from 17% to 20%, when comparing the two time periods.

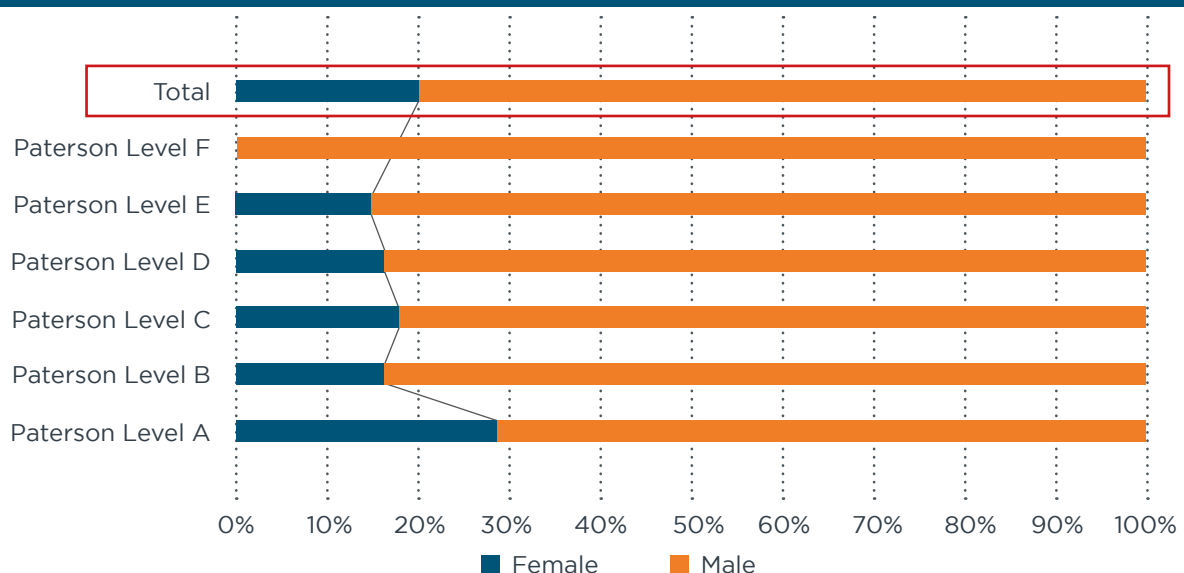
Paterson Bands: Gender 2012



The most significant changes noted when comparing the two periods under review, is the decrease of female representation in the Paterson F band and the significant increase of female representation in the Paterson A band. Apart from these two outlier results, there has been a steady increase of female representation across all the Paterson levels.

Of further interest to note is the increase in Female representation in Paterson E and D bands when the two periods are compared. However, due to the sharp decline in the absolute numbers of Paterson E and D band employees, the increase in representation could be the result of a decrease in the number of male counterparts employed within middle and senior management positions.

Paterson Bands: Gender 2017



Education and the availability of an employable population are key drivers to economic growth, addressing poverty and closing the inequality gap. In an assessment of the current educational levels vis-a-vis the Paterson levels reported in the sample, the results generated through Form Q - a regulated form required for reported by the

DMR - have been utilised.

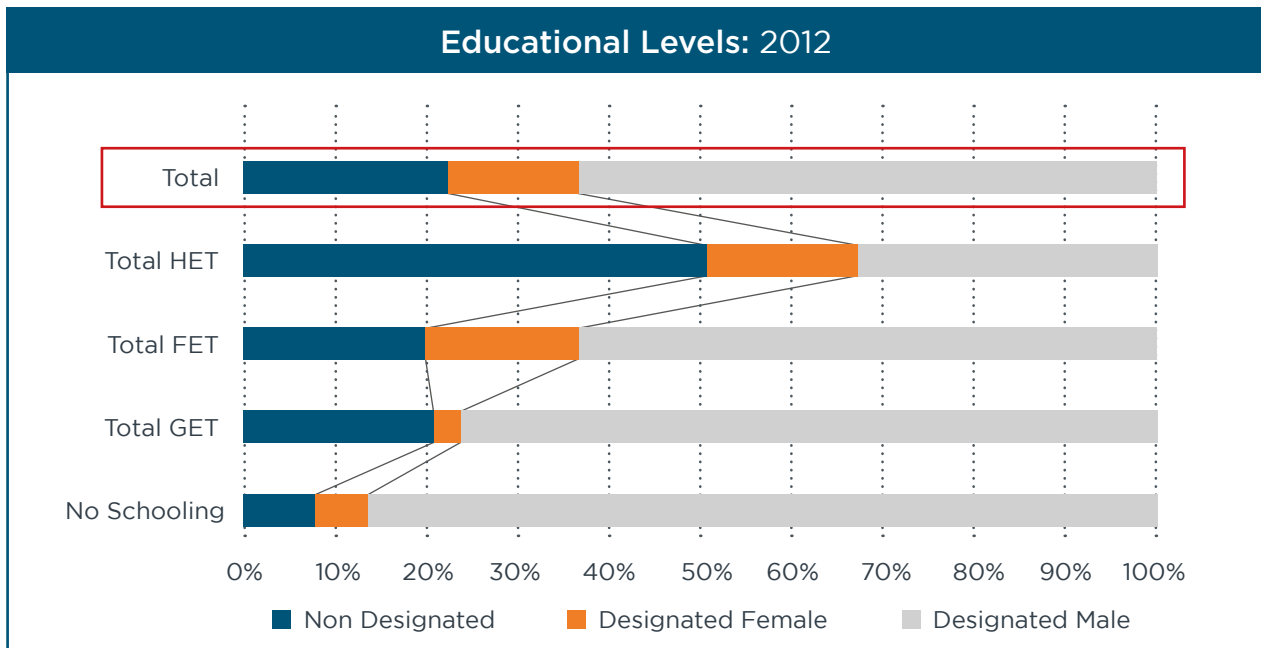
Form Q reports on the following broad educational categories:

- General Education and Training (GET):
No Schooling³ - Grade 9

- Further Education and Training (FET):
Grade 10 – Grade 12
- Higher Education and Training (HET):
Higher Certificates – Doctoral Degrees

It is evidenced from the broad categories outlined above that only employees in the category FET and above have a matric or equivalent qualification, most often required to access further learning opportunities such as apprenticeships, learnerships or graduate programmes.

