

ENVIRONMENTAL SUPPLY CHAIN MANAGEMENT: EVALUATING THE USE OF ENVIRONMENTAL MENTORING THROUGH SUPPLY CHAINS

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ABSTRACT

Environmental supply chain management is a burgeoning area of interest for businesses and researchers. There appears to be a generally accepted belief that environmental improvements through supply chains are easily achievable, and many researchers have provided case studies of companies where such programmes appear to deliver successful environmental performance outcomes. In reality, however, the use of environmental supply chain management tools often focuses on relatively limited approaches such as the use of environmental questionnaires, site assessments or criteria based environmental programmes developed by large customer companies. These programmes may require suppliers to obtain certification to ISO14001, to carry out self assessment of environmental performance or to attend information dissemination sessions on particular topics such as packaging management. While these may contribute towards some degree of environmental improvement, it is clear that a more fundamental relationship needs to be developed between customer and supplier companies.

This paper examines the whole concept of environmental supply chain management and the tools that it currently employs to effect environmental change in suppliers. It briefly evaluates the role of the tools described above, and goes on to examine the potential offered by mentoring through the supply chain. The paper provides an understanding of the term environmental mentoring and looks at the ways in which it actually works within companies. The core of the paper focuses on a mentoring project currently involving the research team and identifies the barriers and promoting factors that act on environmental mentoring within companies at the current time. The paper concludes by evaluating the actual and potential role of environmental mentoring as a tool to promote environmental improvements through supply chains on a local, regional and global level. It suggests strategies which will need to be adopted if such potential is to be realised.

1.0 INTRODUCTION

In recent years, the definition of environmental responsibility has extended beyond ensuring compliance with government regulations, and also beyond a few proactive initiatives in leading edge companies. The need to integrate environmental concerns into the economic strategies of the company is seen as key to the sustainability of the company's future. In many large companies, environmental responsibility now includes a

comprehensive view of the company's own environmental impacts, products and facilities, and an understanding of how wastes, emissions and discharges can be reduced and eliminated through the supply chain. As Godfrey (1998) argues, "The practice of monitoring and improving environmental performance in the supply chain is fast becoming a requirement of responsible business practice. It is also accepted that the ecological performance of a company may depend on that of its suppliers" (Godfrey, 1998, 244). Companies are therefore constantly on the search for new ideas and methods that may allow them to achieve their aims. How successful these methods are is dependant on a highly complex set of variables, and businesses sometimes have little appreciation of the challenges facing them in trying to improve environmental performance through the dynamic and difficult web created by inter-business and interpersonal relationships that exist throughout supply chains and supplier networks.

2.0 WHAT IS ENVIRONMENTAL SUPPLY CHAIN MANAGEMENT?

2.1 Definitions

To understand why companies are beginning to choose to enter such a potential minefield, it is first necessary to take a brief look at the framework in which such changes are occurring. There are a number of definitions that have been given to the practise of managing and achieving environmental improvement through the supply chain. Green et al (1996) suggest that it is "the way in which innovations in supply chain management and industrial purchasing may be considered in the context of the environment" (Green, Morton and New: 1996, 188) Messelbeck and Whaley cited in Sarkis (1999) provide a more detailed definition when they state that the greening of the supply chain includes consideration of "the environmental effects of the researching, developing, manufacturing, storing, transporting and using a product, as well as disposing of the product waste". From such definitions, it is obvious that a company choosing to implement any form of environmental supply chain management strategy, needs to critically evaluate all of the available methodologies and tools if they are to pursue supplier environmental improvement programmes that stand a chance of succeeding.

While some methodologies have become relatively well understood, if not always well practised, for example, the use of supplier environmental questionnaires, other rather more challenging approaches have yet to receive much exposure in industrial situations, or much attention from the academic community. To achieve successful environmental improvements throughout its supply chain, a company needs to understand more fully the factors that contribute towards successful business to business relationships. It also needs to be aware of the many barriers and problems that can arise when methods demanding more intimate and resource heavy relationships are instigated as part of any programme. It is, therefore, a research area that requires further substantial investigation in both theoretical and empirical terms, if companies are to feel secure in investing in programmes that may demand significant commitment from a wide range of employees.

