

Work reorganisation and technological change: limits of trade union strategy and action at ArcelorMittal, Vanderbijlpark

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Abstract

The black South African trade unions were known globally for challenging apartheid in the workplace and low wages. In fact, they played a significant role in the broad liberation movement which ushered in democracy in 1994. However, little is known about the unions' ability to respond to production issues such as technological changes at the 'point of production'. Using a case study of the Vanderbijlpark Plant currently owned by the global steel corporation ArcelorMittal International, this article shows that the National Union of Metal Workers of South Africa (NUMSA) – the biggest trade union in South Africa – adopted a bargaining strategy which consistently ignored production issues at the plant while focusing on wages and working conditions.

This article suggests that this unidimensional strategy meant that building the union's capacity was neglected, reducing its ability to respond proactively to technological innovation and work reorganisation. While it does not present union capacity as a panacea, the article presents international examples that indicate that unions with more developed research and education capabilities were able to save some jobs by engaging union members and proposing alternatives.

Keywords: *education, research, technology, union capacity, union strategy*

Résumé

Les syndicats noirs de l'Afrique du Sud étaient connus mondialement pour défier l'apartheid sur le lieu de travail et les bas salaires. En fait, ils ont joué un rôle important dans le mouvement de libération général qui a inauguré la démocratie en 1994. Cependant, on sait peu de choses sur la capacité des syndicats à répondre aux problèmes de production tels que les changements technologiques au «point de production». À l'aide d'une étude de cas de l'usine Vanderbijlpark actuellement détenue par la société sidérurgique mondiale ArcelorMittal International, cet article montre que l'Union nationale des travailleurs du métal d'Afrique du Sud (NUMSA)

– le plus grand syndicat d'Afrique du Sud – a adopté une stratégie de négociation qui ignorait systématiquement Problèmes de production à l'usine tout en se concentrant sur les salaires et les conditions de travail. Cet article suggère que cette stratégie unidimensionnelle a permis de négliger la capacité de l'union, en réduisant sa capacité à répondre de manière proactive à l'innovation technologique et à la réorganisation du travail. Bien qu'il ne présente pas la capacité syndicale en tant que panacée, l'article présente des exemples internationaux qui indiquent que les syndicats dotés de capacités de recherche et d'éducation plus développées ont pu sauver des emplois en engageant des syndicalistes et en proposant des solutions de rechange.
Mots-clés: éducation, recherche, technologie, capacité syndicale, stratégie syndicale

1. Introduction

By the end of the first decade of the twenty-first century, the black trade unions that emerged in the wake of the 1973 Durban strikes had grown into a formidable force that left an indelible mark on workplace relations and on the political landscape of South Africa. Their power derived from the presence of unions in workplaces across the country: South African unions became models of successful worker mobilisation at a time when unions in other parts of the world, particularly in developed countries, were facing what appeared to be terminal decline. This wave of mobilisation inspired scholars of labour movements to coin the term *social movement unionism* to characterise this democratic and organisationally robust form of unionism (Webster 1988, Waterman 1993, Von Holdt 2002). Social movement unionism encapsulated three elements: shop-floor mobilisation, involvement in community struggles and active participation in the broader anti-apartheid resistance movement.

Shop-floor mobilisation was the most crucial dimension of union power and provided an impetus for the unions' ability to engage in other arenas of struggle. The strategy of shop-floor organisation entailed the creation of structures made up of worker representatives who were able to force management to negotiate binding agreements about wages, working conditions and health and safety issues. In this way, the black unions were able to challenge what Von Holdt (2003) referred to as 'the apartheid workplace regime' – an apparatus of workplace structures and practices of capitalist control characterised by racial domination and the use of ethnic control in the context of an apartheid state. Workplace organisation was underpinned by the shop stewards' movement, which connected union members across workplaces, companies, industries and regions and across the entire country. Shop stewards performed many roles within the new unions: representing workers on the shop-floor, leading union campaigns, negotiating with management, defending union members in disciplinary cases and taking up grievances on behalf of members. Shop-stewards who received union education and training were also expected to impart their knowledge on union members.

However, existing scholarship on union mobilisation, particularly in relation to

social movement unionism, took for granted that unions had the capacity to engage effectively in production politics. The work of Webster et al. (2008), which was hailed as ground-breaking international scholarship, presented comparative research material on labour flexibility and considered the prospect of a Polanyian 'counter-movement' in the global South. While this work raised the bar in labour studies in the age of labour-market insecurity, its conclusions about a possible counter-movement in three countries, including South Africa, were rather optimistic. The work of these scholars failed to give serious consideration to the capacity of trade unions to effect such a counter-movement. This is particularly true of the capacity of trade unions to understand work reorganisation, to conduct research and to incorporate the new knowledge in union education programmes and strategic planning and mobilisation. In this article, it is argued that both activists and scholars of South African trade unionism have suffered from a blind spot when it comes to issues of production, especially of the role of technology in the production process.

Technology remains a decisive element in determining the size and character of the workforce. For example, in the case of the Iron and Steel Corporation (Iscor), a state-owned company that was privatised by the South African government in 1989, the workforce was reduced by close to 50 000 workers between 1989 and 2012. This dramatic reduction was due to several factors, including the introduction of new technologies, the reorganising of work and the unbundling of several divisions of the company. The composition and character of the workforce also changed from predominantly blue-collar and unskilled to one that was dominated by semi-skilled and skilled workers operating in a highly automated production environment. The iron- and steel-making division of Iscor, incorporating plants in Newcastle, Pretoria, Saldanha Bay, Vanderbijlpark and Vereeniging, was bought by ArcelorMittal in 2007 and comprises the case study under discussion here (Hlatshwayo 2014).

Using a case study of ArcelorMittal Vanderbijlpark plant and focusing on NUMSA's inability to respond to technological innovation in the plant, this article highlights limitations of trade-union strategy, with its emphasis on traditional union issues such as bargaining about wages and working conditions. The main objective of the article is to demonstrate how NUMSA was unable to build its research and education capacities as tools for mitigating the negatives effects of technological innovation in the steel plant in Vanderbijlpark. Another objective is to show how, despite the negative effects of technological changes on workers, the union has continued to operate as before, without attempting to strengthen its capacity to conduct research and education which seeks to help it to respond to production issues.

The core argument present in this article is that, over the same period of time, union action and strategy failed to come to terms with the changing nature of production and workplace organisation. Unions were therefore rendered incapable of responding appropriately and effectively; union structures were ill-prepared to respond to sophisticated processes of

automation and innovation in workplace organisation. We posit that trade union action and strategy in the South African context have tended to focus, to a disproportionate degree, on reproduction issues such as wages, working conditions, broader social wage issues, union 'palace politics' and party political alliances, and have therefore neglected the sphere of production, particularly with regard to technology and work reorganisation, as well as the education of their members about these issues.

2. Trade unions, technology and capacity

Our decision to focus on research and education is informed by the approach of the International Labour Organisation (ILO), which underlines the significance of union research and education on workplace changes:

[T]he key to learning in the labour movement is effective union education. Improving the funding of union education, linking it to labour research and workplace issues, making it relevant to a broader spectrum of working people, updating its methodologies and training its practitioners will help the movement learn how to create the new knowledge it needs to face the challenges ahead (ILO 2007: p. iii).

In similar vein, Chikutu's study on trade union research and education in Kenya (1982) concluded that: "If it could be recognised by all trade unions that a well-educated and informed membership makes a strong trade union..." (Chikutu 1982: p. 2).

Trade union research and education, and the capacity to respond to technological innovation and other changes in the workplace, is a crucial and complex issue that trade unions have to grapple with, especially in the context where the spread of technology tends to lead to job losses. Knowledge about production has the potential to help unions formulate proposals which can mitigate the negative employment effects of work restructuring and changes in the production processes (Hlatshwayo 2013).