Most of the employees reported on in the study in 2012 are designated males⁴ and this employment group represent most of the educational level categories, apart from the HET category, which is dominated by the Non-designated employees. This representation of educational levels in this study group is related to the high percentage of unskilled and semi-skilled positions (Paterson A and B Band positions) that were noted throughout the report.



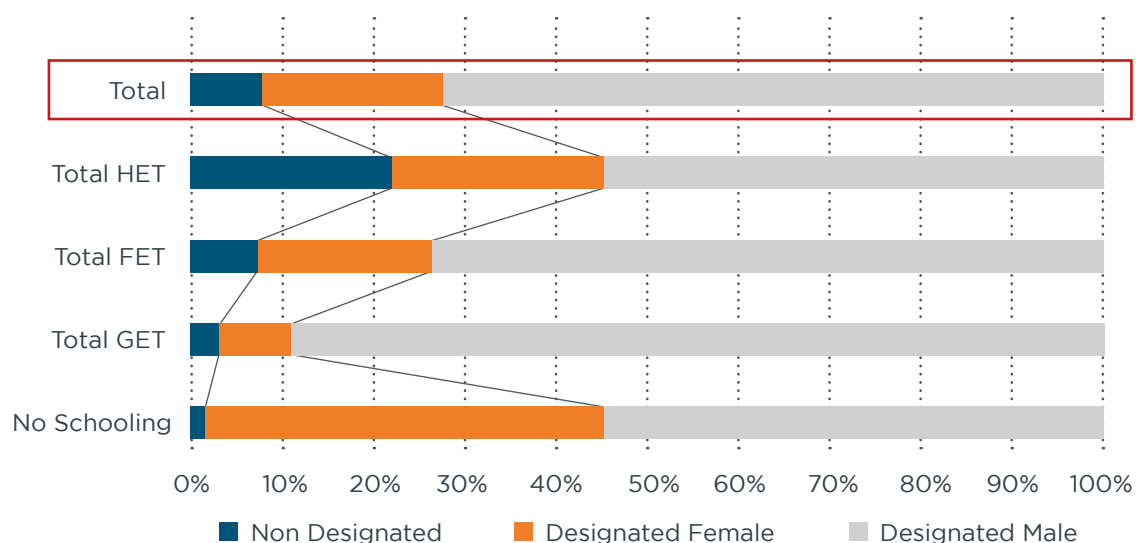
Of interest to note in the 2017 results is the increased representation of designated females in the overall results. The significant increase in the representation of women with no schooling is a concern however, but supports the previous trend noted in the increase of the number of women employed as 'General Workers' in core mining activities. Further, the decrease of non-designated employees in 2017 is noted across all the categories, including the HET category, which

shows a significant increase in the representation of designated males and females, when compared to the 2012 data. This increase of designated males and females in the HET category is encouraging and may be as a result of the higher numbers of designated employees in managerial positions as well as an overarching drive to get employees not only at the HET level, but also all other levels, to gain some form of formal education.

³For purposes of this report the respondents with status 'no schooling' has been reported separately from the GET category

⁴Race related terminology was adopted from the Form Q format in which designated males refer to South African males of African, Coloured or Asian descent, designated females are South African females of African, Coloured, Asian or White decent that work in the mining industry and non-designated employees are South African White males or Foreigners.

Educational Levels: 2017



Evidently, there has been a fair increase of women overall and a significant increase of women with limited or no schooling. Further to the data on the educational levels of women, it was also reported earlier that a considerable number of women are employed in Paterson A and B positions as 'general workers'.

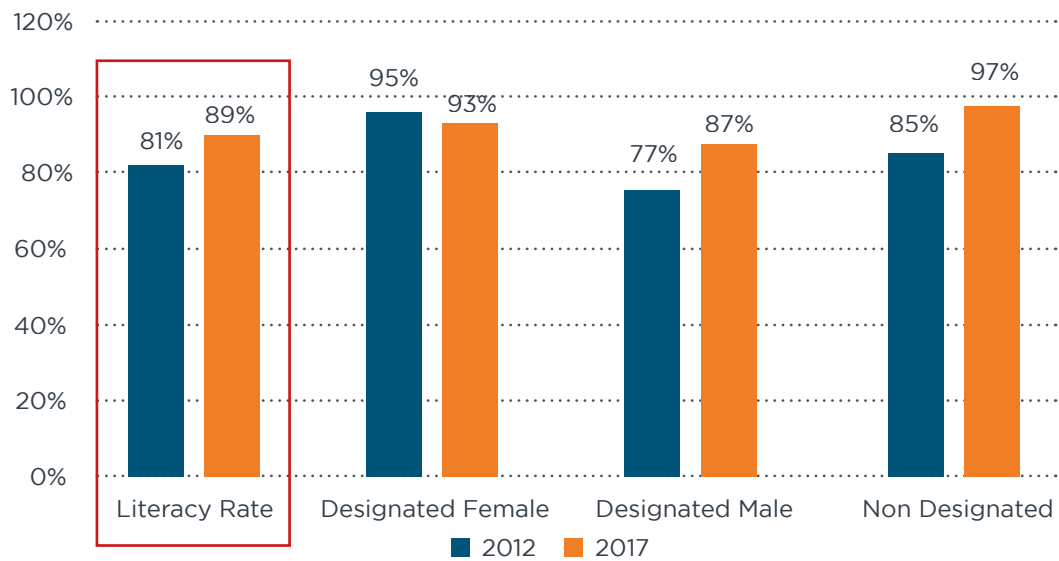
Additional key changes noted above indicate a declining representation of non-designated employees across all the educational categories, and most notably so in the HET category. These results are supportive of the results previously reported wherein the decline of white males in skilled and management positions was found; the area's most often associated with the requirements for higher education and training.

