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Paper Title: Two Case Studies on the Implementation of Team-based Work Organisation at Manufacturers in South Africa


Author: Anton Grütter

Institution: University of the Western Cape

Address: Priv. Bag X17, Bellville, Cape Town, South Africa, 7535

E-mail: agrutter@uwc.ac.za

Phone: 27 21 959 3682

Fax: 27 21 959 3219
Abstract

This paper reports two of twelve cases in a longitudinal study on firms that participated in the Workplace Challenge (WPC), a South African government initiative to support the introduction of employee participation and process improvement programs at small manufacturing firms. Qualitative and quantitative data was collected over 36 months in order to fill in the gaps in the research identified by Rogelberg in Church (1998).

The cases are of two firms that made high and low efforts respectively to implement practices associated with team-based work organisation and the resulting different operational performance outcomes. The findings are presented, interpreted in the context of the circumstances at each firm and conclusions are made.

The sustained implementation of an appropriate and comprehensive set of workplace changes was found to be related to operational performance improvement, while substantive participation by shop floor employees in process improvement and maintaining best operating practices appeared also to play a role. The timing lag between implementation and performance outcomes was found to be related to a “triggering” event rather than a definitive interval.

Introduction

While practitioners all over the world are reporting that they consider teamwork and continuous improvement as high on their priority list (Faull & Wood, 1998), the scientific jury is still out on the effectiveness of shop floor improvement teams.
As early as 1987 Lawler & Mohrman’s research showed that after a “honeymoon” period many quality circles failed. Recently Jørgensen et al (2003) made the observation that the majority of continuous improvement initiatives within the US and Europe died out within a few years. Church (1998, p51) interviewed Steven Rogelberg and Richard Hackman, two eminent scholars in the field, and noted that “we are a long way from having consistent concrete support in the literature that teams do in fact yield significant gains in productivity or performance over the individual.”

So why are managers turning to team-based work organisation? Part of the answer might lie with the limitations of the research that have been used. That team-based work organization does deliver improved performance in particular instances, but that given the limited resources to conduct rigorous research of a complex subject we have not yet been able to show what exactly those circumstances are.

Meredith & Sampson (2002, p415) argue that “while there has been solid growth in operations management of studies that statistically relate various elements of operations practice to performance, there has not been similar growth in rigorous case and field research. This methodology is typically aimed at generating hypotheses and deeper insights about operations management issues and problems through direct observation and on-the-spot data collection.” Mohrman & Novelli (1985, p95) suggest that “qualitative case-analytic techniques are appropriate for understanding what actually went on during the intervention while quantitative and (hopefully) quasi-experimental techniques can be used to measure impact.”

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The opportunity for doing this kind of research on a natural experiment arose when in 1996 the South African government launched the Workplace Challenge, a R24m (approximately US$3m) project to support manufacturing firms implement participative work organisation. It started with the negotiation of a national workplace change framework agreement between the organized business, labor and government constituencies at Nedlac, a national consultative forum seeking socio-economic accords. Since 1999 the project has been managed by the National Productivity Institute and approximately 60 firms participated in the first phase until 2003 during which consultants helped firms to develop and implement firm-level initiatives.

The author conducted longitudinal, multi-case research at 12 of the participating firms over a period of 36 months by collecting quantitative data on the practices implemented and operational performance outcomes and qualitative data about the implementation process and circumstances at the firms by means of recorded interviews with management, observation on site and document analysis.

The firms researched had on average 135 employees ranging between 20 and 400 employees and average sales of R50m, ranging between R2m and R200m pa. Six were in the auto-component sector, two in clothing, two in footwear and one each in furniture and metal fabrication. The original firm selection criteria were to have a cross-section of firms in the sectors participating in the WPC with at least two firms in each sector, but circumstances beyond the control of the researcher determined that firms from the auto-components sector predominated.
**Bundles of Practices**


Appelbaum et al (2000, p11) suggest that “at plant level, managers may adopt different workplace practices because they confront differences in such contingencies as the availability of modern technology, the characteristics of the labor force, the complexity of the product mix produced, or the value that customers place on on-time delivery.” Nevertheless all combinations of practices reviewed included core practices such as team-based work organisation and process improvement.