In broad terms, trade unions can respond in one of two ways to technological changes and work reorganisation. The first is to follow a conventional union path, with the emphasis on 'bread-and-butter' issues like wages and working conditions. Following this approach, a union tends to use research and education to strengthen its ability to negotiate better wages and working conditions for its membership. The second approach does not ignore bread-and-butter issues, but combines campaigns for wages and working conditions with building the capacity to bargain over technological changes and other production issues.

In the 1980s, when work reorganisation and technological innovation were introduced in the steel industry globally, there was consensus among scholars that trade unions in the United Kingdom tended to ignore technical innovation and emphasised wage-bargaining – in other words, they retained a traditional approach. On the other hand, German and Scandinavian unions used industry-based and plant-based bargaining to mitigate the effects of technological changes on their membership. Using the labour relations framework which gives unions a voice, and building their research and education capacity, unions in Germany and Scandinavia moved away from the conventional approach and adopted a dual strategy, intervening in production on one hand and wages and in working conditions on the other (Hlatshwayo 2015).

In their longitudinal study of steel unions and bargaining in the UK, Bacon and Blyton (2004) showed a shift in union strategy from a narrow focus on wages to engaging with issues of changes in production. These authors concluded that, regardless of their ideological orientation, unions operating in four steel plants participated in plant-based negotiations and workplace restructuring with a view to minimising the negative effects of restructuring and technological innovation on their membership.

Comparing union capacity to participate in work restructuring between NUMSA and the German metal union, IG Metall, Masondo (2010: p.209) concludes, “German labour law allows for Works Councils to commission external experts for technical expertise on workplace restructuring or any other issue”. IG Metall was able to move away from a traditional approach towards a strategy which entailed developing the union’s capacity to conduct research on, and education about, work reorganisation and technological innovation (Thelen 1991; Rogers & Streeck 1994). Despite some attempts by employers to undermine labour standards, IG Metall used the works councils and its own research department for the unions to develop strategies which defended the interests of their members and saved some jobs. Konrad Siegel, who advised IG Metall on production issues, argued that unions could no longer afford to leave production issues in the hands of employers (Mashilo 2010).

A combination of wage and production struggles seems to be a plausible strategy, as it seeks to defend workers on all fronts. Thus building research and education capacity on production has to be part of a union’s strategy for defending and advancing the interests of its membership, especially in a context of technological change (Mathews 1994; Hlatshwayo 2015; Masondo 2010; Mashilo 2010).

In the African context, trade unions are grappling almost exclusively with bread-and-butter issues such as wages and working conditions. Examining the state of African trade unions and the environments in which they operate, Otto (2013: p. 23) observes, “The declining share of formal employment in total employment is explained by the large-scale retrenchment and privatization of state-owned enterprises as part of the structural adjustment policies”. In the context of declining African industries, Otto (2013: 28) further notes, “The traditional role of trade unions has primarily been to protect the

economic interest of its constituency such as to improve wages and conditions under which they operate”.

In Zambia, for instance, Phiri (2013) writes about the weakness of trade unions, which is manifest in unions not being able to run education and research programmes to build their capacity. Phiri (2013:p.426) comments, “Some union members also acknowledged that lack of resources also constrained unions from carrying out workers educational programmes”.

Elsewhere, we have argued that unions in Nigeria and India have adopted the conventional role, emphasising bargaining about wages and working conditions. Building internal capacity to respond to technological innovation has not been one of their priorities (Hlatshwayo 2014). Looking at trade union responses to technological innovation in the Indian context, Ghosh et al. (2009:p.42) confirmed that there has been little progress in formulating a more inclusive strategy, and stated that “Indian trade unions have, however, been slow in reacting to these changes [work restructuring]. This, in turn, has resulted in the loss of membership within these unions”.

South African scholarship on labour relations has tended to focus on union mobilisation, social unionism, strikes, bargaining over wages, employment equity and workplace restructuring (Von Holdt 2003, Webster et al. 2008, Mathekga, 2015, Roman et al. 2015). These themes are pivotal, as they afford a deeper understanding of co-operation and conflict in South African industrial relations and of the role of trade unions in the workplace and in communities. However, the lack of capacity of the unions to respond to production processes and technological changes is ignored, in spite of the fact that technical innovation and production play a major role in defining the size of the workforce and its skills base.

The book *Cosatu in Crisis*, edited by Satgar and Southall (2015) examines various issues which contributed to the decline of the Congress of South African Trade Unions (COSATU), once a powerful trade union federation. The book describes how work reorganisation led to the rise of atypical forms of work, the weakening of industries and subsequent job losses, the dominance of public sector workers within COSATU who had ambitions of becoming managers, the decline of internal democracy and the relationship between COSATU and the ruling political party, the African National Congress (ANC), as a cause of the crisis. All these issues are important and contribute to a comprehensive understanding of the challenges generally faced by trade unions. However, the book ignores the inability of unions to respond to technological change and production issues - one of the critical causes of the weakening of trade South African unions.

3. The ArcelorMittal Vanderbijlpark case study

Situated about 70 kilometres south of Johannesburg, the ArcelorMittal Vanderbijlpark plant is the largest of four South African iron- and steel-making operations. It is owned by the global steel giant ArcelorMittal International, which has its headquarters in Luxembourg. In 2012 the plant employed approximately 4 500 people and was considered to be one of the largest inland steel plants in the world. The plant's history and origins date back to 1928, when Iscor was established as a state-owned steel corporation, although production at the Vanderbijlpark plant only started in the 1940s. Iscor was privatised in 1989 and became fully integrated into the global steel market in 2007, when ArcelorMittal took over ownership and control of all Iscor iron- and steel-making plants (Hlatshwayo 2014).

4. An overview of technological innovation

4.1 Production Process: Phase 1

In essence, the production process at the ArcelorMittal Vanderbijlpark plant entails a transformation of iron ore as the main raw material into iron and flat steel, which is then used by customers for producing flat steel products like cars, fridges, corrugated iron, and cans. Key actors and players in this complex production process include manual workers, semi-skilled workers like machine operators and skilled workers employed as artisans, metallurgists and production planners and production managers. Technologies, such as machines and computers, are very key ingredients in the production process; machines and computers are operated and used by workers to transform raw materials into flat steel. Technologies help in the measuring of quality and quantity of inputs and outputs, the pace of production, and the actual production.

In the early years, or Phase One, the production process was largely about using machines and, in some cases, computers to produce steel in an environment that was labour intensive. However, the production process has evolved since the establishment of the plant on 1943. It can be argued that from the 1940s up to the late 1990s when the plant was owned by the state, the production process was largely driven by the needs of the apartheid state which needed locally-produced steel and job-creation for white workers.

In 1950 the factory commissioned a hot strip mill operation which produced steel that was bendable, allowing it to be used in car manufacturing and household appliances like fridges. The continuous galvanising line whose production process included zinc coating to protect the steel from corrosion became operational in 1951. Besides introducing machines in the 1940s and 1950s, Iscor introduced computers in the late 1960s. Computer technologies conducted production data processing and administration of Vanderbijlpark operations and other plants (Swanepeol, 1996). In 1967 the plant

conducted research which led to the use of the electrolytic tinning line which reduces rust on steel used for producing tins for food and beverage companies, replacing an old hot-dip tinning method (Iscor 1967). The output improved by a factor of four. Two electric arc furnaces were introduced in 1971; before that the plant only used the oxygen furnace for converting iron to steel. This also assisted the plant in improving its production capacity (Iscor 1971).

Technological advances and machines in the labour process compelled workers to work faster. For example, the improvement of iron and steel making meant that workers in the casting department had to work faster to improve the number of slabs cast (Iscor 1969; Iscor, 1971; Iscor. 1973). However, the introduction of machines in the 1950 up to the 1980s did not have a negative effect on employment in the sense that production methods used were based on mass production and work was largely dependent on a large workforce from the sections dealing with raw materials, to the blast furnaces, to steel production and up to packaging.