2.2 Drivers of environmental supply chain management

One of the main drivers of managing the environmental performance of suppliers by a customer company has been the environmental management system standard, ISO14001. While the standard does not contain a high profile section exerting companies

implementing the standard to manage their suppliers, there are a number of points raised which encourage companies to develop some kind of strategy to ensure that they know what suppliers are doing, and to ensure that their environmental liability will not be compromised.

The potential to drive down costs through more efficient and effective use of the supply chain is another reason why companies choose to become involved in such activities (Krut and Karasin, 1999:10). Costs can be cut through the better management of resources and material flows through the supply chain, and the application of waste minimisation techniques such as mass balance auditing can result in significant savings for the customer company, but also for its suppliers. A caveat has to be applied here, however, as those involved in researching the behaviour of retail supply chains will recognise. Cost down may be of benefit, but can also be used as a tool to exert draconian pressures on suppliers wishing to stay in a supply chain serving one of the large supermarket chains.

The avoidance of environmental risk is a big driver for environmental supply chain management (Krut and Karasin, 1999). The linkage of a customer with a supplier, whose reputation becomes damaged because of poor environmental management, or a specific environmental incident, may lead to damage by association. An example found by the research team in Wales was that of a large company who were anxious when one of their local suppliers, having experienced a large and damaging spill on site, were linked with them as a major customer in a local newspaper. The potential effect on community relations was a major factor in the company deciding to participate in an environmental supply chain programme.

Bowen et al (1999) suggest a range of further cost reducing drivers which include lowering the costs of purchasing through choosing less virgin [more recycled] materials, helping the firm comply with legislation at a lower cost, reducing the amount of components that have a poor environmental performance and reducing the use of hazardous materials.

Cost reduction factors are important motivators, but other reasons concerning the reduction of risk and the avoidance of liability are of equal importance. Proactive environmental supply chain management can help to reduce the risks of upcoming environmental legislation if suppliers are encouraged to meet demands relating to products, components or services (CESMB, 1999). The security of supply can also be consolidated if closer customer-supplier relationships are developed, and problems concerning compliance within the supply chain can be dealt with early on in companies supported by a close and guiding relationship with a more knowledgeable customer. It is clear that there may be a number of factors driving a company to become involved in some aspect of environmental supply chain management, and that it is often a combination of factors that initiates the first step. The urgency and aspect of the issues driving a company to become involved may at least partly influence the approach used.

2.3 Tools of environmental supply chain management

There are four main tools of environmental supply chain management. These represent four different steps or stages that allow a company to progress through increasingly involved and comprehensive programmes, requiring a proportionately greater degree of

commitment and resource investment from all the companies involved. Figure 1 shows these four stages:

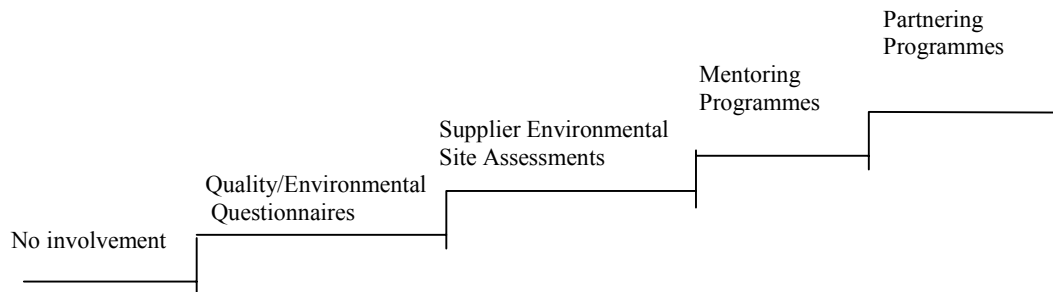


Figure 1. Stages of supplier environmental involvement through the supply chain

Each of these tools is briefly described below. Questionnaires have long been part of a company’s methodologies in identifying what suppliers are doing, but usually in terms of quality programmes such as ISO9001. When environmental activities are integrated into a company’s management systems, the quality supplier questionnaire may be supplemented by a number of specific environmental questions. These questions may range from the simple, for example, “does your company have an environmental policy” to the more complex investigation focusing on specific emissions or environmental impacts. In recent years, a number of major companies have developed questionnaires designed to provide a comparative analysis across their primary supply network.