As no single approach predominated in the firms participating in the Workplace Challenge the set of structural changes and ongoing practices chosen for documentation was based on finding a balance between what the literature suggested should be included, what was actually found on site (e.g. records on maintenance were inadequate at most firms) and the time and resource constraints of the researcher. The over-riding concern was to include sufficient structural changes and practices to achieve a reliable indication of the extent of efforts to implement new work organisation.
With respect to the dependent construct several authors raise the issue of the level at which performance is measured: employee/team, plant operations or firm financial performance (Klein et al, 1994; Beech & Crane, 1999; Appelbaum, et al., 2000). In this research it was decided to measure performance at the level of plant operations as it is aggregate plant performance which most closely relates to the expectations of industry practitioners who advocate new forms of work organization. In addition, time and resource constraints precluded a detailed enough investigation at the other levels.

The research model and primary variables that made up the theoretical constructs are summarized in the following table:

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<th>Independent Constructs &amp; Variables</th>
<th>Dependent Constr &amp; Variables</th>
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<td>Communication/Consultation</td>
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<td>Retrenchment</td>
<td>Best Operating Practices</td>
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Table 1 Research Model
Sustaining Implementation

Sustainability of teamwork has also received attention in the literature. Lawler & Mohrman (1987) and Griffin (1988) were some of the early authors to warn that quality circles often wane after a “honeymoon” period. Womack and Jones (1996, p270) provided a five year timeframe for implementing a lean initiative. Caffyn (1999) and Fullerton et al (2003) suggested that implementation of this kind of initiative is a long-term process and indeed Grütter et al (2002) reported that sustained implementation of appropriate practices was found at firms where performance improvement was achieved.

Therefore this research was designed to document implementation of the variables included in the research model on a monthly basis over a three year period. For most firms the research period commenced at about the time when their initiatives started, but in two cases the initiatives commenced some years before this research.

Summary Findings

It was found that a composite measure of paid time taken off from direct production for weekly paid wage staff for communication, training and teamwork activities as a percentage of total hours worked was a good comparative measure of the extent of efforts to prepare and sustain the initiative to introduce the new work organisation at the firms. Firm averages over the research period ranged from 0.27% to 6.03% and was consistent with other indicators of the independent constructs.
Variability was also found across the dependent variables and the following clusters of firms could be discerned on the basis of the quantitative and qualitative data collected.

<table>
<thead>
<tr>
<th>Firms</th>
<th>Extent of Implementation</th>
<th>Performance Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>7</td>
<td>Moderate</td>
<td>Low/Moderate</td>
</tr>
<tr>
<td>3</td>
<td>High</td>
<td>Moderate/High</td>
</tr>
</tbody>
</table>

Table 2 Summary Findings

The low and high implementing firms experienced outcomes more or less as suggested by the research model. The firms that were classified as moderate implementers experienced a range of inhibiting factors such as organisational re-structuring and difficult market conditions. While a number of other interesting issues can be explored in the data, this paper focuses on comparing two of the firms representative of the low and high implementers of workplace change.

**Firm R**

Firm R had 57 shop floor employees and sales of R25m p.a. making it one of the smaller firms in the group researched. The firm produced “case goods” (furniture made from fibre board) and operated in a very competitive market. It was established a few years before this research when key management and shop floor employees left a dominant firm in the industry to start out on their own. Some of the original shop floor employees still had a small shareholding in the firm. The organizational structure was flat, although the work organisation was hierarchical. The working relationship between management and the workforce was good.
The batch/assembly process was arranged in a line with circular flow around the small factory. There was a separate prototype make-up area for seasonal changes in the product line. The basic production technology and manufacturing process had not changed much over the years. Boards came in one end, were sawn to size, edges trimmed and prepared for assembly. After coming out of the clamps, trimmings like handles were fitted and finally the goods were packaged.

The firm participated in the Workplace Challenge to the extent that its management and some employees participated in the early information and capacity building workshops on participative work organisation. However the typical practices associated with work organisation change were not implemented at the firm, because the management did not think it would be of significant benefit to the firm. The consultants’ report was interpreted as confirming that the operation was running well and that their recommendations amounted to “just basically better organisation, better planning and a selected second shift, instead of just throwing sort-of blanket overtime at
the [increased orders] problem, ...identifying the proper bottlenecks and manning those, which we'd already started doing anyway.” (Interview with Firm R Managing Director, 2000)

Figure 1 shows that Firm R spent a low proportion of shop floor paid time on workplace change supporting practices. What little training took place at the outset was not integrated into a human resource development strategy and communication and consultation with shop floor became more irregular. The supervisor’s production meeting was classified as teamwork, because it could not reliably be distinguished from what was known as a “team leader” meeting at other firms, but in effect they were given orders at the meeting. Virtually no other structural changes or practices were implemented at Firm R.