4.2 Production Process: Phase 2

In 1989, Iscor was privatised and introduced lean production which put an emphasis on production according to customer specification and use of new technologies to increase the quality and quantity of products. All these changes were largely motivated by an intense competition and an increased global exposure of the former state company. Unlike Phase One, Phase Two of the production process saw much more pronounced technological innovations, which were accelerated further by the acquisition of Iscor and the plant by ArcelorMittal International, a global steel producer, in 2007. In fact, one of the key objectives of this acquisition was to fast-track the use of technology in the Vanderbijlpark plant and other operations of the company.

In 1988, the iron-making section of the plant replaced manual repairing of blast furnaces with remote controlled methods, leading to an increase in the pace of production, and prolongation of the life span of blast furnaces. New continuous cast slabs were introduced at the Vanderbijlpark plant, helping to increase the quantity of steel production. In the same year, new machinery was introduced to produce new products, namely, steel roof tiles and insulated steel building panels (Iscor 1989). To meet the demands of the can and container market, a chrome plated steel line was to be commissioned at the plant in 1991, according to Iscor. In 1990, considerable effort was invested in increasing the productivity of labour through training and upgrading the technology of the plants. There were alterations of the colour coating line and this led to the acceleration of the production process in that section (Iscor 1990). In 1992, new technology was acquired to produce steel used for making trucks, motor cars and building materials (Iscor 1991). In 1993, the company reported that a technical

and technological operation with Nippon Steel Corporation of Japan resulted in the improvement of the production control system at the plant. Computer technology played a role in monitoring the pace of production and its quality (Iscor 1993).

Technological changes and workplace restructuring improved the company's productive capacity but workers were retrenched, outsourced and some were redeployed in the plant. The company also reported on redeployment and exit programmes which took place in 1998. A section 21 company called Prosperous Future Company (PFC) was to be involved in retraining and career change, entrepreneurial training to create small business and self-employment, finding alternative employment and follow-up support to ensure a smooth redeployment process (Iscor 1998).

In 2004, the company reported, "Expenditure on value-adding projects included the completion of the hot strip mill process computer upgrade and the reconfiguration of the sinter plant [which prepares raw materials for blast furnaces] at Vanderbijlpark" (Mittal Steel 2004:31). In 2007, ArcelorMittal South Africa (following the take-over of the plant by ArcelorMittal International) argued that it would use its direct link with other global ArcelorMittal International plants as well as the expertise within the group, to improve the quality of production at the Vanderbijlpark plant in order to be on par with world standards. Workers at the plant were to be exposed to quality control measures of these global ArcelorMittal International plants. Use of technology in improving quality was to be key in the process of quality production improvement at the plant (ArcelorMittal 2007).

According to ArcelorMittal South Africa, "Yet another factor is the need to continually re-invest in plant and equipment to keep pace with technology or market growth or both" (ArcelorMittal 2010:19). Broner Metals Solutions, the global provider of "supply chain planning, scheduling and manufacturing execution systems specifically for the Metals Industry, was awarded a data and production scheduling contract by the ArcelorMittal Vanderbijlpark Plant in 2008 (Business Editors and High-Tech Writers 2001:1).

According to Broner Metals Solutions (2007), Vanderbijlpark "is the largest of the four plants of ArcelorMittal South Africa, and represents an unusually challenging, planning and scheduling environment, because of the wide variety of plate and strip products and the intricate product routings required within the works" (Broner Metals Solutions 2007:1). The work of Broner Metals Solutions at the plant is about replacing manual processes with automated and computerised process (Broner Metals Solutions 2008:1). Broner Metals introduced "supply chain management solution" which was to deliver more responsive production and good service to buyers in 2007 (Broner Metals Solutions 2007:1).

Some of the technological changes in the 1990s and 2000s included use of remote controls in the use of cranes, increase use of computers in quality control of production in all phases, use of computers located in control rooms to control the machines, computerisation of the entire production process right from the beginning till the end of the process, and

mechanisation of packaging. All these process increased the pace and quality of production, but also led to the drastic reduction of the workforce at the plant (Hlatshwayo 2014).

5. Research methodology

A purposive sampling technique was employed, which meant that the researchers had a sense of the generic profiles of various categories of interviewees (Pickard 2012). According to Curtis et al. (2000:p.1003), "The sample should be likely to generate rich information on the type of phenomena which need to be studied". To generate information on NUMSA's capacity to respond to technological innovation, we made sure that our sample was representative of all the union structures, from regular members to union officials and leaders at the head office. In addition, the sample had to take the production line at the plant into account, which is why regular NUMSA members and shop stewards working in the raw materials section, the coke ovens, the blast furnaces in the iron-making section, the steel-making section and the storage section were interviewed. Another group of interviewees was ex-NUMSA members who had been retrenched as a result of restructuring and technological innovation.

The following were included: 26 members, six shop stewards, three ex-shop stewards, 23 ex-NUMSA members, three union officials based at head office, a regional secretary and an ex-organiser. In addition, a member of IG Metall who was based in Germany but working with NUMSA on how to respond to work reorganisation and technological changes, was also interviewed. In total, 64 in-depth and semi-structured interviews were conducted in 2010 and 2012.

Archival sources and documents from the union's websites, and head office, as well as from interviewees, were also collected. Some South African trade unions have university-based archives in the form of conference resolutions, correspondence and other documents which have helped labour researchers to understand various aspects of trade unions, ranging from gender issues to union responses to work reorganisation (Tshoaedi 2012). The ArcelorMittal library and museum in Vanderbijlpark also provided data on technological changes at the plant and the firm from the early 1949s to 2013. The researchers also paid a site-visit to the plant in July 2010, which helped them understand the role of machinery and labour in the production process (Hlatshwayo 2014). To maintain the anonymity of the respondents, they are referred to by numbers.

The interviews were transcribed individually. The transcribed interviews, archival documents, union documents, company documents, documents from the company, the union's websites and field notes made during factory visit were then analysed thematically. This entailed coding data and isolating themes and sub-themes, with a view to understanding NUMSA's education and research capacity in the context of technological changes at the Vanderbijlpark plant. To ensure the validity of the research

findings, triangulation was used, which entailed combining various research methods (Denzin 2008). The use of various methods and the presentation of findings to union meetings and conferences were important methods of validating the findings. For example, all the interviewees and participants in union meetings concurred that the union did not have the requisite capacity and skills to respond to technological changes at the ArcelorMittal Vanderbijlpark Plant (Hlatshwayo 2014).

6. The findings

6.1 The impact of technological innovation on jobs

Table 1 below demonstrates that the company, which comprised plants at Vanderbijlpark, Pretoria, Newcastle, Sishen and Vereeniging, responded to global and local competition largely by introducing new technology, as well as by drastically reducing the number of employees, in order to continue generating revenue.