The second type of customer – supplier environmental management technique is that involving assessment of the supplier at their own site (or on the site of the customer if contracting work is being carried out). Here the assessment procedure is likely to be carried out either by personnel from the customer company, or by a third party, for example, a consultant. In both cases, the assessment may assume the form of a site assessment or audit, supported by examination of company records and documents and by interviews with key personnel. Such assessment may take from a few hours to a number of days depending on the scale of the task, the nature of the supplier (i.e. a complex chemical process may involve more work than a simple industrial tools supplier), and the level of detail required by the customer. Assessments are generally undertaken by trained personnel, or at least somebody within the customer company with a basic knowledge of environmental issues, although this is not always the case. The research team has discovered many instances where companies carrying out supplier environmental assessments have relied on their quality staff, health and safety personnel or production teams to collect and analyse data about which they have very little training or knowledge.

The third and fourth tools are those of partnering and mentoring. Some authors and practitioners appear to use these terms somewhat interchangeably, but there are a number of important differences. Mentoring involves the development of a close relationship between the customer and supplier company, usually focusing on one or more discrete projects. The customer company may agree to mentor or guide the supplier company in developing or working through a particular project. The most common instance of this in relation to environmental management is guidance in developing and implementing

ISO14001 or the instigation of a waste minimisation programme, although other examples exist. Partnering implies a much more balanced approach, whereby customer and supplier work closely together on a number of levels and in a fairly integrated way to improve the operational efficiency of each. Projects are long term and may include research and development, product design, marketing and product stewardship. In reality, however, partnering and mentoring are indeed likely to combine to some extent in programmes between customers and suppliers depending on the characteristics of each company, and on the departments and individuals taking part.

Jenner (1997) states that the concept of supply chain [partnering and mentoring] represent “a sea change in attitudes by larger companies who, with the goal of achieving or maintaining world class status and remaining competitive, wish to form closer working relationships with selected key supplier companies” (Jenner, 1997:8). He goes on to identify the role of the mentor company as “providing guidance, advice and assistance to their suppliers..[by]..shar[ing] their knowledge and skills with their suppliers, in order to increase the capability and standards of their suppliers, and thus improve the quality of the product” (Jenner, 1997:8). From these statements and the brief review of what each technique entails, it is clear that becoming involved in a partnering or mentoring programme with suppliers is a big step on from engaging those suppliers at arm’s length through the use of questionnaires or other such tools.

2.4 Evaluation of environmental supply chain management tools

As part of the work carried out with companies through an Environmental Supply Chain Management Network in Wales, the research team have worked closely with a range of companies, large and small, to develop the ideas of managing the supply chain in an environmental way through applying them to everyday practice. One exercise carried out in a workshop was to look at the different tools used in managing the supply chain in an environmental way, and companies were asked to identify what they thought the strengths and weaknesses were of each tool. Tables 1 to 4 below summarise these responses:

Table 1. Strengths and Weaknesses of the Questionnaire Method

Strengths	Weaknesses
<ul style="list-style-type: none"> • Easy to produce • Helps communication • Method of reporting back • Data for targets and objectives • No site visit – low cost • Customer identifies requirements in a structured way 	<ul style="list-style-type: none"> • Return rate • Supplier may misunderstand questions • Incorrectly filled in • Reliability of data • No control over who responds • Does not accomplish anything • What will be done with gathered information? • Not enough to rely on questionnaires alone

Table 2. Strengths and Weaknesses of the Environmental Assessment Method

Strengths	Weaknesses
<ul style="list-style-type: none"> • More comprehensive / accurate than a questionnaire • Less threatening to suppliers • Can help to set up own internal procedures • More specific to company • Results to potential customers 	<ul style="list-style-type: none"> • Reliability of data • Skills and resources in SMEs to carry out exercise • Difficult to check • Biased attitude • Time consuming