7.6 Education level distribution

Historically the mining industry in South Africa was characterised by a high percentage of illiterate black male general mine workers with limited opportunity to improve their career prospects or employability during their life time. As a result, one of the early commitments made in the Mining Charter was the eradication of illiteracy by 2014.

Through various programmes and skills development initiatives, the literacy rate in the mining industry has shown a significant improvement. This trend has continued through the 8% improvement from 81% to 89% noted between the two periods under assessment.

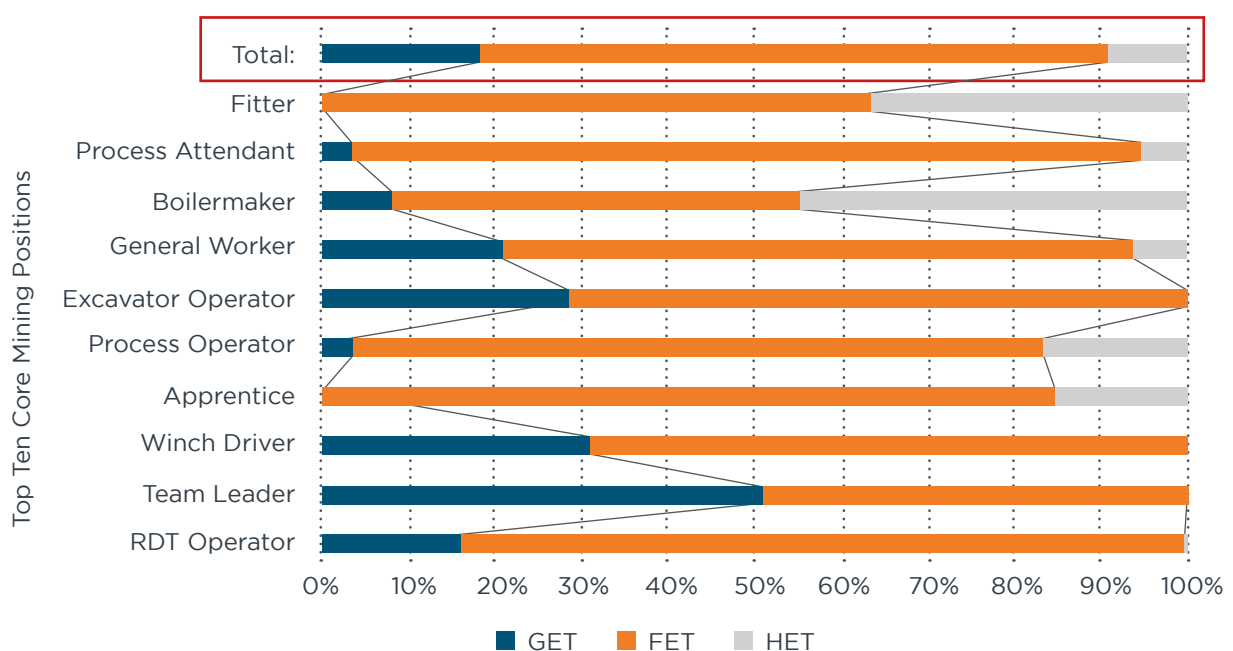
Comparison of Literacy Rate: 2012 and 2017



The most significant improvements in literacy levels were noted in the categories 'Designated Male' and 'Non-Designated', where an improvement of 10% and 12% were noted, respectively. The slight decrease in the literacy rate reported among 'Designated Females' is a concern and further empirical support with regards to the increase in unskilled and semi-skilled female employees, was noted in this trend.

In overview of the educational levels reported for the top ten core mining positions it is clear that the majority of employees were reported as having an FET level of education in 2012. The most highly educated positions were that of 'Boilermaker' and 'Fitter', followed by 'Process Operator' and 'Apprentice'. Conversely, the positions of 'Team Leader', 'Winch Driver' and 'Excavator Operator' had the lowest level of education.

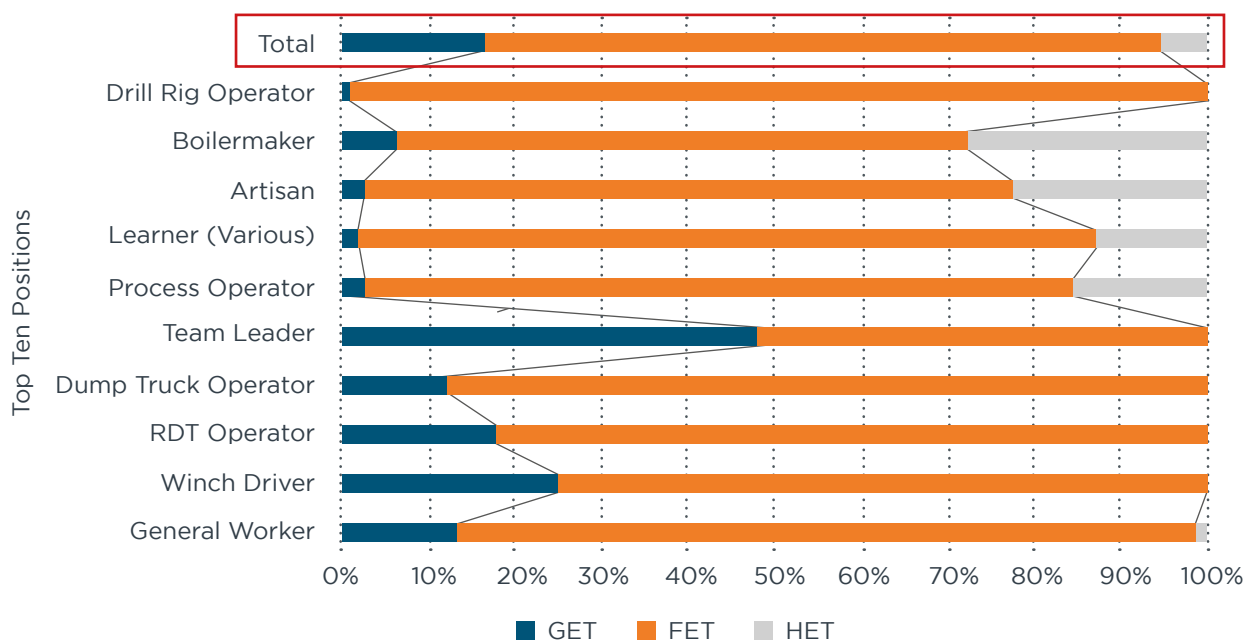
Top Ten Core Positions: Educational Level 2012