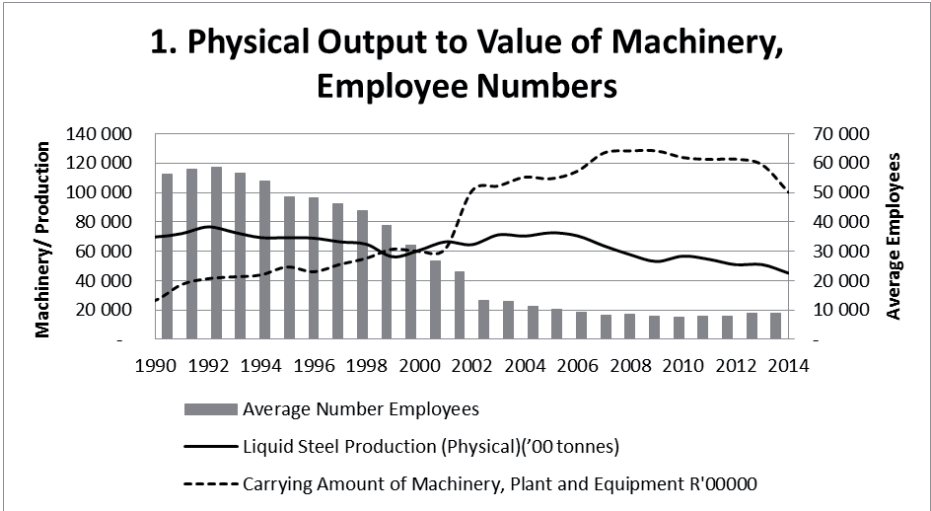


Table 1: Croock and Hlatshwayo (2016)

Through the data analysis, the following was observed:

Employee numbers at Iscor/ArcelorMittal declined from an average of 56 200 during 1989 to just 8 947 during the 2014 financial year. This represented a compound growth rate of negative 6.82% over the twenty-six year period and an average annual decline of 7.01%. Since revenue generated by the entity has continued to increase steadily (see table 2 below), it can be concluded that there is currently little need for physical labour by the company.

The carrying value of machinery, plants and equipment, as shown in the annual reports of the company, has increased five-fold since 1989, representing a compound growth rate of 5.49% and an average growth rate of 7.19%. The carrying value, or net carrying amount of machinery, plants and equipment represents the cost-price of those items used in production, less depreciation and any other loss of value, such as impairment due to damage or obsolescence. It can therefore be inferred that a continued increase in capital assets has been necessary in order to support increasing production costs and sales demands over the past 26 years.

Meanwhile, revenue generated by the company's operations has increased from R5 950m to R 34 852m on a nominal basis, increasing by a multiple of 5.9 and closely mirroring the escalation in the value of the machinery, plants and equipment owned by the company. On a real basis, excluding the effects of inflation, revenue has increased from R5 950m to R5 817m at a real average growth rate of 0.8%.

The entity's asset turnover ratio, calculated as revenue divided by the value of machinery, plant and equipment, has remained stable, ranging between 1.82 times and 3.5 times. This ratio reflects the amount of revenue generated by every R1 invested in machinery (i.e. the entity has generated between R1.82 and R3.50 for every R1 invested in capital assets). Its stability reflects the close relationship between the level of machinery, plant and equipment and revenue earned, suggesting that the level of investment in such fixed assets is a significant driver of turnover.

On the other hand, the amount of revenue earned per employee has climbed dramatically from R 119 000 (real: R105 900) in 1989 to R 3 895 000 (real: R650 100) in 2014, an increase of 33 (6.14) times, at an average annual growth rate of 17.84% (9.6%). See table 2, below:

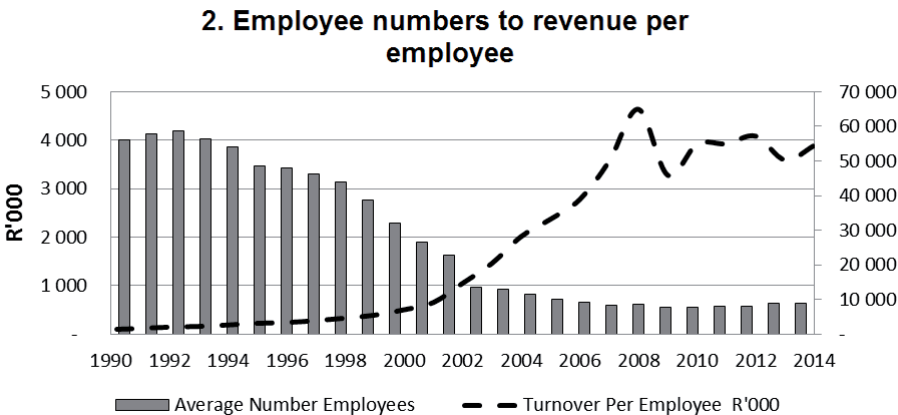


Table 2: Croock and Hlatshwayo (2016)

This increase is a function of both the solid increase in revenue and the dramatic decline in employee levels, as noted above, and again suggests that revenue is not reliant, in any significant way, on the number of employees on the company's books.

Consistent with the above tables, which noted a drastic decline in employees and an increase in the use of new technology, workers confirmed that machinery and the introduction of new technology had led a drastic reduction in jobs.

A worker at the Vanderbijlpark plant, spoke about job losses in the blast furnaces, recalling,

"We were using hands. We were lifting the steel, fixing things and loading things, using things called cranes. ... That changed. They introduced new cranes that were highly automated. The manual work we did was taken over by these new cranes. About 65 workers lost jobs as a direct result of the introduction of these automated cranes. It was in 2008" (Respondent 1, interview, 2010).

6.2 Inadequate research capacity within NUMSA

Launched in 1988, NUMSA's Research and Development Groups (RDGs) covered the following research areas: "housing, political economy, training and grading, health, collective bargaining, land, industrial restructuring and shelter" Masondo, 2010: 64). Among other things, the RDGs were meant to conduct research and formulate responses to work reorganisation, which was beginning to affect union members in the late 1980s. However, for various reasons, these structures collapsed in the mid-1990s. There were concerns that research findings by the RDGs were "not communicated to ordinary members" of the union (Masondo 2010:p. 64). Issues raised by RDGs were complicated and simplifying these issues for ordinary members proved difficult as even the top leaders were not familiar with them. This led to a proposal by the RDGs that did was not supported by the leaders and the ordinary membership. In addition, the RDGs were not part of the formal structures of the union, so there was no internal processing of the RDGs recommendations within the union structures. In addition, employers and unions did not have a strong tradition of cooperation and union participation in production issues (Forrest 2011).

Although the RDGs represented an innovative approach to dealing with the need to research production-related issues, the groups never moved beyond the stage of identifying problems and formulating general proposals for negotiation. We could find no evidence of the RDGs undertaking any production-related research at Iscor, nor did we find union proposals that addressed the specific issues of the plant relating to the complex reorganisation of the production process and the introduction of new

technology. A former NUMSA national organiser conceded that in general the union's research during the period of the restructuring of the plant in Vanderbijlpark was 'very weak or non-existent':

Our research on the actual restructuring at the Vanderbijlpark Plant was very weak or non-existent. In the late 1990s, Tanya Rosenthal from SWOP [Sociology of Work Unit, University of the Witwatersrand] did research on the restructuring of the plant in Vanderbijlpark. That was helpful, but this came in the middle of restructuring. There was another research project which looked at the steel industry in general. There was no very specific research which looked at the production process of steel at the plant. There was research done on wages by the Labour Research Services [a labour support organisation]. (Respondent 2, interview, 2014)

On record are the union's responses to production restructuring: calls for a moratorium on retrenchments and for retraining and redeployment of workers. Workers and former shop stewards from the period when the RDGs were active, some of them now unemployed, had no knowledge or recollection of union research on production issues at the plant. Many of them spoke of a deep sense of vulnerability and helplessness, particularly because the union seemed paralysed in the face of the massive job losses resulting from production re-organisation and technological innovations.

A NUMSA shop steward during restructuring in the 1990s, who was an ordinary member of the union when this study was conducted started working at Iscor in 1989 as a general worker and then became a controller in the coal-mill. He also confirmed that the union and its RDGs did not help them deal with technical changes at the plant in Vanderbijlpark. 'Technology has played a huge role in the drastic reduction of the number of workers at Iscor Vanderbijlpark. As a union, no research was done to help us respond to job losses' (Respondent 3, interview, 2011).

Even after technological and work reorganisation had changed the nature of work and reduced the number of workers, the union and its research arm had not developed the research capacity to intervene in production at the plant. It appeared that management still had the upper hand and controlled the pace and nature of changes at the plant, with no meaningful union input. Respondent 4, a former shop steward at the plant, was asked if the union had the research capacity to deal with technological changes and work reorganisation at the plant. His response was: "We do not have the capacity to conduct research. We need to build our own research capacity" (Respondent 4, interview, 2010).