Table 3 Strengths and Weaknesses of the Mentoring Method

Strengths	Weaknesses
<ul style="list-style-type: none"> • Builds relationships • Common goals / targets • Highlights problems • Working towards something • Two way transfer of knowledge • Non threatening • Pro-active • Provides necessary skills etc • Helps suppliers meet customer environmental objectives 	<ul style="list-style-type: none"> • Cost and resources • Cost – must prove benefit • Location e.g. lack of physical facility • Possibility of personality clashes • Need clear aims to avoid losing focus • Over reliance on outside assistance • Need mentoring skills and the right people

Table 4. Strengths and Weaknesses of the Partnering Method

Strengths	Weaknesses
<ul style="list-style-type: none"> • Can develop long term relationship • Builds teamwork • Highlights problems • Platform for innovation • Ability to plan • Provides necessary capabilities • Pro-active • Shared benefits 	<ul style="list-style-type: none"> • Resource investment • Limited number of partners • May limit business opportunities • Could lose out on technology from other supply chains • Very fragile –based on openness and trust • Problem of ‘one-way’ partnering • ‘open book’ – financially sound • Passing phase

While the participating companies were agreed that partnering and mentoring had much to offer in strengthening their relationships with customers and gaining the skills and knowledge to improve environmental improvement, they were clearly aware of some of the difficulties involved in taking such a course. It was interesting that they felt that partnering or mentoring could actually limit business opportunities and cause significant cost implications.

Despite such reservations, many authors have identified partnering and mentoring as having such positive benefits that they cannot be disregarded. Bowen et al (1999) suggest that partnering practices following a pattern of collaboration are likely to assist in the greening of the supply chain and that these relationships will enhance a company’s ability to manage its own environmental issues more effectively. They argue that “a partnering approach with suppliers may be a key resource appropriate for facilitating green supply, for promoting understanding between customers and suppliers on the environmental impact of their activities.....[and] communication and the transfer of information between the [company] and its suppliers and build confidence within inter-organisational relationships to aid in the implementation of environmental change”(Bowen, 1999). Lamming and Hampson agree, stating that “joint [collaborative] working should create the best results, giving a more cost effective environmental solution” (Lamming and Hampson, 1996:S52).

It is, therefore, against this background of potential expectation that companies can choose to become involved in partnering or mentoring programmes, as they appear to offer, on the surface at least, positive returns for both the environmental performance of all companies involved and for the overall relationship and working environment in which they operate. The experiences of companies involved in partnering or mentoring for reasons other than environmental, i.e. for technical development, quality improvements or logistics management does appear to prove to companies that programmes involving environmental issues are likely to impose little greater demand on the relationship between them and their suppliers.

3.0 ENVIRONMENTAL MENTORING – WHAT IT OFFERS

3.1 Identification of the Possibilities

Mentoring is perceived as a tool that may help to ensure compliance with environmental legislation, as well as assisting in the identification of markets. It has been suggested that mentoring can help assess the effectiveness of environmental programmes and can assist in the reduction of costs by eliminating wasteful activities. It is also often suggested that mentoring can assist mentor and mentee companies in identifying company practices that may be in non-compliance with environmental regulations or the standards required by key stakeholder groups. As a result of the closer relationship, practices or situations that may pose future liabilities to a company, such as a spill or illegal emissions, are more likely to be identified. The nature of the mentor relationship may well enable a range of employees within each company involved in the programme to develop new skills and new understanding through increased exposure to wider experiences across new industry sectors or contact with employees from other companies who hold new competencies. This process can enhance the environmental and economic performance of each company taking part in the programme, not just within the environmental departments, but in the company as a whole. The increased coherency derived from taking part in such programmes may also demonstrate to customers that companies within a supply chain, from primary supplier through the vertical chain to secondary, tertiary and quaternary suppliers, are acting together to enhance their environmental performance. This may create a supplier network that offers reduced risks as well as reduced costs. This kind of enhanced reputation can prove positive for all companies engaged in a mentoring programme as it demonstrates to a range of stakeholders, including regulators, the media and society as a whole, that a company is making a commitment to become more responsible and accountable in its actions, and that it recognises the current demands of consumers and society. Such improvements are of particular value to small and medium sized companies whose capacity for improvement is often limited by the size of the company and the resources it has available. Sarkis (1999), too, suggests that “close and inter-firm networks [can] be a way to help small organisations become more effective environmental partners” (Sarkis, 1999:20). The process of mentoring can provide such companies with much needed support and offer them the opportunity to feel as though they are contributing to significant change through their involvement with an internationally recognised firm.

