TRAINING IN THE SOLID WOOD MANUFACTURING INDUSTRY:

A Comparison Between Interior British Columbia, Alberta and New Zealand

by

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ABSTRACT

This study examines training in solid wood manufacturing companies in Interior British Columbia, Alberta and New Zealand and determines the success of implementation at the sawmill site level. Information obtained in this study will be used to determine the degree of the company's investment and commitment to training; to determine the types of training programs for management and staff; and to define desired skills set that are required by the company.

Two mail surveys were developed for the study. The population for the corporate survey consisted of 17 solid wood manufacturing companies having two or more sawmills while the sample for the site survey consisted of 53 sawmill sites. The response rate was high where 64% and 51% of the sample responded to the corporate and site surveys, respectively, in the three regions. Topics in the survey included training policies, corporate and site budgets, training programs, skills requirements, and training culture.

Results of this study show that a majority of companies had informal training policies, training decisions were largely decentralized, and sites were committed to increasing their training budget for the year 1999, where about three-quarters was allocated to specific training. In addition, the companies invested in their in-house trainers and direct supervisors to train their employees and widely used teamwork, on-the-job training, cross training, and retraining programs to expand their employees' skills. This was backed by their immense use of employee performance measures and productivity reports to evaluate training. Although almost all companies strongly viewed training as an investment and encouraged employees to develop new knowledge, they did not have long-term plans to identify their skills needs. Time constraints and financial resources were seen as a major barrier to training their employees. Overall, corporate respondents were not significantly different from site respondents with respect to their attitudes and behaviors towards training.

Most sawmill respondents said that site operations improved in the last three years as a result of training. In an effort to improve training within the company, about half of the respondents said they needed to do more effective succession planning, better link training needs to overall business strategies and develop more results-oriented evaluation measures.

TABLE OF CONTENTS

Objective 3: To determine the types of training programs for management and staff

Objective 4: To define desired skills set that are required by the company

Objective 1: To define corporate training policies and determine the success of implementation at the sawmill site level

Objective 2: To determine the degree of the company's investment and commitment to training

Objective 4: To define desired skills set that are required by the company

LIST OF TABLES:

LIST OF FIGURES:

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CHAPTER 1

LITERATURE REVIEW

1 LITERATURE REVIEW

1.1 INTRODUCTION

The global economy is entering a new era: growth of the service industry has exploded; newly industrialized countries have emerged (Benton, 1991); and technological developments continue to grow exponentially (Wright, 1991). At the industry level, the solid wood manufacturing sector has gone through significant changes and restructuring in the 1990's. It has been faced with increasing challenges created by:

- strong global competition from countries that have faster growing trees, and lower fiber and labour costs (Clark, 1999);
- oversupply of low value commodities (Maness et al., 1994);
- the decline of traditional exports, such as British Columbia's green hemlock lumber (Ernst & Young, 1998) or New Zealand's export logs to Japan (New Zealand Forestry, 2000);
- increasing use of non-wood alternatives and development of engineered wood composites (Maness et al., 1994);
- more complex trade barriers, such as the Canada-US Softwood Lumber Agreement (Clark, 1999); and
- shifting from specialized machinery for fixed stages of manufacturing production to more flexible and adaptable machinery to perform a variety of tasks (Benton, 1991).

With these challenges, the ability of companies to adjust their business strategies and adapt their manufacturing equipment will be critical to survival (EIS Inc., 1999). Forest owners need to manage their forests according to future markets, rather than simply achieving the best biological outcome (Stanley, 1998). Likewise, lumber manufacturers need to become more flexible to satisfy the changing needs of customers by producing the products they demand (Cohen, 1992; Cohen and Sinclair, 1990). An important part of achieving these objectives has been corporate rationalization, restructuring and consolidation, and the adoption of new processing technology (Cohen, 1990).

However, the use of sophisticated processing technologies requires appropriate levels of quality control and sufficient numbers of trained sawmill employees (Maness et al., 1994; Clark, 1999). For example, sawmill managers have been frustrated by a shortage of skilled workers to operate

the advanced technologies or by frequent retraining of new operators given the high rate of job mobility across borders (EIS Inc., 1999).

It also requires a transformation of not only the nature and content of collective agreements, but employee training and development and the ways organizations view or use educational activities. Many companies have responded by eliminating or enlarging jobs, retraining displaced workers within the company, or establishing partnerships with their union for training design.

In summary, a well-educated and highly trained workforce is fundamental to the competitiveness of the solid wood manufacturing industry. This relationship is evident in numerous studies (Barron et al., 1989; Britton, 1999; EIS Inc., 1999; Hum and Simpson, 1996; Stevens and Walsh, 1991). However, not much has been done at an international comparison level. Hums and Simpson argue that the priority for subsequent training surveys should not be to replicate data on the incidence of training. Rather it should attempt to measure training duration and expenditures and capture different facets of the employer-based training decision for workers and firms (Hum and Simpson, 1996). Stevens and Walsh states that there is a lack of international comparisons of the expenditure, level of training and other related issues. They recommend further research on skills requirements at an industry level (Stevens and Walsh, 1991).

A study conducted by EIS Inc. recommends further research in three areas: "Firstly, private sector and public sector stakeholders would benefit from a province-wide survey to measure the extent of the skills gap specific to BC's wood products manufacturing sector. Secondly, further research should identify some industry benchmarks of education and training success, where investment in human capital is demonstrated to yield a high rate of return. Thirdly, research should identify procedures, or benchmarks, that could be used by wood products manufacturers to evaluate the effectiveness of their education and training programs" (EIS Inc., 1999). These three studies (EIS Inc., 1999; Hum and Simpson, 1996; Stevens and Walsh, 1991) plus recommendations from industry human resources professionals have helped establish the parameters for the objective of this study.

This literature review is divided into 7 sections. The first section provides an introduction and background of training, followed by a summary of objectives for the study. The third section provides a background of the forest industry (e.g. timber supply, industry sales, demographics, importance of the industry, etc.). The fourth section describes and compares the evolution of labour relations in British Columbia, Alberta and New Zealand and how it may impact training within an organization. The fifth section defines training and describes several different training models that are incorporated in the results and discussion chapters of the thesis paper. The next section describes the skills shortage crisis and the critical skills–technical, conceptual and communications—which are required by companies in the solid wood manufacturing industry. Finally, the last section ends with a conclusion.

1.2 OBJECTIVE OF STUDY

This study examines the solid wood manufacturing industries from very different yet similar regions of the world—British Columbia, Alberta and New Zealand. While geographically dispersed all three regions serve many of the same markets (e.g. Japan and the US), with similar products (e.g. dimension lumber, millwork and moulding) and substitutable wood species (e.g. lodgepole pine vs. radiata pine). In addition, these regions have not evolved their secondary manufacturing or value-added industry to the same degree as Eastern Canada or Europe. Comparing these regions will reveal opportunities, trends, and experiences in which these participating companies can learn from and potentially apply to their own primary production and secondary manufacturing operations.

Information obtained in this study will be used to compare the level of employee training in the three forest economies with different international labour relations climates. The objectives of the study include:

1) to define corporate training policies and determine the success of implementation at the sawmill site level;
2) to determine the degree of the company's investment and commitment to training;
3) to determine the types of training programs for management and staff; and
4) to define desired skills set that are required by the company.

In addition, the information will help profile the opinions and training concerns of managers in companies in the three regions.

A look at some of the elements of the forest economy in each of the three regions sets the stage for examining training and education in detail. Elements that will influence the direction of training include: timber supply, industry sales and establishments, import and export activity, contribution to gross domestic product, productivity levels, technological developments, and demographics.

1.3 THE FOREST INDUSTRY

1.3.1 Timber Supply

Although the world demand for wood is increasing, supply is becoming more restricted. This is due in part to environmental pressures to reduce logging activity, particularly in the old growth forests. The supply shortage, however, is being offset by the emergence of forest industries in newly industrialized nations, increasing use of non-wood substitutes, improved wood processing efficiencies and new technological developments and forest management practices (New Zealand Ministry of Forests, 1995).

In global terms, New Zealand accounts for 1.0 percent of the world's total supply of industrial wood and 1.2 percent of the world's trade in forest products. In comparison, Canada accounts for 18.8 percent of trade, Chile 1.1, Russia 2.2 percent, and Sweden 8.2 percent (NZFIC, 2000).

British Columbia's forests totaled over 7.5 billion cubic metres in 1996. The predominant species (i.e. douglas fir, hemlock, spruce, red cedar, and lodgepole pine) are softwoods accounting for 94 per cent of the total (COFI, 1998). These species have an average age of 60 to 80 years and are known for their density and strength. In 1999 the total harvest in BC was 75.6 million cubic metres (PricewaterhouseCoopers, 2000).

Most of Alberta's 38.2 million ha of forested land is located in the northern region of the country and has a total timber harvest production of 16.8 million cubic metres (Natural Resources Canada, 1997). The north supports a very productive forest industry (NADC, 1999). Softwoods

account for 44 percent of the forests whereas hardwoods and mixedwood account for 33 and 23 percent, respectively (Natural Resources Canada, 1997). The predominant coniferous species are white spruce at 47 percent, pine at 41 percent, and black spruce at 9 percent. Its hardwood consists primarily of aspen (AFPA, 2000).

In 1999, New Zealand's forests cover 8.1 million hectares, of which, 1.7 million hectares are planted production forests (NZFIC, 2000). It plants about 80,000 hectares per year, whereby sixty-two percent of its total stand is 15 years old or younger. It is predicted that as these plantings mature, the number of logs available for processing will be beyond the current capacity of New Zealand sawmills. The industry must therefore improve its processing efficiency, upgrade the skills of the workforce, develop new products, and add value through further processing (Stanley, 1998).

Radiata pine is by far the dominant species in New Zealand accounting for 91% of the total. These trees are fast growing, having an average age of 28 years. About 65 percent have been pruned to produce knot-free timber. Radiata pine is followed by Douglas fir at 5% of total plantation and only about 2% of the resource is made up of its indigenous species, including beech, kauri, rimu and tawa (NZMAF, 2000).

Up until 1989, the majority of NZ's plantation forests were owned by the government. However, by 1999, the government had reduced its ownership of planted forests to 6% from 52% ten years earlier. This is quite different from British Columbia where the government owns almost all of its forests (Stanley, 1998).

1.3.2 Industry Sales[1]

The B.C. forest industry is a key contributor to the provincial economy. Sales in BC's forest products industry in 1999 increased 21% over 1998 to $18.2 billion. It reported net earnings of $923 million in 1999, up significantly from the $1.1 billion loss employed in 1998. Lumber net earnings were $816 million in 1999, compared to net losses in 1998 of $58 million. Despite

[1] All Canadian and New Zealand financial figures in this report are in Canadian dollars. Since the surveys were completed between February and July, 2000, an average exchange rate is used where $1 NZ is equal to $0.67CAN.

these improvements from last year, "driven by improved product prices and internal restructuring, the industry is still in need of further price increases, additional cost reductions and improved efficiencies" as well as more focused employee training (PricewaterhouseCoopers, 2000).

The forest products industry is extremely important to New Zealand. Already, it makes up over 6% of national income (Stanley, 1998). The total products output exceeds $3.35 billion per year (NZFIC, 2000).

1.3.3 Industry Establishments

British Columbia has over 700 wood products manufacturing establishments in which over 200 of these are primary sawmills (Natural Resources Canada, 2000). Alberta has almost 650 wood products establishments (Natural Resources Canada, 2000). Of these 650, there are more than 200 sawmills, 5 oriented strandboard mills, and approximately 300 value-added wood products operations (AFPA, 1995).

New Zealand's forest product industry consists of more than 350 sawmills, approximately 80 remanufacturing plants, 11 panel board companies, and 4 pulp and paper companies. By 1999, its sawmills produced 3.2 million cubic metres of sawn timber, and panel board companies produced approximately 1.2 million in particle/fiber board, veneer and plywood (NZFIC, 2000).

1.3.4 Import and Export Activity

The total value of BC's forest products exports was $14.6 billion in 1997, a drop of $300 million from 1996. In 1997 its lumber exports totalled $8.1 billion, accounting for 55 percent of total forest products shipped overseas. International markets showed signs of a fragile recovery with overseas shipments from BC interior mills increasing by 35% in 1999 to 900 million fbm (PricewaterhouseCoopers, 2000). Recipients of BC's softwood exports include the US at over 54 percent , Japan at 21 percent, and the European Union at 3.8 percent (COFI, 1998).

Alberta's total value of forest industry exports in 1998 and of shipments in 1996 was $2.6 billion and 4.2 billion, respectively. About a quarter of the total was softwood lumber exports, valued at $640 million. Its top three export markets in 1998 consist of the US (71%), Japan (12%) and the European Union (8%) (Natural Resources Canada, 1997).

The total value of New Zealand's forest products exported in 1999 was $1.84 billion, ranking forestry third in terms of commodity exports. Its top four markets - Japan, Australia, Korea and the United States – consume about three-quarters of the country's forest products exports (NZFIC, 2000). About 85% of log exports were destined for just two countries, Korea and Japan. This has left the industry vulnerable to changing economic circumstances in those countries, having no real competitive advantage against other commodity grade log suppliers (Stanley, 1998).

1.3.5 Contribution to Gross Domestic Product (GDP)

BC's forest industry contributed $12.9 billion, or 16% of the gross domestic product ($80.7 billion) and accounted for 49 % of the province's manufacturing shipments in 1999 (PricewaterhouseCoopers, 2000). Alberta's forest industry contributed an estimated $1.2 billion to its GDP in 1996 of which $823 million came from the wood products sector (NADC, 1998). The New Zealand forestry industry accounts for 3.9% of GDP, or $2.51 billion in 1999 (NZMAF, 2000).

1.3.6 Productivity Levels

In British Columbia, ongoing technological improvements led to consistently rising productivity in the sawmills in 1997-98. For example, board feet per man-day on the coast was 1,850 and 3,000 in the Interior. Return to log, measured by earnings per cubic metre, was $110 for the coast and $90 for the Interior (Ernst & Young, 1998).

Labour productivity increased by 3.5% in Interior British Columbia in 1999, showing a continual growth in the last three years. These improvements continue to arise from the closure of less productive mills and gains in productivity at others (PricewaterhouseCoopers, 2000). However,

many interior mills are now reaching a technological and productivity limitation as cost savings measures and advanced technologies that make better use of available timber are being offset by the decreasing availability of high quality large logs (Ernst & Young, 1998). A report by EIS Inc. attributes the plateau to a lack of advanced training and education. It reports that "Canadian wood products companies have repeatedly achieved lower levels of productivity when compared to their European or American competitors. One reason is that most companies did not have the required level of education and training in staff and management to achieve better results" (EIS Inc., 1999).

The New Zealand solid wood manufacturing industry is not efficient by world standards although it has improved considerably in recent years. The average recovery rate (green lumber) in a sawmill is only 53% (Stanley, 1998) as opposed to world standards of about 65 percent (Tolnai, 2000). Average recovery rates at the better mills are around 58% (Stanley, 1998). Large sawmills have rationalized and restructured their mills, invested in new optimizing equipment, hired their suppliers to train its employees on these new technologies (Tolnai, 2000), and increased the number of operating shifts at remaining mills. While new sawmills will be built over the next few years, the immediate focus is to achieve better performance from their existing operations. Given the upcoming surplus of maturing radiata plantations, substantial new investment in new capacity is also required if New Zealand is to maximize the potential of its forest resources (Stanley, 1998).

1.3.7 Technological Developments

In the past decade, the purpose of equipment and lumber manufacturing processes in the forest products industry has evolved dramatically. "Initially, technology tended to be drivers of industry competitiveness. Later, they became enablers, helping the industry enhance its global competitiveness. Today, the main focus of technology applications in the forest industry is cost minimization" (Ernst & Young, 1998).

To keep up with the market changes, sawmills in all three regions have invested or have planned to invest in upgrading its technologies. In BC, capital expenditure increased slightly in 1999 to $800 million from $729 million in 1998 (PricewaterhouseCoopers, 2000). Likewise, Alberta has invested more than $4 billion in new and upgraded facilities since 1986 (AFPA, 1995).

According to the Ministry of Agriculture and Forestry, New Zealand will need to invest some NZ$4.36 billion in new processing facilities over the next 15 years. This could include 100 medium-sized sawmills, 90 remanufacturing plants, and a mix of either 20 panel board mills or six pulp and paper plants (NZMAF, 2000). But the types of technologies they decide to invest in will depend on the markets a sawmill serves.

According to a study conducted by Lee et al. (1999), technological innovation, quality control procedures and target markets served are directly interrelated. For example, Interior BC and Alberta sawmills, that predominately supply the North American market, produced much more planed and kiln-dried dimension lumber than mills serving Japan or other Asian markets. These mills focused more on optimization technology aimed at a standardized product (Lee et. al., 1999). Coastal BC operations and New Zealand mills supply the Japanese and the US markets. For the Japanese mills, large-size and high-density lumber seems to be the demand. These mills favor manual systems that require a high level of human judgment and control. Lumber shipped to the US, on the other hand, would need technology similar to the Interior BC mills (Tolnai, 2000; Lee et. al., 1999).

In the last few years, mills have had to move away from commodity products, such as log exports, and moved to more value-added products to ensure long-term success. It will be a challenge for some of these mills to successfully shift their market focus given their lower quality timber supply (Lee et. al., 1999). Sawmills are already incorporating engineered wood products, such as laminated lumber and finger-jointed lumber, into their sawmill processes (NZMAF, 2000). However, a successful strategic shift requires a company's willingness to foster a culture of innovation and upgrade employees skills so that they can effectively respond to highly selective customers and deliver high quality products and services (Wright, 1991). In addition, greater vertical integration and strategic alliances between the forest growing and processing sectors appear to provide another good method for achieving this (EIS Inc., 1999).

1.3.8 Demographic and Employment Trends

"The forest industry is British Columbia's largest industrial employer, employing more than twice as many people as the next largest industrial employer". In 1999, A total of 90,600

employees were directly employed in the forest industry, and a further 181,200 jobs were indirectly linked to this sector, bringing it to a total of 271,800 people. Lumber employment averaged 20,300 in the same year (PricewaterhouseCoopers, 2000).

The forest industry also plays an important role in Alberta and New Zealand. Alberta's forest products industry directly employs almost 26,000 people and indirectly supports 16,000 other workers (Natural Resources Canada, 1997). In New Zealand, the forest industry directly employs 31,000 people where over half work in sawmills and remanufacturing plants (NZFIC, 2000).

The demographics in the workplace is changing: workers are aging, more women are entering the labour market, and contractors and independent consultants are becoming more popular. As the average age of the workforce increases, many unionized companies confronted the prospect of being unable to develop a group of skilled young workers (Apodaca, 1998; Sibson & Company, 1998). Companies, particularly unionized companies, face the challenge of providing developmental opportunities for their skilled young workers. On the one hand, seniority clauses or job descriptions often act as barriers for young workers to grow with the company. On the other hand, companies face serious loss in human capital if the expertise and experience of older employees are not transferred to the younger cohort. This dilemma gave rise to an increased emphasis on early retirement schemes, mentoring programs, or other training programs geared towards succession planning for their entry-level professionals (Chaykowski & Verma, 1992; EIS Inc., 1999; Giber, 1997).

There are concerns for finding highly talented young people in BC and New Zealand's wood products industry. Highly talented people are not pursuing a career in the wood products industry or skilled people are leaving for better paid work overseas (Kelly, 2000). Efforts to develop a high-tech value added wood products manufacturing sector have also been frustrated by a shortage of skilled workers (EIS Inc., 1999; Kelly, 2000).

The forest industry has gone through tremendous change over the last decade. The sources of timber supply has diversified, sales are on the rise with improvements in the Asian crisis, and sawmills are becoming more flexible in their manufacturing in response to a highly selective

customer base. All these and the changing demographics have forced people out of their comfort zones and dealt with a new realm of training and labour relations issues. A look at the history of labour relations in the last few decades will help position the state of labour relations and training in each region today.

1.4 EVOLUTION OF LABOUR RELATIONS (A COMPARISON)

1.4.1 British Columbia[2]

Labour relations have had a long, rich, and problematic history in British Columbia's forest industry. Powerful employers and anti-labour government made it a battle to win the right to organize, bargain collectively and establish trade union democracy. But the remarkable progress to the current labour relations system has been evolutionary (MacNeil, 1971).

The working conditions between the 1920s and 1937 (the birth year of the International Woodworkers of America, the IWA) was characterized by 70-80 hour work weeks, compulsory layoffs with no pay, hazardous working conditions, undernourished and exhausted workers, unsanitized working conditions and a blacklisting or firing of workers for union activity. The 1930s were characterized by employer efforts to counter union organizing efforts. Government legislation related to minimum wages and unemployment insurance were emerging (MacNeil, 1971).

For the first time, the union considered an industry wide strike even though there was no legislative protection. Strikes centered on attempts to organize workers, consolidate union footholds and increase wages. Strikes were often bitter, confrontational and quite violent. In 1939, the union made some headway in organizing the sawmills and established a minimum wage scale. The legacy of strike activity from these earlier years has continued to influence the conflictual approaches to current union-management relations (MacNeil, 1971).

[2] Much of the historical information was summarized by documents obtained from the International Woodworkers of America (IWA).

The 1940-70s was a period of strong demand for goods and services that required uninterrupted production. Grievance and arbitration procedures, dues and other union security measures were developed (MacNeil, 1971). In the same period, the IWA was successful in organizing major employers and adopting a strategy to "take wages out of competition" (Downie and Coates, 1995), facilitated by the tariff protection against imports that seriously threatened the domestic market.

Throughout the 1960s and 1970s, the industrial relations function continued to grow. The IWA had long sought protective labour legislation, such as that favourable to union organizing and collective bargaining through political means. There was a continual increase in government legislation covering human rights, workers' compensation, employment standards and pensions (Downie and Coates, 1995). The New Democratic Party's (NDP) ban on replacement workers, new automatic certification rules and other union-friendly legislation have helped tone down the potential for labour disputes. The relationship between organized labour and the NDP has therefore been an important component of labour's strategy for social change (Ready et al., 1998).

By the 1980s and 1990s, forces such as the free trade arrangements, rapid technological change, deregulation, currency devaluation and demographic changes have affected the workplace. Failure of the industrial relations system to rapidly change its traditional practices will lead to a less competitive forest industry (Downie and Coates, 1995).
Forestry companies have undertaken significant industrial restructuring and changes in corporate structure in an attempt to meet these challenges. Employers have been forced to restructure, cut costs, improve efficiencies and profits, eliminate jobs, contract out and downsize (Ready et al., 1998). There has also been a widespread application of new technology, elimination of non value-added tasks, closures, relocations, and the sale of unproductive assets, or the establishment of mergers, acquisitions and strategic alliances (Downie and Coates, 1995).

For employees, this has meant minimal or frozen wages and benefits, layoffs, job loss, or longer periods of unemployment for both young and older workers. On the collective bargaining front, employers have taken a firm stand against wage increases without improvements in productivity. Bargaining structure, strategy and processes have all undergone changes (Downie and Coates,

1995). Government has been responsible for developing public policy which has been a critical determinant of industrial relations developments and the firm's competitive position in the global arena (Ready et al., 1998).

With such a hostile history of union-management relations in BC, it is to no surprise that trust remains a critical labour relations issue in the implementation of new technology. Unions generally are suspicious of new workplace designs, especially where management does not seek employee consultation. This is often acknowledged during contract negotiations where unions demand better protection for employees from the adverse impacts of technology and innovation. They argue that technology has led to a decrease in job satisfaction, downgrading of jobs, an increase in stress levels and grievances, or has undermined the role of the union (Wright, 1991). On the other hand, management is often annoyed with the employees' slow pace of or resistance to change.

1.4.2 Alberta

Like BC, Alberta's natural resource sector had an early period of radicalism, followed by a period dominated by international unions, which paved the way for a highly unionized public sector. However, unlike BC, the natural resource sector today is largely non-unionized. The oil and gas industry's culture of individualism and entrepreneurialistic nature, as well as the cyclical nature of the economy, has played an important role. "High prices create boom conditions leading to tight labour markets and upward wage and benefit pressures. Declining prices can destroy the viability of collective agreements and necessitate ...wage cuts, benefit reductions, and layoffs" (Ponak et al., 1999). Interestingly, Alberta's solid wood manufacturing industry has remained largely unionized despite the low union density in other natural resources sectors.

Before the election of the Klein government, Alberta Labour was a traditional bureaucracy, consisting of seven layers of management run in a centralized fashion (Bowerman and Ford, 1994). However, Alberta now has the lowest level of union density in Canada (Akyeampong, 1997). A distinctive feature of Alberta's industrial relations system has been the existence of well-established, non-union representation plans designed for employees who might otherwise become unionized (Taras and Copping, 1998; Taras and Ponak, 1998).

In addition, labour legislation emphasizes "the competitive world-wide market economy" and the "common interest in the success of the employing organization" on the part of employers and employees, not on the unions (Ponak et al, 1999). It also contains a more comprehensive list of exclusions and restrictions from its labour code, such as the right to strike, has a mandatory vote requirement for new certifications, has privatized large parts of the labour department, and has other employer-friendly conditions (Block and Roberts, 1998).

1.4.3 New Zealand

Both New Zealand and Alberta have had: employer-friendly labour legislation and a low level of union density, gone through economic reform, and converted from a centralized, union dominated labour relations climate to one that is highly deregulated and management dominated. What is interesting is that these changes have happened with little resistance from the union.

Before the 1984 economic policy reform in New Zealand, called Rogernomics, its labour market was considered to be too rigid and not flexible enough to promote maximum efficiency to support the move to a market based economy (Hill, 1994). The industrial relations environment was defined as regulated, union membership was compulsory, and settlements were based on a national award system administered by the Department of Labor (Wilson, 1995).

In 1991, the government introduced the Employment Contracts Act (ECA) which was to be the new model for labour relations policy. This act had a dramatic impact on labour, making it more flexible and responsive to the labour market. It enabled employers and individuals to enter into independent contracts at market rates and allowed employees to negotiate their own working agreement outside a national context. The ECA essentially disintegrated multi-employer bargaining and decentralized the methods of negotiations. As a result, unions no longer had an automatic or exclusive right in the workplace (Wilson, 1995). The lack of access to inclusive bargaining and the collapse of multi-employer bargaining has caused a large fall in union density (Hill, 1994).

In November, 1999, however, significant changes were made to the labour legislation. The victory of the new Labour government over the liberal National Party brought back more union

power into the workplace. The new Act promotes collective bargaining, relies on mediation as a formal mechanism to solve a dispute, and preserves the employee's choice to join or not to join a union (New Zealand Government, 2000). These changes have significant impact on the employer's flexibility in operating its business and determining appropriate human resources strategies and training requirements.

The state of the labour relations climate is one significant indicator for the success of change strategies within a company. Companies are starting to realize that effective change can not happen without the diffusion of their human resources and labour relations strategies with their overall business strategies. At a more micro level, they need to see training as an investment, as a skilled workforce is key to having a large competitive advantage. This next section therefore dedicates itself to training, education and development at the workplace.

1.5 TRAINING, EDUCATION AND DEVELOPMENT

1.5.1 Definition

Training is "a planned, systematic effort by the organization to facilitate the acquisition of job-related behavior, knowledge, skills, motivation, and attitudes by employees in order to improve their performance and help increase organizational goal achievement" (McShane, 1994). In other words, training is the process of identifying, retaining, and developing key competencies within the company that help individuals achieve a high level of performance in their current jobs.

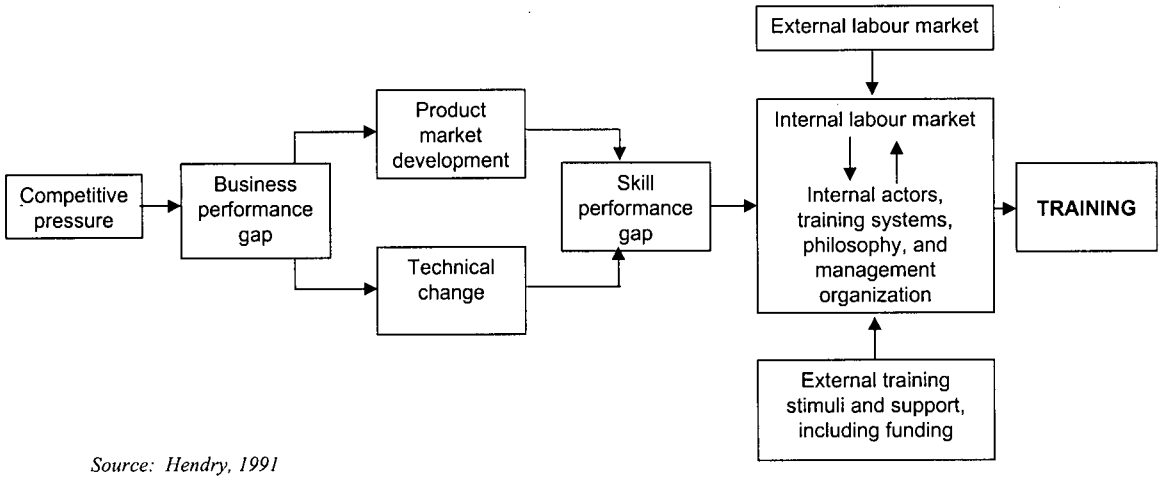
Education is much like training but focuses on giving people the skills and knowledge they need to do their future job, rather than their current job. Development usually refers to non-training activities that will enhance organizational performance. Development programs include succession planning, coaching, mentoring, experiential learning and other alternatives to classroom training. In summary, all three levels exist for the purpose of filling the gap between what is and what should be (Anciano, 2000; Kirzinger, 2000).

Training serves an important role in positioning the company to become more competitive. However, this does not mean that training is the solution to every performance deficiency or long-term skills needs. On the contrary, it involves a wide variety of human resources practices. Stevens and Walsh argues that for companies to realize full potential of their investment, they need to make parallel changes in product quality, management, work design and internal labour market structures (Stevens and Walsh, 1991; Benton et al., 1991).

One of the objectives of the study is to understand the level of training in sawmills. This next section therefore presents two models by Hendry and McShane that help identify the factors that drive and stabilize training (Hendry, 1991; McShane, 1994).

1.5.2 The Hendry Model

No single factor accounts for why some companies train more than others. It is therefore important to have an overview of the range of factors that impact a company's training behavior. Hendry provides a model of the training system and the factors affecting it, drawn in part on the Warwick studies and other papers (Hendry, Jones and Pettirgrew, 1990; LeBrasseur and Lambert, 1991; Pettigrew, Hendry and Sparrow, 1989). An overview of the Hendry model is provided in Figure 1:



Source: Hendry, 1991

Figure 1: Hendry's Model of Factors that Drive and Stabilize Training

It shows five sets of factors which drive and stabilize training activity: (1) business strategy (e.g. product market development and technical change) and competitive pressure, (2) the external labour market, (3) the internal labour market, (4) internal actors and systems, and (5) external support for training. He concludes that these forces will positively or negatively influence a firm's willingness to train (Hendry, 1991). See **Appendix 1** for the interaction of positive and negative factors on training.