Respondent 5, one of the former union organiser who is trying to help NUMSA build research capacity, commented: "NUMSA still struggles just to set up a proper research department of about ten or fifteen qualified people. They just pull one guy and say go and do a research on work place restructuring. What can one person do on such a broad

topic?” (Respondent 5, interview, 2011).

Respondent 6, who has been involved in helping NUMSA to develop the capacity to respond to work restructuring, reflected on the urgent need to respond to technological changes at plant level:

The problem is that we do not have the research capacity to deal with technological changes and production. We have worked with some local academics and comrades from overseas but that has not been sustained. A more systematic approach is needed. A unit dealing with production is needed. We need to employ engineers who can help us understand work reorganisation concretely (Respondent 6, interview, 2011).

Respondent 7, who used to organise NUMSA members at the Vanderbijlpark plant and now works at the union's national head office, spoke about building capacity to anticipate and respond to technological changes and work reorganisation. He stated that, in order to build internal research capacity, the union would need to create reinstitute organisers who could help build the unions' research capacity. This respondent argued that,

We need to look at training shop stewards and organisers so that they can be able to conduct research which will help the union to respond to production issues. (Respondent 7, interview, 2011)

In addition, the union can also ask employers to provide support and space for the union to craft strategies for tackling workplace changes. Respondent 5 (quoted earlier) commented on how IG Metall creates space to deal with production challenges in the context of work restructuring. He said,

I have a friend in Germany, he is not in unions but he is a progressive left activist. He says he gets paid by the companies to come and sit with shop stewards when they are reorganising the workplace. In the union here we do not have people with those technical skills for designing and organising a workplace. (Respondent 5, interview, 2011).

Despite very recent promises of organising ‘along the ‘value chain’, which means that the union intends organising all workers belonging to the same plant, including those working as cleaners and security guards and those that have a link to the metal and engineering sectors (NUMSA 2013:3), the union's recent collective bargaining

conference was not able point towards a new direction which incorporated research and capacity development and which would enable the union to influence changes in production. The statement of the bargaining conference of 2016 noted some of the problems: “Jobs, especially in the manufacturing sectors, are becoming more and more precarious, as retrenchments are announced almost daily; whole workplaces and even entire industries are in danger of disappearing and throwing thousands more on to the streets” (NUMSA 2016:1). However, the statement does not even hint at the direction to be taken by the unions to deal with concrete production challenges at the workplace.

6.3 Research conducted by external researchers and NGOs

Over the years, NUMSA and other black South African trade unions have benefited from the capacity provided by labour support organisations, specifically in the areas of education, research and health and safety advice. In cases where research was done for the unions, these organisations also followed up with seminars, workshops and accessible media such as posters, pamphlets and booklets. In nearly all these cases, the focus of the research, education and advice was on reproduction-type issues such as wages, working conditions, company ownership, directors’ salaries and health and safety concerns (Buhlungu 2001).

There was a general investigation of work reorganisation undertaken by the Trade Union Research Project, a labour support organisation based at the University of Natal (now the University of KwaZulu-Natal). The results were published as a primer on work organisation for trade union shop stewards and organisers (Jarvis et al. 1999). The contents were based on a study of union policies, reviewing the literature and conducting other forms of desktop research. Although it served a useful purpose in highlighting the importance of union engagement with workplace issues, it remained limited because it was not based on actual research in workplaces.

Another relevant study was a research project undertaken by the Cape Town-based International Labour Research and Information Group (ILRIG), which examined forms of work reorganisation and flexible production techniques such as ‘just-in-time’ production and its implications for workers and trade unions. It used case studies from the retail sector. The research methods used were diagnostic in nature and the study found that the South African retail sector had adopted new forms of work organisation that conformed to patterns of lean production and globalisation (Gentle 2009).

NUMSA and other unions were affiliated to global unions (formerly International Trade Secretariats) such as the International Metalworkers’ Federation (IMF) and the International Federation of Chemical, Energy, Mine and General Workers’ Unions (ICEM), both of which merged into the IndustriALL Global Union. As a result, they benefited from research conducted by these bodies in other parts of the world. But,

once again, this research was of a general nature and did not lend itself to practical applications in workplaces in the South African context (Hlatshwayo 2013).

Another research report was delivered in 2009 by a team of researchers from Ditsela (an education NGO), the Society, Work and Development Institute (a university-based research organisation), and the Friedrich Ebert Stiftung, a German donor-driven organisation that produced a research report evaluating NUMSA's collective bargaining strategy from 1992 to 1996 and proposing approaches to work reorganisation for the union (Webster et al. 2009). NUMSA shop stewards were part of the union structure to which these research projects were presented, but their scope was limited as they did not deal specifically with the technological challenges at the Vanderbijlpark plant.

Research on work restructuring focused on the automobile industry in South Africa. Two MA dissertations at the University of the Witwatersrand (Mashilo 2010; Masondo 2010) were funded by German sponsors. Both were supervised by Edward Webster, an academic associated with the black trade union movement since its formative years in the 1970s. His research, together with the two dissertations, arrived at three broad conclusions. First, they observed that NUMSA's organisational efforts and campaigns were narrowly focused on wages, working conditions and national politics, and that little attention was paid to the nuts and bolts of production and work organisation. Second, they recommended that union structures be reorganised so that they could respond proactively on production and general workplace issues. Finally, the research recommended that the RDGs be resuscitated so that they could conduct ongoing production-related research at workplace level (Webster et al. 2009, Mashilo 2010, Masondo 2010). While the findings of these studies could be generally regarded as lessons for the union at the Vanderbijlpark steel plant, no specific study was commissioned or conducted by the union with a view to helping the union respond to the very specific challenges of technological innovation.

Xaba's (2004), research, which was not commissioned by the union, investigated the effectiveness of the Employee Assistance Programme in South Africa. He used Iscor Vanderbijlpark as a case study of post-retrenchment assistance. Once again, this research did not investigate issues of production reorganisation. Instead, it was confined to examining the effects of retrenchments and the employers' attempts to address the conditions of ex-workers.

All of the above examples of workplace research studies done by the union and by independent bodies were general and broadly diagnostic in nature. This meant that, while this research was useful in identifying general trends and served to alert the union to its capacity deficits, it did not have much value in helping workers and shop stewards to grapple with production issues on the ground.

When asked whether researchers and NGOs had conducted research which enabled the union in a plant to respond to technological changes, Respondent 8, who had been a shop steward since the mid-1980s, responded: "NGOs and researchers play an

important role in building our research capacity, but the challenge is that no research has helped us to develop responses to changes in technology in our plant” (Respondent 8, interview, 2010).

6.4 NUMSA's National Education Programme

NUMSA and its predecessors had a reputation for running a vibrant union education programme and for producing layers of leadership, including shop stewards and organisers who had occupied prominent roles within the union, COSATU and political movements in general. Indeed, many former NUMSA unionists went on to become prominent local or national politicians, civil servants and even businessmen and women (Von Holdt 2003, Forrest 2011). The first decade of the twenty-first century saw many union education departments collapse as the focus shifted to other areas of organisation-building. NUMSA, in contrast, not only maintained a strong education department but also invested more resources in education and made innovative use of their newspaper, *NUMSA News*, and the journal, *NUMSA Bulletin*, to promote internal union education. To date, NUMSA's education department and the programmes that it runs are arguably the best in the country (Hlatshwayo 2013).

However, the union's education programme still has a serious blind spot in that it does not cover work reorganisation and technological change in the workplace in any significant detail. As with research, the educational topics covered by union education for shop stewards and organisers – collective agreements, induction, case handling, labour law and health and safety (NUMSA 2012a) – are driven by issues of reproduction.

