new technology: *new* skills, *new* opportunities?

DAVE KAPLAN* describes the new technology which is being or will be introduced in many companies. He argues that this will open up new opportunities for workers, especially in terms of skills and training. He suggests broad principles the unions should adopt when developing training policies.

The old technology and the new technology

Most companies in South Africa use the old technology of mass production. Each firm specialises in a very few products. It standardises its products in order to cut down costs of production and sell cheaply. This allows for dedicated machines - each designed to produce a specific part of the final product.

To complement the specialised machinery, operators are also specialised. Each operator is trained to operate his/her particular machine.

Under the old technology, management defines jobs very narrowly. Each job is relatively easy to learn. Workers are easy to replace with others who can be quickly trained. When the firm does badly it does not hesitate to fire workers. New workers can be employed when times improve and can be quickly trained.

The pioneer of this kind of production was the Ford factory in the 1920s. That is why this system is often called Fordism.

But now a very different kind of technology is being introduced in many industries. The new technology enables each firm to produce a wide variety of different products. Companies now attempt to compete not so much in terms of the price of the product but much more in terms of the variety and quality of the product. Henry Ford once said: "You can have any colour Model T Ford as long as it is black." Today, a Toyota model in Japan is said to be available in over 10 000 variations - different colours, different features etc.

Why has this change happened?

There are two basic reasons. Firstly, there have been changes in the world market. As incomes have risen, consumers increasingly want variety and quality. The new technology enables companies to meet these demands. Secondly, and most important, the new technology is more efficient. This allows management to reduce costs and increase profits.

The new technology is to

* *Dave Kaplan is the Director of the Economic Policy Research Unit at UCT and a member of the COSATU-linked Economic Trends group. This article was first delivered as a talk at a NUMSA workshop for shopstewards, as part of a programme to develop union strategies for training.*

	Old Technology	New Technology
Product	Standardised	Many Variations
Machinery	Dedicated	Flexible
Workers	Single - Skilled	Multi - skilled
Competition	Price	Quality, Variety

management's advantage. This does not mean, however, that it has to be to the workers' disadvantage - as I shall argue below.

The new technology

In the most industrially advanced countries, firms are now attempting to compete through providing a wider variety of products, or better quality products. Management uses new technology, new work organisation and worker participation to achieve this.

Firstly, in place of dedicated machines which each produce one product, management is introducing new machines that are flexible, ie which can produce a variety of products. Most of these machines are computer controlled. They can be programmed and reprogrammed quickly to do a range of different tasks.

Secondly, management is reorganising factories into cells which are responsible for producing a range of products, or doing a range of processes, and therefore has an almost full range of equipment. A cell is almost "a factory within a factory." This facilitates much more group working. Group supervision replaces the old system where supervisors check each individual's work.

Thirdly, and most importantly, operators need to be able to operate a number of different machines, re-set machines to produce different products, and do maintenance. In Toyota in Japan, the time taken to change the dies in the body press fell from 8 hours to 2 minutes. This is only possible if the operators are also able to perform the tasks of changeover.

Another important change is that workers are being made responsible for quality, in order to ensure there are no defects. This is known as quality-at-source, and it differs from the old system where a specialised quality control department checked the goods as they left the factory.

But, more than this, if management want to constantly improve the products, they need to involve the workers. Workers can be a very important source of ideas for improving production and products, and improving quality. The Japanese call this kaizen. For example, Sharp Corporation told its workers that unless they could get a 30% saving in materials, they would have to lay off workers. The workers made 30 000 suggestions, the savings were made and there were no lay-offs. At Toyota, employees made one and a half million suggestions in one year - an average of 32 per worker.

So the new technology consists of new machines and changes in the way in work is actually organised. In fact, it is the changes in organisation that are more important, rather than the introduction of the new machines. For example, General Motors in the US invested over $50 billion in the best of the new machines. But they introduced no major changes in work organisation. As a result the machines were poorly used, workers did not have the right skills and were angry about not being consulted - and the massive investment led to very little increase in productivity.

Challenges

Many companies in South Africa are introducing new technology and new methods of organising work. But they will not be successful unless they can win the active participation and co-operation of the workers. So if management wants the new technology to be successful, it will have to make sure

- that the workforce actively supports the changes
- that the workforce is trained in a broad range of skills so as to be adaptable and flexible in their tasks, but also creative with new ideas.

This means management will have to change its attitude to labour. Labour will have to be seen as a

resource (a resource for new ideas and improvements) and not simply as a cost (a cost of production which it is constantly seeking to minimise through low wages and retrenchment).

These changes can be a source of greater power for workers in the workplace, since management requires their co-operation.