Business strategies and competitive pressures. The first factor, business strategy, has a large effect on training. Generally, an increase in training directly relates to the pace of business change. Studies have demonstrated that an increase in company training will occur with increased changes in product design, technological innovations, manufacturing processes, new management systems, and improved customer service (Hendry, 1991; Betcherman and McMullen, 1987). The same relationship holds for a company wishing to expand into new markets.

As the market for relatively standardized services become saturated, companies have looked to diversifying and customizing their product lines, or expanding into entirely new markets. This strategy often calls for a large investment in technology upgrading and employee training.

Using the same Lee et al. study presented in **Section 1.3.7**, it indicates that the Interior BC and Alberta mills intend to increase their kiln-dried and special metric-sized lumber shipment overseas. However, it will be challenging for these mills to successfully shift their market focus given their lower quality timber supply. The study suggests that a solution to the timber supply may be the development of engineered wood products such as laminated lumber and finger-jointed lumber. In such a case, the company will need to upgrade and develop new employee skills, and change technologies and processes to accommodate the new market. On the same note, mills dealing with the overseas groups need to frequently upgrade their production lines to satisfy their overseas customers' demands for customized and diversified products. This also requires new employee skills, particularly in flexible manufacturing (Lee et al., 1999).

Competition from global players will also induce training. Michael Porter concludes in his well known study of Canada's competitive environment that education and training are the most

important factors for maintaining a strong and competitive position amongst other industrialized countries (Porter, 1991). Although this theory seems logical, it does not hold up well in BC sawmills. He and many others have noted that Canada's commitment to investing in advanced skills through private sector training is inadequate (EIS Inc., 1999).

According to the Ernst and Young report, BC forestry firms spend large amounts of capital annually on equipment upgrade and advances in milling technologies. Recent mill optimizations have witnessed, for example, a significant increase of computerized log scanning machines (Ernst & Young, 1998; Cohen, 1999). However, these firms were ranked much lower on a global scale in terms of the effectiveness of technology implementation. This report and several other studies have cited that Canadian wood products companies have repeatedly achieved lower levels of productivity than their global competitors. Many sawmills have not had the required level of education and training in staff and management to achieve full potential of their expensive advanced technologies (Ernst & Young, 1998; EIS Inc., 1999, Forest Sector Advisory Council, 1992; National Education Initiative, 1994).

The good news is, this is changing. The same Ernst and Young report that many knowledge-based companies are beginning to contract their skills and services to many forest industry firms in areas such as training and improving the effectiveness of existing technology management (Ernst & Young, 1998).

External labour market. The second set of factors refers to the supply of labour in the current market. Firms may not readily perceive the benefits of participating in broader-based training to improve the basic skills of all workers unless there is an acute shortage of workers (Benton et al., 1991). In fact, a shortage of skilled forestry workers exists in the wood products industry. Sawmill managers from all over New Zealand and Canada have expressed their concerns for not being able to fill skilled entry-level and management positions, or for losing their good people to their competitors. Some companies have responded to this shortage by researching long-term demographic trends, keeping a close watch on their competitor's human resources strategies, or implementing formal succession plans. If they believe the shortage of skilled workers will impact the company's effectiveness, they will increase their training (Hendry, 1991).

Internal labour market. The third factor, the internal market, is concerned with the skills of the current workforce. In response to changing market conditions, a company may impose long-term adjustment strategies that call for substantial internal reorganization and revamping of training. In the process, they are reducing the number of employees to improve productivity, often leading to an expansion in the tasks and skills demanded of individuals. Alternatively, employees are cross-trained in multiple functions or broader roles, are rotated frequently through their jobs or within other divisions, take part in a variety of project teams, are appointed a mentor, or are brought in as an apprentice.

These flexible work structures educate workers on how their jobs fit into the larger production process. They also push decision making further down the organization, demanding new types of training (Benton et al., 1991; Johnston and Chartrand, 1994). Upgrading existing employees, therefore, may be one of the most effective ways to provide a rapid improvement in the supply of skills (Stevens and Walsh, 1991).

Of course, the success of cross training and restructuring efforts depends on the labour climate within the company. On one hand, a positive, trusting, and open relationship between the union and management generally supports training activity. The union may see cross training as a way of keeping the work and expertise in-house so that the company would not have to outsource the skills it needs. On the other hand, a closed and militant labour climate generally deters flexible work structures. The union may be suspicious of management's intention and believe they are trying to make due with fewer jobs. As a result, unions have often mandated detailed job descriptions that discourage cross-training.

However, not all companies develop long-term human resources strategies or organizational flexibility. They only go so far as adopting short-term solutions (e.g. improving technology specific and product specific training), and thereby postponing changes that have a more profound effect on overall competitiveness. Several examples exist of trained workers who have returned to their plants and offices only to be used in the same old ways despite their new skills (Benton et al., 1991; EIS Inc., 1999). Firms may also be unwilling to invest in the development of their employees if labour mobility is high. High labour mobility means that the benefits of

training are less likely to be captured by the firm investing in the training (Stevens and Walsh, 1991; Baldwin et al., 1993).

Another factor that may hinder training is the demographics in the workplace. Studies have shown that a stable and aging workforce are less likely to invest in upgrading employee skills (Hum and Simpson, 1996). According to a Statistics Canada report, companies tend to provide more training opportunities to workers that have at least a high-school education or previous training. Likewise, professionals and managers generally have a higher incidence of training than trades workers, operators and assemblers. Employees with supervisory responsibilities not only received more training but also were more likely to want and ask for training (Statistics Canada, 1995).

Internal actors and systems. The fourth set of factors concerns the culture in organizations, its politics and personalities. With respect to culture, companies may want to influence the direction of change by endorsing sophisticated equipment, adopting innovation strategies and continuous learning principles, promoting research and development, or encouraging managers to retire so that they may promote a younger, better educated staff (Hendry, 1991; Benton et al., 1991; Baldwin et al., 1993). For example, a major capital purchase or the introduction of a new product concept usually ensures senior management support for training and labour requirements (Hendry, 1991).

Along the same lines, companies may make it their policy to make managers at all levels accountable for improving employee and company performance through training. If line managers are not perceived as being fully committed, training will be seen as optional or as not a priority at all (Tolley, 1992). In fact, a study conducted by Stevens and Walsh showed that most senior managers were unaware of the training activities. They acknowledged the relevancy of training, but in practice, the links to overall strategy were very trivial (Stevens and Walsh, 1991). Likewise, a lack of internal systems to improve the relevance of training (e.g. pay for knowledge or competency-based pay) may also impede training. Individuals may not be motivated to train if they see no related rewards for such training (Benton et al., 1991; Stevens and Walsh, 1991).

Politics often play a negative role in training activity. Management who feel pressure to reduce costs and raise productivity with their already "skeleton" staff, for example, may not be willing to release their employees for training. Instead, they adapt to skill shortages through more use of overtime or subcontracting. This only leads to an overall negative effect on productivity: firms either have to reduce output, not expand, or steal skilled workers from their normal jobs (Stevens and Walsh, 1991). Another example is in the case where publicly traded companies choose to hold off training for the purpose of meeting short-term profit criteria (Dore, 1985).

External support for training. Companies that receive external training support positively influences training activity. Examples of external support include: government funds or grants to finance certain courses, new health and safety legislation that mandate training, the presence of a union where the collective agreement mandates employer-based-training, or supplier agreements that specify that suppliers provide training on their equipment (Hendry, 1991; Hum and Simpson, 1996).

Customer requirements for increased and consistent quality have also driven a company to train. In many cases, this has motivated companies to review the operation of their quality systems and bring them up to the level necessary to achieve a quality award (Stevens and Walsh, 1991).

The Hendry model has described the factors that drive and stabilize training: business strategy and competitive pressure, the external labour market, the internal labour market, internal actors and systems, and external support for training. Using similar factors, McShane's diagnostic approach to training is described next.

1.5.3 A Diagnostic Approach to Training

Like Hendry, McShane looks at the external influences that influence training. These include: government legislation such as employment equity, health and safety, job strategy policies; economic and technological shifts; new product markets, and unions. In addition, internal influences such as a company's human resources budget to train, business strategies, sense of social responsibility, policies towards human resources, culture, as well as the trainability of its

employees all influence the emphasis placed on training. For many of these factors, the reasons for training are the flip side of the reasons for recruiting (McShane, 1994).

The Hendry and McShane models have described several factors that diagnose the need for and affect the level of company training. Hendry's model also shows that a company will have a stronger commitment to training when several of these factors are positive (e.g.positive labour climate, large training budget, shortage of skills in the labour market) and interact simultaneously. A higher commitment to training also exists when training activities are framed within a broader human resources management programs and are linked to corporate business strategies (Hendry, 1991). A typical company that is committed to training is revealed next.

1.5.4 Commitment to Training

Frequently, companies that are committed to training are larger companies, often having advanced technologies. They have a "formal education and training budget, make efforts to forge closer ties with educational institutions, participate in co-op and internship programs, and encourage employees to pursue continuing education and training opportunities by paying a substantial percentage or the full cost of work-related courses" (EIS Inc., 1999).

There is no doubt that training is expensive. The level of commitment to training will depend on the company's perception of training. If it sees it as an expense or business cost, it will be less committed to training. However, if it considers it as an investment to improve organizational productivity and performance, it will invest heavily in training (Cassels, 1991, McIntyre, 1994). Therefore, the human capital model is presented next to help us understand these costs and benefits of training.

1.5.4.1 The human capital model

The human capital model approach has become the most widely accepted explanation of a company's commitment to training, its education and training decisions, and an employee's earnings potential, job mobility and job search. The "cost" of investing in education or training includes the actual costs of course development, delivery and evaluation, the employee's salary

and foregone production while employees are attending a course. The "return on investment" is the higher future earnings to the worker, cost savings, productivity and profits within the company, and other benefits discussed in **Section 1.5.5.** Individuals and firms will continue investing in employee training as long as the expected future earnings justify the cost of acquiring the skills (Hum and Simpson, 1996; Stevens and Walsh, 1991).

The model specifies the type of training (e.g. specific versus general) firms will pay for (Rottenberg, 1961). Firms generally support specific training since an increase in employee productivity as a result of training stays with the firm and is of little use to another firm. General training (e.g. problem solving skills), on the other hand, raises the employee's potential productivity to other firms as well as to the training firm. Therefore, firms tend to not pay for this training because they fear employees will be poached by rival companies (Stevens and Walsh, 1991; Hum and Simpson, 1996; Campbell, 1991; Becker, 1964). If a firm paid for all training, then a trained worker could threaten to quit if they were denied a higher wage, thereby depriving the firm of any return on its investment (Becker, 1964). Interestingly enough, one of the other reasons why employers avoid training is that they do not want to pay the higher salaries of a more skilled workforce, not realizing the opportunity cost of higher productivity (Cassels, 1991).

On the contrary, studies by Becker, and Katz and Ziderman adopt a slightly different perspective. Becker sees general training as inexpensive insurance that employers are willing to pay for. As long as the worker remains with the firm, the company's investment in general training will be repaid (Becker, 1964). Katz and Ziderman argue that poaching firms do not realize the potential skills and knowledge of the trained workers. They may not see the value of their acquired training, and employees may not move to the "poaching" firm, thereby making them more valuable to the training firm (Katz and Ziderman, 1990).

One problem with the human capital model is that the return on investment can not be easily quantified. Employees may not see a direct increase in earnings from training and may not be motivated to stay at the company. Managers in turn may find it difficult to prove the impact training has had on productivity or profits or lack understanding or faith in the "payback" of training (EIS Inc., 1999; Hum and Simpson, 1996). They may see it as a "diversion of valuable

effort and resources, as a distraction from the job at hand, or at best, as an expensive overhead that must be put up with" (Tolley, 1992). For example, Gordon Betcherman and his colleagues provide a number of case studies of Canadian industry and conclude:

"People and organizations, no less than machinery and equipment, need constant care and upgrading. ... it is regrettable, therefore, that too many enterprises still spend greater emphasis on the husbanding of financial and physical (as opposed to human and institutional) capital" (Betcherman, 1990).

Although no precise relationship between training, productivity and competitiveness has been establish, comparative micro studies suggest the link is strong, as demonstrated next (Barron et al., 1989).

1.5.4.2 Training and productivity

In the EIS Inc. report, anecdotal evidence suggests a strong correlation between wood products companies that have a "strong commitment to human resource development and global leadership and competitiveness" (EIS Inc., 1999). In addition, a comparative study between American and British industries, Daly found that industries that have a higher proportion of skilled workers had a greater productivity advantage than those which employed less skilled labour (Daly, 1985). Other studies have come to the same conclusions at an international level (Hum and Simpson, 1996; Statistics Canada, 1995; Task Force on Advanced Training Models in Other Jurisdictions, 1992).

Research by David Worswick, too, showed that lower skilled workforces required more overhead labour in the form of quality controllers and production planners (Stevens and Walsh, 1991). In the Oregon sawmills study, the majority of respondents agreed with statements that linked training to having a skilled workforce and increasing productivity (Brown and Niemiec, 1997). Another study by Daly et al. examined the causes of productivity differences between manufacturing plants. They found that considerable productivity differences arose mainly from differences in the qualifications and skills in production and not from differences in physical capital employed (Daly, Hitchens, and Wagner, 1985, Stevens and Walsh, 1991). The

Organization for Economic Cooperation and Development states that one of the major barriers to adoption of advanced manufacturing technologies is lack of skilled personnel (Baldwin et al., 1993). In the Ernst & Young study, focus groups said that operator skill levels in BC's wood products industry are low and the potential productivity and value gains consequently are not maximized (Ernst & Young, 1998). This is a common problem across the wood industry sectors throughout North America (Schultz, 1998; Penn, 1998; Wilson, 1999).

Once a company is committed to training in the organization, they usually then establish some kind of framework for developing training policies. Since a whole paper can be written on just policies, this next section will focus on three commonly held issues amongst forestry companies: degree of centralization for training, what the training budget should be, and who is pays for training.

Degree of centralization. The downsizing and rationalization of company divisions have led many companies to decentralize functions that corporate staff traditionally held. Evidence of this trend is seen in the number of organizations implementing "train the trainer" programs. On the most part, companies have a blend of centralized and decentralized approaches. They have centralized training to encourage consistency across the organization and ensure that training is aligned with corporate strategy. Generic-type or personal development courses are typical at this level. However, companies depend on a decentralized approach to ensure that training activities are driven by the business needs of line divisions (McIntyre, 1994). Training on more specific subjects, such as machine operations or work flow processes, are often done at the site level.

Training Budget. The formalization and size of budget is largely influenced by the size of the company. According to the Training and Development Survey developed by the Conference Board of Canada, "a large majority of survey respondents (85%) reported having a formal training and development budget. The probability of having a formal training budget increases with organizational size. A majority of respondents (70%) also reported having a tracking system for training activities. However, smaller companies (fewer than 1000 employees) spent more per capita on employee training and development than did larger companies" (McIntyre, 1994).

In the past, most training resources were invested in executives, managers and professionals. However, the demand for more flexible work structures have resulted in more equal distribution of training resources for all employees, including clerical, labour and trades (McIntyre, 1994).

Financing training. There is debate on the respective roles of educational institutions, government, the private sector, and employees, and who should pay for education and training. Details on this study are beyond the scope of this paper and can be found in several studies (Hum and Simpson, 1996; EIS Inc., 1999; Brown and Niemiec, 1997; Barron, 1989).

In short, it is difficult to isolate the impact of training on a company's performance in quantitative measures. However, several studies in literature provide anecdotal evidence of its benefit, both in the short-term and long-term.

1.5.5 The Benefits of Training

In the study conducted by Brown and Niemiec, it asks Oregon sawmill owners and managers for their general attitudes toward training and staff development, among other areas. Almost all respondents agreed that "training leads to an increase in productivity, is necessary to assure a skilled workforce, helps promote workers to management positions, and is a continuous process" (Brown and Niemiec, 1997). Other studies by Bartel and Holzer et al. also conclude that employer-based training increases labour productivity at the firm level (Bartel, 1991).

Training also has a positive influence on employee wages and job mobility. Brown, Lillard and Tan, and Bishop find that on-the-job training has a positive and significant effect on wages and reduces voluntary turnover (Brown, 1990; Lillard and Tan, 1992; Bishop, 1990; Krueger and Rouse, 1998). Bartel analyzes a company database and finds that company training positively affects both wages and performance valuations for professional employees. Harry Holzer found a strong link between reported on-the-job training and wage progression (Bartel, 1995; Hum and Simpson, 1996).

Other benefits associated with investing in training include:

- lower recruitment costs
- reduction in staff turnover
- reduction in labour requirements
- improvements in productivity and product quality
- increased worker confidence and higher worker morale
- better utilization of equipment and materials
- immediate costs savings
- more efficient and effective technology and manufacturing processes
- provides a springboard to learning more advanced skills

(Baldwin et al., 1993 and EIS Inc, 1999).

1.5.6 The Training Model

Despite sizeable budgets, good intentions, and real needs, many training programs fail to achieve lasting results. In the past, training was done in reaction to skill deficiencies, training objectives were not set and the effectiveness of training programs was not evaluated. However, forestry companies today have realized the importance of their human resources and have developed effective training policies and programs based on a training model (Giber, 1997). The following sections incorporate five training models – MsShane, Kirkpatrick, Robinson and Robinson, Giber, and Phillips -- that have been used by several companies for skills assessment and training direction. All five models follow three main phases: needs assessment, development and delivery, and evaluation phases. For simplicity, McShane's model will be used to describe the training process (MsShane, 1994; Kirkpatrick, 1959, 1560; Robinson and Robinson, 1990; Giber, 1997; Phillips 1995).

McShane's training model is built on external and internal influences on training (as mentioned in Section 1.5.3) and the interrelated phases of the training process: assessment of training needs, development of training programs and evaluation of training needs (**Appendix 2**). As shown, both the training and development phase and the evaluation phase are determined by inputs from the assessment of training needs. If the needs in the assessment phase are not relevant, the training program will have little chance of accomplishing its purpose. With needs clarified, it is possible to specify training objectives and the content of training (McShane, 1994).

The next phase involves translating training needs and objectives into a training program. Training programs are designed to manage the learning process by controlling the "what and how" of learning. Consideration is given to the trainees selected, program content, delivery methods, desired outcomes and individual differences among trainees. Training and development programs include on-the-job training (e.g. job rotation, coaching, and apprenticeships) and off-the-job training, such as conferences, workshops, and lectures (McShane, 1994).

Evaluating the effectiveness of training is the final phase of the training process. Training evaluation is based on comparing training results with the program objectives. It also provides continuous feedback to those who reassess needs, and plan, develop and deliver future programs. Evaluation measures might include: questionnaires that measure the relevance, quality and comprehensiveness of training content; method of training and quality of training aids; changes in sales volume and operating costs; absenteeism rate; grievances; turnover rate; production quality and quantity; work unit morale; and frequency or severity of accidents (McShane, 1994).

The following blends each of the other four models in order to provide a more in-depth understanding of each program phase.

1.5.6.1 Needs assessment phase

The needs assessment phase is the first stage of the model. It identifies the gaps between current performance and desired performance, how they impact the goals of the business, and what can be done to narrow the gaps. Information is obtained through observation, questionnaires, tests, reports task analysis, historical data, etc. An effective needs analysis looks beyond the request for training and challenges whether the need identified by the client is the correct need and if training is the best solution (Giber, 1997; Robinson and Robinson, 1995). In summary, this phase ensure that "training was matched to the right audience, delivered at the right level, and focused on the right objectives" (Basarab and Root, 1992). Although this stage is critical, formal educational needs assessments are not commonplace in the forest products industry. The cost, time commitment, and lack of needs assessment and program evaluation expertise may be contributing factors (Thomas et al., 1986).

Robinson and Robinson have identified four levels of needs that exist in defining a performance problem: business needs, performance needs, training needs, and work environment needs (Robinson and Robinson, 1995). McShane has three levels of analysis for determining training needs: organizational, operations and individual (McShane, 1994). Giber identifies three levels: organizational level, task level and person level (Giber, 1997).

Business needs, or organizational analysis, ensures that a steady supply of critical skills exist in the company and across all divisions. It identifies the goals and missions of the organization and the critical operational measures to assess performance goals. The second level – performance,operational, or task-- involves a careful study of the knowledge, skills, abilities and behavior that is required for successful performance on the job. The third level – training needs,individual, or person -- determines how well individual employees are performing their jobs. Unique to Robinson and Robinson, work environment needs assessment identifies the skills that are required for successful operations of company work processes and internal management systems (McShane, 1994; Giber, 1997; Robinson and Robinson, 1995).

After needs at the organizational, task and individual levels are assessed, the company will need to facilitate the design, development and delivery of training material.

1.5.6.2 Training design, development and delivery phase

Data from the needs assessment phase is used to design the best mix of instructional strategies, given the organizational constraints, opportunities and technologies. A variety of factors will influence where training development and delivery takes place. Some of these factors include: the extent of centralization; the advances in technology; the length of training and availability of expert knowledge within the company; and the degree of organizational learning.

Extent of centralization. The extent of centralization within a company will determine where training programs are designed or developed. A more centralized company will have more courses developed by their corporate human resources staff. However, a decentralized organization typically makes line managers and supervisors responsible for their own training needs (McIntyre, 1994).

Advances in technology. Advances in technology are also helping to decentralize training. It has literally expanded the modes of training delivery to areas that were thought inconceivable only a decade ago. Computers, the Internet, and video-assisted learning have revolutionized distance learning, self-paced learning or other hands-on methods of learning. For example, employees have learned complicated machining tasks on highly sophisticated, expensive equipment through computerized simulations. This has eliminated some of the negative consequences (e.g. safety) associated with trial and error. These advancements have enabled the company to deliver more cost-effective products and services by cutting fixed costs (McIntyre, 1994; Benton et al., 1991).

Length of training and local talent. The investment in time for training and the talent within the company will also influence training development. Training programs that are long-term or highly sophisticated will often be developed outside the company. The problem associated with employee poaching may contribute to this (Betcherman, 1990).

The same holds for companies that lack the expert knowledge or skills of a subject area. Instead of developing in-house programs, training professionals may choose to outsource, develop internal training committees, or build strategic alliances and partnerships with other companies, government, or educational institutions in order to lower the costs of training (McIntyre, 1994).

Organizational learning. Training in organizations was traditionally conducted in a classroom setting, focused on the individual rather than the group, and reacted to more predictable market conditions. A survey conducted by Statistics Canada reports that training was most often delivered through classroom instruction, including workshops and seminars (Statistics Canada, 1995). Similarly, participants of a Virginia economic development study were asked to rate the effectiveness of several training methods. The highest rated method was one to one personal visits, followed by conferences, short courses, and regional workshops and classroom instructions (Smith et al., 1999). However, non-traditional companies are slowly replacing this type of training by more flexible training methods of the organizational learning model.

Organizational learning relates to the organization's ability to transform itself on a continuous basis in response to changing market conditions. Typical elements in this type of organization include a large investment in research, development and innovation, formalized human resources development plans, and an adaptable and responsive organizational structure. In order to be in congruence with this model, training and development methods will need to match the organizational style (Basarab and Root, 1992; Dixon, 1992).

More traditional organizations are characterized by a hierarchical structure where procedures are passed down from the top. This type of organization will most likely suit training in which the instructor provides expert answers in the classroom. In companies that purculate organizational learning, employees are expected to develop their own procedures and are empowered to try new things. In this case, the old training technology is inappropriate, both in content and methodology (Dixon, 1992).

In addition, group-learning will replace individual learning as topics such as teamwork, problem solving or strategic planning become the norm. More just-in-time training will take place with the rapid pace of change in consumer demand. Training is therefore delivered in smaller modules, is more accessible (e.g. on-line courses) and targets more specific skills (Dixon, 1993).

Videotapes, action learning[3] and context-specific training are also being used more (Dixon, 1990; Revans, 1990). Examples of each include:

- Using videotapes of instructions on machine repairs at the workstation when repairs are needed.
- Teaching strategic planning while the group is actually in the process of developing its own strategic plan
- Learning and applying fishbone diagrams in addressing a specific quality program, respectively (Dixon, 1993).

These methods are supported in the Bratkovich and Miller study where fifty per cent of Ohio sawmill operators preferred a less formal method of educational program delivery (i.e. one on one contact) as compared to the more formal method of group education via meetings (28.1%).

[3] Action learning involves solving real problems in real time. Trainees bring actual problems to the training program, develop action plans to solve them, and are held accountable for their actions (McIntyre, 1994).

Also, approximately 22 percent of the operators preferred the self-study method either at home or office (Bratkovich and Miller, 1993).

The needs assessment process is a critical stage in the training model. It helps identify gaps in employee performance and determines whether training is the best option to solve a business problem. Programs are then developed based on those needs. The final stage of the training model evaluates the training program based on information obtained during the needs assessment stage.

1.5.6.3 Evaluation phase

Evaluation takes place at all phases of training. At the needs assessment phase, it evaluates training needs, resource requirements and organizational constraints. In the design and delivery phase, the trainer develops instruments, strategies and processes to measure: the acquisition of skills, knowledge and attitude; the appropriateness of the content, facility, and activities; and the transfer of learning to the job. In summary, program evaluations are needed to help management decide whether to adopt, continue, or revise programs that make them more effective (British Columbia Ministry of Forests, 1994).

Training measures may take on a variety of forms. They may be subjective (e.g. opinion data) or objective (e.g. number of employees taking different courses). Some measures reflect the skills and knowledge given in the training (e.g. test performance measures), the application of those skills and knowledge to the job (e.g. employee productivity improvements following training), or the results of the training, such as return on investments (London, 1989). This section introduces the three types of evaluation models, then describes and compares them in more detail.

Evaluation of training has traditionally revolved around a model developed by Kirkpatrick (Kirkpatrick, 1959, 1960). His model is based on four levels for measuring the effectiveness of training which are evaluated after participants have completed a program. A more recent model of evaluation by Brinkerhoff is a spin-off of the Kirkpatrick model but stresses the importance of evaluating the training method itself, and the process used for identifying needs and goals (Brinkerhoff, 1987).

A third model of evaluation by Robinson and Robinson contains the same elements as the above two models (e.g. evaluating training objectives) but adds one more step for creating a consultative partnership (Robinson and Robinson, 1990). See **Appendix 3** for a description of each.

The value of any evaluation tool largely depends on how their reliability and validity. In assessing the reliability, or the accuracy of the data, the trainer must control for potential bias. For example, a measure of employee satisfaction with a course may be biased by how the questions are phrased. One way to control for this is to use multiple sources of information, such as measures of post-training test performance in conjunction with job performance measures (London, 1989).

In assessing validity, the trainer needs to examine the extent to which an evaluation tool measures the amount of new learning, the transfer of learning to the job, or improved job performance (London, 1989; Campbell, 1971). Goldstein describes the criterion deficiency and criterion contamination issues with evaluation tools. "Criterion deficiency exists when the tool being used to measure performance does not adequately measure all the behaviors or aspects of performance that have been impacted by training. Criterion contamination occurs when the tool used to measure performance is also measuring other factors" (Goldstein, 1991). Other errors may include inaccurate measurement, researcher bias, participant sensitivity to what is measured, and changes that would have occurred over time regardless of the intervention (London, 1989). Isolating the impact of training can be accomplished by: pre-testing and post-testing employee performance and skills; using control groups; and using multi-sources of data (Poister et al., 1990).

1.5.6.4 Challenges with a return on investment model

Although an extensive literature exists on the effectiveness of job training, a much smaller literature exists on the impact of private-sector training on workers' wage, productivity, and other employment outcomes (Krueger and Rouse, 1998). This may be due in part to the difficulty of quantifying the impact of training.

One of the major challenges training professionals face is senior management's requirement that the impact of training be quantified and that it contributes to overall profits (Phillips, 1991; Baldwin et al., 1993; McIntyre, 1994). A study by the American Society for Training and Development indicates that approximately two-thirds of training managers feel pressure to show that training programs are producing "bottom-line" results (Carnevale and Schulz, 1990). The difficulty in this is that most managers are used to using a conventional payback analysis that does not lend itself well to measuring the softer side of training (EIS Inc., 1999). They have difficulty identifying the appropriate measures to determine impact and lack the tools to demonstrate that changes in individual and business performance result from training (Giber, 1997). In addition, the impact that training has on employee motivation and morale, product quality, or labour requirements cannot be easily measured and quantified (EIS Inc., 1999).

Another challenge is that the processes for evaluating the impact of training on business goals are not in place. Almost all organizations evaluate their training effort at the reaction level, which is only marginally useful since it gives senior executives no basis for making strategic business decisions, allocating resources or controlling internal operations. Some do not even track training costs at all (EIS Inc., 1999). According to industry surveys, only 5% of all courses were subjected to a return on investment evaluation (McIntyre, 1994), indicating that measuring the impact of training on business results is still the least commonly used method of evaluation (Robinson and Robinson, 1990). However, Brinkerhoff suggests that, in some situations, extensive efforts to determine quantifiable measures or dollar values to benefits may not be worth the trouble. A combination of qualitative and quantitative data might be adequate to demonstrate benefit (Brinkerhoff, 1987).

A third challenge is to know how much to invest in training for each dollar in capital. A report prepared by EIS Inc. argues that there is a spectrum of possibilities in presenting the business case for training investments. The report also illustrates a matrix that compares the degree of technology in the manufacturing industry with the level of education. For high tech primary manufacturing companies, it states that large investment in education and training helps maximize the company's return on investment, and low levels of training pose significant constraints to productivity and competitiveness (EIS Inc., 1999).

In response to these pressures, many training departments are shedding their expense-centre image by introducing transfer pricing, charge-back or cost-recovery systems for their training activity. They are also repositioning themselves to become a partner in the strategic decision-making process (McIntyre, 1994). Success at this level relies on extensive work in developing measures prior to the design of the training program (Brinkerhoff, 1987).

In summary, training serves an important role in positioning the company to become more competitive. Two models were presented--Hendry and McShane--that describe the factors affecting a company's training behavior. But for training to take place, a critical mass of positive or supporting factors must play together to increase the commitment to training. The human capital model was also presented to help understand the level of commitment to training, and the costs and benefits associated with training. Several training models are used by forestry companies today. Each model includes the same phases for effective training: needs assessment, design, development and delivery, and evaluation.

The whole purpose of training is to build a highly skilled and motivated workforce in order to improve a company's performance and help it enter new territories that would have formerly been unachievable. This last section confirms the need for skills development in the wood products industry. It describes the current skills shortages and the critical skills that are required for success in the future.

1.6 SKILLS DEVELOPMENT

1.6.1 Shortage of skilled labour

The wood products industry is facing a crisis in the supply of skilled labour. Businesses are adjusting their structures for better survival in the global market. They are downsizing, expanding operations, and adopting flexible production systems, robotics, and system wide optimization controls. However, the calibre and sheer number of skilled people in the workforce has not been able to match this. A Forest Renewal BC survey of secondary wood products manufacturers revealed that 53% of respondents plan to expand their operations between 1998 and 2000, but 37% see training and a skills shortage as major constraints to expansion (Wilson, 1999). Therefore, three challenges faced by wood products companies are presented: a low number of forestry graduates, lack of basic skills, and ability to attract and retain skilled people.