The overall educational levels of the 2017 cohort has decreased slightly when the proportion of employees with a HET qualification is compared with the 2012 results. The job categories with the highest listed educational levels remains 'Boilermaker', 'Artisan' and 'Process Operator'. With the majority of employees reporting a

FET educational level. Similar to the 2012 data, the positions of 'Team Leader', 'Winch Driver', 'RDT Operator' and 'General Worker' remain the areas with the lowest education, with the 'Team Leader' position reporting a significantly higher proportion of employees with a GET educational level.

Top Ten Core Positions: Educational Level 2017



In an analysis of the educational levels of all employees in the Top Ten Core Positions it is noticeable that employees recorded in both the GET and HET categories decreased slightly in 2017. Looking at the top 10 positions for 2012 and 2017 the positions with the most educated employees are those within positions of 'Boilermaker', 'Artisan', 'Learner', 'Process Operator', 'Fitter' and 'Apprentice', with a small number of 'General Workers' recording a post-matric qualification in 2017.

The FET educational category was recorded for the bulk of employees across the sample except for 'Team Leader' wherein a significantly higher

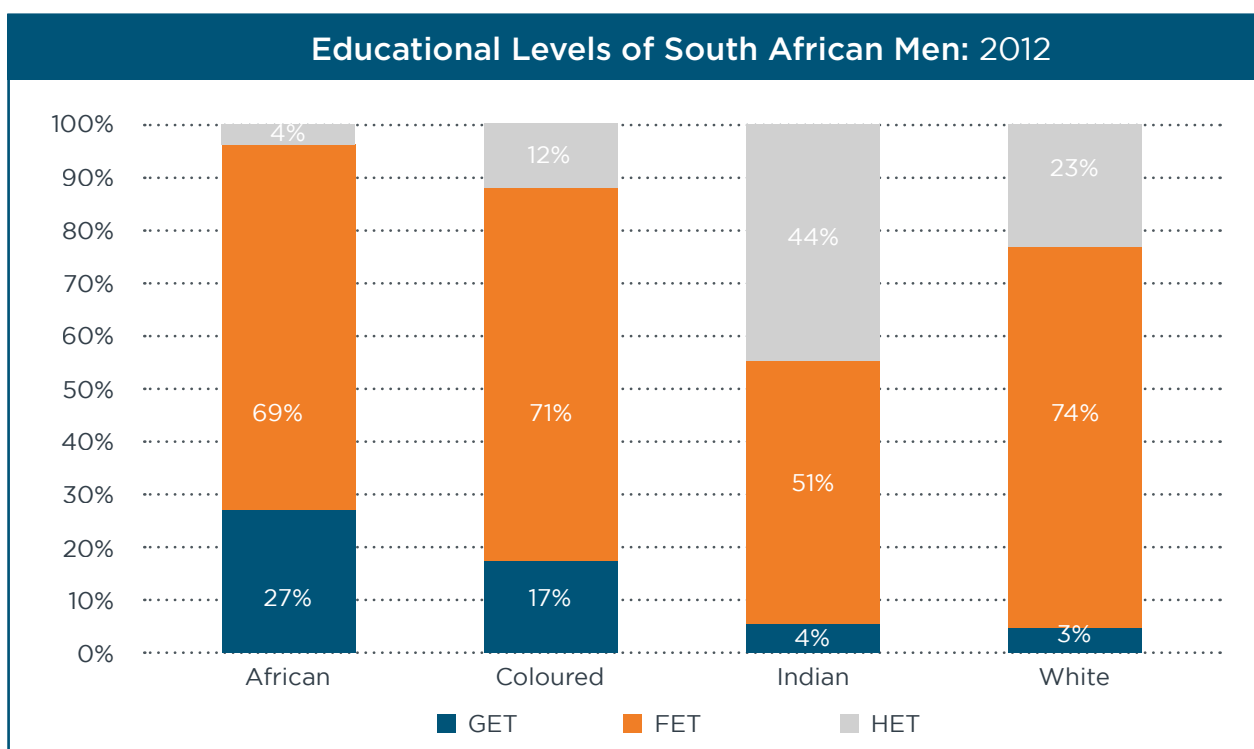
proportion of GET education was noted. This is in support of earlier findings wherein the position of 'Team Leader' was recorded among older employees (above 45 years old) with a lot of experience in mining but with a concomitant lack of formal education.

Furthermore, a trend was noted whereby fewer 'Team Leader' positions were reported in 2017, when compared to the 2012 data, and further research and a deeper understanding might be required with regards to the potential vulnerability of older, more experienced, employees with a lack of formal education in the mining industry.

7.7 Education level distribution by gender and race:

In a comparison of the educational levels of all employees within the sample, it is of interest to note that there has been an overall decrease in the reporting of HET categories in the mining industry. In understanding this phenomenon, it would be important to note the decrease in the absolute number of skilled professional and senior management positions (in comparison to unskilled and semi-skilled positions) reported, rather than to make assumptions with regards to the educational levels within the positions.