![Figure 2 Firm R: Productivity Performance](image)

The firm’s sales and physical output fluctuated over the research period, but ended at roughly the same levels where it started out. As can be seen in Figure 2 productivity improved marginally over the period. No internal quality measures were recorded at the firm. The number of customer
queries per month was used as a proxy measure although it was not entirely driven by product quality related queries only. It also fluctuated around the same level through the research period. The same applied to work-in-progress and absenteeism. Overall operational performance at Firm R remained at much the same level as at the outset of the research.

There was some merit in the management’s choice not to make changes to the work organisation at the firm as it was already a successful firm and there were no compelling reasons for changing a working formula. As the firm had equal access to government support for workplace change it served as a good base case against which to compare other firms where more extensive implementation took place.

**Firm N**

Firm N was a manufacturer of sintered metal products in which metal components were pressed into shape from metal powder and heat fused into the final product. Their biggest customer assembled auto-components, but they also supplied domestic appliance, office furniture, engineering and other manufacturers. They had 98 shop floor employees and sales of R21m p.a.

The firm was part of a global group that was supportive of their workplace change initiative, but practiced a policy of decentralized management. Local management initiated a workplace change programme well before the WPC. In fact the firm participated in the WPC as a revitalization of their workplace change initiative. Cells were introduced in spite of having to incur the expense of moving some heavy machines to improve flow through the operation. Employee consultation was well established and employees were regularly briefed on firm financial performance.
Figure 3 Firm N: New Work Organization Supporting Practices as % of Paid Time

Figure 3 shows how Firm N not only spent substantial paid time on workplace change supporting activities, but also sustained training and teamwork over a longer period. Apart from stopping production for daily “green areas” meetings, shop floor teams also did process improvement projects with guidance from a facilitator. Teams were given authority and small budgets to implement their recommendations. Shop floor practices such as visual management, 5S housekeeping, maintaining best operating practices, etc. were maintained at a high level.

Staff facilities did not receive much further attention after the toilet facilities and canteen were upgraded early in the process. The employee representative committee went through a difficult time initially due to employee distrust about the committee collaborating with management, but after the burning issues were addressed the committee was eventually absorbed into other structures for lack of issues to deal with. Late in the process, after extensive negotiation, a team-
based incentive scheme based on multiple shop floor performance criteria was instituted. Regular monthly and deferred annual payouts were achieved after some time.

An interesting episode at Firm N illustrates the complex relationship between implementation and performance. After the implementation programme at Firm N was substantially completed there was a period where performance improvements were not realized as had been hoped for. Then the firm experienced a sudden drop in orders and started negotiating with the shop floor employees how to apportion short time. The permanent workforce responded by approaching management with a proposal to eliminate contract labor and to do the work themselves. Management agreed, but with great trepidation, as it would have required productivity levels never achieved before. The necessary productivity levels were achieved and became the new standard for performance.

It would seem that in spite of all the re-organisation, training, support, and encouragement it was difficult for the workforce to conceive that they could perform at substantially higher levels. Until one day a contingency arose where the potential for improved performance was converted into realized gains.

In Figure 4 it can be seen how productivity at Firm N improved and Figure 5 shows their quality performance. Aggregate work-in-progress declined marginally despite a moderate increase in output. Absenteeism declined after initially increasing. It can be concluded that having implemented a comprehensive set of team-based work organisation practices over a period of five years Firm N did achieve substantial operational performance improvement.
Figure 4 Firm N: Productivity Performance

Figure 5 Firm N: Quality Performance
Conclusion

The quantitative operational performance data collected over a 36 month period showed that a firm where an appropriate, comprehensive set of structural changes and ongoing practices were implemented and sustained improved operational performance while a firm where little was implemented merely maintained its performance. As no other significant interventions, such as a change in market or technology took place at the two firms and their circumstances and type of production processes were comparable it is possible to conclude that a positive relationship between the independent and dependent constructs was demonstrated.

When complemented with the qualitative data collected a complex relationship between the timing of the implementation of changes and the performance outcomes emerges. It would seem that realization of potential performance gains may depend on “triggering” events, rather than a definitive time lag.

It would also appear that substantive participation of shop floor employees in process improvement and maintaining best operating practices is associated with performance improvement. However more research is necessary to confirm this proposition.
References


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