Low number of forestry graduates. The number of young people starting their working lives in any year is only about two per cent of the total at work. Moreover, universities and colleges are not pushing through enough skilled graduates to meet the demand. This puts more pressure on those already at work to stretch their skills and increase productivity as a means to improve the company's competitiveness (Cassels, 1991; Kelly, 2000).

According to Robyn Kelly of Pine Magazine, young people are being turned off New Zealand'forest sector. Potential factors many believe are causing the shortage of skilled workers are that teachers are pushing for a career in the high-tech industry, skilled people are leaving for better paid work overseas, or people are not interested in hard, physical work. Peter Clark, CEO of PF Olsen and Co (Rotorua) believes that people are not attracted to the sector because they perceive the work requires low-level skills, is of low value and has no defined career path. But John Blakey, CEO of Forest Industries Training, said that the industry has recognized the problem and is offering more job status built around training. Although this is specific to the forest sector, it does have implications to the overall sawmilling industry (Kelly, 2000).

Lack of basic skills. To make matters more challenging, a number of sawmill managers in the industry have acknowledged their concerns for a lack of basic skills amongst their workers. In fact, a survey conducted in North Carolina found that more than a quarter of the students in their mouldings curriculum had trouble with reading (Morris, 1997). This finding has significant implications for training professionals since the advancement of skills requires at least basic reading, mathematics and writing skills (EIS Inc., 1999).

Attracting and retaining skilled people. The ability to attract and retain skilled employees has also become a top concern amongst manufacturers and across industries (Schultz, 1998). A recent poll by William M. Mercer/Angus Reid revealed that attracting and retaining highly skilled employees ranked as one of the most important priorities of Canada's CEOs. This was second only to concerns over profit growth (30%). The poll also showed that the CEOs viewed educational opportunities and career development as a top strategy for retaining high quality workers (William M. Mercer and Angus Reid 1999; EIS Inc., 1999).

Although wood products are faced with the challenges of attracting and retaining skilled labour, there are other measures they can take to ensure an effective workforce. They need to realize that with changes in business strategies comes a change in the skills of current and future people. This next section discusses the critical skills--technical, conceptual, and communications (Benton et al, 1991)--that are required for success as they move into the work model of the 21st century.

Critical technical skills. One of the major challenges of sawmill managers is teaching their employees the fundamentals of a sawmill operation. For example, employees need a basic understanding of how to break down a log; how machines interact with each other and with the raw material; and how to produce high quality products that are grade compliant (Tolnai, 2000).

With an increasing emphasis on optimizing value recovery, and hence, reducing wood costs, primary manufacturing companies are starting to adopt advanced systems, including the greater application of robotics technologies and system wide optimization and control techniques. With these advances in technology, there is a demand for well-established systems and operatives trained in optimizing value recovery for companies as a whole (Ernst & Young, 1998). Thus,

the increasing cost and complexity of machinery create a need for more highly skilled technicians. They also need supplemental training in areas specific to the firm: its structure, its place in the market within the supply chain, its products and its customers (Benton et al., 1991; Clark, 1999).

The high costs associated with production error and downtime have also prompted management to train line workers in diagnosing malfunctions or machine breakdowns, or at least, recognize problems before they become serious. They are trained in "adjusting to unexpected deviations from normal procedures in order to keep production going. This ability implies a sophisticated understanding of the technical aspects of production" (Benton et al., 1991).

A Vermont wood products manufacturers study conducted by Bousquet supports these predictions. Respondents in the study ranked wood utilization (e.g. timber harvesting, quality control, log quality improvement, and sawmilling methods) and business management (e.g. transportation, market conditions and trends, and marketing) as their highest priorities for education and training (Bousquet, 1988). In another study of Oregon's Lumber Manufacturing Industry by Brown and Niemiec, respondents felt that quality control, safety, manager training, and maintenance was the most needed. However, wood technology, business economics, yard practices, and industrial personal health were the least needed subjects (Brown and Niemiec, 1997).

Critical conceptual skills. Organizations today are trying to become more competitive by empowering their employees and having them work in self-managing teams. Workers are required to take on more responsibility, communicate more frequently, interpret more complex information, and operate in a more uncertain and less-well-defined work environment. For example, they are anticipating production problems, finding the best methods of adjusting production for diversified products, contributing ideas in product design, and anticipating client needs and customizing products and services accordingly. (Benton et al., 1991). These changes have demanded that all employees have a more abstract understanding of their work (Filipczak, 1993; Tolley, 1992), that is, to take on more conceptual skills.

One of the keys to conceptualizing a process, for example, is to think critically. Firms are relying on their employees to "observe their own actions and interactions in order to discover more effective ways of functioning within the organization" (Dixon, 1992). This skill is called "critical reflection" (Brookfield, 1987, Dixon, 1990, Aryris, 1985, Revans, 1980). Critical reflection, however, requires a total shift from the traditional skills and attitudes when addressing information in their environment (Argyris et al., 1985, Brookfield, 1987). Companies must also create an environment that fosters critical reflection by providing employees with the tools and methods they need to understand the direction they are going (Johnston and Chartrand, 1994).

Critical communications skills. Workplace changes have made it necessary for many workers to engage in more frequent and more complex interactions with others. As companies reorganize by product or by market, communication between divisions becomes more immediate and less bureaucratic. At the same time, employees are in more direct contact with their clients or customers, who may have previously been sheltered from them. They are often called on to write proposals, make presentations and deal with clients over the phone. Business changes also place new demands on the supervisor. Following the same restructuring example, supervisors are required to consult their staff in setting strategic goals, share information with subordinates, listen to them, and empower them (Benton et al., 1991).

Studies conducted on critical skills by employee group. According to the Training and Development 1993 Survey, critical training and development challenges for major employee groups include: leadership, strategic planning, change management, and supervisory skills for executives and management; technical knowledge, interpersonal, quality management and customer service skills for professional and technical employees; and technical and teamwork skills for clerical and office (McIntyre, 1994). See **Appendix 7** for a more comprehensive list.

Bratkovich and Miller (1993) conducted research on the perceived educational needs of innovative Ohio sawmill operators. Job competencies with the highest perceived educational needs were: predicting future lumber prices; understanding environmental laws enforced by regulatory agencies; exporting lumber; motivating employees; and disposing of sawmill wastes in an environmentally safe manner (Bratkovich and Miller, 1993).

Several studies were conducted to identify educational needs for senior management employees (Thomas et al., 1993; Bousquet, 1988; Stanturf, 1989; Sinclair, 1989). All studies provide support for related research that reported marketing (Helligmann and Bergman1986; Sinclair, 1989) and environmental constraints (Thomas, 1993) to be high priority training needs of forest products industry managers. The Ernst & Young report states that one of BC's strength is the wide diversity of species and unique characteristics of its natural forests. The increasing volume of second growth forests and the recognition of non-traditional species (e.g. hemlock) poses real marketing opportunities for managers, and hence, a need for strong marketing skills (Ernst & Young, 1998). Specific competencies in sawmill production and communications also had high perceived educational needs in the study, which supports the results of previous research (Niemiec and Brown, 1997; Sinclair, 1989; Thomas, 1993).

It is clear from this research that training is valued by the wood products manufacturing industry. It is also clear that more training is needed. A well-trained workforce is vital if sawmills are to compete with other industrial nations and to better utilize their country's resources. More training programs must be developed and made accessible to the lumber manufacturing industry, as well as to other sectors of the forest products industry (Brown and Niemiec, 1997).

CHAPTER 2

RESEARCH METHODS

2 RESEARCH METHODS

A solid research study involves clearly defined research methods and procedures so that readers can determine the validity and reliability of a study. This section consists of seven subjects: the research design, population and sample frame, sampling procedures, data collection, survey instrument, and limitations.

2.1 RESEARCH DESIGN

Qualitative research is almost always used before a thorough quantitative study begins (Van Maanen et al., 1982). It is particularly useful when there is a lack of theory on the subject, when a research problem needs to be better defined and clarified (Seymour, 1988) or in determining the feasibility of a comprehensive study and identifying the best approach for the study (Babbie, 1979). Therefore, a combination of both qualitative and quantitative research methods has been used in this study to gain an overall understanding of the training issues in the workplace.

Qualitative research in the form of experience surveys, case studies, pre-testing and secondary data analysis has been used in this study to generate ideas, identify the research problem and suggest hypotheses to test quantitatively. These efforts led to the development of a more valid survey instrument since on-going feedback from industry experts resulted in a survey that better represents the problems at hand. With respect to quantitative research, a mail survey questionnaire was designed to assess the rational fit between corporate training strategies and site implementation (see **Section 2.5** for more detail). Many of the items in the survey were derived directly from the qualitative data.

2.2 DATA COLLECTION

2.2.1 Experience surveys

Experience surveys are informal conversations with industry experts rather than consumers (Kozak, 1999). Training professionals and industry experts at the University of British Columbia and companies within the wood products industry were contacted to gain knowledge in the field under study. They provided insights into the problem, clarified concepts, and gave direction as to where the research should go. This method is appropriate since much of the training-related information in the solid wood sector has not yet been published. In addition, it is quick and easy to administer, and provides the most up-to-date information on the subject at hand (Kozak, 1999).

2.2.2 Secondary Data

Secondary data analysis usually takes the form of a literature review. The researcher compiled and summarized existing information from related studies to gain a better understanding of labour relations and training issues in forestry companies throughout British Columbia, Alberta and New Zealand. Secondary data was collected, analyzed and summarized from industry and union publications, the Internet, associations and councils, academic papers, trade journals, government publications, annual reports of wood products companies and consultant reports.

2.2.3 Pre-testing

Pre-testing is a form of qualitative research that is often used to design or redesign an instrument and ensure the information is relevant and accurate (Kozak, 1999). It can help the researcher modify the questions asked in the survey to be more reflective of the respondent's actual point of view rather than relying on the instincts of the researcher (Seymour, 1988).

Pre-testing the survey took place before mailing the final surveys in order to ensure that the questions, wording and instructions were valid, clear and easy to follow. Full-scale pre-testing

did not take place given the small size of the population, as well as time and budgetary constraints. Instead, peers, friends, colleagues and related professionals were asked to fill out the survey and offer suggestions for improvement. The final survey captures the main objective of the survey, making it valid and reliable.

In conjunction with qualitative research, two survey instruments (i.e. corporate survey and site survey) were designed to capture quantitative data. Before the survey instruments and procedures are described in more detail, the population and sample frame for each survey is discussed.

2.3 POPULATION AND SAMPLE FRAME - CORPORATE SURVEY

In an industrial setting, companies are not considered equal. Culture, finances, policies, and, more importantly, training programs in a small company are often quite different from those in a larger company (Cohen, 1999). Moreover, one of the objectives of the study is to determine how well corporate training policies are being implemented at the sawmill level. This objective limits the research to include only companies having at least two sawmills since corporate training policies exist more frequently among the larger companies.

Because of the small size of the target population, the researcher tried to obtain a census of all companies in the solid wood manufacturing sector (having more than two sites and a corporate human resources function) in Interior British Columbia, Alberta and New Zealand[1]. This criteria precludes smaller mills and thus captures the larger mills producing more than 3 million board feet[2] of lumber per year.

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[1] Not every company in the census responded to the survey, and therefore, no inferences could be made to the population. However, respondents represented 27% of sawmill production in Interior BC and 69% in New Zealand. Alberta corporate respondents' total production was not available since all respondents' headquarters were located in British Columbia. However, Alberta site respondents represented 33 percent of the total Alberta's lumber/secondary manufacturing production for 1999. These results represent a substantial proportion of the total lumber production in three regions.

[2] This figure is used in the Major Primary Timber Processing Facilities in British Columbia 1997, Economics and Trade Branch, British Columbia Ministry of Forests publication. All firms listed in the directory that produced less than 3 million board of lumber in 1997 only had one sawmill site.

As stated in **Section 1.3.7**, training is correlated with the level of technology, product types and the markets a company serves. Therefore, it is important to ensure that companies produce similar solid wood products and serve similar markets so that training-related data can be properly compared (Lee et al., 1999). In summary, the population for the corporate survey consists of 17 companies in Interior BC, Alberta and New Zealand.

The following directories were used to create the sample frame of solid wood manufacturing companies in each of the three geographic regions:

- *1999 Directory of the Wood Products Industry*
- *1998 Edition Independent Directories' of British Columbia Forestry Directory*
- *Madison's Canadian Lumber Directory 1997*
- *Major Primary Timber Processing Facilities in British Columbia 1997, Economics and Trade Branch, British Columbia Ministry of Forests*
- *The Alberta Forest Products Association (web site)*
- *New Zealand Forest Industries Directory & Yearbook 1999*
- *Discussions with and distribution lists from the Sector Manager Wood Technology, Forest Industries Training and Education Council (FITEC), New Zealand*
- *Directories from several industry associations*

2.4 POPULATION AND SAMPLE FRAME - SITE SURVEY

The population for the site surveys was defined as all of the solid wood manufacturing sawmills of companies having more than two sites and a corporate human resources function in Interior British Columbia, Alberta and New Zealand. This accounted for a sample frame of 86 solid wood manufacturing sawmill sites.

A modified snowball sampling was used to select sample sites from the population. Snowball sampling is a non-probability sampling technique where the researcher identifies potential respondents who meet the criteria for inclusion in the study. They are then asked to recommend others who also meet the criteria in the study (Kozak, 1999).

Since some companies had 10 mills and others had only two or three, the researcher's objective was to obtain three site respondents from each company (except in the case where a company only had two sites) so that companies could be fairly represented in the site sample. The

corporate human resources manager was asked to randomly select three sites that met the population profile. Thus, the sample consisted of 53 randomly selected solid wood manufacturing sawmills. Although the sample was derived from a non-probability sampling procedure, the researcher assumed an unbiased sampling given that all corporate human resources managers in the census were contacted to participate in the survey. Moreover, these managers were asked to randomly distribute the site surveys within the company. Confidence intervals were then built for appropriate variables in the study in order to make inferences to the population.[3]

2.5 SAMPLING PROCEDURE

Two different surveys were developed for the study (see next section – Survey Instrument). The researcher contacted corporate human resources managers at 17 solid wood manufacturing companies to complete a corporate survey. Upon confirming survey participation, the researcher sent a package including one corporate survey and cover letter, and three site surveys to the corporate office. The human resources managers were asked to randomly distribute copies of the site surveys to at least three human resources representatives at the sawmill level. An electronic version of the cover letter to accompany the site surveys was also prepared by the researcher and sent to the corporate human resources managers so that they can address and print the letters on their corporate letterhead. This helped gain corporate commitment and site "buy-in" to the study.

2.6 SURVEY INSTRUMENT

Survey topics were selected based on the researcher's interest, a lack of training information in forestry-related literature, and recommendations by industry experts. The corporate survey asks questions pertaining to training strategies and policy, whereas the site survey asks questions related to the implementation of training programs (See **Appendices 9 and 10**). A mail survey was used, as it is the most efficient and cost effective means of gathering data in the three geographic locations. It is also an effective means of gathering facts and figures and conducting statistical analysis (Kozak, 1999).

[3] Where applicable, confidence intervals were provided in the footnotes of the Results portion of this paper.

Survey questions were logically ordered without bias with broader, more general questions at the beginning of the survey, funneling down into more specific training issues (Kozak, 1994). The survey was divided into the following sections:

Company Information:	This section covers level of production, sales revenue and employee profile.
Training Policy:	This section asks about training policy and budget, the impact of training, and type of training delivery methods.
Skills Development:	This section identifies how training needs are identified and the skills required by the workforce.
Summary:	This section asks for the level of agreement on a variety of statements regarding the company's and site's training practices and attitudes.
Personal Information:	This section collects the information that is required to send the final survey results to the respondents.

An effective way of increasing the response rate for a study is to have a mix of different types of questions in the survey. Hence, a variety of measurement scales were used, including: nominal, ordinal, and interval scales (Kozak, 1999).

Generally, nominal scales were used for classification purposes, ordinal scales were used to collect facts and figures, and interval scales and open-ended questions were used to measure attitudes and perceptions (Kozak, 1994). In addition to these scales, *open-ended questions* ended most sections where respondents were asked to comment on training-related issues.

2.7 RESPONSE RATE

In order to increase the response rate, the survey was pre-tested for clarity, non-bias, appearance, length, complexity, and ease of flow. Corporate respondents were also contacted before the survey was sent out to ensure they met the sampling criteria and verbally confirm their participation in study. In addition, three different cover letters were created (**Appendix 11**). The first letter introduced the thesis topic and explained its importance. It described how respondents were chosen, gave instructions on completing the survey, seeked their participation and cooperation, assured confidentiality, and provided a contact for any questions that the respondents may have had. The second and third letters served as reminders to those who had not completed the survey. As the rate of incoming surveys reached a plateau (i.e. 3 to 4 weeks), non-respondents were contacted by telephone to encourage participation and to offer the

researcher's help in completing the survey. An electronic copy of the survey was also sent by email or fax. Lastly, prepaid, self-addressed envelopes were used and a copy of the survey results was offered to those requesting it (Kozak, 1999).

Having done that, combined response rates of 64% and of 51% were obtained for the corporate and site surveys, respectively, in the three regions:

Corporate:

- 5 out of 9 companies in British Columbia, or 56 percent
- 0 out of 1 company in Alberta, or 0 percent
- 6 out of 7 companies in New Zealand, or 86 percent

Site:

- 13 out of 26 sites in British Columbia, or 50 percent
- 6 out of 10 sites in Alberta, or 60 percent
- 8 out of 17 sites in New Zealand, or 47 percent

The population, sample frame, sampling procedures, survey instrument and response rate have been described in detail. When using any sampling technique, however, it is important to identify some of its limitations.

2.8 LIMITATIONS

As in most surveys, there are two major types of errors: sampling error and non-response error. Sampling error is the difference between the sampling statistic and the population parameter. Non-response error is the difference in statistics between those who responded and a perfect sample where everyone responds (Kozak, 1999). Six companies out of 17 did not respond to the survey questionnaire. As such, there are no means of assessing the probability that these companies would have responded in the same way as those that have responded. However, in comparing characteristics, such as size, degree of unionization, types of products and markets served, similarities were found between non-responding and responding companies. It is therefore assumed that survey responses of non-response companies would have been similar to those who participated. Other methods used to increase the response rate and reduce the

sampling error include pre-canvassing, reminder letters and personal follow-up, participant incentive (i.e. copy of survey results), and postage-paid, self-addressed envelopes.

A third type of error, administrative error, was also present in the site surveys. In the study, corporate human resources managers were asked to randomly select sites on the basis of the population characteristics. In the sampling process, three plywood respondents from two companies completed the site surveys. However, their responses were omitted from the survey results.

The researcher also made efforts to reduce the non-sampling error, which comes from imperfect aspects of designing the survey. The researcher pre-tested the survey and ensured mutually exclusive questions where appropriate, used simple language, and avoided leading and loaded questions, double-barreled questions, incomplete questions and assumptions (Kozak, 1999). However, one oversight in the survey design was realized in analyzing the data. For example, in the second question of the survey, New Zealand respondents were asked to select a revenue category based on New Zealand dollars, rather than Canadian dollars. In this case, the researcher assumed that the categories selected by these respondents would have still applied if Canadian dollars were used. This is because the dollar range for each category is large enough to account for the exchange rate.

The goal of this section was to provide a detailed account of research methods and procedures. The researcher addressed the research design, population and sample frame, sampling procedures, data collection, survey instrument, and limitations.

CHAPTER 3

RESULTS

3 RESULTS

Results are reported in three sections. The first section highlights key findings from the survey, using proportions, means and total evaluation points (described later). The following outline is based on the objectives of the study and is used to present the findings from each section of the corporate and site surveys:

Company/Site Information

- Production
- Sales Revenue
- Product Type
- Workplace Demographics

Objective 1: Define corporate training policies and determine the success of implementation at the sawmill site level

Training Policy

- Degree of Formalization
- Extent of Decentralization
- Objectives for Training

Objective 2: Determine the degree of the company's investment and commitment to training

Training Budget

- Corporate and Site Training Budget
- Degree of Commitment to Training

Objective 3: Determine the types of training programs for management and staff

The Training Model

- Needs assessment phase
- Design and delivery phase
- Evaluation phase

Objective 4: Define the desired skills set required by the company

Skills Requirements

- Management/Supervisory
- Technical
- Trades
- Skilled Line Workers
- Labourers
- Office/Clerical

Summary (Training Culture)

Comparisons were made between corporate respondents in each region, between site respondents in each region, and between corporate versus site respondents within each region. Note that the training models presented in **Section 1.5.6** were incorporated into the "Training Policy" section of the analysis.

Statistical tests were conducted to detect for differences in the means between Western Canada and New Zealand corporate respondents and between Interior BC, Alberta and New Zealand sites. Specifically, t-tests/Anova tests were used to compare the means in: average production, employee size, training budget, type of training decisions and attitude towards training between the regions. Z-tests were used to compare the proportion of companies/sites with formal training policies. It was also used to compare those having formal skills needs assessments. Confidence intervals and standard deviations were not provided for corporate respondents since not all companies in the census responded to the survey, making it inapplicable. Having said that, these results do represent a substantial proportion of lumber production in Interior BC, Alberta and New Zealand.[1]

In many cases, there was no strong evidence supporting the claim that Interior BC sites and Alberta sites were significantly different on a particular variable. In cases where they were not significantly different, the two regions were amalgamated and renamed Western Canada sites.

Doing so facilitated the statistical comparison between Interior BC, Alberta and New Zealand. Moreover, when the two regions were amalgamated, it became evident that Western Canada sites and New Zealand sites were significantly different on a number of variables. In the case where Interior BC and Alberta were different, the three regions were treated separately and Anova tests were conducted to determine if any significant differences existed between the three means.

The second section amalgamates the results from each of the three regions and compares the aggregate corporate data to the aggregate site data. The third section represents the findings from multivariate statistical analysis. Cluster analysis and multiple discriminant analysis were used to segment the sawmill sites in Interior BC, Alberta and New Zealand.

3.1 REGIONAL COMPARISON OF CORPORATE AND SITE RESPONDENTS

3.1.1 Company/Site Information

3.1.1.1 Production

In 1998, Western Canada[2] and New Zealand companies had an average total production of 712.3 millions of board feet (MMBF) and 156.8 MMBF, respectively.[3] Western Canada companies produced almost five times more lumber than New Zealand companies.[4]

In the same year, Western Canada sites[5] had a larger average total production than New Zealand by almost threefold, as shown in Table 1:

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[1] 70% and 86% of all solid wood manufacturing companies in Western Canada and New Zealand responded to the survey, respectively. Moreover, 50%, 60% and 47% of all sawmills in Interior BC, Alberta and New Zealand responded, respectively.

[2] Western Canada corporate respondents represent all Interior BC and Alberta site respondents.

[3] Note that only 4 of 5 Western Canada respondents provided production-related information.

[4] T-tests provided evidence that the two regions were statistically different at a significance level of .05.

[5] Although Interior BC sites produced a larger volume of lumber in 1998, it was not proven to be significantly different from the Alberta sites. The researcher has therefore lumped the two regions into a category called "Western Canada" sites.

Table 1: Average Total Production in 1998

Region	Range	Average Production/Site	Total Production of All Respondents
New Zealand	14.8 to 84.75	56.4	450.94
W. Canada	45 to 380	154.8	2477.47
Interior BC	45 to 380	144.8	1447.8
Alberta	78 to 240	171.61	1029.67

Western Canada's higher average production per site could be explained by their adoption of newer and more advanced technologies in the last decade, thereby increasing productivity.

3.1.1.2 Sales Revenue

In 1998, 4 out of 5 Western Canada corporate respondents (80%) said they had sales between $250.1 and $500 million while one company had sales between $500.1 and $750 million. New Zealand respondents, on the other hand, had significantly lower sales revenues. Half of the respondents had sales between $10 and 100 million, and 2 out of 6 sites (33%) had sales between $100.1 and $250 million. Only one company said they had sales over $750.1 million.

All sites, however, had relatively similar sales for 1998. Five out of 8 Interior BC respondents (63%) had sales between $10 and $100 million, 2 sites (25%) had sales between $1 and $10 million, and 1 site (13%) had sales over $100 million. All of the Alberta and New Zealand respondents had sales between $10 and $100 million.

3.1.1.3 Product Type

The type of products produced by the companies seems to be in direct correlation with the markets they serve. At a first glance, it appears that Interior BC and Alberta sites strongly focused on standardized, commodity products for the North American market and New Zealand focused on more customized, specialized wood products for the Japanese market. Figure 2

shows that, on average, Western Canada companies produced more commodity products (71%) than New Zealand (43%), respectively. New Zealand, on the other hand, produced almost two times more specialty wood products (46%) than Western Canada (24%). However, there was not enough evidence to support the claim that Western Canada's production of specialty wood products or commodity wood products was significantly different from New Zealand.[6]

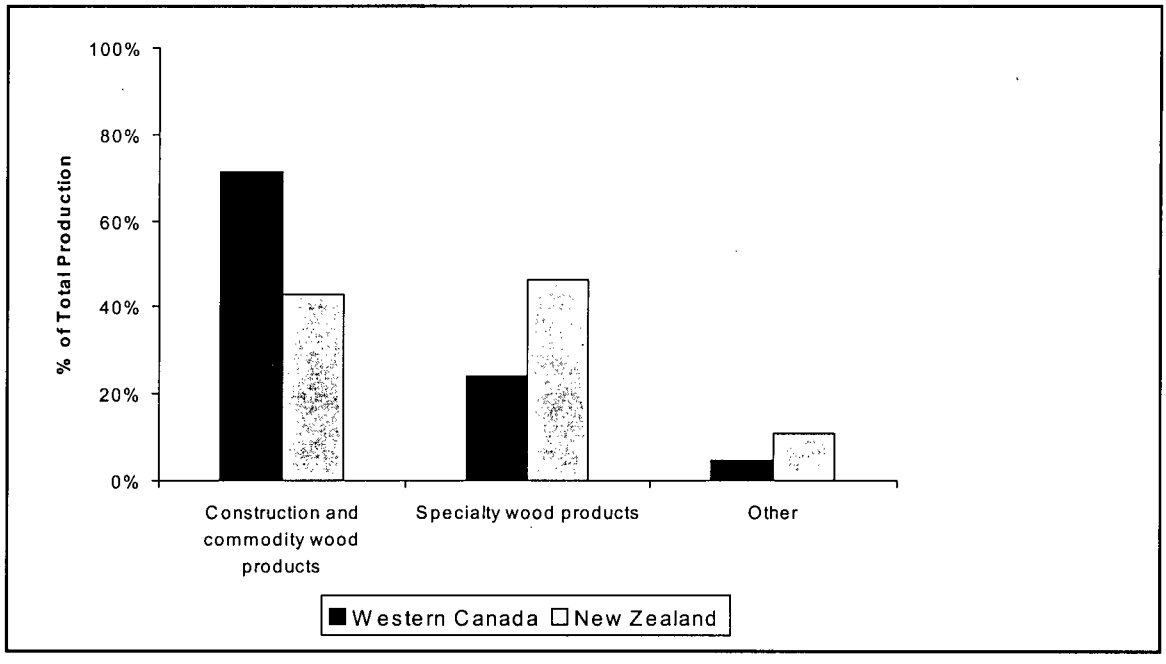

Figure 2: Type of Wood Products Produced by Companies[7]

Figure 3 demonstrates a similar ratio at the site level. Alberta respondents produced almost all commodity wood products (94%, SD 10.8) and Interior BC produced about 84% (SD 18.6)[8]. Even with a 10% difference, t-test results showed that production of commodity and specialty wood products was not significantly different between the two Western Canada regions.

The researcher combined data from the two Western Canada sites so that a more meaningful comparison could be made with New Zealand. Western Canada sites, on average, produced

[6] T-tests were conducted assuming a normal distribution at a significance level of .05.
[7] Other wood products include low grade/economy lumber in BC and appearance grade lumber in New Zealand at 5% and 11%, respectively.
[8] The 95% confidence intervals of the mean for commodity products produced by Interior BC and Alberta sites were 73.4 to 95.4% and 84.5 to 103.5%, respectively.

about 88% commodity wood products and 9.4% specialty wood products (S.D. 16.3 and 14.5, respectively).[9] New Zealand produced about 71% (SD 26.3) commodity and 29%

(SD 26.3) specialty wood products, which is almost triple the volume of specialty wood products than its western counterpart.[10] Although the larger average proportion of commodity wood products in Western Canada sites was not significantly different than New Zealand, there was evidence proving that the proportion of specialty wood products between the two regions was significantly different.[11]

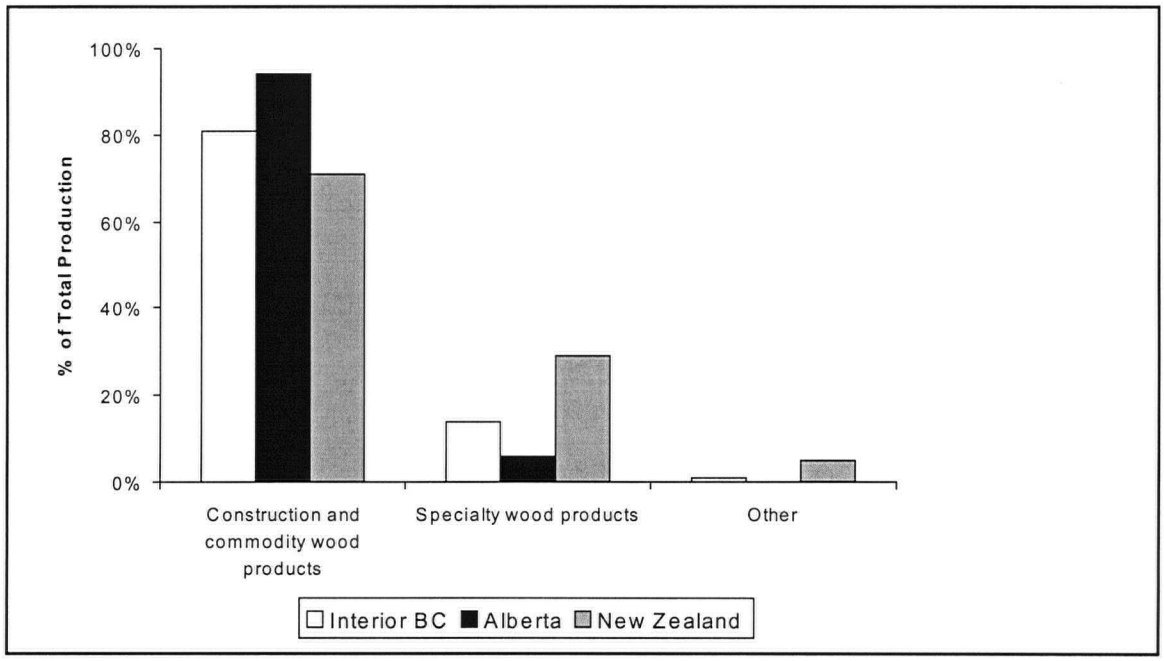

Figure 3: Type of Wood Products Produced by Sites

3.1.1.4 Workplace Demographics

Interior BC sites, on average, had slightly more employees per mill than Alberta. As expected, there was no evidence showing that the two averages were significantly different. On the other

[9] T-tests were conducted assuming a normal distribution at an alpha value of .05.