There were instances in the past when the union had to respond to work restructuring and technological innovation in the metal industry. However, these educational interventions were general and lacked the detail that is required when dealing with technological change. These interventions were not, therefore, part of a sustained, long-term strategy. In addition, the ArcelorMittal Vanderbijlpark plant was not involved in these educational interventions.

In 1992, the union invited an Australian metalworkers' union official, Chris Lloyd, and two of his colleagues, to assist the union in responding to workplace reorganisation, skills development and career path development by running education programmes for shop stewards. Initially funded for six months through a grant by Australian People for Health, Education and Development Abroad (APHEDA), the programme was later funded directly by NUMSA for an additional two and a half years (King & Carton 1999).

The engineering sector was chosen as a pilot case for exploring these issues. Lloyd acted as an advisor to shop stewards, union organisers and national decision-making structures. In 1995, Lloyd and Roger Etkind, another NUMSA official, produced *Das Kettles: NUMSA Productivity Training Manual on Productivity and Work Organisation*.

This training and education manual was introduced in the context of generalised technological changes and the reorganisation of work to increase productivity in plants where NUMSA had a membership. The production of the manual and its related workshops and training programmes was a rushed response to the organisational changes at the workplace in the context of collapsing RDGs that were supposed to guide the union's interventions in work restructuring. The organisational direction of the manual was clear: the union had to come to terms with the fact that work reorganisation was here to stay and was driven by global restructuring of firms in order to reduce wastage and to base production on the needs of a customer. Computers and other forms of technology were therefore key in this process. Reemployment and retraining of workers so that they could use the new technologies had to be negotiated with management in cases where jobs were affected (Hlatshwayo 2013).

However, the union struggled to make a practical link between union education on production issues and collective bargaining demands. Despite efforts to include work reorganisation and technology issues in union education, wages continued to dominate union bargaining strategy and technology was not addressed, leading Lloyd to argue strongly that the new form of bargaining was only captured in union documents and popular publications and that, in practical terms, nothing had changed and the union continued to prioritise wage increment bargaining over workplace restructuring issues (Hlatshwayo 2014). It is important to note at this point that the need to engage with work reorganisation, presented by Lloyd and his Australian colleagues and embraced by leading union figures such as Adrienne Bird and the decision-making structures did not enjoy universal support within the union. As early as 1990, a group of unionists distributed a discussion paper entitled 'New Realism or Struggle for Socialism?' in which they critiqued the new direction taken by the union, which they called the 'social contract':

Then these policies are simply presented inside our organisation as finished proposals. We are then not given the chance to discuss these proposals in our structures, before they are adopted as policy in the CC [Central Committee]. Comrades, you can see that this politics starts at the leadership level. Our members are reduced to the role of spectators (cited in Hlatshwayo 2013; 245).

The viewpoint that favoured participation in work reorganisation initiatives prevailed and the concerned members had to toe the line. However, the new ideas did not take root inside NUMSA or the rest of the union movement. In his book *Work Organization and World Class Management: A critical guide* (1994), Lloyd (1994) chastised the South African unions for what he considered to be a narrow focus on wages and other reproduction issues.

Since Lloyd's criticism of NUMSA's lack of focus on production issues, there has been no discernible movement towards combine them with wage bargaining. In 2012, NUMSA reported that international exchange visits were organised for the purpose of learning more about work reorganisation and technological changes. The report noted a mismatch between the union's collective bargaining with employers and work reorganisation. In other words, there was no expression of the union's collective bargaining strategies in educational workshops on the reorganisation of work (NUMSA 2012b).

The lack of focused education on technological changes and work reorganisation is consistent with the general picture in other COSATU unions. The COSATU survey published in 2012 reported that course topics provided by its affiliates to shop stewards and organisers in 2011 and 2012 included "labour law, negotiations, health and safety, skills development, pensions, HIV and AIDS, political school, gender, economics, induction, organising and sector specific training" (COSATU 2012: 35). 10% of those who took part in the COSATU survey were trained in workplace issues.

Instead of looking at how to use education workshops and meetings to develop strategies and tactics for responding to workplace challenges, as well as broader economic and political issues, the NUMSA Congress resolution reduced its political education to political and ideological ends. The union stated that, "We must re-inculcate the culture of learning and literacy campaign as part of ideological work.... NUMSA must endeavour to build an institution mainly to serve as a base for political and organizational education" (NUMSA 2012a: 5).

On the other hand, Respondent 9, a NUMSA shop steward at the Vanderbijlpark plant, was more concerned about education which sought to provide shop stewards and union members with the capacity to respond to technological innovation. He said, "We as shop stewards we need training because the management has noticed that of us they lack education on how to respond to changes in production. This disadvantages us during negotiations with management about changes in the plant" (Respondent 9, interview, 2011).

The resolutions that emerged from the 9th NUMSA Congress, held in 2012, did not directly address the education concerns raised by shop stewards like Respondent 9. There were general resolutions on technology, including: "Despite these changes we should continue to demand for 6 months' notice period Main agreements [have] to be reviewed because of technological changes" (NUMSA 2012a: p. 21).

When asked about NUMSA's inability to respond to technological changes at the Vanderbijlpark plant and an orientation which seemed to prioritise wages, Respondent 10, a former NUMSA official, suggested that a new cadre, that understands the shift of the struggle from apartheid to post-apartheid workplace challenges, still needs to be born, and that education would play a major role in that process of birth. Respondent 10 said:

I can tell this thing it did not come without a challenge [work restructuring]. Remember, we had a trade union cadre who under apartheid his union task was to fight apartheid. It was to sell out to entertain these matters [work reorganisation and technological change]. Today we have to engage these issues. There are serious ideological question which are necessary. I am not surprised with those unions who hadn't moved (Respondent 10, interview, 2011).

The birth of a new union cadre means that shop stewards, organisers and union officials need to come to terms with the fact that strategic abilities are required, taking into account the democratic dispensation, the legal framework of post-apartheid South Africa and the need to have union education which directly responds to production challenges. For the union to be able to respond to technological challenges at plants like the one in ArcelorMittal Vanderbijlpark, the entire union leaders at all levels, union membership, shop stewards and organisers have to seriously consider moving away from putting production issues in the back burner. In other words, education about technological changes and production issues should cascade down to all union structures so that a new and a balanced unionism is born, that combines bread-and-butter issues with production challenges.

6.5 NUMSA's education at the plant

Regarding the specific education related to technological innovation at the Vanderbijlpark plant, a former NUMSA national organiser, Respondent 11, serviced the region that incorporated ArcelorMittal for many years. Reflecting on his experience of the relationship between union education and production issues, he observed:

The problem is that we did not have a concrete understanding of production, and our education on work restructuring was too general, and there was no consistency in the provision of education in this area of work. (Respondent 11, telephonic interview, 2014)

The shop stewards at the plant took part in a number of NUMSA's education initiatives; these included basic shop steward training, understanding trade unions and politics, workplace changes and health and safety issues. However, Respondent 8 (quoted earlier) felt these programmes did not help the union in responding to technological change at the plant. He said:

There has not been specific education focusing on our plant and changes in production and technology. We will only have discussions on these issues as soon as we are told that workers are about to be retrenched (Respondent 8, interview, 2010).