Many unionists fear that new technology will reduce the level of employment, and therefore they oppose its introduction. It is true that these new technologies often do lead to a loss of jobs in the firm where they are introduced. But if unions do succeed in blocking the introduction of new technology, they may find that they lose jobs anyway. This is because the company will probably become uncompetitive, lose business or even go bankrupt.

New technology may in fact help to create a healthier, more competitive economy with more chances to grow. This can increase jobs in the following ways:

- Lower production costs and lower prices mean consumers can buy more goods. This increases demand and leads to more jobs.
- New industries are established to supply and service the new technologies.
- More competitive products lead to greater exports, which means more jobs and wealth for the whole economy.

It is also important to stress that the introduction of new technology will not automatically lead to more skills for workers. It can *reduce* workers' skill and *increase* management control over workers. In West Germany the introduction of computerised machine tools was generally accompanied by up-skilling for workers. In Britain, on the other hand, this was accompanied by deskilling. Whether the new technology benefits workers or not depends on management's aims, and also on workers' power.

Let me take an example, the introduction of Computer Aided design (CAD) in South Africa. Draughtsmen are in short supply and firms introduce CAD to allow for greater output of existing draughtsmen. But another route would be to upgrade skilled machinists to use CAD. If skilled machinists were trained in CAD, they would be able to make use of their knowledge of manufacturing to participate in the detailed design and specification of products.

The new technologies provide important opportunities for workers because management now can compete on the basis of a better quality product or faster introduction of new products. This requires the workers' co-operation and support. Skill and education play the key roles.

Training & career under old & new technologies

	Old Technology mass production	New Technology Flexible specialisation
Job Categories	Narrowly defined by machine characteristics	Broadly defined by process or skill level
Training	Once-off skills acquisition	Continuous skill-enhancing
Career Path	Nil (supervisor or seniority)	Progression to higher skill-based categories

How should the unions respond to the introduction of new technology?

National technology agreements

There are national technology agreements in a number of European countries. These agreements require employers to inform workers about the economic, social, financial and technical implications of new

technology before it is introduced.

However, national technology agreements have not been very successful in improving worker participation in the introduction of *new technologies. They do not* question management prerogatives to decide on what technology to introduce, but they do provide some framework for negotiation over the introduction and impact of new technologies.

If it wants some control over technology, the union movement has to gain far more knowledge about technology and work organisation. In some countries unions have established their own research centres and developed co-operation with the universities.

Training

Studies show that in countries where on-the-job training is provided, such as West Germany and Japan, workers have the flexibility and the skills to respond to rapid change in technology and in markets. In Germany, there is extensive apprenticeship training to develop general skills which can be used in different industries. In Japan trainees are given a range of assignments and work in different factories.

Trade unions should ensure that training programmes are based on on-the-job traning. They should also ensure that training develops general skills, not only skills for specific jobs, so that skills can be put to many different, and most importantly, yet unkown future uses. Training which imparts both generalised skills and company-specific skills makes workers more mobile. This will encourage *companies to hang on to* their workforce if they possibly can, even when times are tough, rather than retrenching them.

New principles for training

Training must embody certain new principles that will benefit workers. These principles will require other changes in the way the firm operates.

The first principle is that there must be *continuous skill enhancement* for all workers at all stages of their career. In Sweden, for example, workers are entitled to four weeks of paid leave per year for further education throughout their working lifetime. Companies have to pay 10% of their profits into a training fund. Training schemes have to be agreed on by both management and the workers.

The second principle is that job categories will need to be made far more broad. In the past, job categories have been defined very narrowly. The new technology is breaking this down : workers are becoming multi-skilled. Operators are maintaining their own machines or administering quality control procedures, for example. Using more broadly based job categories, based on workers' skills and training, is called *skill broadbanding*.

Jobs should be classified and paid according to the degree of skill that they entail, rather than the kind of machine the worker operates. *There should be a ladder of* jobs with increasing skills.

This skill broadbanding and the establishment of a ladder allows a career structure for workers, so that they can advance continuously through the additional skills/training that they acquire. Previously, the only route up for many workers was either to become a supervisor or to leave his/her job and train at something else. So, the third principle is to link training and skill acquisition to *a new career path or structure*.

Problems

There are major obstacles in achieving these objectives in South Africa. The most critical obstacle is that many workers have very poor basic education because of Bantu Education. There are also dangers that the new technologies can very easily benefit the more highly skilled workers, and widen the gap between these workers and the rest of the working class who have little or no access to such technology and training. The introduction of new technology and skills upgrading schemes should therefore be examined by the union movement both in relation to their own membership and in a wider context. ☆