[10] The 95% confidence intervals of the mean for commodity products produced by Western Canada and New Zealand sites were 80 to 96% and 47.6 to 93.6%, respectively. The 95% confidence interval of the mean for specialty wood products produced by Western Canada and New Zealand sites were 1.4 to 20.4% and 5.7 to 51.8%, respectively.

hand, Western Canada sites had significantly more employees per site than New Zealand (Table 2). On average, almost all employees in all three regions were permanent, full-time employees (over 95%).[12]

Table 2: Average Number of Employees Per Site in 1998

Region	Range	Average	SD of Observations	90% Confidence Interval	Total Number Employees
Interior BC	80 to 400	205	87	152-259	2,052
Alberta	115 to 280	198	64	146-249	1,186
W. Canada	80 to 400	202	77	160-245	3,238
New Zealand	35 to 218	132	69	84-180	1,055

The lower number of employees per site may not necessarily mean that New Zealand sites were more efficient. The large use of contractors and lower production volumes in New Zealand sites may help explain their lower number of employees per site. In looking at productivity measures (total average production divided by the average number of employees), Western Canada sites surpassed New Zealand's productivity (0.748 versus 0.427 MMBF/employee, respectively). This may be explained by more advanced technologies in the former region and New Zealand's more labour-intensive sawmills.

Both Interior BC and Alberta reported a highly unionized setting, where over 68% (SD 36.6 and 34, respectively) of the employees were in-house unionized (Figure 4)[13]. Not surprising, the two regions did not have significantly different means. In contrast, a majority of New Zealand sawmill employees were non-unionized (54%, SD 35.4) and about a quarter were contract employees (22%, SD 36.3). The proportion of in-house unionized and contract employees were

[11] T-tests provided evidence that the two regions were statistically different at a significance level of .05.

[12] T-tests were conducted between Interior BC and Alberta and between Western Canada and New Zealand at an alpha value of .05. A significant difference in the mean was apparent for the latter comparison.

[13] The 95% confidence intervals of the mean for in-house unionized employees for Interior BC and Alberta sites were 45.3 to 90.7% and 41.7 to 96%, respectively. The 95% confidence intervals of the mean for in-house non-unionized employees for New Zealand sites was 29 to 78%. The 95% confidence intervals of the mean for contract employees for New Zealand sites was 0 to 46.9%.

significantly different between Western Canada and New Zealand sites.[14] Oddly, this was not the case when comparing the proportion of in-house non-unionized employees.

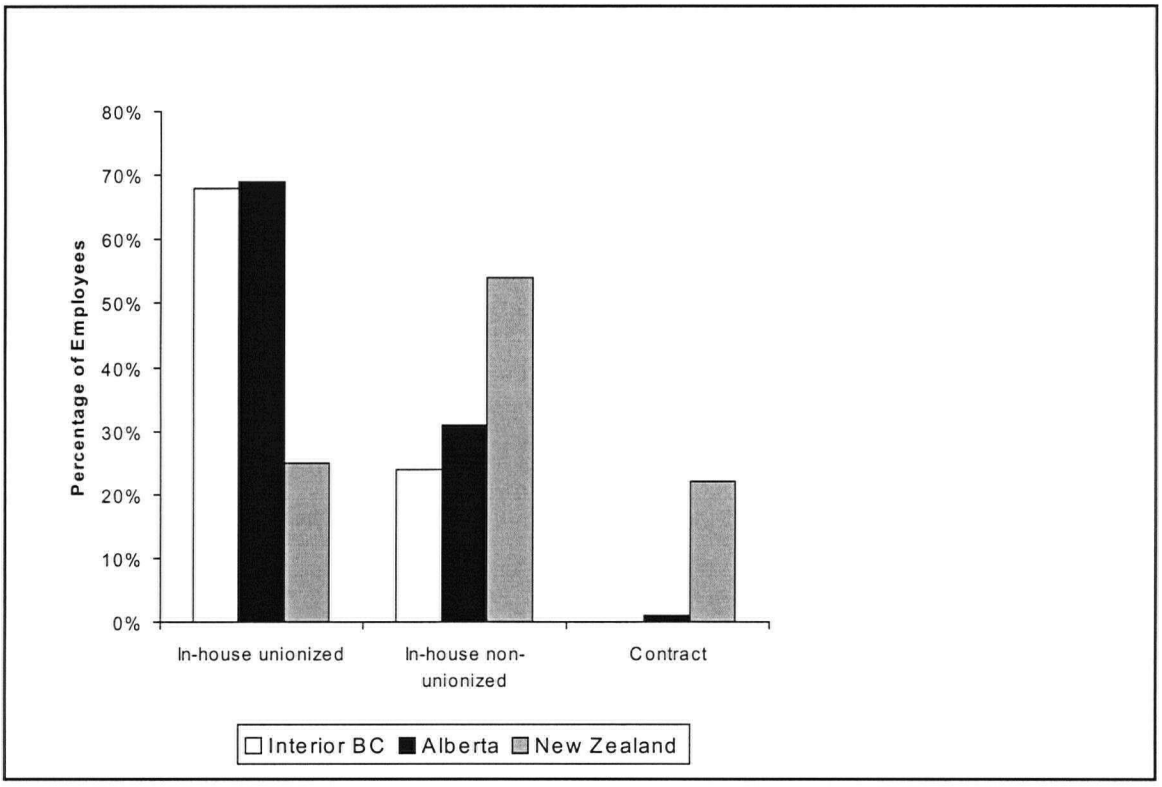

Figure 4: Proportion of Unionized Sawmill Employees

The high level of unionization in Interior BC and low level in New Zealand was expected given the union-friendly legislation in British Columbia and employer-friendly legislation in New Zealand in 1998/1999. However, the proportion of unionized sites in New Zealand may increase in the future with the recent onset of the new Employment Relations Act (2000). Surprisingly, Alberta's highly unionized sawmill sector did not fit in with the highly non-unionized natural resources sector, or the low union density in the province.

As unionized sites generally have little tolerance for contract employees, it is to no shock that both Interior BC and Alberta sites had very few contract employees (less than 1%)[15], whereas

[14] T-tests were conducted between Interior BC and Alberta and between Western Canada and New Zealand at an alpha value of .05.

New Zealand sites had a larger proportion of contract employees (22%). Interestingly, one New Zealand site said they had all contract employees.

In looking at the proportion of management employees to line workers[16], Alberta sites did not display a highly decentralized structure (Figure 5). On average, about one-quarter of the employees was management. That is, for every management employee, there were four line workers.[17]

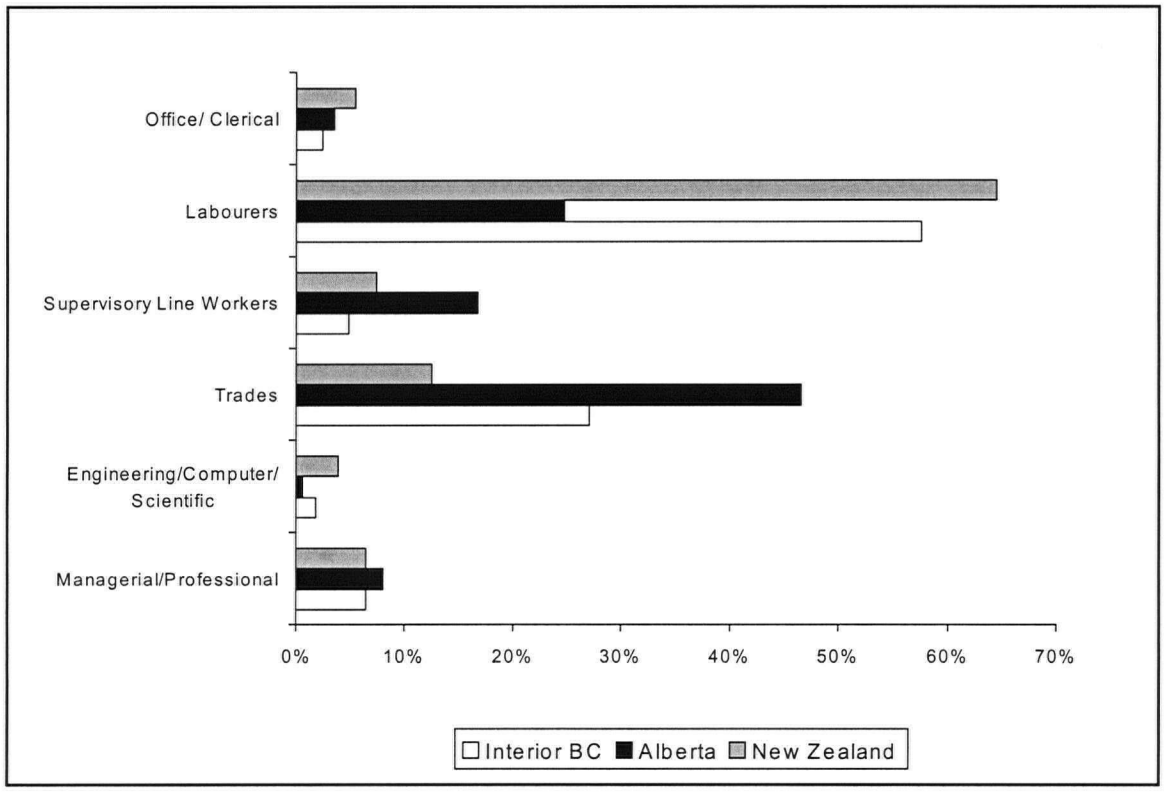

Figure 5: Proportion of Sawmill Employees - By Occupation

Although this ratio seems high at face value, it does not mean that the organization is "top-heavy". Rather than having a large number of supervisory managers, it appears that Alberta had

[15] The 95% confidence intervals of the mean for contract employees for Interior BC and Alberta sites were 0.1 to 0.6% and 0.6 to 1.7%, respectively.

[16] In order to determine the level of decentralization, the researcher grouped occupational categories into two groups: management and line workers. The management group includes management, professional, supervisory line workers, engineering, computer and scientific employees. Line workers include trades, labourers, and office/clerical employees.

more line or technical managers. For example, the adoption of advanced technologies, organizational restructuring and other changes may have demanded more engineers and computer professionals and expanded the role of supervisory line workers.

British Columbia appears largely decentralized where about 13% of the average total employees per site were management.[18] That is, there was about one manager for every 10 line workers. New Zealand fell in between the two regions, where about 18% of the employees were management.[19]

Even though there was a large difference in the proportion of management employees between Interior BC and Alberta, they were not proven to be significantly different. The same holds in comparing Western Canada and New Zealand sites.[20] Like New Zealand, Western Canada sites had an average total proportion of 18%.[21]

At a more micro level (i.e. looking at each occupational group), there was evidence that Interior BC and Alberta sites had significantly different means on only one category: the proportion of labourers. All other occupational categories were not proven to be significantly different. In comparing Western Canada and New Zealand sites, the proportion of trades, labourers and office/clerical employees were proven to be significantly different.[22]

The flipside of looking at the proportion of management employees is the proportion of line workers. Although the distribution of labourers and trades, for example, differed among the regions, the overall amount of line workers in each region was roughly the same (75 to 87%). Interior BC and New Zealand had the highest proportion of labourers at 58% and 64%, respectively, whereas Alberta had just under 25%. Alberta, on the other hand, had the highest proportion of trades employees (47%), whereas Interior BC and New Zealand correspondingly

[17] The 95% confidence interval of the mean for Alberta sites was 4.7 to 45.8%.
[18] The 95% confidence interval of the mean for Interior BC sites was 9 to 17%.
[19] The 95% confidence interval of the mean for New Zealand sites was 12.4 to 23%.
[20] T-tests were conducted between Interior BC and Alberta sites and between Western Canada and New Zealand sites assuming a normal distribution at an alpha value of .05.
[21] The 95% confidence interval of the mean for Western Canada sites was 9.4 to 26.4%.
[22] T-tests were conducted on the proportion of each employee group between Interior BC and Alberta sites and between Western Canada and New Zealand sites. A significance level of .05 was used.

had 27% and 13%, respectively. More advanced technologies in Alberta may explain their larger proportion of trades.

In summary, Western Canada sites were larger than New Zealand sites with respect to the number of employees and production volume per site. They also had a higher proportion of unionized employees but used far fewer contract employees. New Zealand sites produce a higher proportion of specialized wood products than Western Canada sites. The production levels, types of products produced, sales and workplace demographics generally influence the direction of training policies within a company.

Objective 1: Define corporate training policies and determine the success of implementation at the sawmill site level

3.1.2 Training Policy

The following sub-sections take a look at the comparative evaluation tool, the degree of formalization, extent of decentralization, degree of commitment to training, training objectives, and the different phases of the training model.

3.1.2.1 Comparative Evaluation Tool

In order to compare ranked items, the researcher developed an evaluation tool that assigned evaluation points to each rating. Respondents were asked to give five points to the maximum rating and one point to the minimum rating. For example, in looking at the most important factors that limited a site's ability to provide training, five points were assigned to the most important factor; 3 points to the second most important factor; and 1 point to the third most important factor. The points were then totaled for each region (e.g. Interior BC sites assigned a total of 23 points out of the maximum 50 points for lack of financial resources).

In order to remove the upward bias towards Interior BC companies (given their larger proportion of total sites)[23] and establish a common measure, total evaluation points for each region were converted to a scale out of 100.[24] Table 3 provides an example of the revised total evaluation points (where 100 points represented the most important factor by all respondents in the region):

Table 3: Total Evaluation Points for Lack of Financial Resources[25]

Region	Total evaluation points	Maximum Allowable Points for Region	Proportion	Revised Total Evaluation Points
Interior BC	23	50	46%	46
Alberta	11	30	37%	37
NZ	3	40	8%	8

3.1.2.2 Degree of Formalization

Generally, the more decentralized training decisions are, the more formalized training policies will be. This is because companies generally want to encourage consistency across the organization and ensure training is aligned with corporate strategy. This generalization holds true for Western Canada corporate respondents (refer to **sub-section 3.1.2.3 and Figures 6 and 7**). Most Western Canada corporate respondents (60%) indicated a formal training policy and 2 out of 5 (40%) indicated a distinct training department. Moreover, training decisions were fairly decentralized. On the contrary, only 1 out of 6 (17%) of New Zealand corporate respondents had a formal training policy but no respondents indicated a distinct training department. Despite this discrepancy between the corporate respondents, the difference between the two proportions was not significant.[26]

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[23] Depending on the variable being observed, Interior BC, Alberta and New Zealand sites accounted for 48%, 22% and 29% of the total site respondents, respectively.

[24] Essentially, the total points for each region was divided by its maximum allowable points.

[25] Note that despite the use of proportions, the tool is still an arbitrary scale and should be used with caution.

[26] Z-tests were conducted between Western Canada and New Zealand companies at an alpha value of .05.

These findings were supported by the results of the site survey. A vast majority (85%) of Interior BC sites and half of the Alberta sites followed corporate directives for training; however, only 3 out of 8 New Zealand sites (38%) reported that they follow corporate directives. Surprisingly, there was not enough evidence to support the claim that the two proportions between Interior BC and Alberta sites, and between Western Canada (74%) and New Zealand sites, were not equal.[27]

3.1.2.3 Extent of Decentralization

In order to assess the extent of decentralization for training decisions, two questions were asked. The first question asked respondents where training decisions were made within the company; the second questions asked about the degree of influence the corporate office had on a variety of training decisions (e.g. training budget, training content, etc.)[28]. With respect to the first question, training decisions in all three regions were highly decentralized. Three out of five Western Canada corporate respondents (60%) and all of the New Zealand respondents indicated that training decisions were made mostly by the site or all at the site level.

The same holds at the site level. Eleven out of thirteen Interior BC respondents (84%) and all of the Alberta and New Zealand respondents said that training decisions were made mostly by the site or all at the site level.

Results from the second question provided a slightly different picture. Western Canada and New Zealand corporate respondents both indicated slightly more corporate influence on training decisions (Figure 6). Western Canada and New Zealand companies had similar views on the level of corporate influence on training decisions.[29]

[27] Z-tests were conducted between Interior BC and Alberta sites and between Western Canada and New Zealand sites at an alpha value of .05.

[28] A five point interval scale was used where 1 point indicated site makes all decisions and 5 points indicated corporate makes all decisions.

[29] T-tests were conducted but there was no evidence supporting the claim that the means for each training decision were significantly different between Western Canada and New Zealand corporate respondents.

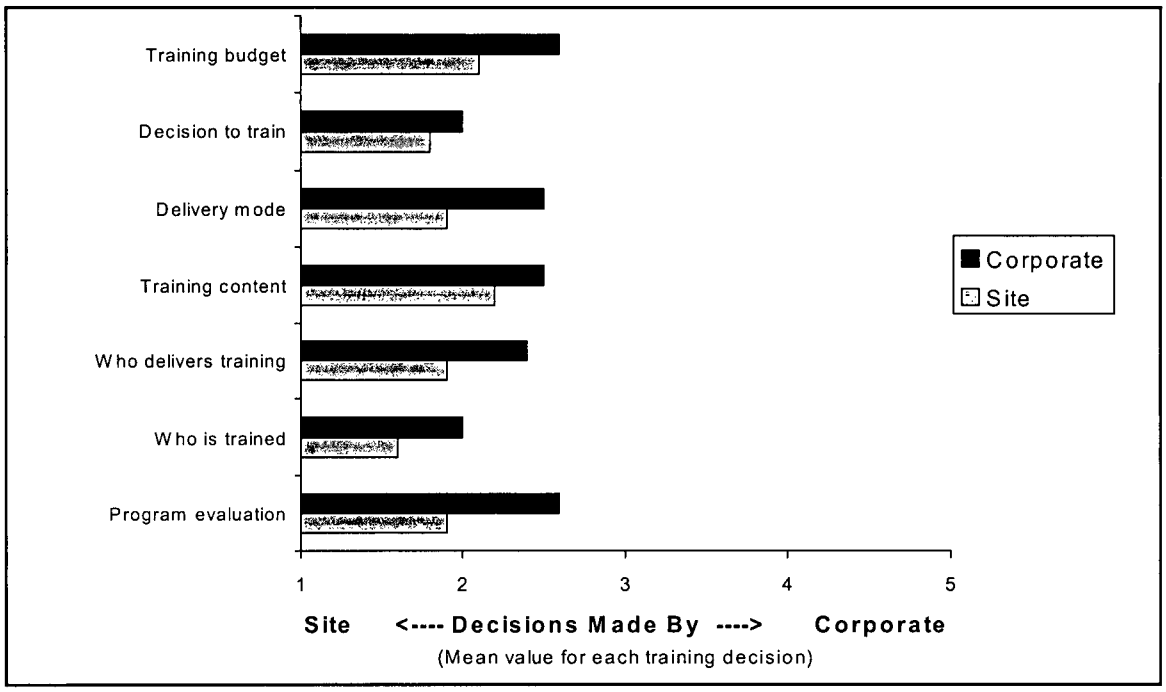

Figure 6: Where Training Decisions are Made – Corporate[30]

Training decisions made by sites in each of the three regions were quite decentralized (Figure 7). Alberta respondents appeared to have quite decentralized training decisions. This may be due to the fact that their corporate human resources function is located in British Columbia.

Interior BC and Alberta sites differed in training decisions pertaining to delivery mode, training content, who delivers training, and program evaluation.[31] Because of these differences, Interior BC and Alberta sites could not be grouped together as Western Canada sites in order to compare their means to New Zealand sites. Instead, one-way Anova and Scheffe tests were conducted to identify the specific regions having different means for a particular training decision.

[30] Note that the scale from one to five had implicit values that were not communicated to the respondents, as follows: 1 indicates sites make 100% of the decisions and 5 indicates that corporate makes 100% of the decisions. A value of 2 signifies corporate and sites have 25% and 75 % authority on training decisions, respectively. A value of 3 indicates that corporate and site have equal influence on training decisions and 4 signifies that corporate and site have 75 and 25% influence on training decisions, respectively. This is an oversight of the study and the researcher assumed the respondents would have had the same interpretations.

[31] T-tests proved significant differences in the mean between Interior BC and Alberta at an alpha value of .05.

One-way Anova tests revealed differences in the mean between the three regions for only two of the seven training decisions. The means for training budget decisions were not equal between Interior BC and New Zealand sites or between Alberta and New Zealand sites. Likewise, the means for training program evaluation decisions were not equal between Interior BC and Alberta sites.

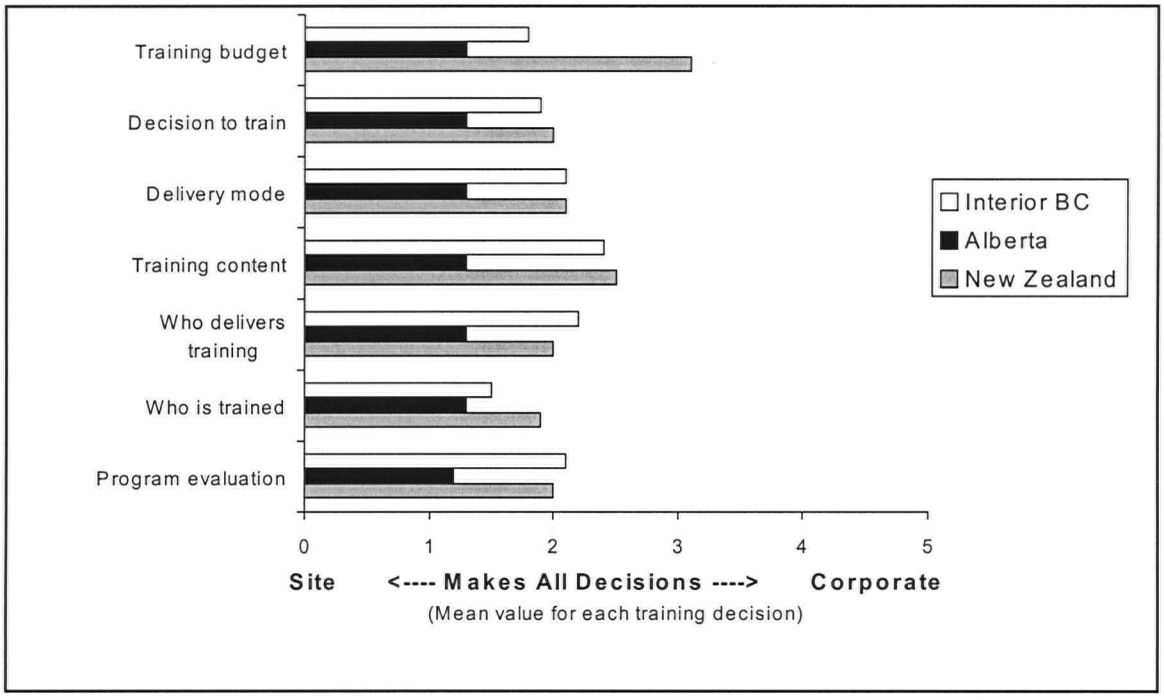

Figure 7: Where Training Decisions are Made – Site

In summary, Western Canada and New Zealand corporate respondents indicated a similar degree of corporate influence on training decisions. Western Canada companies indicated a stronger corporate influence than its sites; however, New Zealand companies were in agreement with the amount of corporate influence on training decisions. At the site level, New Zealand respondents had a much stronger corporate influence than Western Canada sites for decisions pertaining to the training budget. Alberta sites made almost all their own decisions regarding training program evaluation.

3.1.2.4 Objectives for Training

The most important training objectives are clearly linked to the operational needs of the company. Both Western Canada and New Zealand corporate respondents ranked "improve work performance" as their most important training objective (Figure 8). While Western Canada companies ranked "improve productivity" as their second most important objective, New Zealand companies did not see it as high a priority. Instead, New Zealand companies ranked "keep abreast of new technologies" as their second most important objective. These rankings may be explained by both region's desire to upgrade their existing facilities and technologies, with New Zealand having generally older machinery and equipment than Western Canada.

New Zealand placed equal emphasis on "attract and retain qualified employees" and "improve product/service quality" as their third most important training objective (30 points for each); however Western Canada corporate respondents did not select these objectives as one of their top three. This may be because of New Zealand's larger dependence on contract employees and Western Canada's highly unionized environment, which usually breeds a more stable workforce.

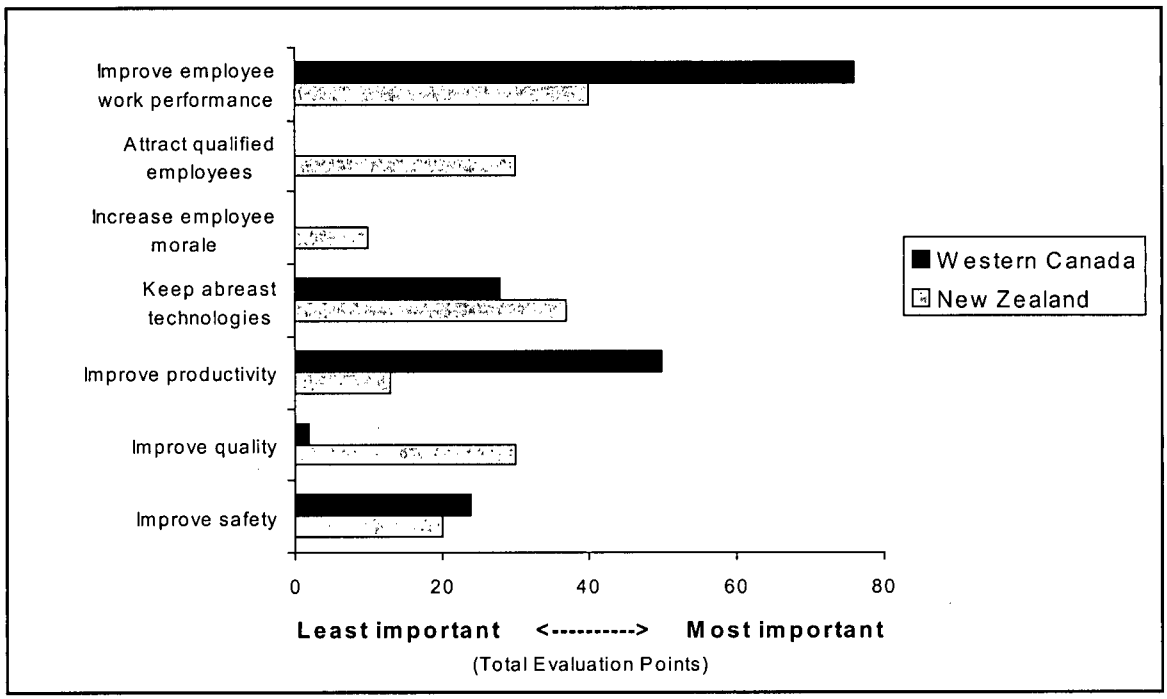

Figure 8: Most Important Training Objective – Corporate

Similar to the corporate respondents, Figure 9 shows that sites in each region ranked "improve work performance" and "keep abreast of new technologies" as one of the three most important training objectives.[32] However, site respondents differed from the corporate respondents in other training objectives. For example, sites in each region ranked "improve safety" as their most or second most important training objective. Corporate respondents, on the other hand, did not select this objective as one of the three most important training objectives.

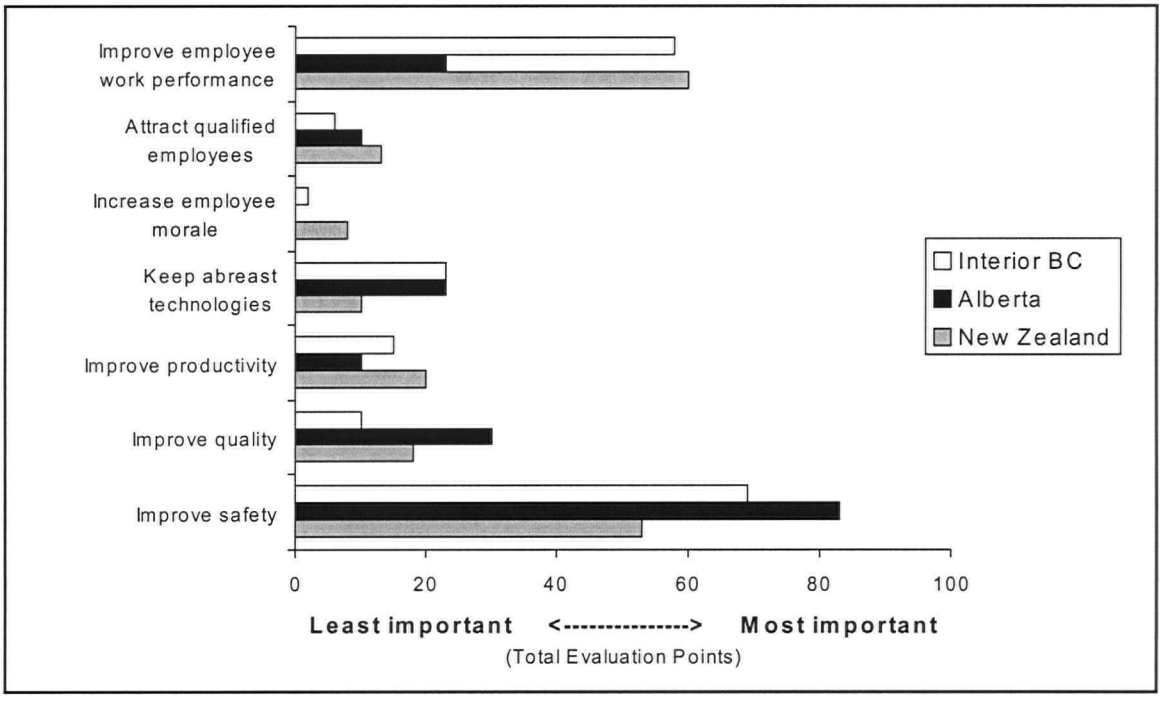

Figure 9: Most Important Training Objective – Site

Overall, a majority of sites had informal training policies, training decisions were largely decentralized, and training objectives were focused on improving employee performance. The extent these training policies were backed financially is highlighted in the second research objective.

[32] One site respondent selected but did not rank the items. In this case, a ranking of 2 points was assigned to each selected item.

Objective 2: Determine the degree of the company's investment and commitment to training

3.1.3 Training Investment

3.1.3.1 Corporate and Site Training Budget

A vast majority of Western Canada and New Zealand corporate respondents (60 and 83%, respectively) indicated they had a separate training budget. Site respondents were asked about the proportion of allocated training funds that they received from the sawmill, corporate office, employees, unions, and government. Almost all said they received their training funds from the sawmill site.