There have been a number of examples of companies using partnering and mentoring approaches to drive environmental performance improvement through their supply chains.

The number tends to remain fairly small, however, and the reasons for this are discussed at some length in analysis of the research team's own experiences. However, the experiences of a small number of case studies are beneficial in determining what it is that creates a successful programme, and where problems and barriers are likely to arise.

One example of mentoring is that of the Jaguar car company based in the West Midlands of the UK. The company decided as part of its commitment to the Accelerate programme (a part European funded programme designed to help create a world class supplier base for the motor industry in the region) to work in an intensive way with a relatively small group of fifty SME suppliers (ENDS, 1998:23-24). The Jaguar programme focused on providing assistance to these fifty companies through the involvement of three mentors, working in conjunction with the company through local authority participation. The mentors were designed to provide regular assistance and transfer of know-how to supplier company employees in order to help the companies achieve savings and to bring them up to ISO14001 certification level if appropriate. Even here, though the application of the mentoring concept was perhaps not applied in the true sense of company acting as mentor to company, as the mentors used by the company were not company employees, but were involved with the programme as part of the joint approach with the local authorities.

3.2 The current research work – environmental supply chain management mentoring in Wales

The current research has been carried out as part of a European Regional Development Fund (ERDF) part financed project designed to produce environmental improvements through the supply chain. The methodology used in this particular project is to work with customer companies, some large companies and some SMEs, and a small number of their suppliers based in the South Wales region, through a partnering and mentoring approach. A variety of environmental and business issues are targeted through this approach, including the management of transit packaging, packaging use and waste creation in the customer company as well as product tracking to reduce rejects and product quality failure between supplier and customer.

The research team used a model developed by the consultancy partner to develop the programme. This model is shown in Figure 2.