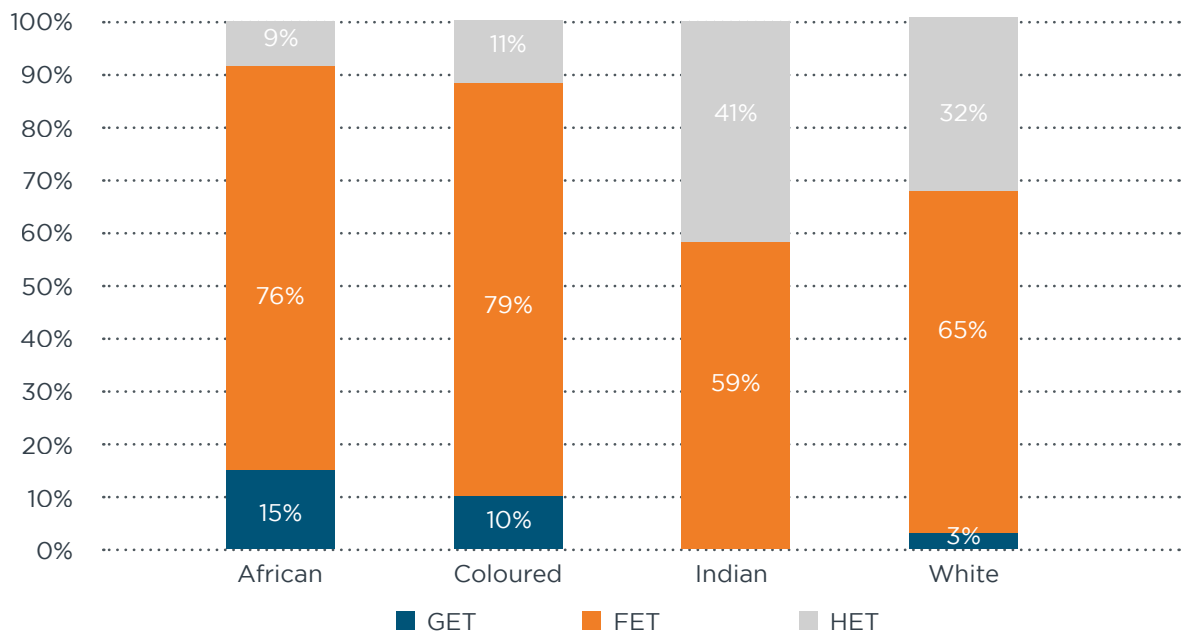
It is of interest to note that the majority of male employees in the 2012 sample cited FET as their highest level of education, with Indian and white males dominating the HET level. African males recorded the highest level of GET education, followed by coloured males. Of further interest is the 8% difference in the HET levels of coloured and African males reported.



Similar to the 2012 data set, the HET category remains dominated by Indian and white males, however African males have shown a 5% increase, from 4% - 9%, in the HET category. Further African males has shown a 7% increase in FET levels and

conversely a 12% decrease in GET levels. The educational level of coloured males has improved with a rise in the number of FET educated employees and a decline in the percentage of GET levels reported.

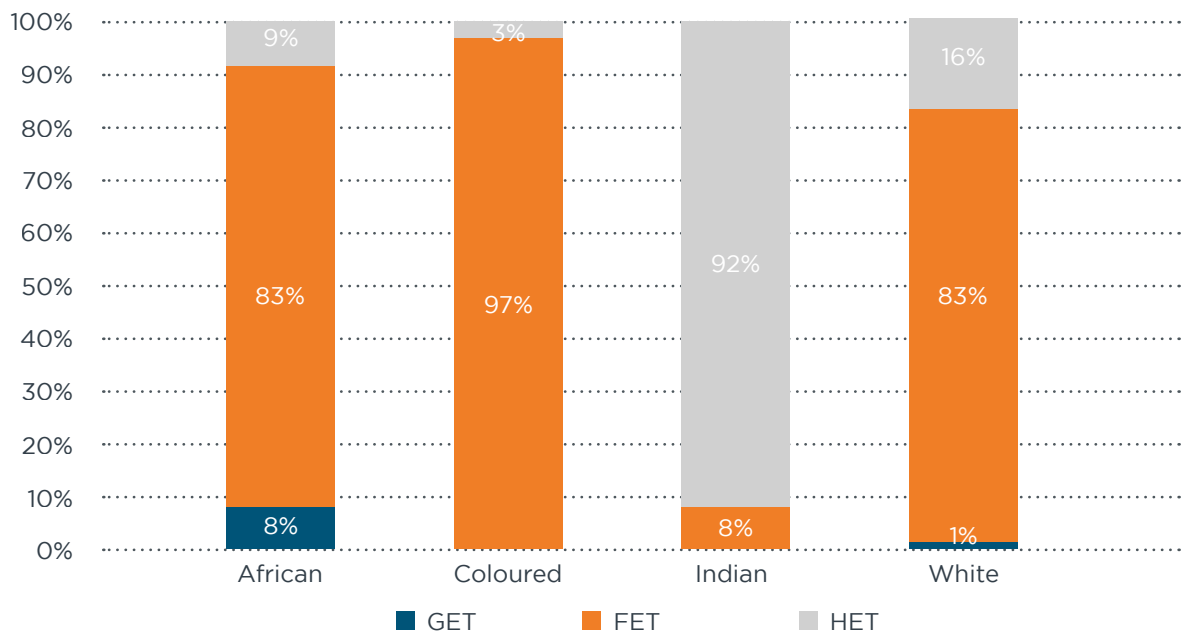
Educational Levels of South African Men: 2017



African males are the most dominant group with regards to employee numbers in the mining industry and from the above findings it is evidenced that the levels of education of, in particular African and coloured males, have improved over the period under review. Even though the representation of African males in the HET category remains low, the percentage of African males in the sample group reporting a HET level of education has more than doubled from the 4% reported in 2012, to 9% reported in 2017. This statistic is in support of the increase with regards to the representation of African men in management and senior management positions.