Information on the corporate training budget[33] for the period 1998 to 2001, along with an average for the 1990's is provided in Table 4.[34] The corporate training budget dropped in Western Canadian companies between 1998 and 1999 but respondents said they would increase their spending significantly in 2000[35]. However, they planned to drop their spending again in 2001. On the other hand, New Zealand companies showed a steady increase between 1998 and 2001, and planned to double their investment between 2000 and 2001. This is confirmed in Figures 35 and 36 where New Zealand site respondents more strongly agreed with the statement that training is an investment.

[33] Corporate training budget includes training funds allocated to all sites and to head office.

[34] The exchange rate between Canada and New Zealand fluctuated extensively in the year 1999. $1 NZ fluctuated from $0.6708 CAN in February, 2000 to $0.6604 CAN in July, 2000. The average for the five month surveying period was therefore taken, where $1 NZ = $0.67 CAN.

35 Only 3 of the 5 Western Canada and half of the New Zealand corporate respondents provided financial data for the years 1999 and 2000.

Table 4: Corporate Training Budget (in thousands of dollars)

	1998	1999	2000	2001
Average:				
Western Canada[36]	$ 1,709	$ 2,221	$ 3,179	$ 575
New Zealand ($CAN)	$ 323	$ 251	$ 626	$ 1,236
Median:				
Western Canada	$ 468	$ 235	$ 753	$ 575
New Zealand ($CAN)	$ 44	$ 267	$ 615	$ 1,850

Despite the large differences in the means and medians for corporate training budget between the two regions, there was not enough evidence to prove that they were significant. Not enough participants responded to the questions pertaining to the 2001 or average 1990's training budgets. Only two of 5 Western Canada and 2 of the 6 New Zealand corporate respondents provided financial data for the year 2001. Less than half Western Canada sites and only 2 New Zealand site respondents provided financial data for the average 1990's budget.

At the site level, all three regions, on average, had increased their training budgets between 1998 and 1999 (Table 5). Interior BC and Alberta sites had a significantly larger training budget than New Zealand sites for the years 1998 and 1999.[37]

[36] One of the Western Canada respondents had a training budget that was significantly higher than other Western Canada respondents. Therefore, the median values were used in the analysis.

[37] T-tests were conducted and proved a difference in the means between Western Canada and New Zealand sites at a significance level of .05.

Table 5: Site Training Budget

	1998	1999	Average for 1990's
Average:			
Interior BC	$ 131,613	$ 148,628	$ 123,000
Alberta[38]	$ 180,116	$ 188,837	$ 178,750
New Zealand ($CAN)	$ 67,394	$ 78,473	$ n/a[39]
Median:			
Interior BC	$ 108,308	$ 98,273	$ 100,000
Alberta	$ 100,000	$ 173,185	$ 132,500
New Zealand ($CAN)	$ 48,874	$ 71,024	$ 33,500
Standard Deviation:[40]			
Interior BC	$ 69,157	$ 124,270	$ 56,635
Alberta	$ 127,960	$ 104,577	$ 117,358
New Zealand	$ 37,859	$ 46,578	$ 23,688

Expressed as a percentage of operating budget, Western Canada and New Zealand corporate respondents, on average, expected their sawmills to spend 2.5% and 1.62% (SD 1.50 and 2.31)[41] of their operating budget on training, respectively. Interior BC sites were the only ones to exceed their expectations by devoting an average of 3.6% (SD 3.0)[42] of their operating budget on

[38] Note that the lower financial figures of Interior BC and New Zealand sites are to be interpreted with caution. Figure 17 shows that a large proportion of sites used computer based training that tends to be an efficient form of disseminating information. In other words, Interior BC and New Zealand sites could be doing more with less.

[39] Note that only 2 of the 8 New Zealand sites responded to this question.

[40] The 95% confidence interval for Interior BC, Alberta and New Zealand sites for 1998 include: $88,750 to 174,476; $67,956 to 292,276; and $21,687 to 82,272, respectively.
The 95% confidence interval for Interior BC, Alberta and New Zealand sites for 1998 include: $71,606 to 225,650; $97,173 to 280,501; and $23,255 to 97,794, respectively.
The 95% confidence interval for Interior BC, Alberta and New Zealand sites for average 1990s include: $73,358 to 172,642; and $671 to 66,329, respectively.

[41] The large standard deviation can be explained, in part, by the large range of proportions of operating budget (1.0 to 5% for Western Canada and 0.1 and 5.5% for New Zealand corporate respondents). The 95% confidence intervals for Western Canada and New Zealand companies were: 1.19 to 3.81% and 0 to 3.65%, respectively.

[42] The large standard deviation can be explained, in part, by the large range of proportions of operating budget (0.5 to 10% for Interior BC; 0.03 to 2.2% for Alberta; and 0.13 to 2.5% for New Zealand sites). The 95% confidence interval for Interior BC sites was 1.75 to 5.45%.

training in 1998. However, given the large standard deviation and small number of respondents to this question, no statistical significance to the differences in the means could be made.

In looking at Figure 21, Western Canada corporate respondents, on average, spent the highest proportion of their total training budget on management staff (44%)[43], followed by labourers (28%) and skilled labour (21%)[44]. It is expected that the proportion spent on skilled labour will increase in the next couple years, as more training will be provided to skilled labour (Figure 22) and as more companies upgrade their facilities.

Similar to Western Canada, New Zealand corporate respondents spent 30% and 29% of their training budget on labourers and skilled labour, respectively. T-tests were conducted to test the difference in the mean proportion of the training budget spent on each employee group in Western Canada and New Zealand companies, but no significant differences arose.[45]

[43] Includes all managers, supervisory line workers (e.g. lead hand, foreperson) and professional staff (e.g. accounting and marketing).
[44] Includes qualified electrical and mechanical maintenance staff (e.g. fitters and turners, electricians) and unqualified but skilled line workers such as saw doctors, machinists, general maintenance.
[45] T-tests were conducted assuming a normal distribution at an alpha value of .05..

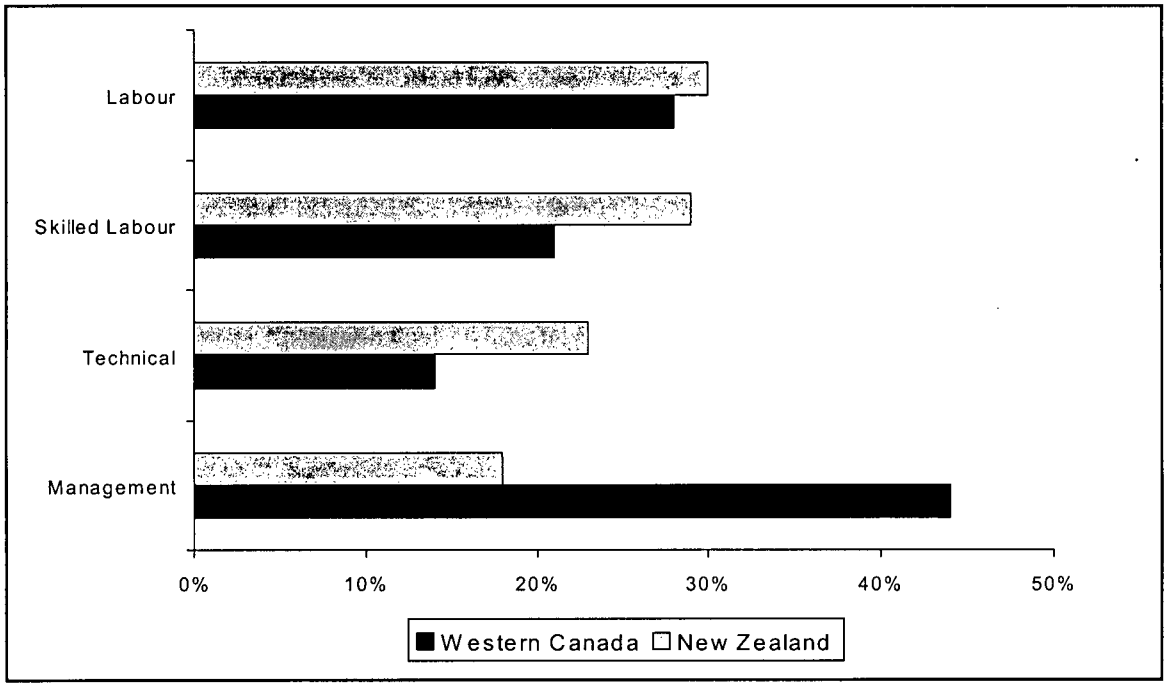

Figure 10: Proportion of Corporate Training Budget Spent on Each Employee Group

At the site level, Interior BC respondents, on average, spent the highest proportion of their training budget on their office or clerical employees, whereas Alberta and New Zealand sites spent the most on labourers (Figure 22). Interior BC's proportion may be a result of an increase in automation, thereby demanding more technical training from their office/clerical staff. Alberta's proportion may result from their desire to upgrade their labourers' skills so that they may use their more advanced technologies, while New Zealand's proportion may simply be from their high proportion of labourers.

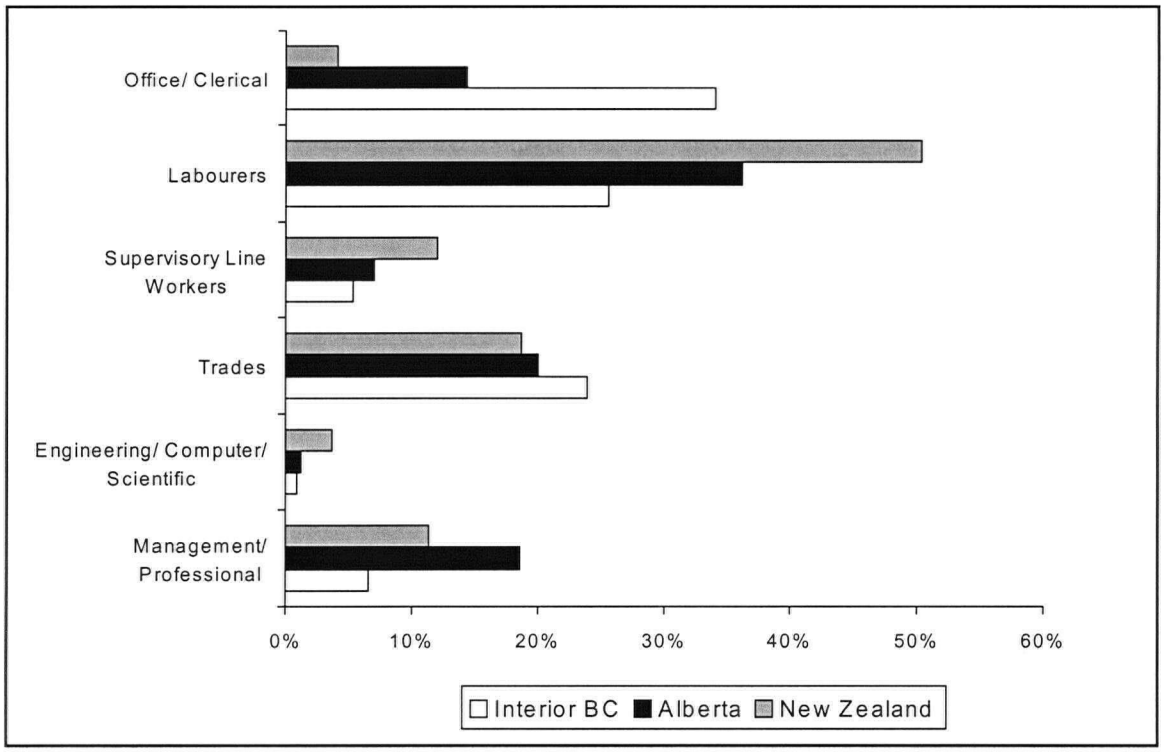

Figure 11: Proportion of Site Training Budget Spent on Each Employee Group

Despite the variation in the means between each region (e.g. Interior BC's higher proportion on office/clerical employees), significant differences were proven between Western Canada and New Zealand sites in only two of the six employee groups: trades employees and supervisory line workers.[46]

Figure 23 shows the proportion of the corporate training budget that is spent on a set of skills[47]. Western Canada companies spent the highest proportion of their training budget on workplace training (33%) followed by performance competencies (24%). Figure 20 confirms these proportions since a high proportion of their budget is spent on management and skilled labourers. New Zealand spent the highest proportion on technical competencies (35%) followed by workplace training (27%), which corresponds to the amount they spent on their labourers (50%). Although there is a large discrepancy in the proportion spent on each skill (e.g. technical

[46] T-tests were conducted assuming a normal distribution at an alpha value of .05.
[47] Definitions for each type of training can be found in the glossary provided in Appendix 7.

competencies), the means between the two regions in any of the six skills sets were not significantly different.[48]

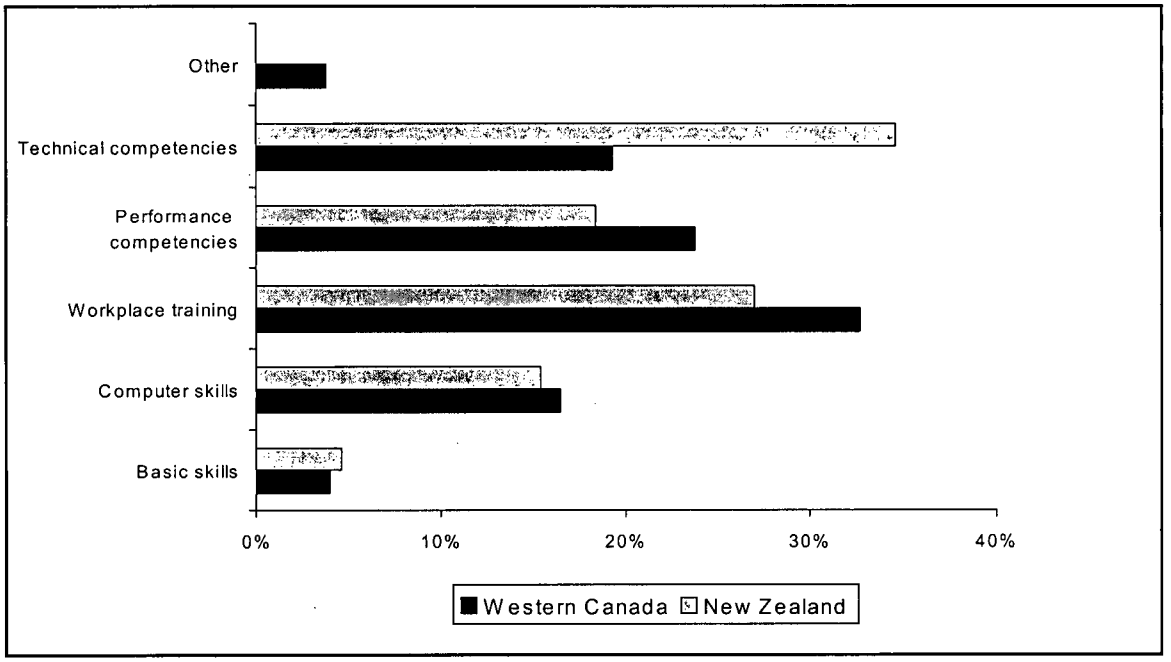

Figure 12: Proportion of Corporate Training Budget Spent on Skills Type

3.1.3.2 Degree of Commitment to Training

For sites in all three regions, the most important factor that limited their ability to provide training was time constraints (Figure 10)[49]. Interior BC respondents ranked a lack of financial resources and a lack of physical resources to conduct training as their second and third most important factors, respectively. These limitations may be due to management pressure to reduce costs and increase productivity with a "skeleton" staff in the limelight of downsizing. They may feel they can't afford the time to release their staff or the money to pay for training.

Interior BC and Alberta ranked a lack of financial resources and lack of union support as their second and third most important factors, respectively. British Columbia's history of hostile

[48] T-tests were conducted assuming a normal distribution at an alpha value of .05.

[49] One site respondent selected but did not rank the items. In this case, a ranking of 2 points was assigned to each selected item.

union-management relations may contribute to the lack of union support for training. For example, current contract language in the collective agreements specifies the conditions required before new technologies are implemented. In addition, some employee groups have negotiated their job descriptions into the contract, potentially reducing management's flexibility to cross-train.

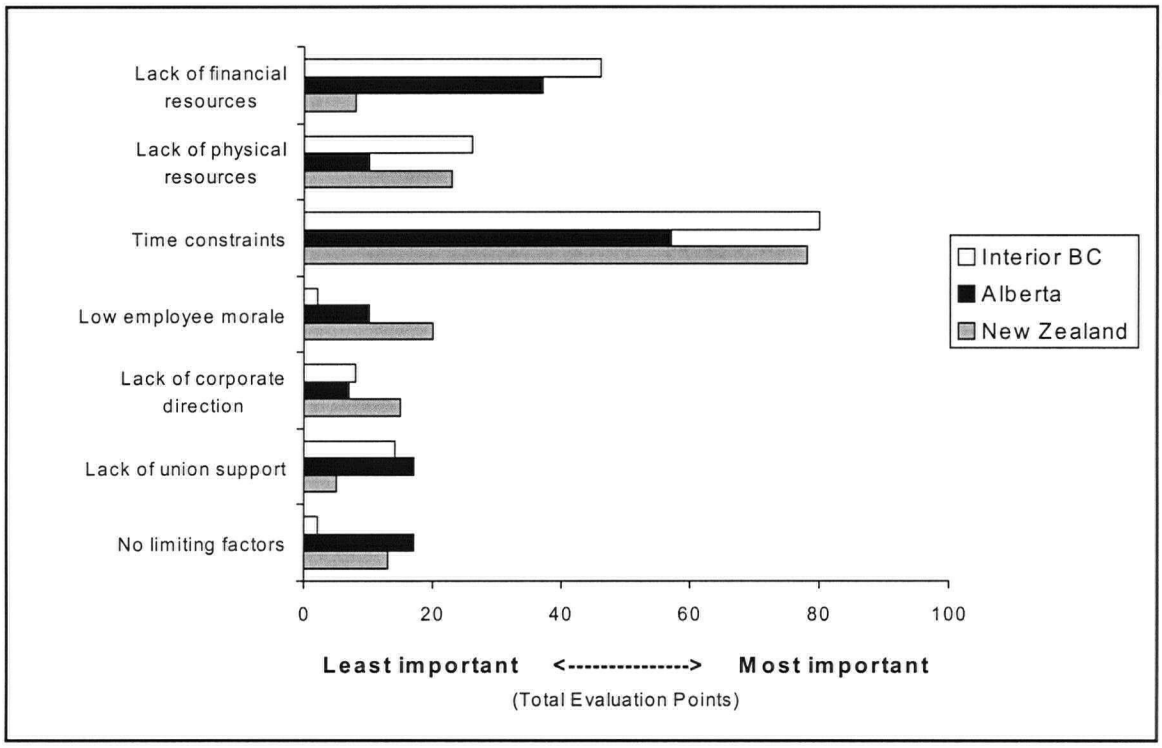

Figure 13: Factors that Limit the Ability to Provide Training

New Zealand respondents, on the other hand, did not view a lack of financial resources as one of the three most important factors. Rather, they ranked a lack of physical resources as their second and low employee morale as the third most important factors. Both low employee morale and lack of corporate direction were significantly more important in New Zealand than in Interior BC and Alberta. The lack of corporate direction may be from their lack of formal training policies within the company. Only two sites indicated that there were no limiting factors that affected their ability to provide training.

Although sites stated a lack of financial resources was as one of the most important factors that limited their ability to provide training, allocating more money to training is not always the right answer. Hence, the next objective looks at how valid training is within the company.

Objective 3: Determine the types of training programs for management and staff

3.1.4 THE TRAINING MODEL

3.1.4.1 Needs Assessment Phase

Western Canada companies evaluated their skills needs on a longer-term basis than New Zealand companies (Figure 11). In Western Canada, 3 out of 5 corporate respondents (60%) said they evaluated their skills and training needs 1 to 2 years in advance. Moreover, one respondent said they planned 2 to 3 years in advance, whereas one other respondent answered "less than 6 months". Five out of 6 New Zealand respondents (83%) planned their skills needs 6 months to a year in advance and only one respondent evaluated their skills needs 1 to 2 years in advance.

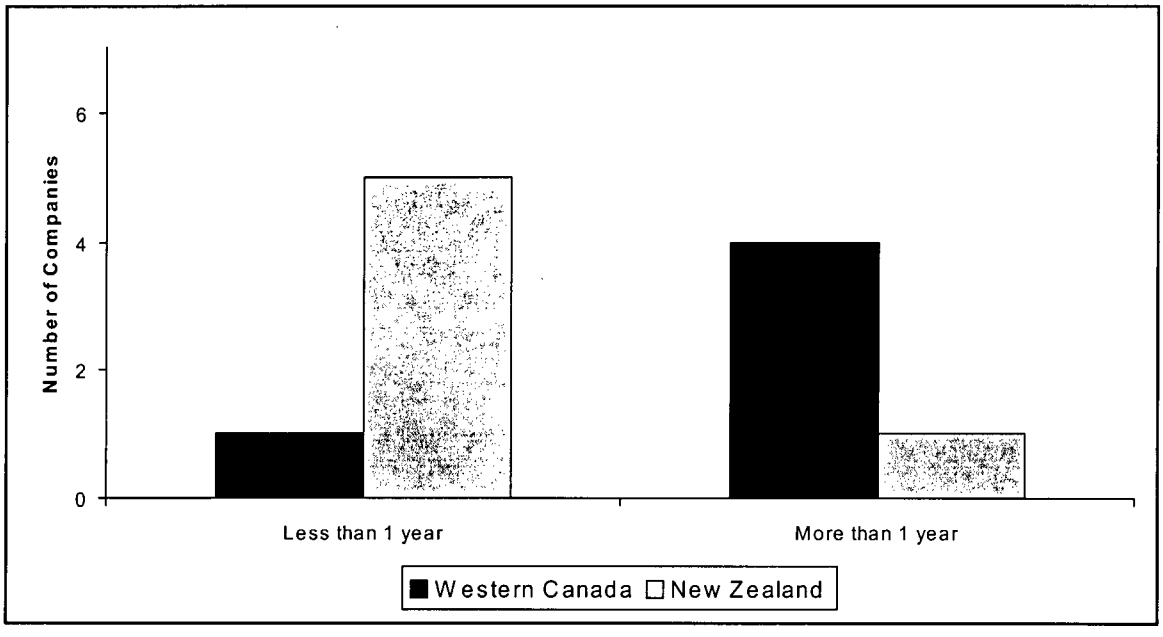

Figure 14: Time Required to Evaluate Skills Needs – Corporate

As compared to the corporate respondents, sites had a shorter time frame for evaluating skill needs (Figure 12). Twelve out of 25 sites[50] in the three regions (48%) assessed their skills needs less than 6 months in advance, 10 sites (40%) did so 6 months to 1 year in advance, and only 3 sites planned 2 to 3 years in advance. About three-quarters of the Interior BC site respondents and almost all New Zealand respondents assessed their skills needs less than a year in advance. In congruence with the corporate survey results, Interior BC site respondents were the only sites to look 2 to 3 years into the future (23%).

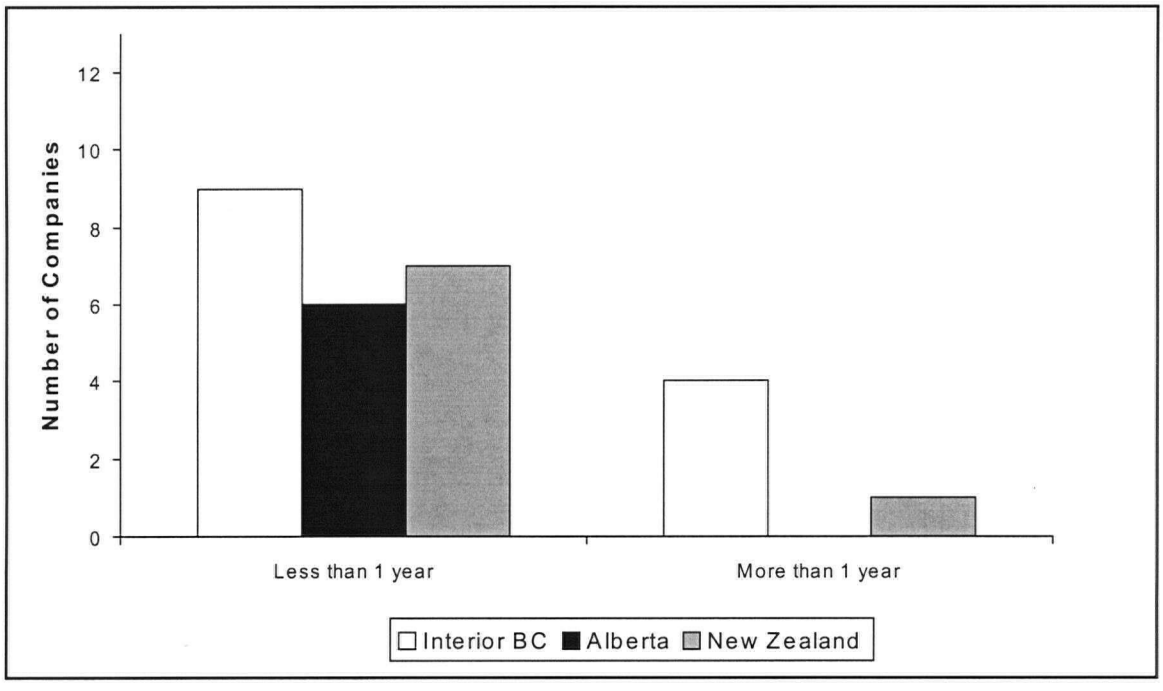

Figure 15: Time Required to Evaluate Skills Needs – Site

A large majority of New Zealand corporate and site respondents (83% and 63%, respectively) had a formal skills assessment process whereas less than a quarter of Western Canada corporate, and Interior BC and Alberta site respondents identified skills and training requirements informally (e.g. conversations with site managers and supervisors).[51] This may seem to contradict the earlier observation of which 60% of Western Canada corporate respondents and only 17% of New Zealand corporate respondents indicated a formal training policy. However it

[50] Two Alberta site respondents did not provide information on this variable.

[51] T-tests provided evidence that the mean proportion of companies/sites having formalized needs assessments were significantly different between Western Canada and New Zealand.

is possible to have a formal system to identify specific needs without having a formal training policy.

In sync with the decentralized training functions in all three regions, both corporate and site respondents said that the most widely used method to identify training needs was to collect information directly from the supervisors or line managers, followed closely by information collected from employees (Figures 13 and 14).

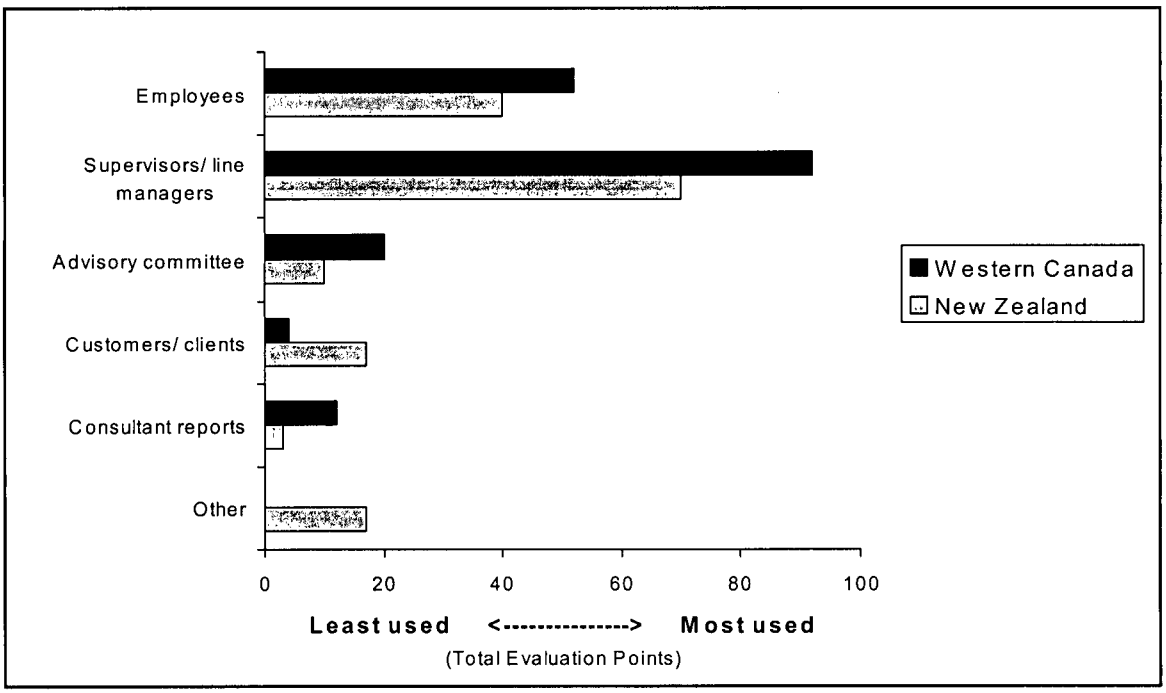

Figure 16: Most Widely Used Methods For Identifying Training Needs – Corporate

All regions at the site level and Western Canada corporate respondents said that an advisory committee made up of managers and workers was used as their third most widely used method of identifying training needs.[52] The use of advisory committees seems appropriate given the high level of cross-training at the sites (Figure 18). New Zealand respondents ranked direct feedback from customers or clients as their third most widely used method.

[52] One corporate and one site respondent selected but did not rank the items. In this case, a ranking of 2 points was assigned to each selected item.