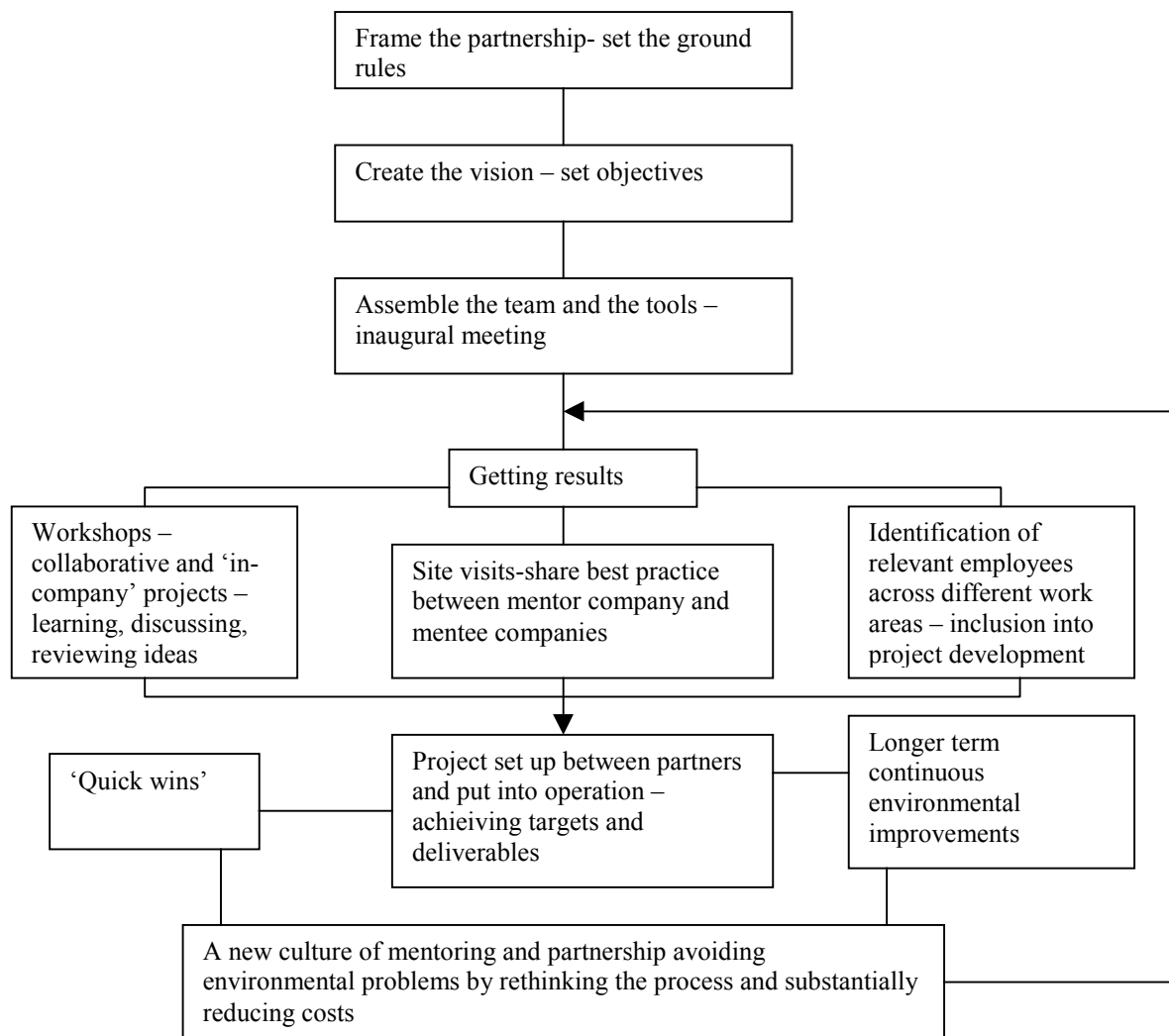


Figure 2. Model of Environmental Mentoring

While the model gave a starting point to the programme and allowed a structure to be set up and followed, it quickly became apparent that weaknesses within the model existed, and that problems or barriers arose to influence the potential success of the programme. Such barriers are not, however, specific to one such model as this, but are prevalent throughout all programmes and approaches relying on companies, and more accurately, individuals, to see them through to a successful conclusion.

3.3 Barriers to the effective use of environmental mentoring

There are a number of barriers that can contribute to reducing the likely success of environmental mentoring or partnering programmes between companies. These barriers can be divided into four main groups; these are communication related, culture related, cost related and commitment related. Within the research areas detailed above, many of these barriers have been encountered. The large company involved was interested from commencement of the project to see if partnering or mentoring could take place to improve the management of transit packaging, thus providing benefits to the company through reduction of packaging waste and reduction of transport used to move excess packaging

from supplier companies to the customer company. Benefits were also expected to accrue to the suppliers by reducing transit packaging purchasing costs and unnecessary journeys. For both supplier and customer it was expected that decision making processes could be jointly developed to provide an effective procedural approach to the complete management of the transit packaging process. Two different departments within the customer company – the purchasing department and the environmental department, initiated the programme. In this particular company, it was the purchasing department that took the most dominant lead. One of the problems encountered during the programmes was that of barriers posed by individuals within the participating companies. In the customer company, the purchasing department was dominated during the start of the programme by one manager, who while stating the need to carry out such programmes with suppliers, showed limited personal commitment and instead expected other staff to become involved without providing them with sufficient authority to carry out some of the necessary operations. While there was continuing commitment from the less dominant environmental department in the company, this was probably not enough to guarantee the ongoing interest and commitment of people in the supplier companies. The behaviour learnt from the customer company in this case was a negative one; the non-integration of the environmental and purchasing departments and the sometimes adversarial nature of their relationship was apparent to those supplier companies taking part in the mentoring and partnering programmes. Commitment to, and interest in, the programme lessened and one company decided not to attend any more meetings or take part in any more actions. Those companies that remained were represented by individuals who had an interest in environmental matters either through personal conviction, or as part of their job.