The results reported for women in the 2012 sample are similar to the men with regards to Indian and white women dominating the HET levels. Of interest however is the much higher percentage of African women reported with an HET education when compared with their male counterparts. Indian women are reported as the most educated with 92% of the sample citing an HET level of education, it would be prudent though to note that the sample size of Indian women is small in comparison to the other race groups and as such it could be concluded not the mining industry does not attract a lot of Indian women, except in professional or managerial positions.

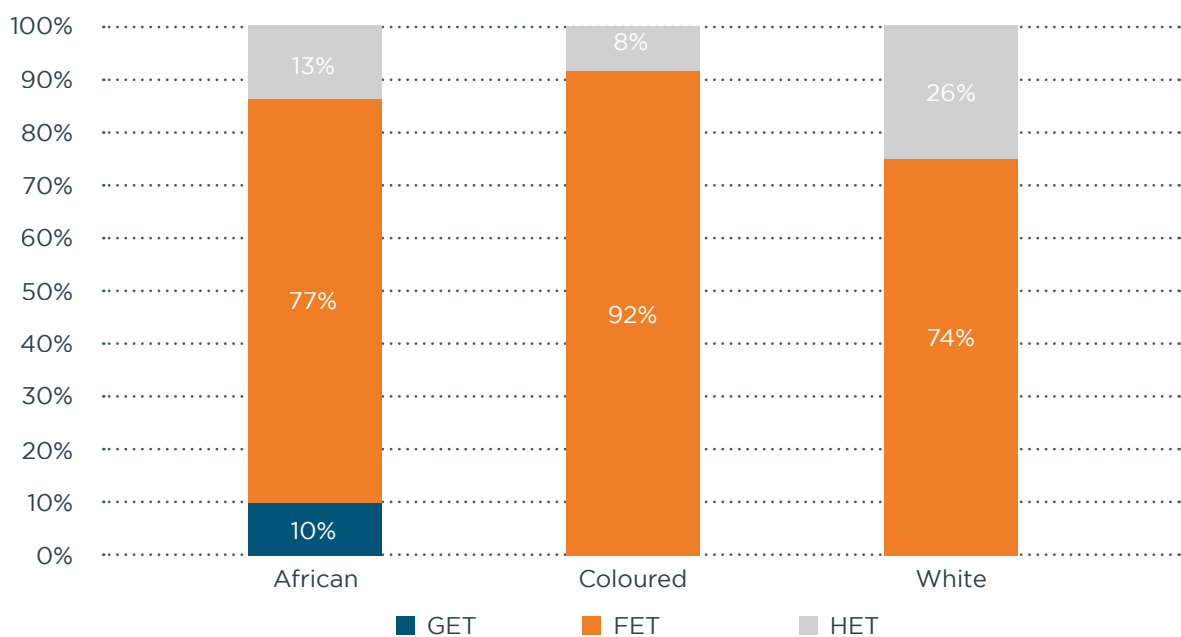
Educational Levels of South African Women: 2012



The trend noted in the improvement of HET levels of African males is further also noted with regards to African females whereby there was increase of 4%, from 9% recorded in 2012 to 13% in 2017. Of interest, however is the increase of

African women in the GET educational category, which is supportive of the earlier trend noted with regards to the increased employment of women on Paterson A and B as 'General Workers' in core mining positions⁵.

Educational Levels of South African Women: 2017



⁵ No Indian women were recorded within the 2017 data sample.

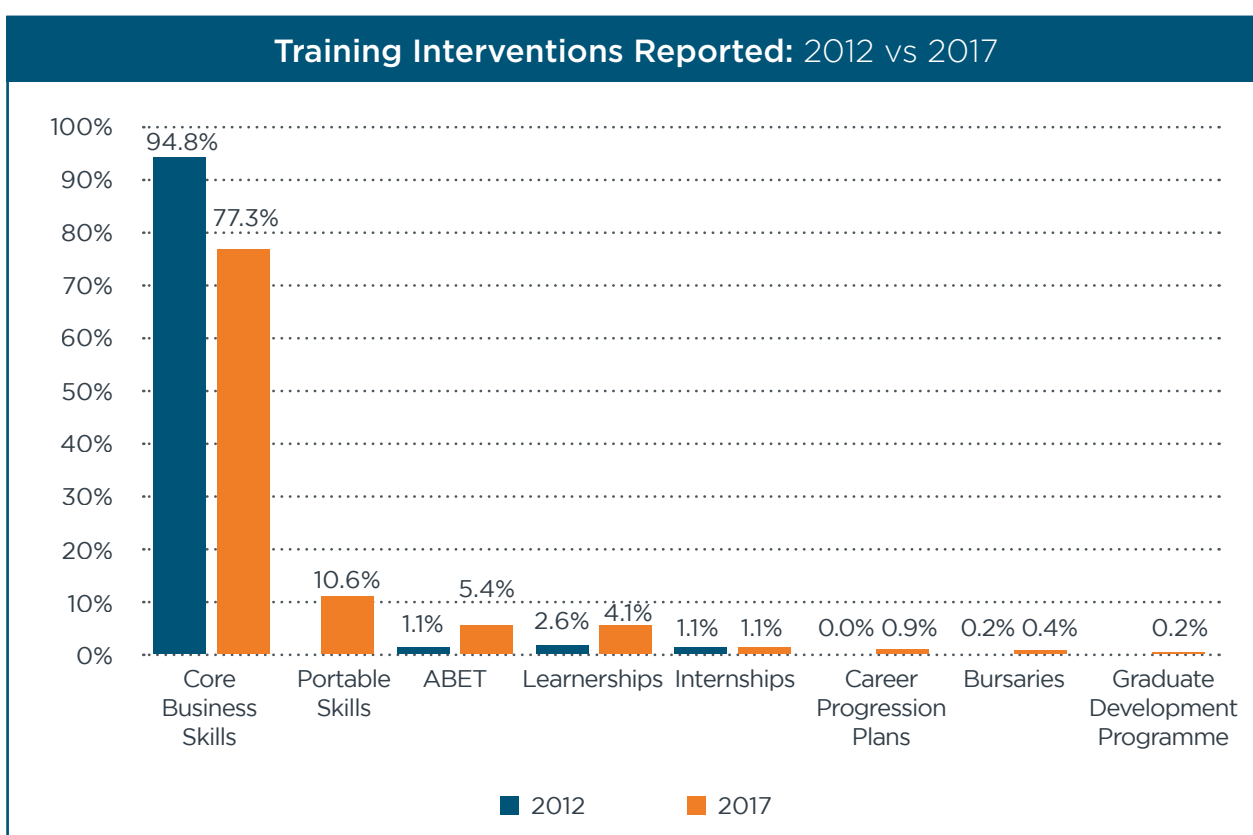
Again, as with male employees, female employees with an FET qualification make up the larger portion of the workforce over the period 2012-2017 across all races except for Indians (the sample for Indian females in the 2017 data included only 3 females).