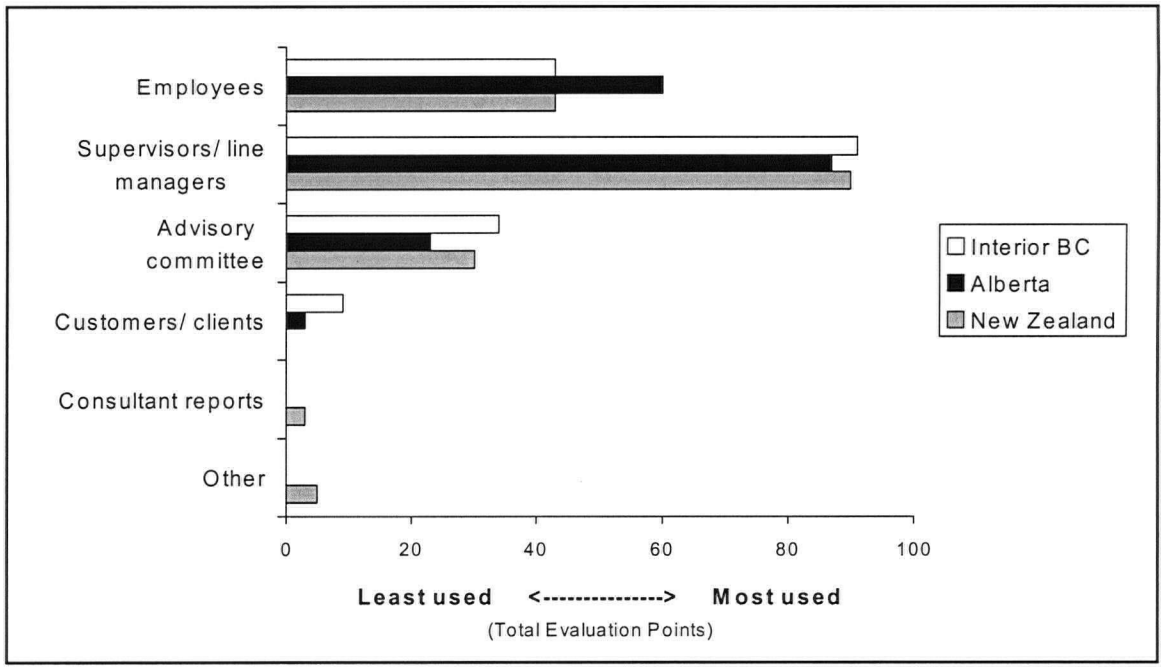

Figure 17: Most Widely Used Methods For Identifying Training Needs – Site

3.1.4.2 Delivery Phase

Comparing training delivery methods between regions illuminated several interesting differences. As indicated in Figures 15 and 16, on-the-job training was rated by both corporate and site respondents as the most widely used method of training delivery in all regions, followed by seminars and workshops.[53] The result is an interesting blend of formal and informal training. At the corporate level, New Zealand companies made more use of seminars and workshops than Western Canada companies. This may be explained by the structure of training in New Zealand's forest industry. For example, Forest Industries Training is a training organization responsible for setting national training standards and qualifications for all forest industries in New Zealand (Forest Industries Training, 2000). They develop training programs and arrange delivery, many of which are seminars and workshops. Courses taken at an education or training institution were the third most widely used method of training delivery for both regions.

[53] One corporate and three site respondents selected but did not rank the items. In this case, a ranking of 2 points was assigned to each selected item.

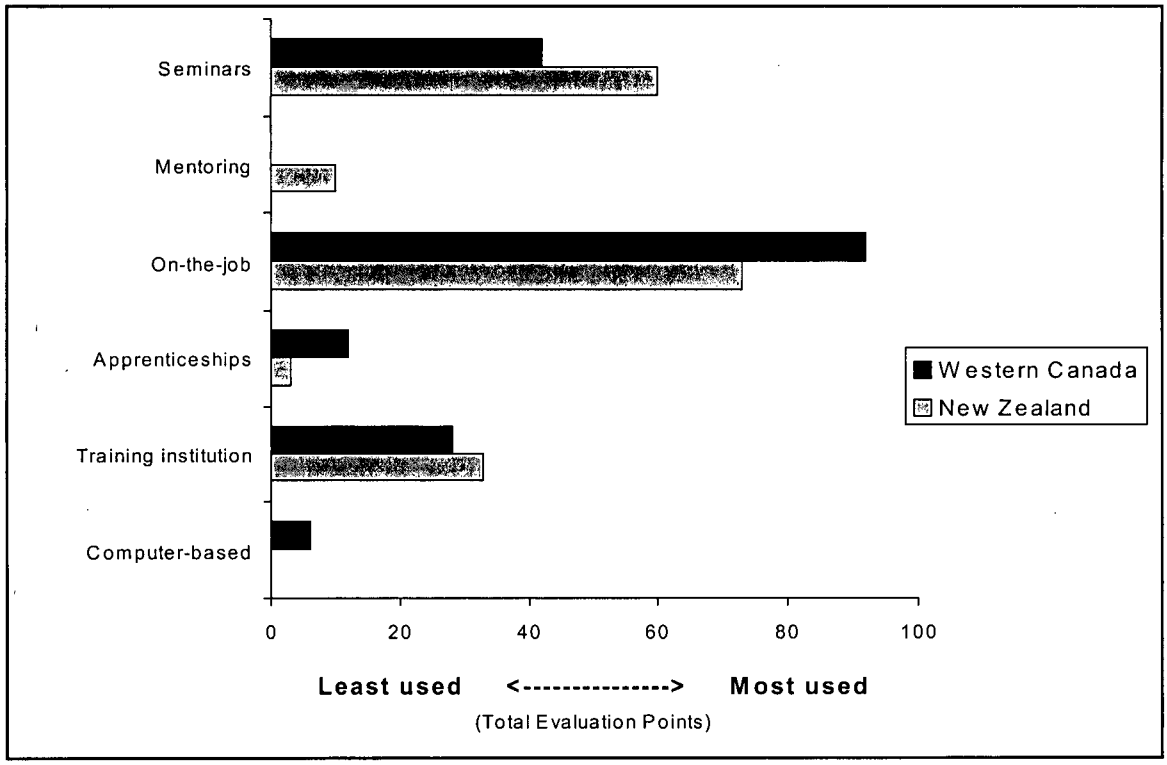

Figure 18: Method of Training Delivery - Corporate

At the site level (Figure 16), apprenticeship programs were used more widely in Interior BC and Alberta (indicative of the unionized environment) than in New Zealand. New Zealand used formal mentoring programs slightly more than Interior BC, with Alberta sites not using them at all. Moreover, with the revolution of training technology, Alberta sites used computer-based training more widely than the other regions, which hardly used or did not use it at all. They were also more involved in self-directed learning. This may be explained by their more advanced technologies or by their distance from corporate headquarters, all of which are in British Columbia. Self-directed learning may also be one of the primary tools they use to meet their third most important objective of keeping abreast of new technologies.

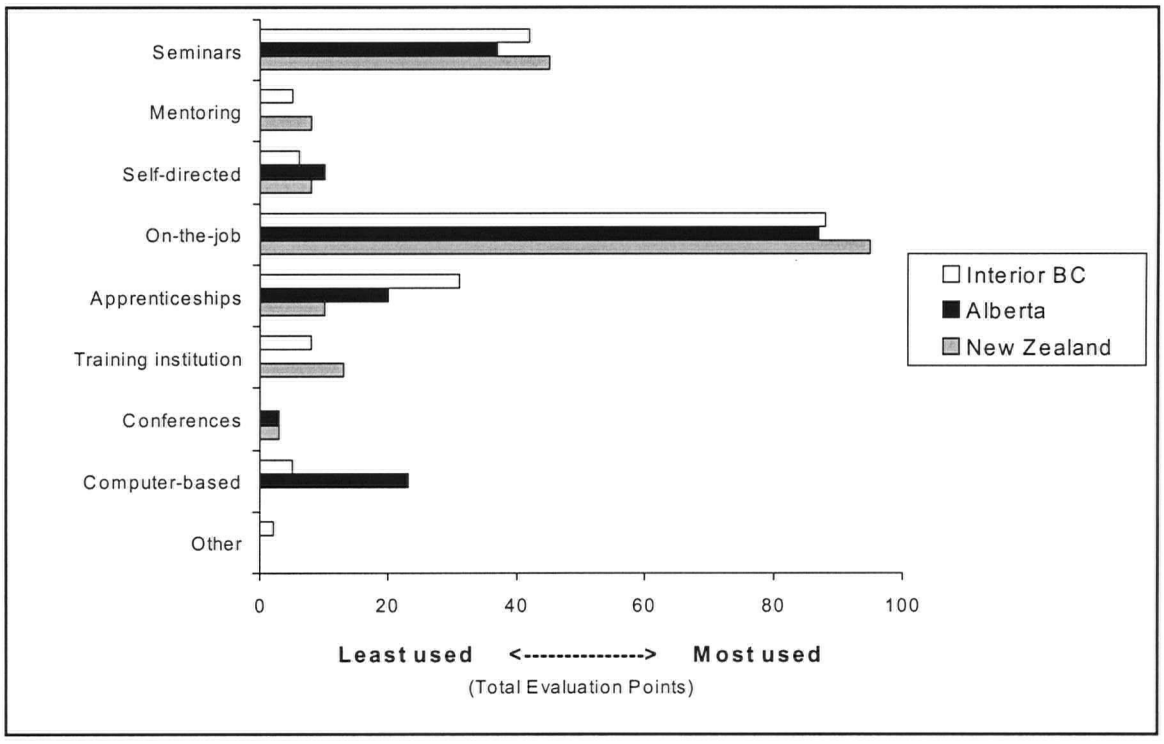

Figure 19: Method of Training Delivery by Sites

With on-the-job training being the most widely used method for training delivery, it is logical that both Western Canada and New Zealand corporate respondents said their most widely used trainers were those from within the company (76 and 63 points out of 100, respectively)[54]. This observation also matches their highly decentralized training function where "train-the-trainer" programs are often used. Although Western Canada companies had a longer-term employee succession plan, they, as well as New Zealand companies, made very little use of mentors (under 5 points) as their top three most widely used trainers.

Western Canada corporate respondents ranked training consultants (48 points) whereas New Zealand companies ranked direct supervisor (50 points) as their next most widely used trainers. In this case more advanced technologies in Western Canada may require more sophisticated training, which is usually developed outside of the company. Both Western Canada and New

[54] One corporate and three site respondents selected but did not rank the items. In this case, a ranking of 2 points was assigned to each selected item. Moreover, one company selected two items for a third ranking. A value of 0.5 was assigned to each of these rankings.

Zealand corporate respondents selected instructors at an education or training institution as their third most widely used trainers.

A similar ranking holds at the site level (Figure 17). Both Alberta and New Zealand respondents ranked direct supervisors as their most widely used trainers, followed by trainers from within the company as their second and training consultants as their third most widely used trainers. Their wide use of direct supervisors may be an outcome of their less formalized training policies. Interior BC, on the other hand, ranked trainers from within the company as their most widely used trainers, followed by training consultants and instructors at an education or training institution. This is a reflection of their more formalized training policies. Alberta's "other" trainers were identified as peers.

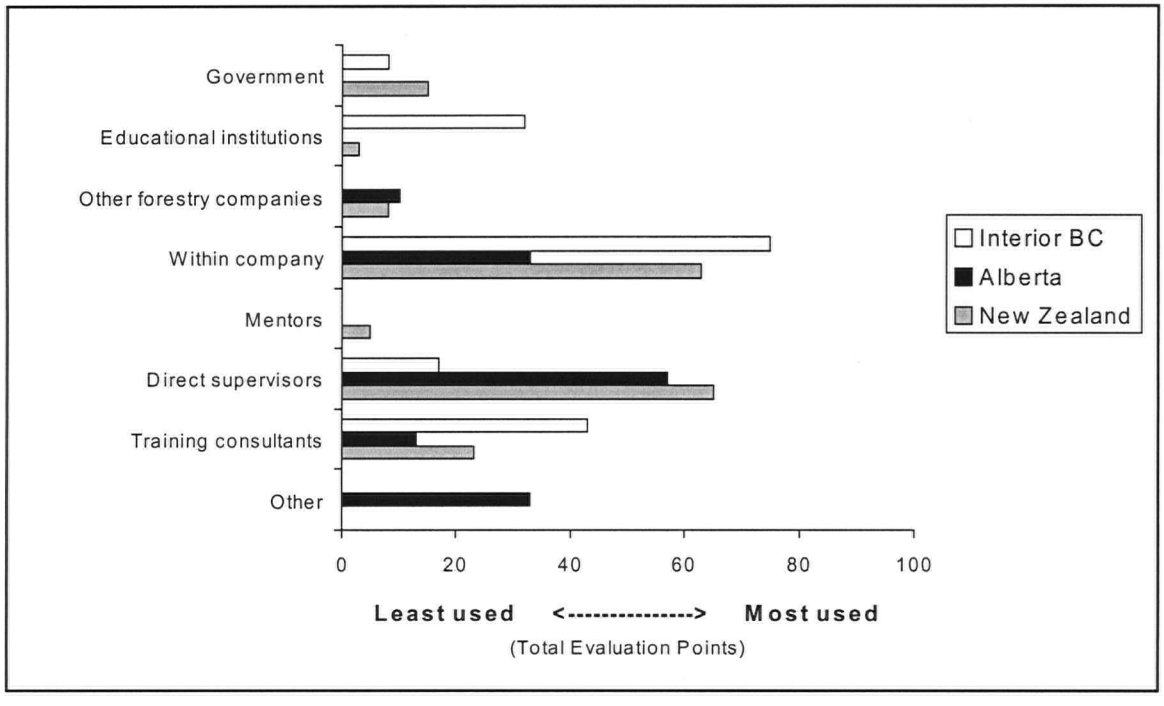

Figure 20: Types of Trainers - Site

Major downsizing and restructuring in the forest industry has brought on new types of training. Figure 18 shows that almost all Western Canada sawmills and over three-quarters New Zealand sawmills implemented cross training. However, there were significant differences in training tools within Western Canada and between the three regions.

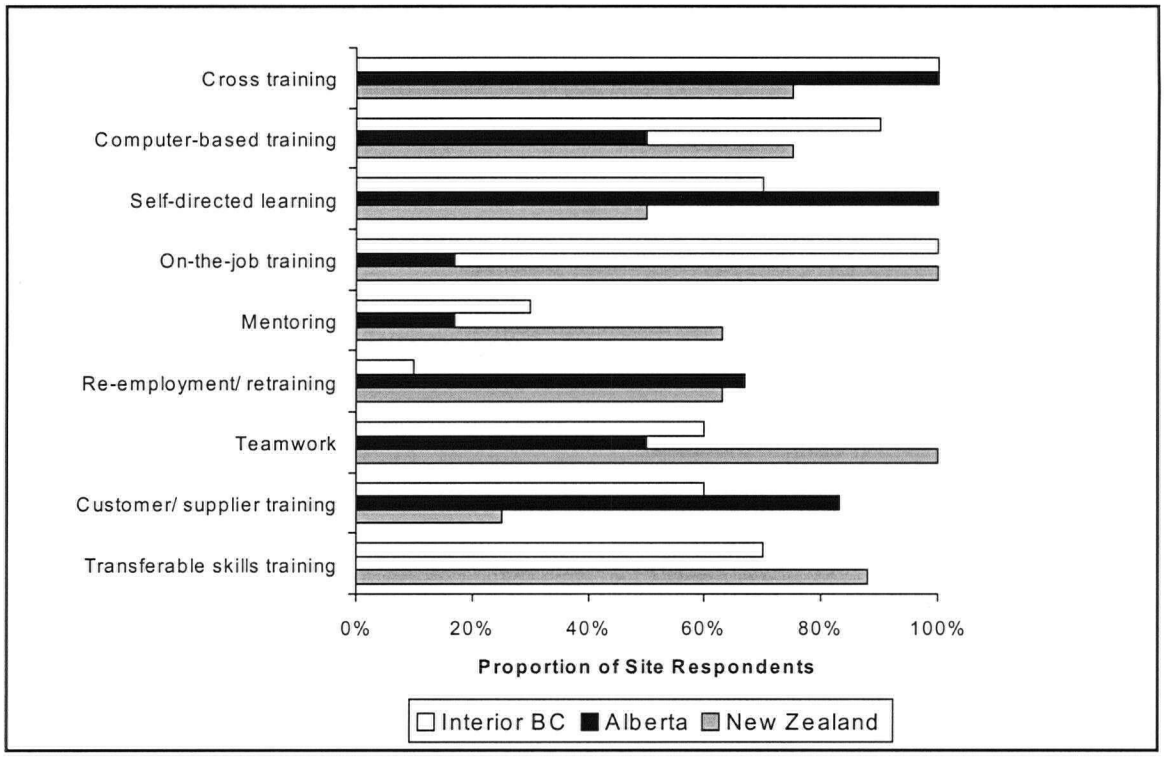

Figure 21: Types of Training Used by Sites

Within Western Canada companies, a higher proportion of Interior BC sites used on-the-job training, transferable skills training and computer-based training[55] whereas more Alberta sawmills used self-directed learning and customer/supplier training.[56] Surprisingly, re-employment or retraining strategies were used much less in Interior BC mills than in Alberta and New Zealand mills. One would assume that highly unionized sites would make more use of re-employment and retraining strategies since redundancy clauses, for example, usually protect the workers.

Different types of training were also used between Western Canada and New Zealand sites. For example, a large majority of Interior BC and Alberta sites developed their courses with

[55] Definitions for each type of training can be found in the glossary in Appendix 7.

[56] There are a couple of points worth mentioning that contradict earlier observations. Firstly, very few Alberta respondents indicated on-the-job training (Figure 18), which seems to contradict its wide use in training delivery, as shown in Figure 16. Secondly, computer-based training was not a widely used method of training delivery in Interior BC (Figure 16), but Figure 18 shows that almost all Interior BC sites use it as a form of training.

customers, suppliers, unions and vendors. They also requested direct feedback from their customers when identifying their training needs (Figure 14). In comparison, New Zealand respondents did not involve their customers/suppliers to the same extent.

Another example is that a higher proportion of New Zealand respondents used mentoring programs and training for teamwork (e.g. cross-functional work teams) than Interior BC and Alberta sites. New Zealand's lower proportion of unionized employees, and hence, fewer restrictions in cross-functional training, may explain this.

3.1.4.3 Evaluation Phase

Employee performance measures and quality standards were the most widely used methods of measuring the impact of training. In Western Canada, 4 out of 5 corporate respondents (80%) used employee performance measures, 2 out of 5 (40%) used quality standards, and 2 out of 5 (40%) used corporate measures such as formal training evaluations and annual planning session. Similar to Western Canada, 3 out of 5 (60%) New Zealand corporate respondents used both quality standards and employee performance measures. However, New Zealand respondents seemed to rely more on the payoffs of a training program. They used productivity reports and return on investment (80% and 20%) more widely than Western Canada (20% and 0%).

Almost all site respondents in the three regions relied on employee performance measures as a way of measuring the impact of training (Figure 19) and more than one-half relied on productivity reports and quality standards. Interior BC and New Zealand sites extensively used quality standards to measure the impact of training but only 17% of the Alberta site respondents employed them. This may be attributed to the newer, more advanced technologies in Alberta sites, where the level of quality should be higher than that found in labour-intensive, older technology mills.

As expected, return on investment (ROI) measures was one of the least used methods of evaluation. About 20% of New Zealand corporate respondents and none of the Western Canada respondents used ROI. The smaller proportion stems from the difficulty of quantifying the costs and benefits associated with training.

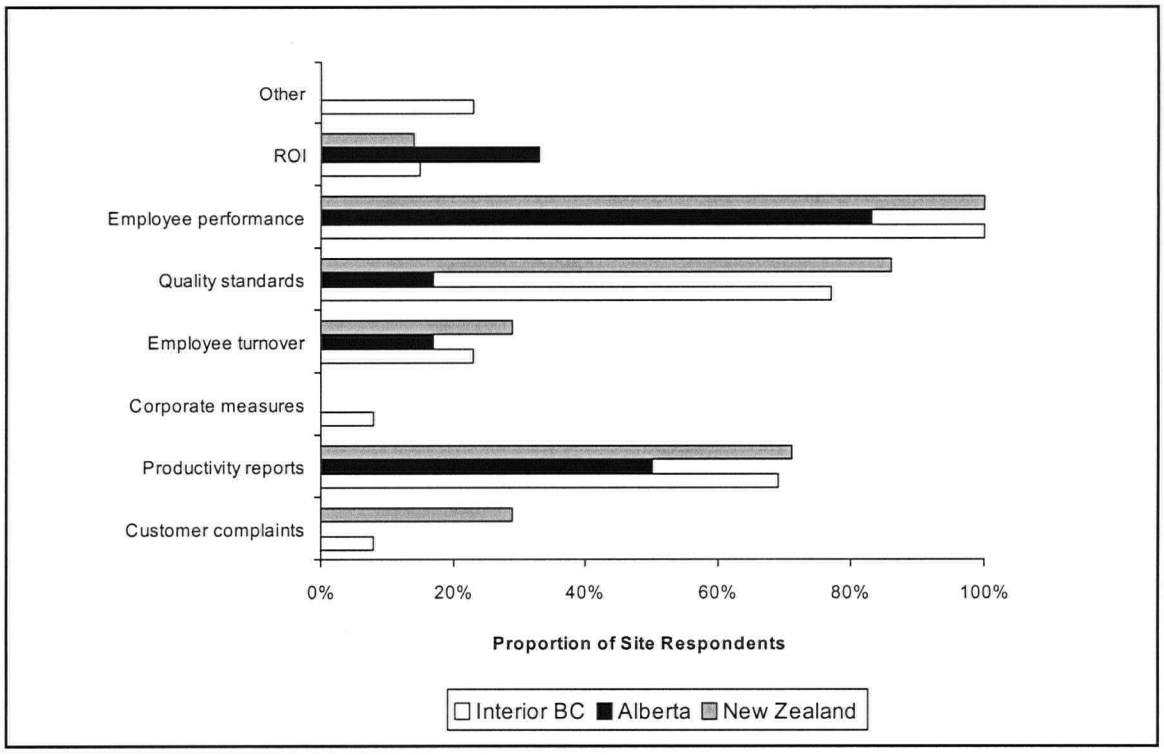

Figure 22: Types of Training Measures - Site

3.1.4.4 Steps to Improve Training

Most sawmill respondents said that site operations improved in the last three years as a result of training. Half of the Interior BC and Alberta site respondents (5 and 3 sites, respectively) said site operations improved significantly and the other half said they were neutral. Only 1 out of 8 New Zealand site respondents said it improved dramatically and 5 respondents said it improved significantly. These improvements may be due to the establishment of a more collaborative method of identifying training needs and on-site training delivery. In addition, training measures appeared to be well linked to training objectives. For example, the three most widely used measures -- employee performance, quality standards, and productivity reports—were linked to two of the three most important training objectives – improve employee performance and improve quality.

Site respondents were asked to comment on the steps they need to take to improve training within the company. About half of the respondents indicated that they needed to do more effective succession planning, better link training needs to overall business strategies and develop more results-oriented evaluation measures, such as return on investment. Respondents also indicated a need to standardize training across the company, regulate training records and processes, and establish a formal tracking process. Other suggestions provided by the sites are shown in Figure 20.

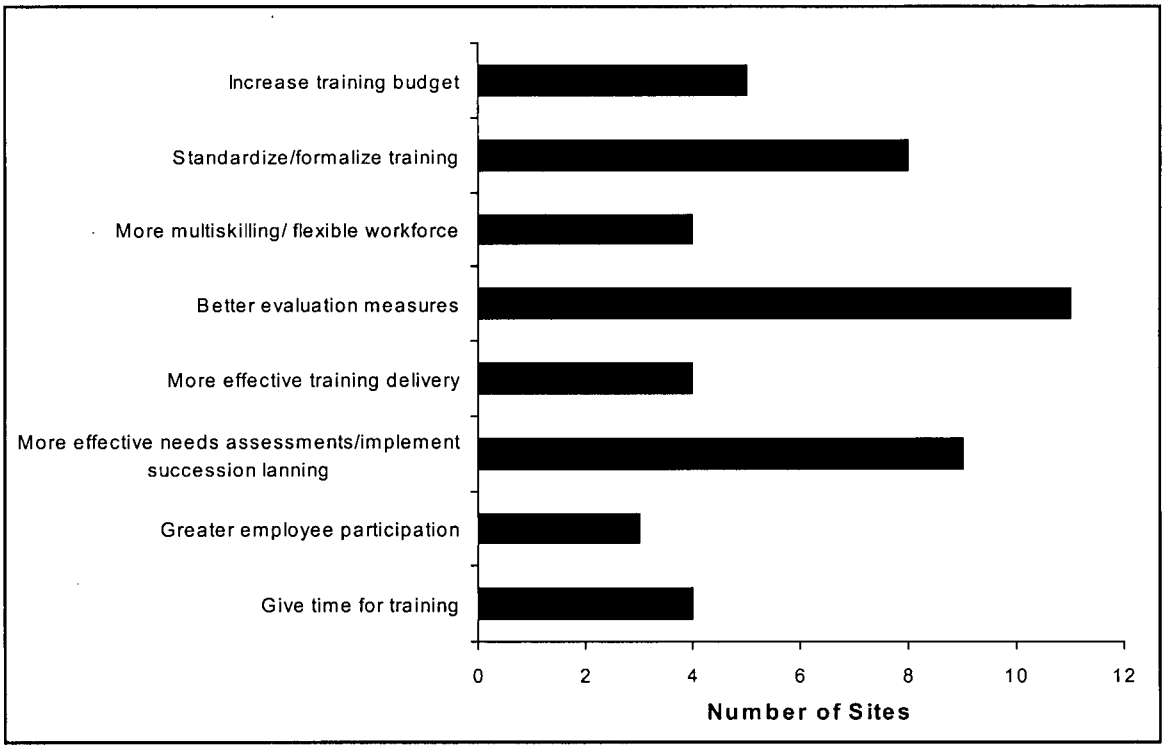

Figure 23: Required Next Steps to Improve Training – All Respondents

In summary, companies in all three regions largely used "flexible" training delivery methods and evaluated training based on employee performance measures. However, sites indicated that training needs were short-term focused (i.e. less than one year).

Objective 4: Define the desired skills set required by the company

3.1.5 Skills Requirements

Corporate respondents were asked to select the three most important skills required for each employee group to succeed in the future. Similarly, site respondents were asked to identify two types of skills training that have been implemented for each employee group.[57]

3.1.5.1 Management/Supervisory

Not surprisingly, all Western Canada and 5 out of 6 New Zealand corporate respondents selected performance competencies as one of the most important skills for management staff, followed by technical competencies and computer skills (Figure 24).

[57] Some respondents selected more items than identified in the question. Where site respondents selected three or four items instead of the required two, a value of 0.67 or 0.25 (rather than the value of 1) was assigned to each selected item, respectively.

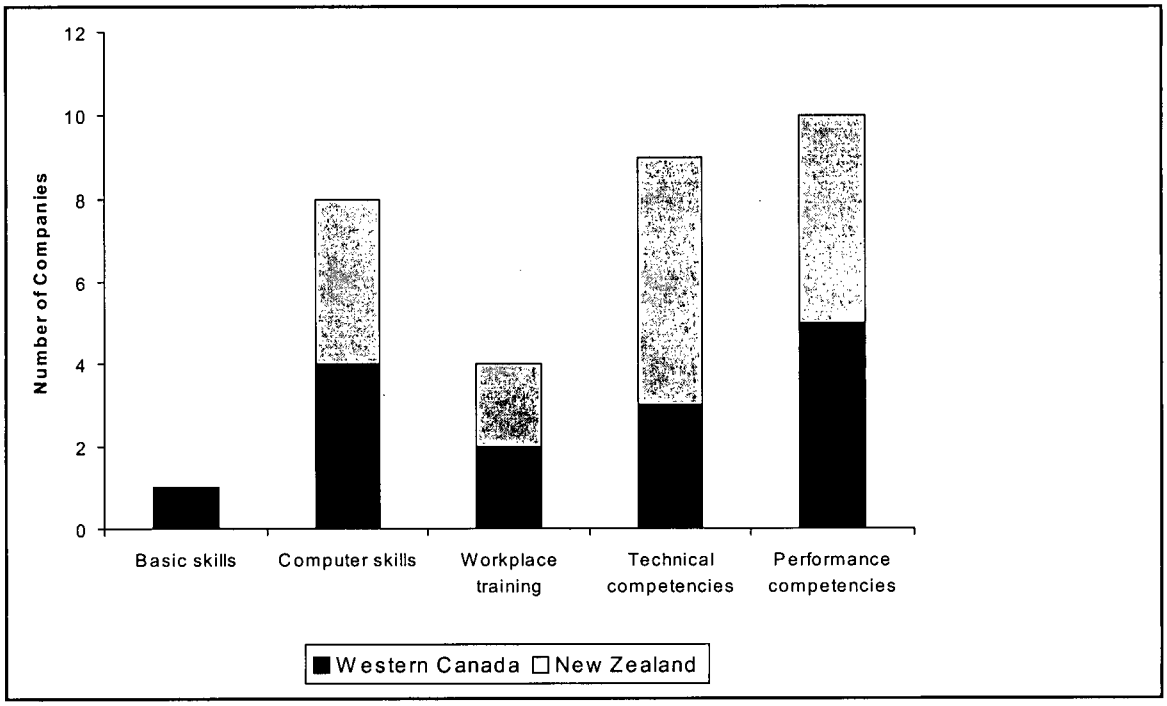

Figure 24: Most Important Skills Required for Management - Corporate

In congruence with this, almost all Interior BC sites and New Zealand sites and half of the Alberta respondents implemented performance competency skills training (Figure 25). Technical competencies and workplace training were also selected by almost half of the total 27 site respondents.

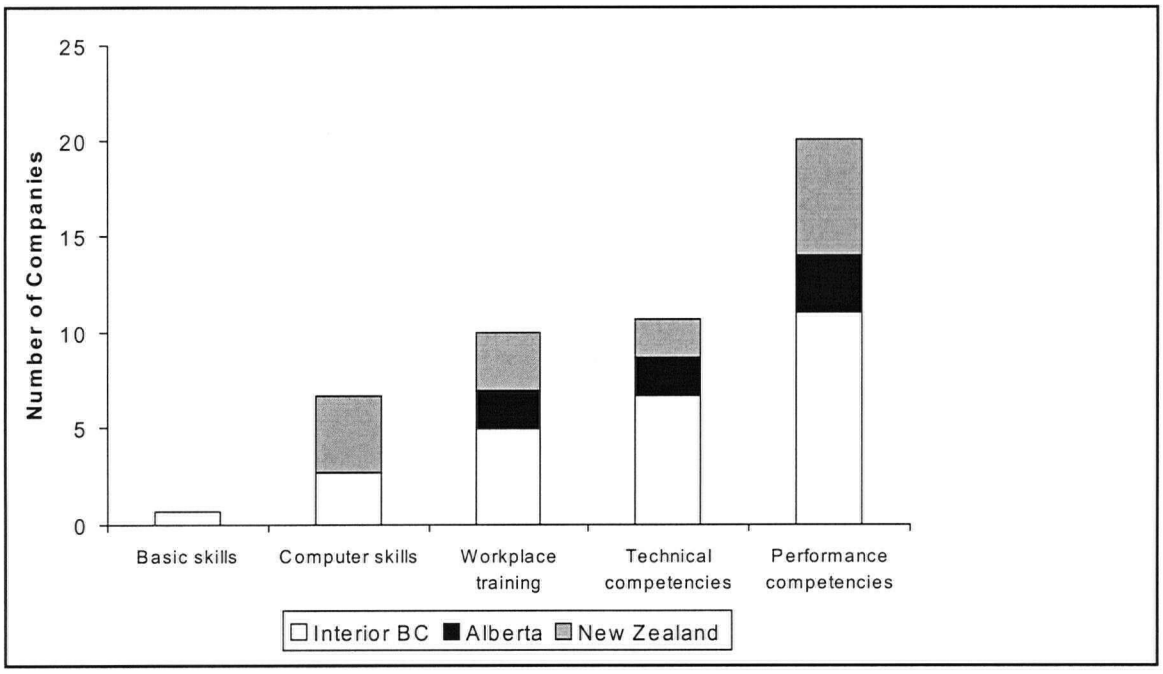

Figure 25: Most Important Skills Required for Management - Sites

With respect to supervisory line workers (Figure 26), 10 out of 13 Western Canada (77%) and 6 out of 8 New Zealand site respondents (75%) said that performance competencies training is being implemented, which corresponds with Figure 24.[58] It is likely that labourers or skilled line workers were promoted to supervisory line workers, thereby requiring the acquisition of more coaching and leadership skills. Less than half of the 27 respondents implemented workplace training.