Although the customer company perceived itself to be fairly innovative in the way it addressed problems and in its approach to new technologies and manufacturing processes, the actual understanding of environmental impacts and their longer term implications for the economic well being of the company were poorly understood except by the environmental manager. His role was effectively restricted to one of monitoring procedures and policy; the company tended to ‘firefight’ environmental problems, and did not appear to have the necessary proactive or preventive mentality, or allow the environmental department the necessary resources, to achieve real progress in developing innovative environmental initiatives. It has taken the recent fuel crisis in the UK to highlight the problems associated with poor logistics and the inefficient use made of transport and related transit packaging within the company.

While a reasonably well-developed relationship existed between the customer company and its suppliers, the relationship was based mainly on cost. It was found that while the customer company wanted to improve its relationship with some of its suppliers through the mentoring programme, when financial or economic circumstances changed the suppliers involved were seen to have little real influence on the relationship between the two companies; suppliers were seen as expendable.

The research team also worked with an SME acting as the mentor company. As mentioned earlier, it was recognised that problems could arise in that the customer company may be smaller and less influential than some of its suppliers. However, in this particular instance this proved to not be the biggest barrier to effective environmental supply chain management using mentoring as its chosen approach. Although at the outset, similarly to the large company involved in the project, the company was interested and enthusiastic

about the aims of the project there soon developed a number of problems and barriers. These were mainly as a response to lack of commitment from a senior level. One of the main necessities with environmental supply chain management, as with a number of other areas in the environmental field, is the measurement of baseline data. Although the research team was able to get the commitment of the team leaders and the workforce in the mentor company, there was insufficient authority at the vital stage to actually make things happen. This then led to a loss of morale among the workforce and the resulting disillusionment communicated itself to those suppliers asked to participate in the programme.

The relationship between the company and their suppliers was less well developed than in the larger company although there was some interest from a number of supplier companies. The emphasis within the mentor company itself tended to be on packaging issues, waste minimisation and management issues and housekeeping relating especially to the delivery and storage of supplied items. The focus within the suppliers appeared to be concerned with the ways in which the purchasing policy of the mentor company impacted on their ability to respond to demands for product change. Their anxieties focused on the relatively poor means of communication the mentor company offered. In addition, suppliers concerned with the ways in which their products were handled and used by the mentor company.

Following the identification of such a range of issues, the research team and the participating companies decided during consultations to examine more closely the relationship between the SME and its *customer* companies in an attempt to extend environmental improvements up, as well as down, the supply chain by focusing particularly on product reject rates between the SME involved and a number of their customers. There was no measurement of these reject rates and a haphazard system for logging customer complaints within the mentor company, but the company felt that some of the problems they experienced with their products could be traced back to the quality and handling of the materials and items they received from suppliers.

It may have proved difficult for the company to mentor its suppliers because it was itself not very advanced in internal environmental performance management. In this way a partnership approach may have been more successful in that the smaller companies could work together with the mentoring company towards achieving a common aim. A mentoring aspect could have been included if one of the customer companies further up the tier had taken on the role of mentor with the SME involved in the project facilitating the information and passing it down the supply chain. The actions of the managing director, whilst committing the company to some form of mentor approach, and then by not acting to support this commitment, meant that the expected progress was not made.

Both the examples discussed exhibit a range of problems that can be encountered when attempting to implement a mentoring programme between companies. It is, however, clear that the personalities and behaviours of individuals within any one company can have a significant effect on the success or failure of the overall programme. This would suggest that more research on the behavioural patterns of individuals within companies is required to identify ways in which such people can be encouraged to lessen the barriers they pose.