The continuous improvement of educational levels of African employees (male and female) is representative of the increased representation of African employees within professional and managerial positions.

7.8 Training Interventions:

Training interventions have remained focussed on the implementation of Core business skills training with the majority, 95% and 77% of employees who attended training interventions, having attended 'Core Business Skills Training'. Furthermore, a significant number of employees attended 'Portable Skills Training' (11%) and 'ABET' (5%)

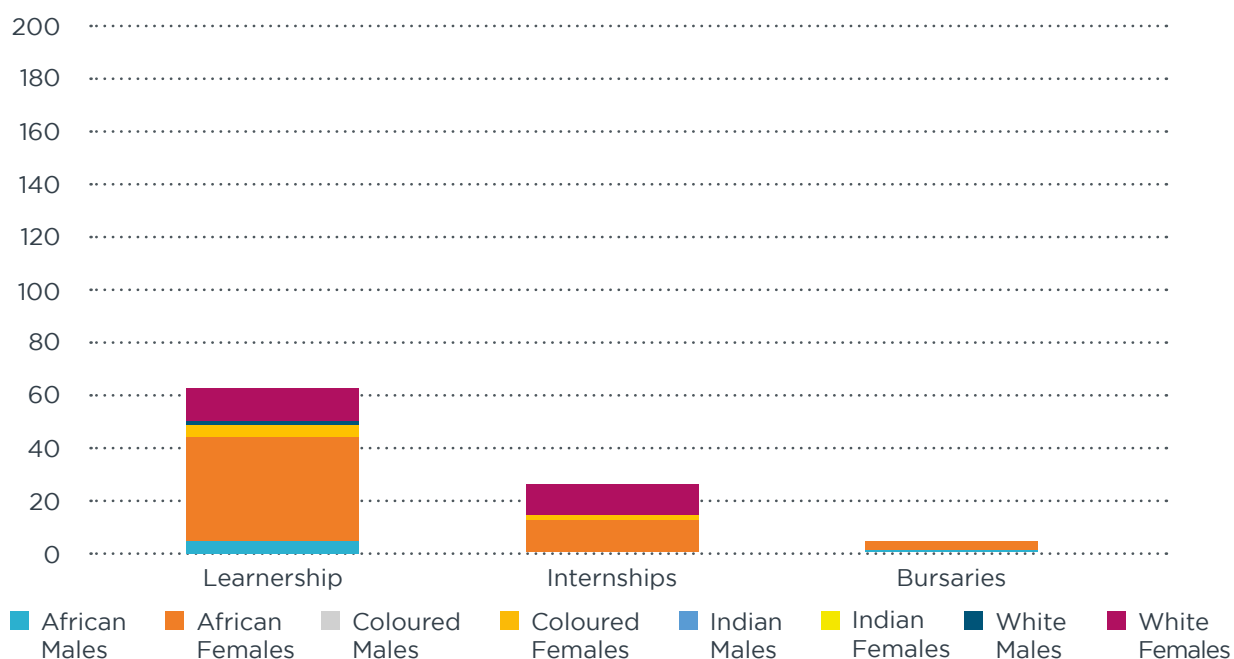
in 2017. With regards to skills development programmes aimed at career advancement, 'Learnerships' was the most often used training intervention recorded with 3% and 4% noted in 2012 and 2017, respectively.



In a more thorough analysis of the data recorded for development programmes such as learnerships, internships, bursaries and Graduate Development programmes, it was found that within the sample studied, the interventions reported have shown significant changes when the two data sets are compared.

The three most often attended development programmes recorded were learnerships, internships and bursary programmes. In the data recorded for 2012, males dominated all the development programmes with African males being the most dominant, followed by white and coloured males, with African Females having a marginal representation in learnerships and bursary programmes.