[58] Since supervisory line workers were included in the management group in question 23 of the corporate survey, a direct comparison between corporate and site respondents could not be made for supervisory line workers.

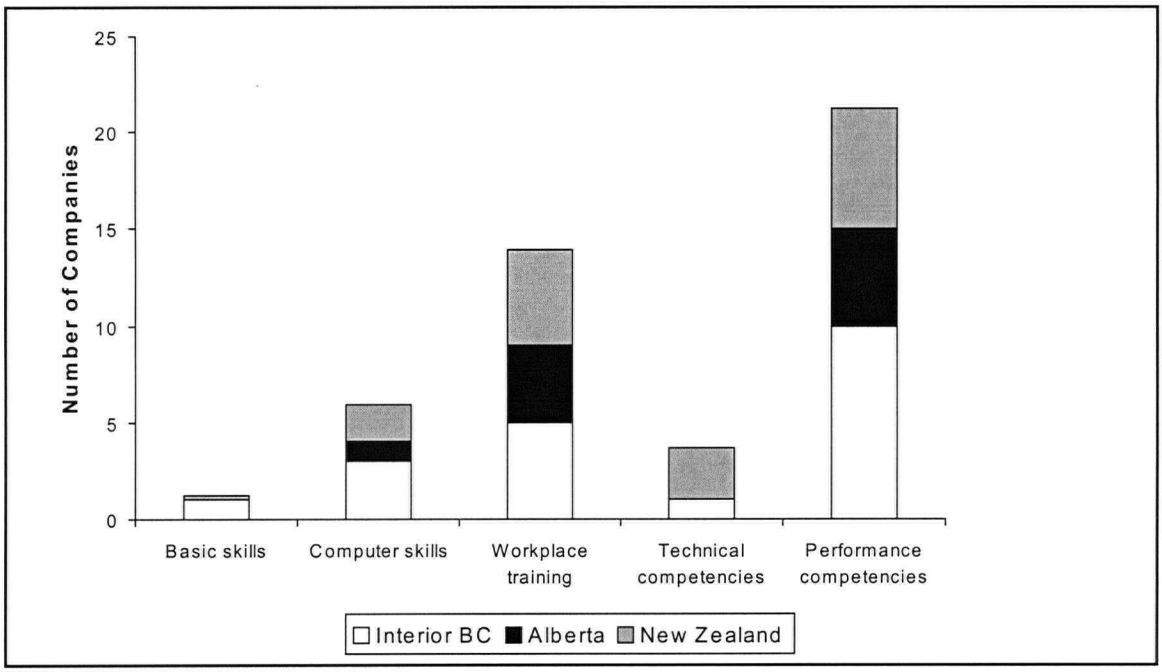

Figure 26: Most Important Skills Required for Supervisory Line Workers - Sites

3.1.5.2 Technical

As anticipated, most Western Canada respondents (80%) and all New Zealand corporate respondents selected technical competencies as one of the most important skills required for technical employees, followed by computer skills and workplace training (Figure 27). Workplace training may have been provided for technical employees since they are frequently asked to partake in quality management or safety-related project teams. Plans to upgraded facilities in all regions generally leads to the use of more computer-controlled machine operation programs, which in turn require more advanced computer skills for technical employees.

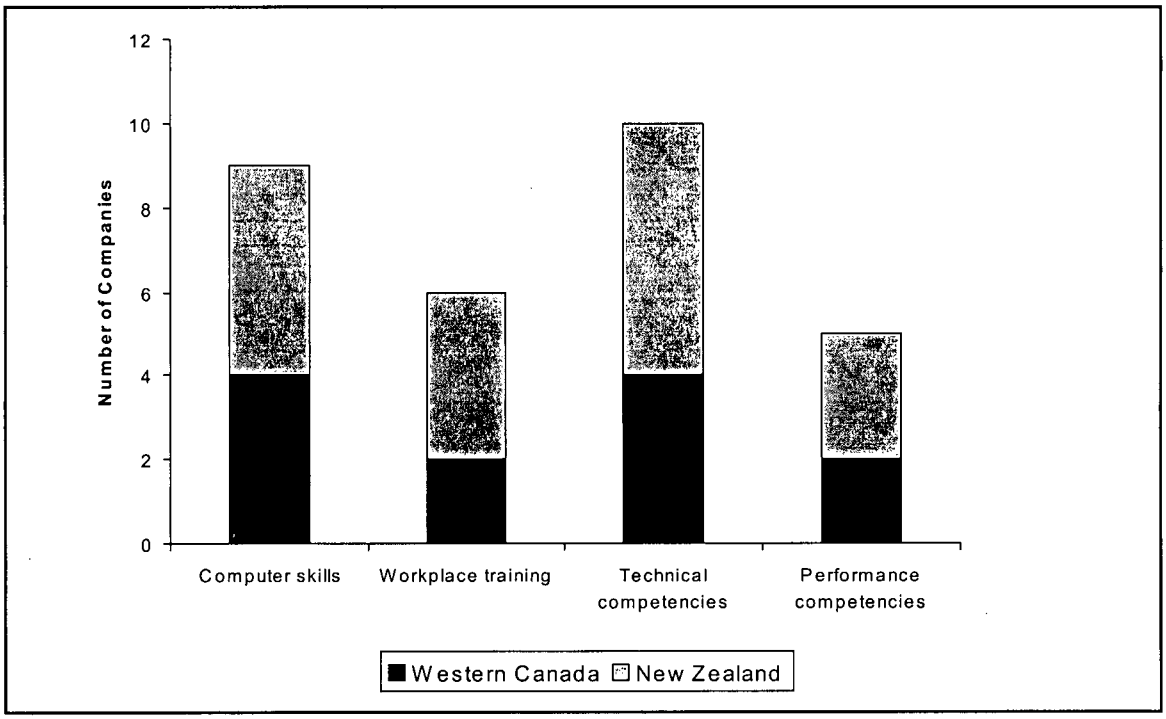

Figure 27: Most Important Skills Required for Technical Employees - Corporate

The importance of technical competencies for this group holds true at the site level (Figure 28). About half of each region's site respondents implemented technical competencies skill training for their engineering, computer, or scientific employees, followed by performance competencies and computer skills.

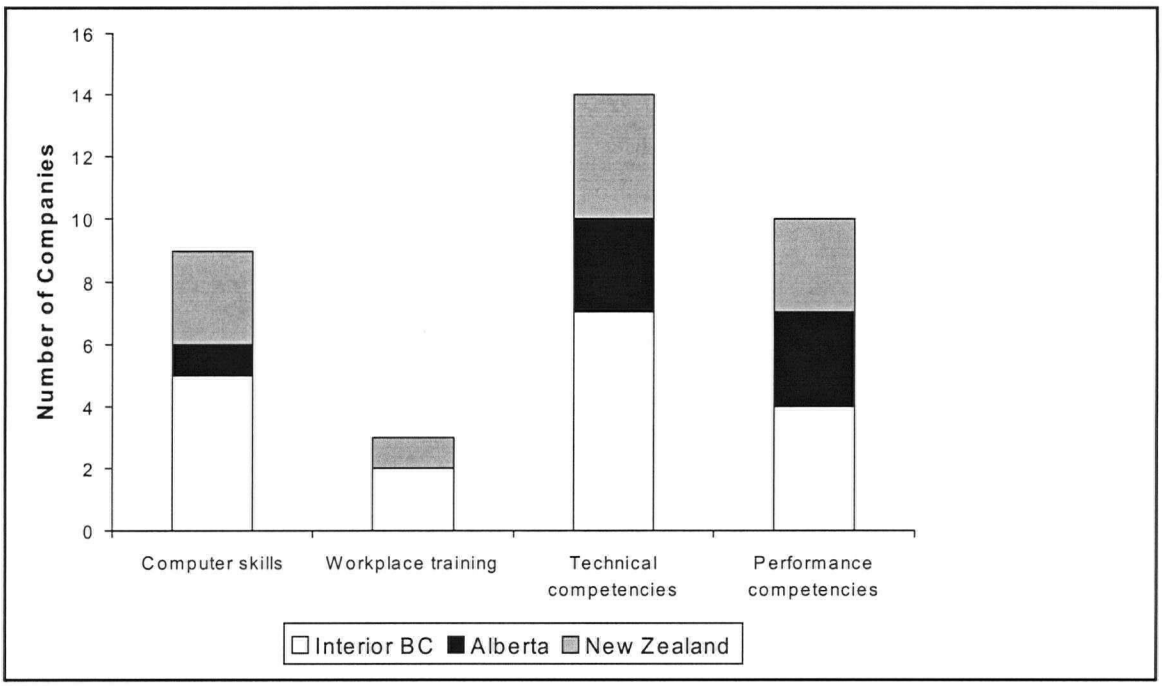

Figure 28: Most Important Skills Required for Technical Employees - Sites

3.1.5.3 Trades

British Columbia and Alberta have two distinct employee groups, trades and skilled line workers, which was not apparent in New Zealand. This may be explained by the highly unionized forestry sector in Western Canada. In order to compare New Zealand results to Interior BC and Alberta results, skilled line workers and trades were combined as one category, trades, for the Western Canada sites.

In Western Canada and New Zealand, almost all companies selected workplace training and technical competency skills as the most important skills required for trades employees, followed by computer skills (Figure 29). The same reasons given for technical employees could apply here. Moreover, primary manufacturing sawmills, particularly in New Zealand, are introducing value-added operations, such as finger-jointing operations, into their sawmilling processes. This requires technnical knowledge of machine operations and wood properties. Interestingly, the largest proportion of the corporate training budget (Figure 23) was also spent on workplace training and technical competencies.

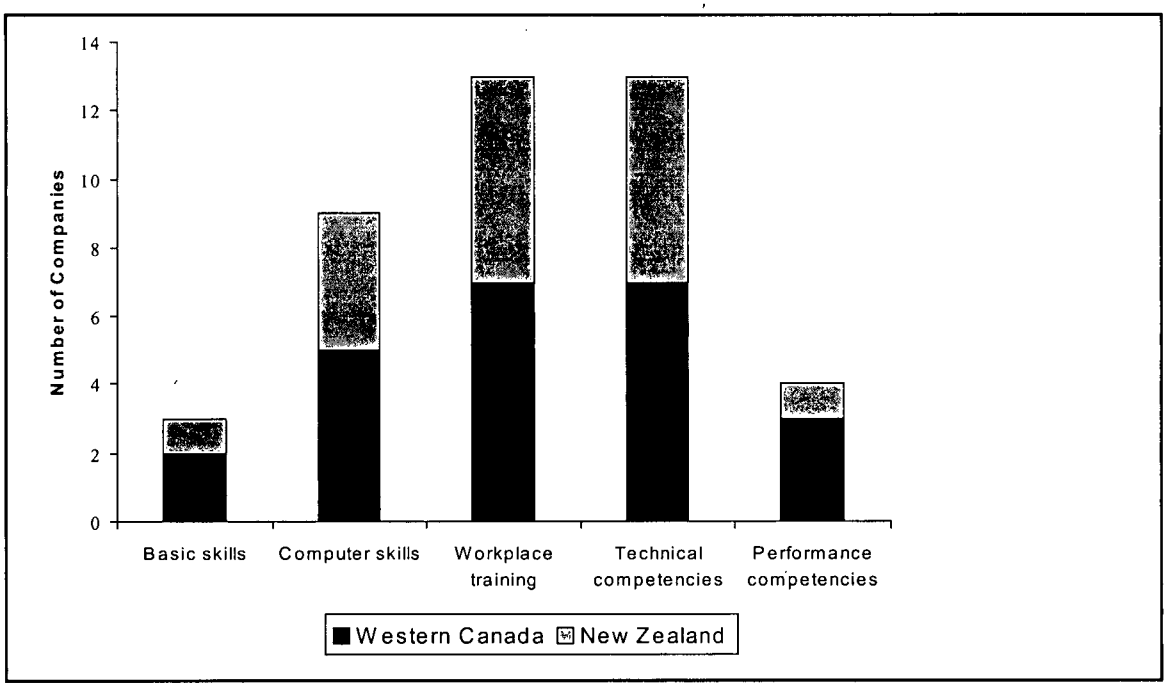

Figure 29: Most Important Skills Required For Trades - Corporate

Site respondents indicated the same skills requirements for their trades employees (Figure 30). One distinguishing difference is that overall, many more corporate respondents saw computer skills training as an important skills requirement for their trades employees whereas not many Interior BC and New Zealand site respondents implemented this training.

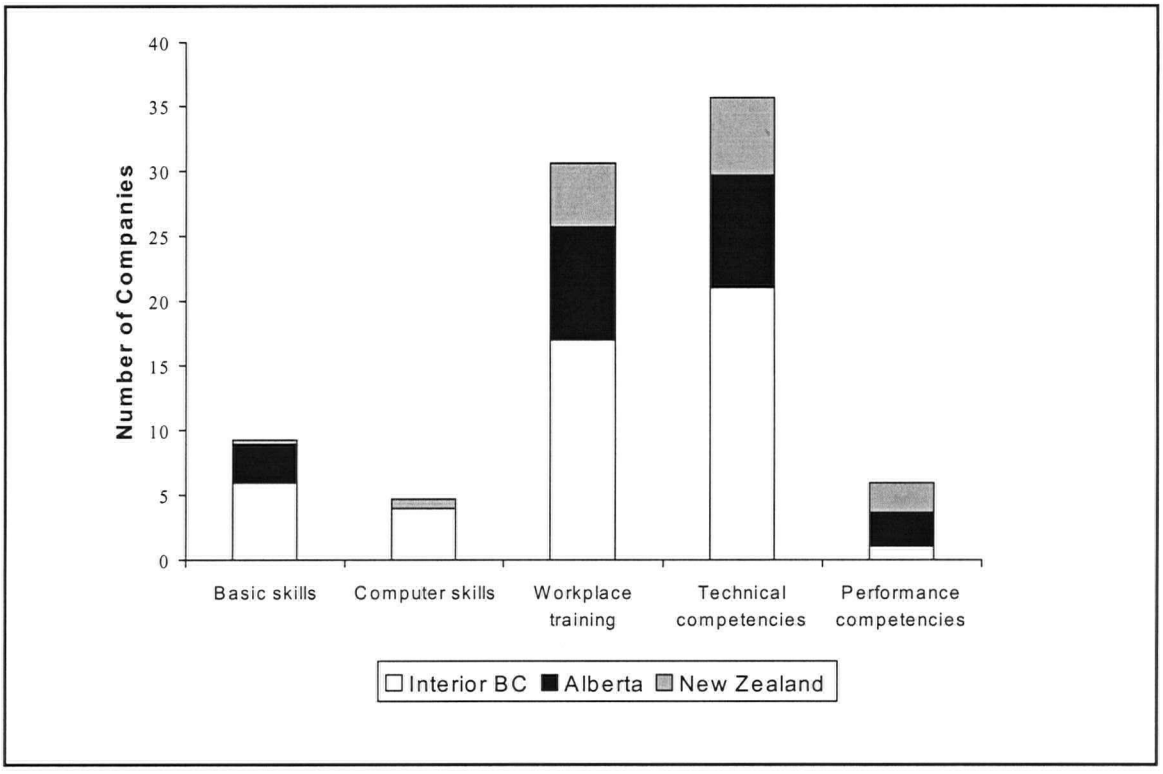

Figure 30: Most Important Skills Required For Trades - Site

3.1.5.4 Labourers

Almost all corporate respondents selected basic skills and workplace training as one of the most important skills required for labourers (Figure 31). Generally, labourer positions are considered entry-level positions where people often lack basic mathematical, reading and writing skills. Therefore, before any advanced training can take place, these basic skills requirements must be fulfilled. Moreover, all labourers take some form of safety training (i.e. workplace training) since a large extent of their job is hands-on experience in machine operations.

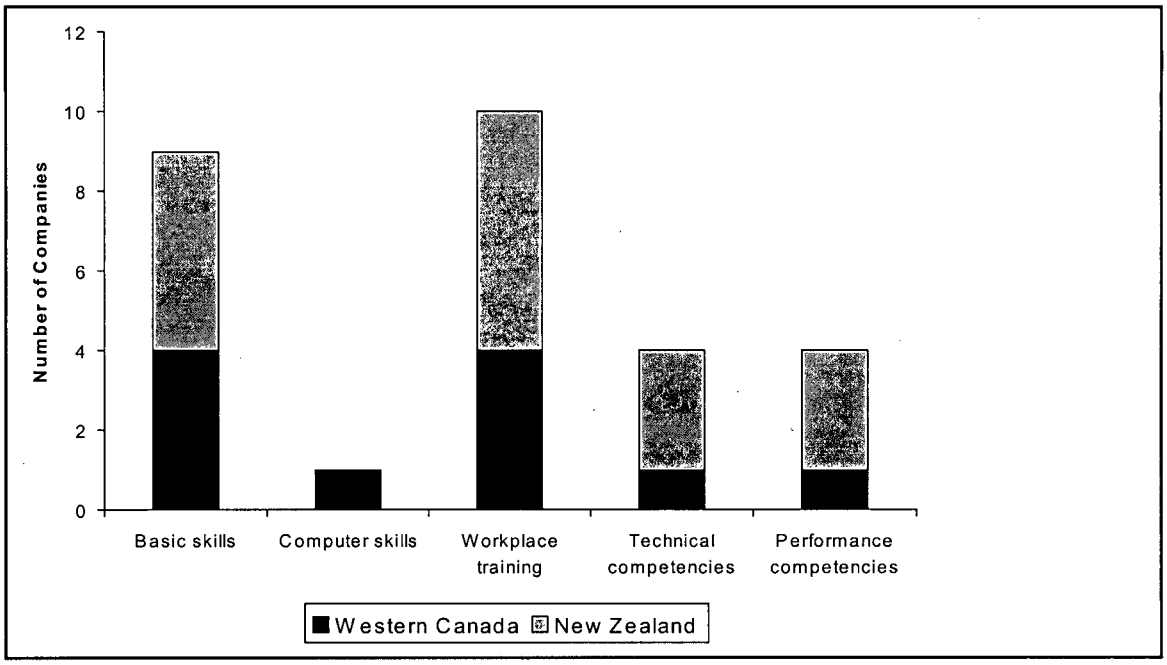

Figure 31: Most Important Skills Required for Labourers - Corporate

Corporate results were on par with those of the site respondents (Figure 32). More than three-quarters of Interior BC sites and about one-half of the Alberta and New Zealand sites implemented workplace skills training and basic skills training.

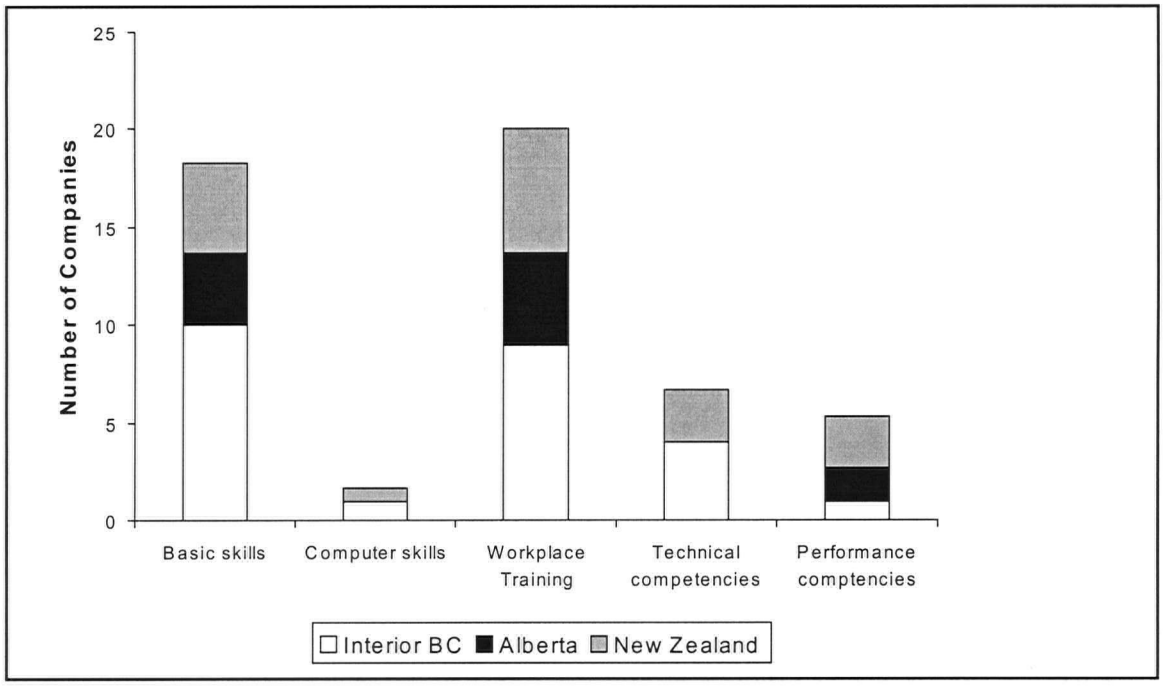

Figure 32: Most Important Skills Required for Labourers - Site

3.1.5.5 Office/Clerical

Almost all corporate respondents selected computer skills training and workplace training as the most important skills required for office or clerical employees (Figure 33). Many office/clerical jobs require data entry, formatting letters and reports, basic accounting, etc. that require extensive computer experience, not to mention constant upgrading. Workplace training may have been selected since entry-level positions usually mandate some form of employee orientation. Moreover, office/clerical employees usually require a basic application of quality management or safety in order to prepare quality/safety reports.

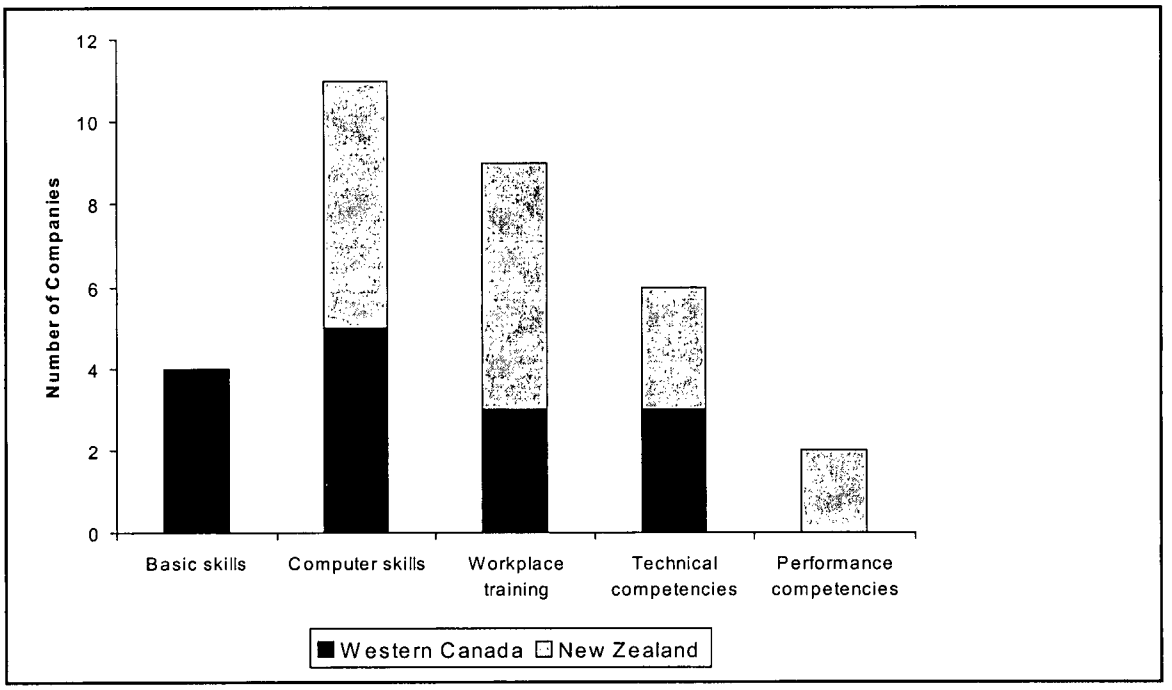

Figure 33: Most Important Skills Required for Office/Clerical - Corporate

Like the corporate respondents, almost all site respondents implemented computer skills training (Figure 34). Workplace training was also being implemented by about a third of the respondents. At a more micro level, a larger number of Interior BC sites (7 out of 13) implemented technical competencies training than New Zealand sites (1 out of 8). Likewise, Half of the New Zealand sites implemented workplace training for office/clerical employees whereas only 1 of 13 Interior BC sites implemented this training.

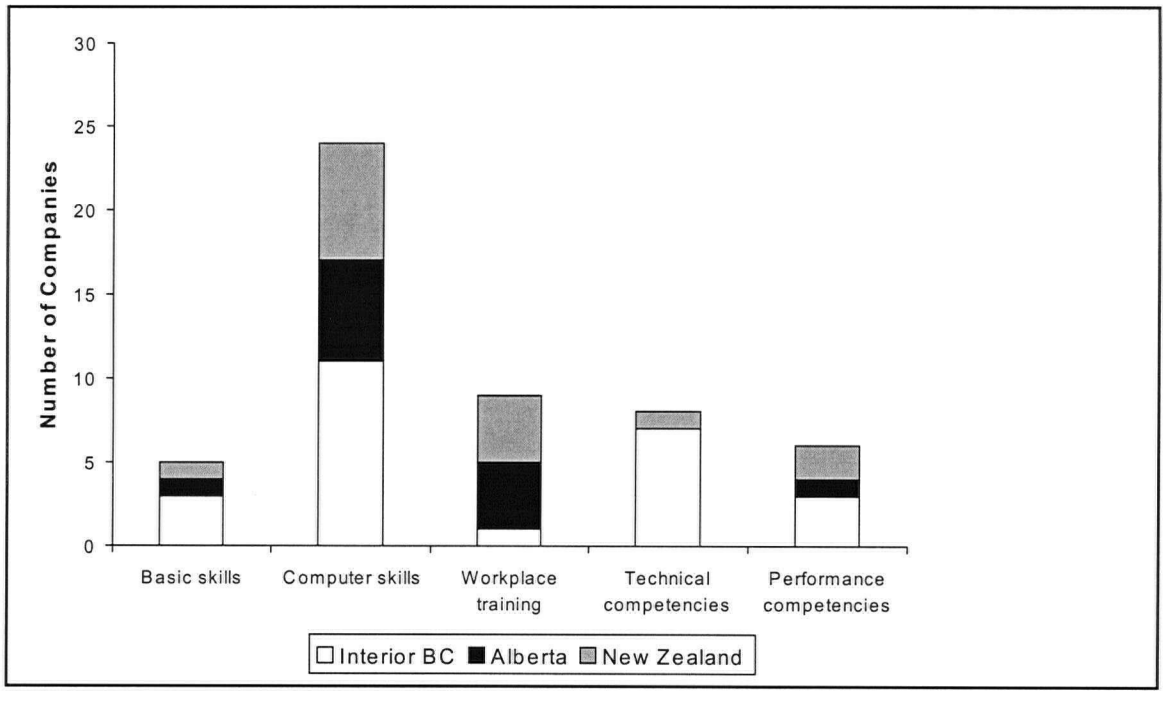

Figure 34: Most Important Skills Required for Office/Clerical - Sites

More than one-half and about a third of the corporate respondents indicated that skilled labour[59] and management employees would receive the most training in the next two years, respectively. These proportions are in line with the allocation of their training budget, as shown in Figure 21.

Site respondents were also asked to indicate the two employee groups that received the most training in 1998. Similar to the corporate respondents, three-quarters of the total site respondents said that trades employees received the most training in 1998. About a third of the sites said that both supervisory line workers and labourers received the most training in 1998.

Site respondents said that the same employee groups would receive the most training in the next five years (i.e. 1999 to 2004). More than 60% said that trades employees and about one-half said that supervisory line workers would receive the most training. The focus on trades and

[59] Includes trades employees.

supervisory line workers may signify the expansion of their roles as a result of downsizing, restructuring and other corporate changes.

3.1.6 Summary (The Learning Organization)

Respondents were asked to indicate their level of agreement on a number of qualitative statements pertaining to a company's training culture. A five point likert scale was developed to measure agreement levels for each statement as follows: 1 = strongly agree; 2 = agree; 3 = no opinion; 4 = disagree, and 5 = strongly disagree. A mean of one point represented complete agreement with a particular statement. Results are graphically represented in Figures 35 and 36.