3.4 Factors promoting the use of environmental mentoring

One of the expected benefits from using a large multinational company as the mentor in the programme rather than using an SME was that larger companies were seen as more likely to have the necessary influence on their suppliers to get them involved in the project. It was thought, and has been reinforced to some extent during the project, that an SME as the customer company and putative mentor would be less likely to be able to exert a positive force on their suppliers, especially when those suppliers could often be larger than the customer company itself.

It was found that one of the main strengths of the mentoring programme at the large mentor company was that strong relationships already existed between the purchasing department and the suppliers to the company. The fact that contracts tended to be medium to long term in duration was part of the cause of the strength of the linkage. Barlow (1999) suggests that success in partnering or mentoring projects is dependent on the degree to which there is “mutual understanding – and an accommodation – of each [others] goals and the way they change over the course of a project” (Barlow, 1999). When the mentoring programme began to focus on the issues of transit packaging as a specific project, the mentoring approach began to take on more partnering characteristics, and the core of interest was generated by the environmental and quality managers taking part. This was not seen as a weakness of the programme, indeed, it was recognised from the outset that a mentoring approach would be increased in effectiveness once the participating companies felt that they were in a sufficiently positive, non-threatening relationship with each other.

3.5 Mentoring locally and globally

To evaluate the use of environmental mentoring as a tool for achieving environmental improvement changes throughout the supply chain, it is necessary to consider the scale and influence that such programmes may have. The majority of mentoring programmes tend to take place at the local level. It may be more difficult to instigate and especially maintain environmental mentoring programmes on a wider geographical scale. The essence of mentoring and partnering appears to lie in the success with which relationships can be built up between companies. These relationships are not between departments or functions, however, but involve individual people within each company. As shown above in the study of the two study companies, it is often the individual that is key to determining the success or failure of such programmes. While companies in the same locality or region may be able to enter into mentoring with relative ease, the same cannot be said when suppliers are located in different countries or different continents. Even considering the advances made in IT and E-business there are still the obvious problems of distance. It is often easier therefore to concentrate on those suppliers that are geographically close. The problem may arise that these closely located suppliers are not the key suppliers or indeed those suppliers with the greatest impacts on the environment.

4.0 STRATEGIES FOR THE FUTURE – USING ENVIRONMENTAL MENTORING IN A MORE EFFECTIVE WAY

It is clear that there are a number of valuable lessons to be learnt from the research. Environmental mentoring and partnering are sometimes seen as a logical extensions to a

company's ISO 14001 system, or to existing supplier programmes carried out by the quality department. While there is some validity in these assumptions, they are reliant on too many variables to make the outcome a certainty. It is important to ensure that any programmes follow a number of rules when being developed and implemented, as without these the programmes are likely to have a limited measure of success.

It is easy to forget that success is invariably measured in tangible outcomes, and that businesses require pay backs in short time frames. Therefore, the quality of the output must equal or exceed the investment put into the project by the company. This remains the case whether the company is required to make a straight financial investment, or to match funds in terms of time spent, equipment loaned or data provided. One of the most important rules to follow is that of manageability. Projects must be measurable, focused and achievable. It is very easy to fall into a trap of inclusiveness. Wathey (2000) argues that evidence from programme implementation indicates a danger involved in partnering type approaches may be that the partnership may "revert to (more) adversarial [approaches].....[especially] in the most competitive markets." It is important, therefore, to involve people from all areas of the company even when it may be unclear at the beginning of the programme as to how they will be directly involved. A degree of ownership, however uncommitted, at an early stage can do much to reduce the danger of creating an exclusive club later on in the programme. One of the factors evident in all successful environmental supply chain management initiatives is the successful inclusion of all sections of the workforce and an overall commitment to change. As Jenner (1997) suggests the challenge to successful mentoring is "to remove barriers of distrust and reluctance to be open, and create the right atmosphere and working relationships to release the ideas, creativity and energy to solve common problems" (Jenner,1997)

In reality, even the largest companies may only be superficially interested in the environment. Working with suppliers in mentoring programmes to achieve environmental improvements is still relatively rare. Mentoring type programmes are still much more likely to occur in terms of quality management, between purchasing departments in the customer company and sales departments in the supplier company or between engineering and design departments, especially in the product development stage.

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