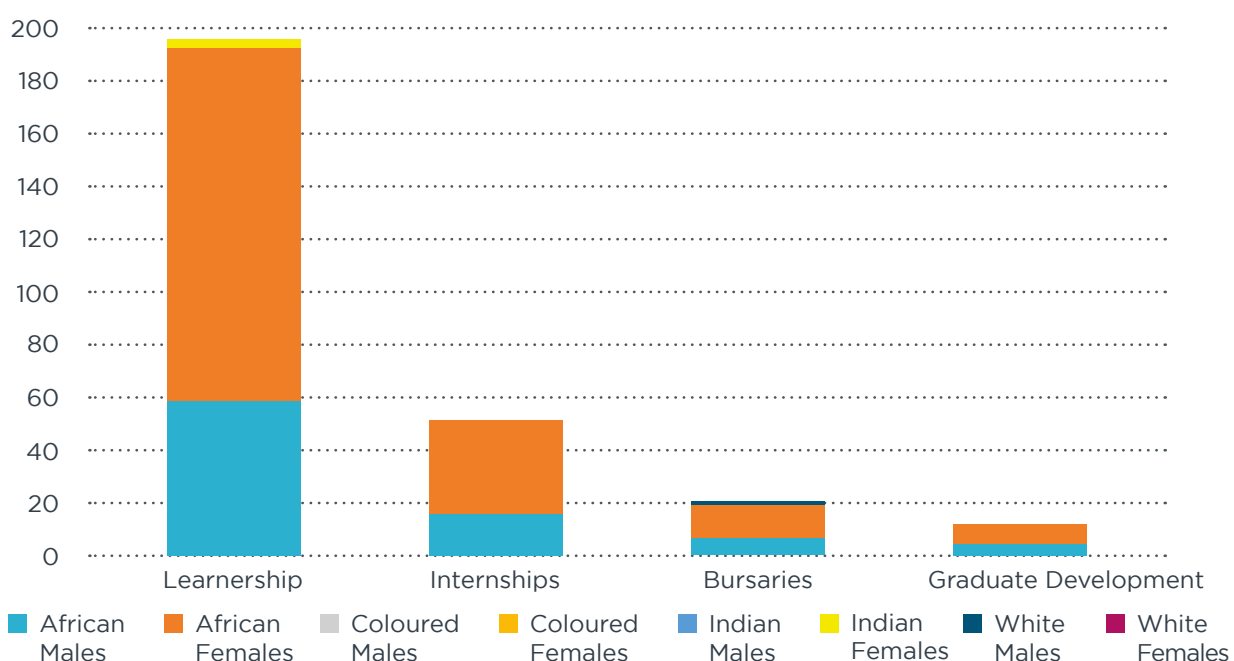
Development Programmes by Race and Gender: 2012



The data for 2017 shows a significant increase in the total number of development opportunities offered, from approximately sixty (60) learnership opportunities reported in 2012 to nearly 200 reported in 2017. The same trend holds true for Internships, bursaries and graduate development programmes. It is of importance to note that all the development programmes reported in these graphs take an average of 3 years to complete and as such the enrolment to these programmes might have commenced prior to the 2017 period under review.

From the results it is evidenced that African males still dominate the attendance to development programmes, however a significant shift has taken place towards an increased representation of African females across all the development programmes. Further to the increased focus on the development of African females in the sample group, is the sharp decrease in white male candidates on these development programmes.

Development Programmes by Race and Gender: 2017



The positive trend noted in the improvement of educational levels of historically disadvantaged employees in the mining sector is further supported by the commitment shown to the further upskilling of qualifying employees through developmental programmes such as learnerships, internships, bursaries and graduate development programmes.

Investment in the continued development of a higher skilled, culturally diverse and representative workforce in the South African mining industry will place the industry on a positive future growth path in order to meet the demands of a globally competitive industry.



8. Way forward

As noted, the downturn in global commodities demand and the resultant cost-cutting by major companies has had a considerable impact on the labour climate in the South African mining sector. Prolonged strikes have further impeded the productivity of various companies that are operating across South Africa's gold, platinum, coal and diamond industries. The resultant response by mining companies is one of moving away from labour-intensive extraction and toward mechanisation within the mining sector. This long and costly transition will be necessary not only as a way to circumvent the labour climate in the country, but also as a way of making the industry more efficient and productive through modernisation rather than mechanisation alone.

Given the various initiatives that mining companies as well as government institutions have put in place to increase the level of education that workers have, it will be important to begin to transition various workers toward higher skilled activities that will require the operation of sophisticated machinery, while also necessitating the maintenance of such equipment. At present, the current study sample highlights a number of aspects that would need to be taken into account going forward.

Transitioning workers through education levels faster

The current research sample notes that far too many mining employees are clustered in low-skilled positions. In order for the industry to become more competitive, the workforce needs to move faster and more efficiently through the education system. Doing so will ensure that workers are not only able to secure higher levels of education, but are also gradually given more technical responsibilities that require a higher skill set. The comparative data also highlights that there are fewer individuals represented within the top 10 core mining positions at an HET level of education when comparing 2012 to 2017. Overall literacy has however increased marginally in the period and now stands at 89% within the sample.

The same holds true in terms of the Paterson grading that workers have with the large majority – 92%-96% in 2012 and 2017, respectively – being clustered in the Paterson A-C bands, with nearly half being at Paterson B grading alone in both years – 43% and 48%, respectively. This highlights that education is not a case of workers becoming more educated, but rather that more workers are becoming educated. The number of women at various Paterson levels has fluctuated somewhat, but remained the same for the most part during the period. Alarming however,

female representation at Paterson F level has disappeared from the sample in 2017.

Progress in equal gender representation and distribution needs to speed up

Undoubtedly the industry has made headway into integrating more women into the mining workforce, however this has been stagnant to a large degree. The data in the research sample highlights that the proportion of women overall within the current sample has moved by only a few percent over the period 2012-2017 from 17% to 20%. Within the top 10 core positions this has changed slightly more with women accounting for 11% of workers in top 10 core positions for 2012, and 14% in 2017. This trend needs to be addressed by better distributing women in other positions that they could participate in, and look to learn more technical skills.

Quality over quantity is key

During the period under review, greater numbers of workers were employed in semi-skilled and unskilled positions (Paterson A and B). This is in stark contrast to the need to bring on-board more workers that have higher qualifications and skills that will enable the sector to transition away from the current labour intensity that it operates at. Going forward, more emphasis needs to be placed on upskilling existing employees that would be more effective and efficient in conducting work that requires the operation of machines while also ensuring that there is an adequate number of staff that are educated enough to maintain them. Doing this will create additional avenues for employment within the sector and start to move it toward the modernisation that it currently strives to achieve.

Taking the above key points into account more strongly will ensure a smoother process in transitioning the sector toward modernisation. In the long term it will also ensure that the South African mining industry stays relevant and competitive on the global stage. Though at present the climate is subdued due to slow global growth and relatively weak demand, this cycle will eventually come to an end and the industry needs to be prepared and well-positioned to capitalise on the future. This will prove a necessity toward avoiding the missed opportunity in the commodity cycle of the 2000's during the period of double digit growth in China. Though there will not be another China for some time, the industry needs to align itself with future demand growth and potential emerging markets that would require raw materials for growth.

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