Education in the unions is not just about formal workshops. Unions also rely on discussion and debate as tools for learning. Discussions in meetings are important because they help to determine the direction and approach of a union (Vally et al. 2013). In line with this assertion, Respondent 12, a NUMSA member, was asked if the union at the Vanderbijlpark plant discussed technology and its role in the production process. His response was, 'No. NUMSA never discussed the issues of technology or maybe it could be that this technology was not yet really clear what it was all about. The union must inform us about those developments so that we can advise it' (Respondent 12, interview, 2011)

Respondent 13, a NUMSA shop steward at the plant, was of the opinion that current issues of technological change should be discussed by the shop steward council at the ArcelorMittal Vanderbijlpark plant. This discussion could also be enriched by the general meetings, because 'union members have ideas and suggestion' (Respondent 13, interview, 2010)

7. Discussion and conclusion: The limits of union strategy and action

The foregoing discussion has raised several questions about the challenges trade unions face in the workplace. We have used ArcelorMittal as a case study to illustrate the paradoxical state of affairs that NUMSA has faced since 1989. On the one hand, the union built up organisational power and became a strong voice of black workers and a defender of their rights in a context pervaded by the structures of white domination. On the other hand, its power declined sharply and its influence diminished as thousands of workers lost their jobs as a result of workplace reorganisation and the introduction of new technology.

We have singled out two areas in which NUMSA was found to be deficient, namely, research on workplace change and the incorporation of new knowledge on technology into union education programmes. In this section, we draw out some of the shortcomings resulting from the union's lack of capacity to respond to technological innovation and to reflect on its implications for union action and strategy in the second decade of the twenty-first century.

NUMSA has a layered decision-making process, comprising structures from the workplace level, the local groupings, the regions and the national level. Each of these layers plays a role in debates and decision-making, but the apex structures, namely the Central Committee and the National Congress, have the final say. Although these

structures received reports and recommendations, they did not have the expertise to make decisions at the various levels of the union about highly technical and diverse issues. As non-specialist representative bodies, the best they could do was to make general policies about work reorganisation.

Union organisers are in a similarly difficult situation as members of the union committees. Organisers are recruited from among shop stewards or from non-governmental organisations, universities and political organisations. They are therefore non-specialist activists, hired for their organising or mobilising skills and other abilities such as knowledge of labour laws, negotiation and other 'people skills', rather than for their understanding of production processes. Few union organisers can read and incorporate research findings into their day-to-day work of organising and mobilisation; even fewer have the skills to conduct rigorous and sustained research.

Shop stewards constitute the first line of defence for workers on the shop floor. They take up grievances on behalf of their members, defend workers in disciplinary cases and negotiate with management on plant-based issues. Once again, the ArcelorMittal research shows that, while shop stewards were supremely courageous and efficient organisers who could mobilise solidarity around worker grievances, very few of them had more than a generalist's understanding of production and technical matters.

Two issues deserve must be highlighted to illustrate the current limits of trade union action and strategy. The first is the general orientation of the union, including its structures, organisers and shop stewards, as well as the way resources are allocated. All of these are oriented towards a single dimension, namely reproduction in the form of wages, other forms of income and working conditions. This focus is expressed through 'palace politics', which involve union leaders and officials in political battles and power struggles in the unions, the African National Congress (ANC) and the alliance. These battles are often about accessing patronage in the form of top government positions and other rewards: membership of parliament, cabinet positions, civil service positions, Black Economic Empowerment (BEE) deals, and provincial and local government positions. For example, many of the key NUMSA leaders and officials who led education and research work left for government appointments in the post-1994 period. The irony is that most of them had argued that unions should distance themselves from national politics so they could build shop-floor structures.

Perhaps the most fundamental issue raised in this article is the limitation of industrial unionism in an age of global work-restructuring and neoliberal capitalism. A product of twentieth-century industrial capitalism, underwritten by structures of mass production and mass consumption, industrial unionism was a unidimensional approach to worker mobilisation, focusing on *reproduction* to the exclusion of *production*. This approach to worker organisation made sense under conditions of full employment and other Keynesian policies, which offered various forms of social protection to the working class. Under these conditions, large numbers of workers aspired to higher wages, better

working conditions and, in the case of South Africa, the elimination of apartheid practices in the workplace. Although Maree (1984) broached the question of technology in production as early as the 1980s, the subject was never taken up by trade unions like NUMSA, LSOs and other labour scholars.

The material base of the industrial union model and its modes of mobilisation, research and education have been eroded by globalisation, work reorganisation and technological innovation. In the case of ISCOR / ArcelorMittal, mass production started unravelling from 1989, at the same time as technology-driven work reorganisation gathered speed. Thus NUMSA was outmanoeuvred in a dual sense by these developments. First, the unravelling of mass production changed the terrain in which organising was taking place. Second, the intensification of technological change rendered the union even more vulnerable to the vagaries of flexible labour practices: the plant became lean and mean, with a tiny core of permanent workers and a growing outer layer of casual and contract workers, and union research and education were woefully inadequate to meet the rapid changes.

Research and education on technological changes have the potential to empower unions to respond comprehensively to work reorganisation. Of course, there is no guarantee that education and research in these areas reverse the tide of labour insecurity, but as the case of the German metal union has shown, unions with capacity to confront such issues are more likely to engage management in meaningful ways and push back the frontiers of work reorganisation to benefit their members (Mashilo 2010; Masondo 2010; Hlatshwayo 2014 and 2015).

NUMSA remains a powerful union in South Africa, known for militancy and strong education programmes which have produced worker intellectuals of note. Its blind spot is that it has not taken education and research seriously in the sphere of technological changes and work reorganisation. Using the case study of ArcelorMittal in Vanderbijlpark, this article has shown that NUMSA did not have adequate capacity in the sphere of work reorganisation, and was therefore unable to respond comprehensively to retrenchments and outsourcing. This article has also challenged the unions, NUMSA in particular, to take research and education on technological innovation at the workplace seriously. Respondent 12 did so when he said, “We have had seminars and workshop on work reorganisation. We are in partnership with IG Mettal [The biggest metal union] of Germany” (Respondent 12, interview, 2011)

References

- ArcelorMittal. 2007. Annual Report 2007. Johannesburg: ArcelorMittal South Africa.
- Bacon, N. & Blyton, P. 2004. Trade union responses to workplace restructuring: exploring union orientations and actions. *Work, Employment & Society*, 18(4):749-773.
- Buhlungu, S. 2001. *Democracy and Modernisation in the Making of the South African Trade Union Movement: The dilemma of leadership, 1973 – 2000*, unpublished PhD thesis, University of the Witwatersrand, Johannesburg.
- Broner Metals Solutions, 2007. Broner Wins Third Major Project with ArcelorMittal. [pdf] Watford: Broner Newsletter. Available at: <http://www.bronermetals.com/documents/newsletter/Broner_newsletter_No9_%20Aug07.pdf> (Accessed 14 August 2017).
- Business Editors and High-Tech Writers, 2001. Largest Steel Producer in Africa Selects Veraon for Real-Time Manufacturing Data. Sunnyvale : Business Wire. [Online] Available at: <http://www.thefreelibrary.com/Largest+Steel+Producer+in+Africa+Selects+Verano+for+Real-Time...-a080152831> > (Accessed 14 August 2017).
- Chikutu, J. 1982. *A Study of Trade Union Education and Research Work in Kenya: Present trends and future improvement*. Available at: <https://idl-bnc.idrc.ca/dspace/bitstream/10625/12335/1/96516.pdf> (accessed on 12 November 2016).
- COSATU. 2012. *Workers' Survey*. Johannesburg: COSATU.
- Croock, S. & Hlatshwayo, M. 2016. Physical Output to Value of Machinery, Employee Numbers. Unpublished Document.
- Curtis, S, Gesler, W, Smith, G, & Washburn, S. 2000. Approaches to sampling and case selection in qualitative research: examples in the geography of health: *Social Science & Medicine* 50(7): 1001-1014.
- Denzin, N.K. & Lincoln, Y.S. 2008. Collecting and interpreting qualitative materials (Vol. 3). Thousand Oaks :Sage.
- Forrest, K. 2011. *Metal That Will Not Bend: National Union Metalworkers of South Africa 1980 -1995*. Johannesburg: Wits University Press.
- Gentle, L. 2009. Trade Union Responses to Lean Production. Cape Town: International Labour Research and Information Group.
- Ghosh, P., Nandan, S. & Gupta, A. 2009. The changing roles of trade unions in India: a case study of National Thermal Power Corporation (NTPC): *Unchabar. Asian Academy of Management Journal* 14(1):37-57.
- Hlatshwayo, M.S., 2013. *A sociological analysis of trade union responses to technological changes at the ArcelorMittal Vanderbijlpark Plant, 1989-2011* (Doctoral dissertation). University of Johannesburg

- Hlatshwayo, M. 2014. NUMSA and Solidarity's Responses to Technological Changes at the ArcelorMittal Vanderbijlpark Plant Unions Caught on the Back Foot in *Global Labour Journal*, 5(3). <https://mulpress.mcmaster.ca/globallabour/article/view/2277> (accessed on 12 November 2016).
- Hlatshwayo, M. 2015. Unpacking Numsa's responses to technological changes at the ArcelorMittal Vanderbijlpark Plant. *South African Review of Sociology* 46(2):77-96.
- ILO. 2007. *The Role of Trade Unions in Workers' Education: The key to trade union capacity building, background paper for International Workers' Symposium, Bureau for Workers' Activities*, Geneva, 8 – 12 October 2007. Available at: http://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---actrav/documents/meetingdocument/wcms_112434.pdf (accessed on 13 November 2016).
- Iscor. 1967. Annual Report. Pretoria: Iscor.
- Iscor. 1969. Annual Report. Pretoria: Iscor.
- Iscor. 1971. Annual Report. Pretoria: Iscor.
- Iscor. 1973. Annual Report. Pretoria: Iscor.
- Iscor. 1989. Annual Report. Pretoria: Iscor.
- Iscor. 1990. Annual Report. Pretoria: Iscor.
- Iscor. 1991. Annual Report. Pretoria: Iscor.
- Iscor. 1993. Annual Report. Pretoria: Iscor.
- Iscor 1998. Annual Report. Pretoria: Iscor.
- Jarvis, D. Isaacs, S., Nicholson, J. & Phillips, G. 1999. *Making sense of workplace restructuring*. Durban: Trade Union Research Project.
- King, K. & Carton, M. 1999. *Transforming the labour skills arena in South Africa: the international dimension*. Unpublished paper, Centre of African Studies, University of Edinburgh.
- Lloyd, C. 1994. *Work organisation and world class management: a critical guide*. Red Earth Pubs: Johannesburg.
- Maree, J. 1984. *Trade Unions, Redundancies and New Technology Agreements, Southern Africa Labour and Development Research Unit (SALDRU)*, University of Cape Town.
- Mashilo, A. 2010. *Changes in Work and Production Organisation in the Automotive Industry Value Chain: An evaluation of the responses by labour in South Africa*, unpublished Master of Arts research report, University of the Witwatersrand, Johannesburg.
- Masondo, T. 2010. *Worker Participation in Workplace Restructuring in the Automotive Industry: A Comparative Study of German and South African Volkswagen Plants 1970 – 2009*, unpublished Master of Arts research report, University of the Witwatersrand, Johannesburg.
- Mathekgga, M. 2015. Fighting the battles of the mine workers: the emergence of the association of mineworkers and construction union (AMCU). *South African Journal of Labour Relations* 39(2):190-204.

- Mathews, J. 1994. *Catching the wave: Workplace reform in Australia* (No. 26). Ithica: Cornell University Press.
- Mittal Steel South Africa, 2004. Annual Report 2004. [Online] Available at: <<http://www.arcelormittalsa.com/InvestorRelations/2004/annual/downloads/reports.pdf>> (accessed on 14 August 2017).
- NUMSA. 2012a. "Numsa Policy Resolutions: Numsa Education Communication and Research, 1987 to end June 2012", <http://www.numsa.org.za/wp-content/uploads/2013/10/Section-3-NUMSA-Education-and-Communication-Edited-Version-5-consolidated-changes.htm> (accessed on 14 November 2016).
- NUMSA. 2012b. Secretariat Report: *Political, economic, social and international trajectory NUMSA*, 9th National Congress, 4-8 June 2012, Durban.
- NUMSA. 2013. Numsa Special National Congress December 2013 Discussion Document 4. Positioning NUMSA as a shield and spear of struggling workers <http://www.sahistory.org.za/sites/default/files/29-nov-2013-numsa-shield-and-spear-oct-24-20132.pdf> (accessed on 14 November 2016).
- NUMSA. 2016. 2016 NUMSA National Bargaining Conference, 24 April 2016 25 April 2016, Posted in 2016 NUMSA National Bargaining Conference, Press Releases <http://www.numsa.org.za/article/declaration-2016-numsa-national-bargaining-conference-24-april-2016/> (accessed on 12 November 2016).
- Otoo, K.N. 2013. Foundation chapter trade Union services and benefits in Africa. In Kalusopa, T., Otoo, K.N. & Shindondola-Mote, H. (Eds) *Trade Union Services and Benefits in Africa*. African Labour Research Network :Accra 17-14.
- Phiri, B . 2013. Trade union services and benefits in Zambia. In Kalusopa, T., Otoo, K.N. & Shindodola-Mote, H. (Eds). *Trade union services and benefits in Africa*. African Labour Research Network Accra: 392-432
- Pickard, A. 2012. *Research methods in information*. Facet publishing. London
- Rogers, J. and Streeck, W., 1994. *Workplace Representation Overseas: The Works Councils Story. Working under different rules*. New York: R.B. *Freeman and Russell Sage Foundation*, pp. 97-156.
- Roman, L.J. & Mason, R.B. 2015. Employment equity in the South African retail sector: Legal versus competence and business imperatives. *South African Journal of Labour Relations* 39(2):.84-104.
- Swanepoel, J. 1996. *Sixty Years: A History in the Making*. Pretoria. Iscor.
- Thelen, K.A., 1991. *Union of parts: Labor politics in postwar Germany*. Cornell University Press.
- Tshoaedi, M. 2012. (En)gendering the transition in South Africa: the role of COSATU women activists. *Transformation: Critical Perspectives on Southern Africa* 78(1):1-26.
- Waterman, P. 1993. Social-Movement Unionism: A New Union Model for a New World Order?. *Review (Fernand Braudel Center)* 16 (3): 245-278.

- Webster, E. 1988. The Rise of Social-Movement Unionism: The Two Faces of the Black Trade Union Movement in South Africa. In Frankel, P, Pines, N. & Swilling, M. (Eds). *State, Resistance and Change in South Africa*. London: Croom Helm, 174-196.
- Webster, E., Lambert, R. & Bezuidenhout, A. 2008. *Grounding Globalization: Labour in the Age of Insecurity*. Oxford: Blackwells.
- Webster, E., Mashilo, A., Masondo, T. and Bischoff, C. 2009. *Changes in the Production Systems and Work Methods*. Johannesburg: NUMSA, Friedrich Ebert Stiftung, Sociology of Work Unit and Development Institute for Trade Union Support and Education for Labour.
- Vally, S., wa Mphutlane, B. & Treat, J. 2013. Worker Education in South Africa: Lessons and contradictions. *McGill Journal of Education/Revue des sciences de l'éducation de McGill* 48 (3): 469-490.
- Vishwas S. & Southall, R. 2015. *Cosatu in Crisis*. Johannesburg: KMM Publishing.
- Von Holdt, K. 2002. Social Movement Unionism: the Case of South Africa., *Work Employment & Society* 16(2): 283-304.
- Von Holdt, K. 2003. *Transition from Below: Forging trade unionism and workplace changes in South Africa*. Scottsville: University of Natal Press.
- Xaba, J. 2004. *Employee Assistance Programme and Retrenchment: A South African case study, unpublished Masters of Arts research report*, Rand Afrikaans University, Johannesburg.

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