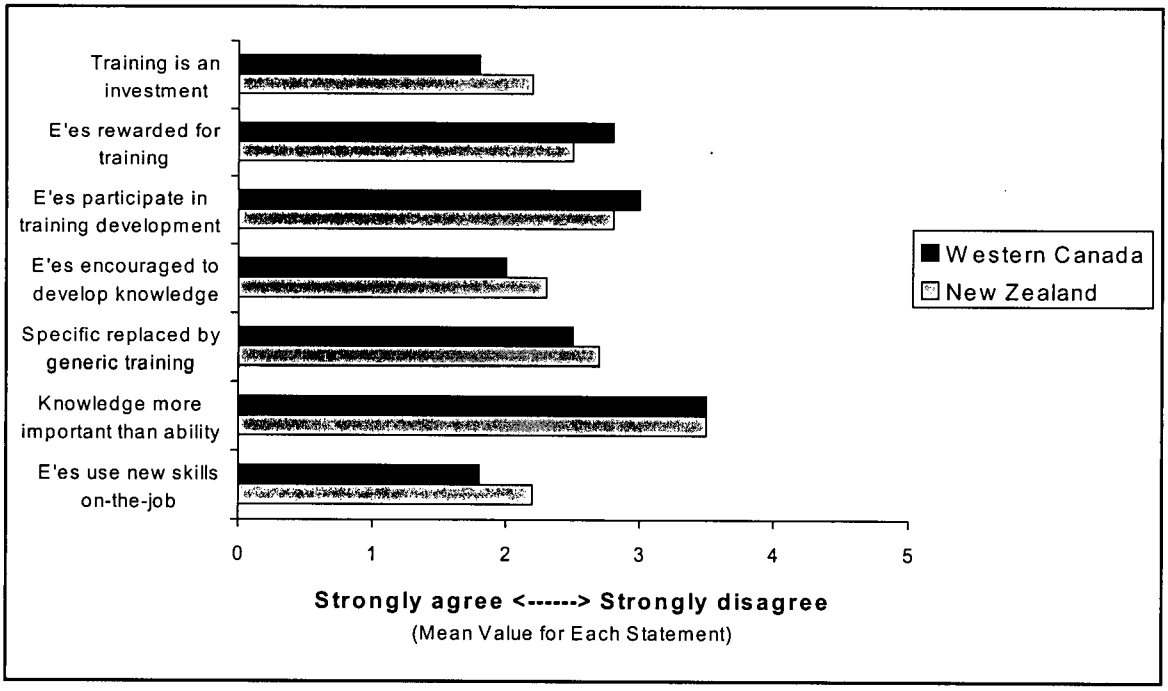

Figure 35: Analysis of Attitudes and Behaviors on Training – Corporate

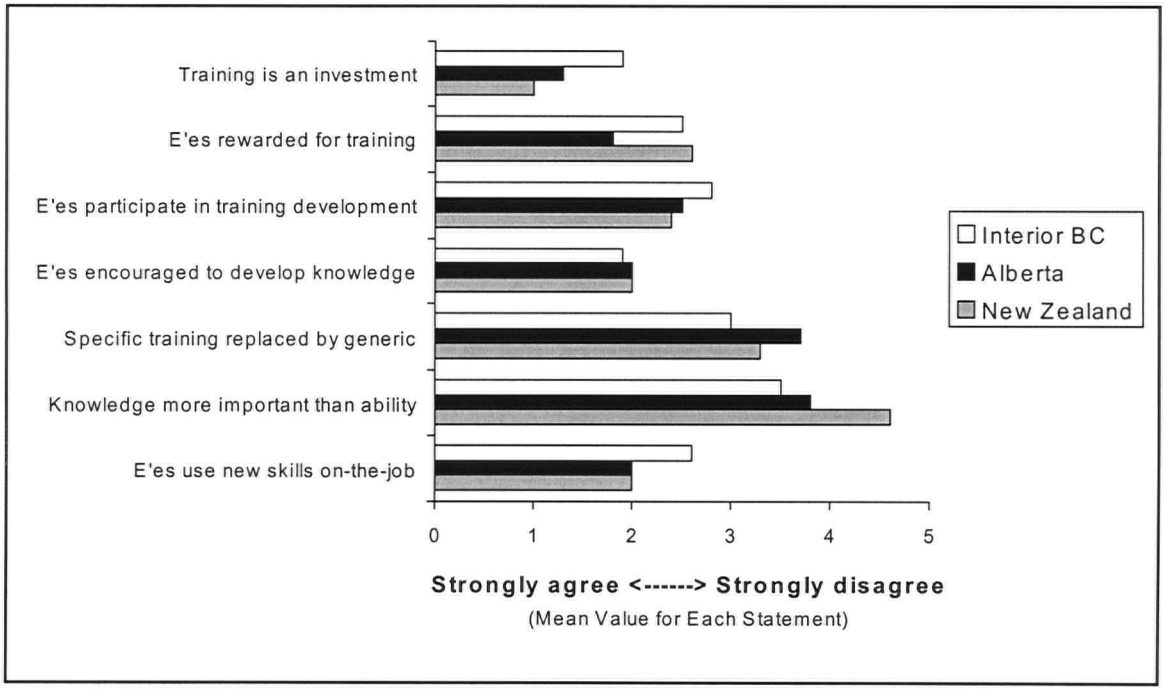

Figure 36: Analysis of Attitudes and Behaviors on Training – Site

3.1.6.1 Training is an investment

On average, almost all corporate and site respondents perceived training as an investment. Likewise, almost all Interior BC and all Alberta and New Zealand sites agreed or strongly agreed with this statement. New Zealand sites had significantly stronger perceptions on training as an investment than Western Canada sites[60]. Their strong perceptions are supported by their increased training budget for 2001. Other factors that support New Zealand sites' strong training culture include the size of their training budget, the wood products they produce, the formality of their skills needs assessment process, and their training strategies.

Training budget. Interestingly, not many New Zealand sites indicated that a lack of financial resources was a major barrier to training. In fact, New Zealand sites planned to double their year

[60] In this case, the means between Interior BC and Alberta sites were not significantly different at an alpha value of .05. The researcher has therefore lumped them together as Western Canada sites. T-tests were conducted between Western Canada and New Zealand sites at an alpha value of .05.

2000 training budget. Rather, the most limiting factor was time constraints, which was also shared by Alberta and Interior BC sites.

Type of wood product. The production of specialty wood products usually demands a culture that allows their employees to come up with new ideas and new ways of doing things. This necessitates continuous learning and the acquisition of more generic skills. Figure 18 shows that New Zealand used transferable skills training more widely than the other regions. This in turn may support New Zealand's stronger attitude on training as an investment.

Skills needs assessment and training objectives. Although New Zealand sites had the shortest planning cycle to plan training needs, most sites had a formal skills needs assessment process. Moreover, as part of their organizational strategies, New Zealand companies employed training as a means to attract and retain qualified employees and increase employee morale as their top three training objectives. New Zealand sites also displayed the widest use of mentoring programs and largely used productivity reports and, to some extent, return on investment measures, to determine the impact of training. All of these factors support their strong training culture.

3.1.6.2 Employees are rewarded for training

On average, New Zealand corporate respondents somewhat agreed with the statement that they rewarded employees for training (2.5 points). This is supported by their use of quantifiable training measures (i.e. ROI and productivity reports) and their strong views on training as an investment. Western Canada corporate respondents, on average, indicated a more neutral position (2.8 points). However, the differences in the means between the corporate respondents and between the site respondents were insignificant.[61]

Like their corporate counterparts, New Zealand and Interior BC, to some extent, rewarded employees for training (2.6 and 2.5, respectively). Interestingly, Alberta sites, on average, rewarded employees for training (1.8 points) despite a lack of financial resources as one of the

[61] T tests were conducted between Western Canada and New Zealand corporate respondents and between Western Canada and New Zealand sites at an alpha value of .05.

most important factors that limit their ability to provide training. Alberta's high rate of self-directed learning, large proportion of trades employees, and largely decentralized training decisions may explain Alberta's strong views on rewarding employees for training.

Self-directed learning. Self-directed learning was widely used by the Alberta sites. Generally, self-directed learning assumes a highly self-motivated workforce, or, at least, a financial incentive for employees to learn on their own. It is therefore likely that Alberta sites reward their employees after completing a self-directed learning course.

Proportion of trades employees. Alberta's large proportion of trades employees may also provide an explanation. Normally, trades employees are compensated as they acquire more practical experience, knowledge and skills and progress through their apprenticeship training.

Decentralized training decisions. Training decisions within Alberta sites were highly decentralized. For example, site managers had almost complete autonomy in decisions pertaining to the training budget. This empowerment may encourage companies to compensate employees for obtaining additional skills.

3.1.6.3 Employees participate in the development of new training programs

Both Western Canada and New Zealand corporate respondents, on average, had no opinion on involving their employees in the development of new training programs (3.0 and 2.8 points, respectively). Four of the10 Interior BC[62] and half of the Alberta and New Zealand sites agreed that their employees participated in the development of new training programs. The degree of decentralization on training content, employee involvement in needs assessment, training objectives, and on-the-job training may influence the level of employee participation in training development.

Decentralized decisions on training content. On average, both corporate office and site managers had equal influence on decisions pertaining to training content in the three regions

[62] Note that only 10 of the 13 Interior BC sites responded to this statement.

(Figures 6 and 7). This matches the neutral position on employee participation in developing new training programs. It seems logical that the more decentralized decisions on training content become, the more employees would participate in its development.

Employee involvement in needs assessment. The second most widely used method for identifying training needs in the three regions was collecting information directly from the employees. Stronger employee involvement in the needs assessment process may dictate a higher level of employee participation in training development.

Training objectives and on-the-job training. Two of the most important training objectives were "improve safety" and "improve employee work performance". Moreover, on-the-job training was widely used by all sites. Since these objectives and on-the-job training directly affect employees, it seems logical that employees would be involved in the training development process.

3.1.6.4 Employees are encouraged to develop new knowledge

On average, almost all corporate and site respondents agreed or strongly agreed that they encourage their employees to develop new knowledge. All respondents ranked keeping abreast of new technologies as one of the most important training objectives and a significant proportion of respondents used self-directed learning (Figure 18). However, Figure 10 shows that time constraints was the most limiting factor to training. These observations validate the importance of new knowledge but suggest that employees may have to acquire it on their own time.

Cited in the literature review, the solid wood manufacturing industry recognized the need to develop new products and more efficient production processes. This may be one of the reasons why respondents have encouraged employees to develop new knowledge. Also, Figure 5 shows a decentralized organizational structure for Interior BC and Alberta, which typically requires employees at all levels to take on new responsibilities and to expand their skills. Figures 24 to 34 validate this observation with employee groups partaking in non-traditional skills training. For example, performance competencies were identified as important skills for office/clerical

employees and labourers. In summary, the move to specialty product markets and corporate decentralization support the strong level of agreement with this statement.

3.1.6.5 Specific training is being replaced by more generic training

On average, corporate respondents in both Western Canada and New Zealand somewhat agreed that specific training is being replaced by more generic training (2.5 and 2.7 points, respectively). However, site respondents were neutral, indicating that both specific and generic training were generally used. A different outcome prevailed when looking at the number of companies that agreed with the statement rather than the total mean value assigned. About one-half of all site respondents disagreed or strongly disagreed with the statement that specific training is being replaced by more generic training. Their disagreement with the statement may be explained by companies not wanting to invest in generic training, simply because they fear their employees will be poached by other companies. The importance of both specific and generic skills is evident by the skills requirements for each employee group, the types of training, the training objectives, and the proportion of training budget allocated to specific training.

In looking at Figures 24 to 34, many employee groups required a blend of specific and generic skills training. For example, management required performance competencies (generic), workplace training (specific) and technical training (specific). Technical employees required the obvious technical skills, workplace training and performance competencies. Labourers and office/clerical employees required both workplace training and basic skills training (generic).

Figure 18 shows that transferable skills training (generic), cross training (specific), on-the-job training (specific) and training for teamwork (generic) were widely used by the three regions. In addition, Figures 8 and 9 indicated that technical training may be required to satisfy the overall top three training objectives: improve safety, improve employee performance, and improve quality. However, generic training would also be required to satisfy these objectives since analyzing information and problem solving is generally a large component in safety and quality management. Lastly, a large proportion of the training budget was devoted to specific training.

For example, two of the largest proportions include technical competencies and workplace training (Figure 23).

3.1.6.6 When hiring, what they know is more important than their ability to learn

On average, corporate respondents in both Western Canada and New Zealand disagreed or had neutral views on hiring employees based on what they know rather than on their ability to learn (3.5 points each). In other words, both may be equally important. Companies may have to hire based on a candidate's abilities given the shortage of skilled labour in the industry. In addition, the move to "just-in-time" manufacturing requires a flexible workforce where technical skills are not as important. Hence, the ability to learn seems to be an appropriate selection criterion when recruiting.

Disagreement with this statement was more pronounced at the site level. On average, New Zealand sites more strongly disagreed with this statement than Western Canada sites (4.6 points versus 3.5 points, respectively).[63] Their support for an employee's ability to learn was particularly evident in Figure 18, which shows that they used mentoring programs, on-the-job training and transferable skills training more widely than the other regions.

In looking at the number of companies that agreed with the statement rather the mean scores, more than one-half of Interior BC and Alberta sites and all New Zealand respondents disagreed or strongly disagreed. In summary, the ability to learn was just as important or more important than what employees knew. This seems to fit the earlier observation that employees were encouraged to develop new knowledge.

3.1.6.7 Employees have on-the-job opportunities to use their new skills

Both Western Canada and New Zealand corporate respondents agreed with the statement that employees have on the job opportunities to use their new skills (1.8 and 2.2 points, respectively). This is supported by their wide use of on-the-job training (Figures 16 and 18).

On average, Interior BC, Alberta and New Zealand sites also agreed that employees have on the job opportunities to use their new skills (2.6, 2, and 2 points, respectively). However, 3 of the 10 Interior BC sites did not agree with the statement.[64]

[63] T tests were conducted between Western Canada and New Zealand sites at an alpha value of .05.
[64] Note that only 10 of the 13 Interior BC sites responded to this statement.

Objective 1: Determine the success of policy implementation at the sawmill site level

3.2 COMPARISON BETWEEN CORPORATE AND SITE RESPONDENTS

This section amalgamates the results from each of the three regions and compares the aggregate corporate data to the aggregate site data. T-tests were conducted for sub-sections 3.2 and 3.4, and Z-tests were conducted for Sections 3.1 and 3.3. The following outline is used to present the findings:

Objective 1: Define corporate training policies

Training Policy

- Degree of Formalization
- Extent of Decentralization

Objective 2: Determine the degree of the company's investment and commitment to training

Training Budget

Objective 3: Determine the types of training programs for management and staff

The Training Model

- Needs assessment phase
- Design and delivery phase
- Evaluation phase

Objective 4: Define the desired skills set required by the company

Skills Requirements

- Degree of formalized skills assessments

1. Summary (Training Culture)

3.2.1 Training Policy

3.2.1.1 Degree of Formalization

Overall, a large majority of companies (74%) did not have formal training policies. Only 19 percent of the corporate respondents had a distinct training department. Although training policies were not formally provided, 63% of the site respondents indicated that they follow corporate directives. These findings may infer that sites implement individual training based on corporate "big picture" guidelines (e.g. better, safer place to work; cooperation and teamwork).

3.2.1.2 Extent of Decentralization

Western Canada corporate respondents indicated a stronger corporate influence in each of the training decisions (Figure 6) than did the Interior BC and Alberta site respondents (Figure 7). The means between these three groups were significantly different for all training decisions, except for the decision to train.[65] On the other hand, New Zealand corporate respondents were on par with New Zealand site respondents for all training decisions.[66]

Overall, training decisions were highly decentralized. Nine out of 11 corporate respondents (82%) indicated that training decisions were made mostly by the site or all at the site level. Likewise, almost all of the site respondents (93%) said that training decisions were also made mostly by the site or all at the site level.

With respect to the degree of corporate influence on the specific training decisions listed in Figure 37, corporate and site respondents agreed with each other's level of influence, except on two decisions: the mode of delivery for training and training program evaluation (Figure 37).[67] This infers a difference in perception between corporate and site respondents. Traditionally, the

[65] ANOVA tests were conducted between Interior BC and Alberta sites and Western Canada corporate respondents at an alpha value of .05.

[66] T-tests were conducted between corporate and site respondents at an alpha value of .05. However, there was no evidence supporting the claim that the means for each training decision were significantly different between New Zealand corporate and site respondents.

corporate training department coordinated training delivery and established a formal evaluation tool. It is likely that with decentralization, sites have more control of sourcing and coordinating their own training programs; hence, sites indication of more site influence on these two decisions. There was no evidence supporting the claim that the means for all other training decision (below) were significantly different between corporate and site respondents.

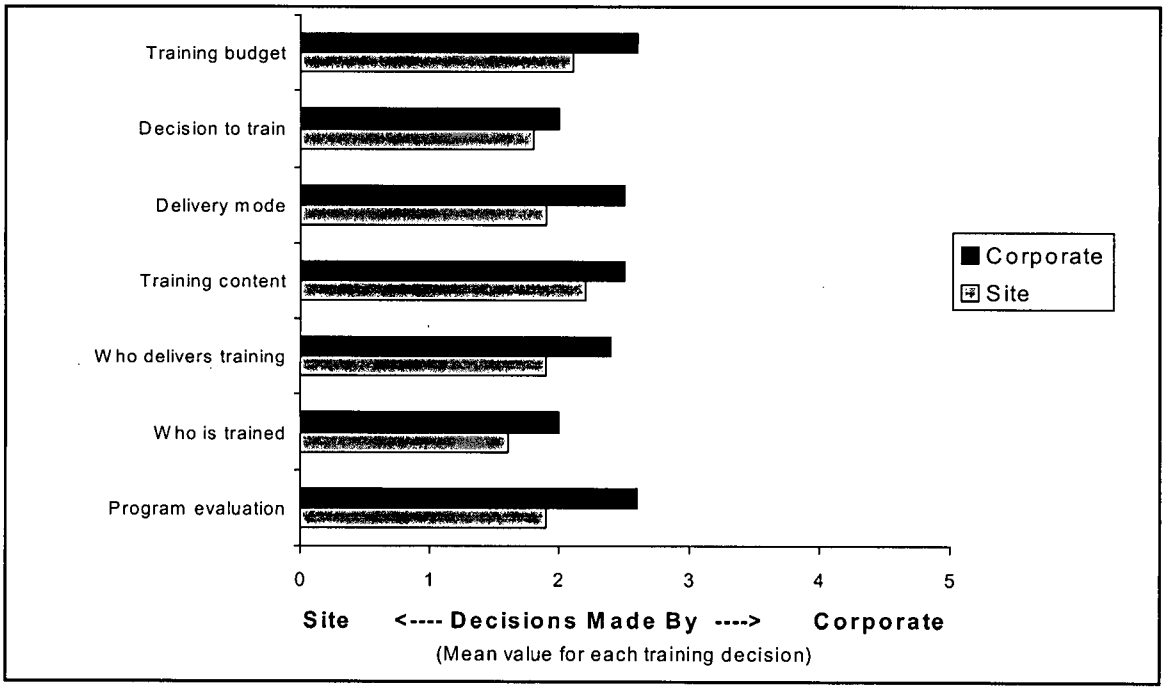

Figure 37: Where Training Decisions are Made – Corporate

3.2.2 Training Budget

A vast majority of corporate respondents (73%) indicated they had a separate training budget. Site respondents were asked about the proportion of allocated training funds that they received from the sawmill, corporate office, employees, unions, and government. Almost all said they received their training funds from the sawmill site.

Expressed as a percentage of operating budget, corporate respondents, on average, expected their sawmills to spend 2.06% of their operating budget on training. Site respondents exceeded their

[67] T-tests were conducted between corporate and site respondents at an alpha value of .05.

expectations by devoting an average of 2.28% (SD 2.54)[68] of their operating budget on training in 1998. However, given the large standard deviations to this question, no statistical conclusions can be made.

In looking at Figure 38, corporate respondents, on average, spent the highest proportion of their total training budget on labourers (29%)[69] and management staff (28%), whereas sites spent the most of their training budget on skilled labour (38.2%). Both corporate and site respondents spent the least on technical employees, where site respondents spent significantly less than the corporate respondents (3.2% versus 19.5%, respectively).[70] This difference may stem from the site's desire to upgrade the skills of labourers, for instance, more readily than an already skilled and educated group (i.e. technical and management employees).

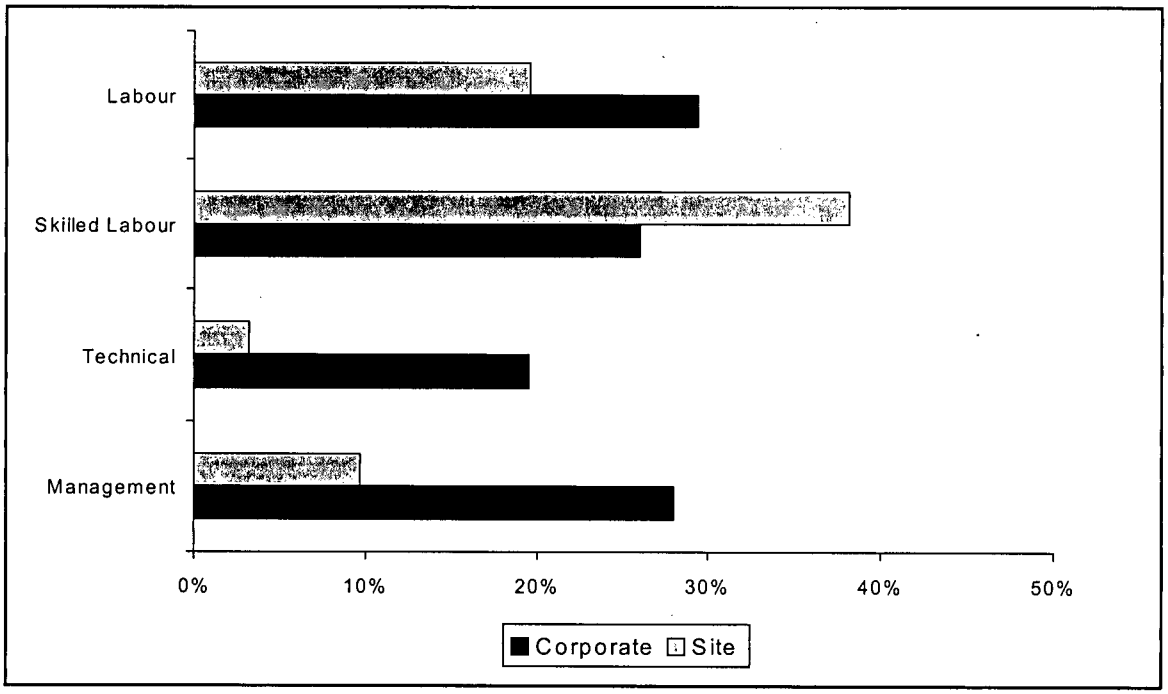

Figure 38: Proportion of Training Budget Spent on Each Employee Group

[68] The large standard deviation can be explained, in part, by the large range of proportions of operating budget (0.03 to 10%) for site respondents. The 95% confidence interval for the site respondents was 1.16 to 3.39%.
[69] Definitions for each employee groups are provided in the glossary, Appendix 7.
[70] T-tests were conducted between corporate and site respondents at an alpha value of .05.

3.2.3 The Training Model

3.2.3.1 Needs Assessment Phase

More than one-half of the corporate respondents (55%) collected skills needs and training information formally whereas two-thirds of the site respondents collected this information informally. However, the differences in their means were not proven to be significantly different.[71]

Corporate respondents evaluated their skills on a longer-term basis than the sites. About one-half of the companies evaluated their skills and training needs more than one year in advance whereas almost all site respondents assessed their skills needs less than a year in advance.

3.2.3.2 Delivery Phase

Corporate and site respondents had similar responses for training delivery. On-the-job training was rated by both corporate and site respondents as the most widely used method of training delivery, followed by seminars and workshops. Trainers from within the company and direct supervisors were the most widely used trainers.

3.2.3.3 Evaluation Phase

Similar to the corporate respondents, almost all site respondents in the three regions relied on employee performance measures as a way of measuring the impact of training (Figure 19). However, more than one-half of the Western Canada site respondents used productivity reports whereas only about 20 percent of the corporate respondents did. Similarly, 40% of the corporate respondents used corporate measures whereas only 10% of the site respondents did. This may mean that sites used more direct, day-to-day measures whereas corporate sought more of the "overall business" measures.

3.2.4 Skills Requirements

About two thirds and less than one-half of the corporate respondents indicated that skilled labour[72] and management employees would receive the most training in the next two years, respectively. Site respondents were also asked to indicate the two employee groups that received the most training in 1998. Similar to the corporate respondents, almost all of the site respondents (18 out of 22) said that trades employees received the most training in 1998. About a third of the sites said that both supervisory line workers and labourers received the most training in 1998.

Site respondents said that the same employee groups would receive the most training in the next five years (i.e. 1999 to 2004). The focus on skilled labour may signify the expansion of their roles as a result of downsizing, restructuring and other corporate changes.

[71] T-tests were conducted between corporate and site respondents at an alpha value of .05.
[72] Includes trades employees.

3.2.5 Summary (The Learning Organization)

Overall, corporate respondents were not significantly different from site respondents with respect to the seven statements in Figure 39.

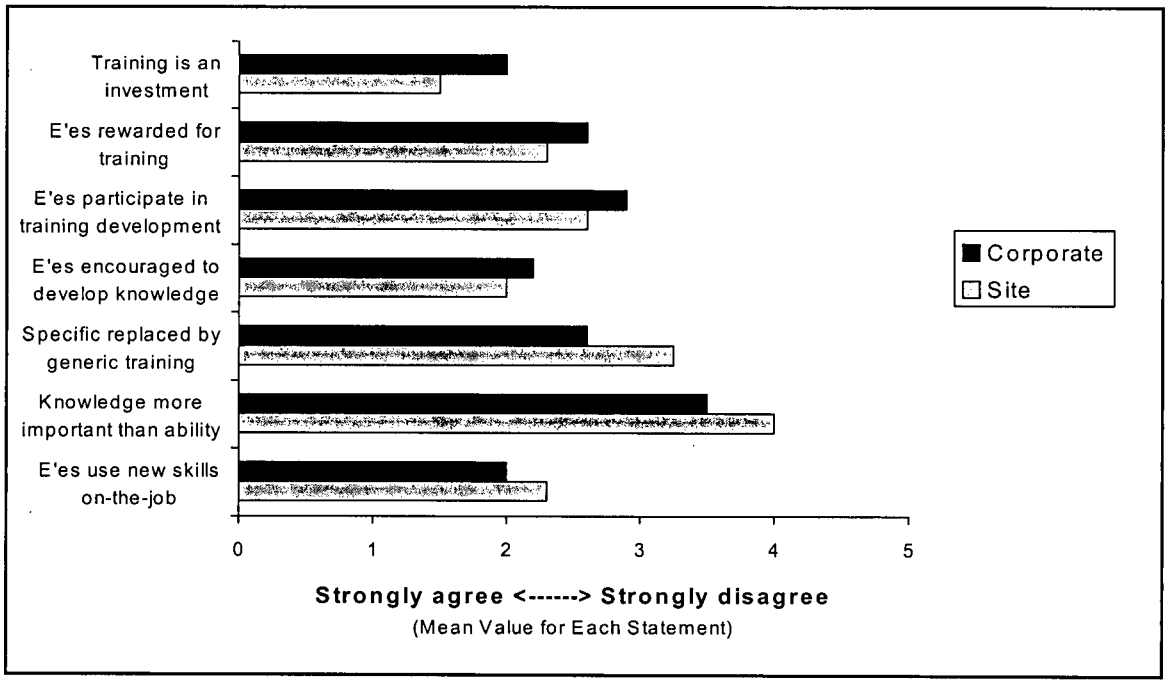

Figure 39: Analysis of Attitudes and Behaviors on Training – Corporate vs Site

They both perceived training as an investment, provided on-the-job opportunities to employees to use their new skills, and encouraged employees to develop new knowledge. They both had more neutral views on rewarding employees for training, involving them in the development of new training programs, and replacing specific training by more generic training. Corporate and site both disagreed that when recruiting, knowledge was more important than the employees' ability to learn. The same reasons provided in **Section 3.1.6** apply here. In summary, corporate and site respondents are in congruence with their attitudes and behaviors on training.

3.3 SEGMENTATION OF RESPONDENT COMPANIES:

Two multivariate techniques were used in the study: cluster analysis and multiple discriminant analysis. Although the sample size of sawmills in the study was relatively small, cluster analysis was used to group solid wood manufacturing sawmill sites in Interior BC, Alberta and New Zealand based on a number of variables. A number of dimensions were used to profile the sawmills, which were identified in prior research as important to understanding a company's training culture and skills requirements. These dimensions include:

- proportion of specialty wood products produced by the sites
- degree of unionization
- degree of corporate influence on training decisions
- extent a site perceives training as an investment
- degree employees are rewarded for training
- level of employee participation in training development
- extent employees are encouraged to acquire new knowledge
- amount of generic training implemented by the site (as opposed to specialized training)
- extent a site uses training to attract and retain employees
- amount of on-the-job training employees are given by the site

A K-means, non-hierarchical clustering technique was used to assign cases into clusters. This method moves cases from one cluster to another until the within-cluster variance was minimized and between-cluster variance was maximized (Hair et al., 2000).

The statistical software program, STATISTICA, was used to selected cluster seeds and assign cases to each group. Given the small sample size and the researcher's practical judgement and common sense, two and three clusters solutions were computed. The 3-cluster solution presented more significant groupings than the 2-cluster solution and was therefore chosen.

Cluster means were also established on each dimension (e.g. degree of corporate influence, employee participation in training development, etc.). In looking at Figure 40 and Table 6, the degree of unionization had the largest variation of the mean between groups. However, this does not mean that it was the most significant since the degree of unionization has the largest range (from 0 to 100) where many of the others are all on a 5 point scale.

Table 6: Cluster Means and Standard Deviations

	Cluster No. 1	SD	Cluster No. 2	SD	Cluster No. 3	SD
SPECIALT	22.5	27.70379066	0.714285731	1.889822364	35	12.5830574
UNIONIZE	2.083333492	5.103103638	79.57142639	9.623879433	72.30000305	16.97635651
INVESTMT	1.333333373	0.516397774	1.857142925	1.463850141	1.428571463	1.133893371
REWARDED	3	0.632455528	2.285714388	1.112697244	2.142857075	0.690065563
EEPARTIC	2.666666746	1.211060166	2.714285612	0.487950027	2.714285612	0.755928934
NEWKNOWL	2	0.632455528	2.285714388	0.755928934	2	1
GENERTRN	3.333333254	1.211060166	3.142857075	1.214985728	3.285714388	1.253566384
RECRUIT	4.833333492	0.408248276	4.142857075	0.690065563	3.571428537	1.272418022
ONTHEJOB	1.833333373	0.408248276	2.428571463	0.786795795	2.714285612	1.380131125
CORPINFL	1.809523821	0.726561189	1.489795923	0.648688614	2.224489689	0.664232671

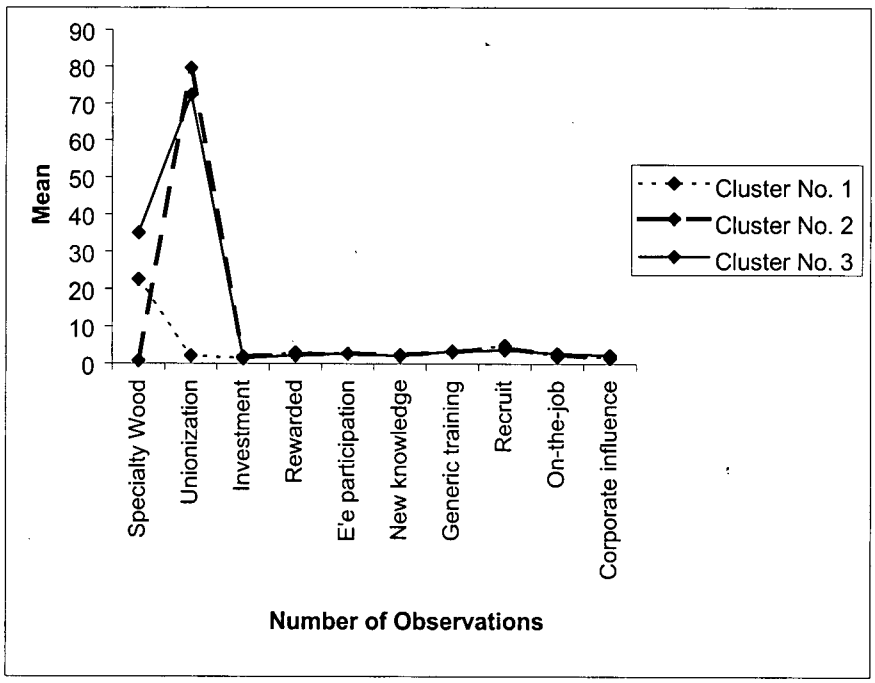

Figure 40: Cluster Means

In meeting the objective of cluster analysis, the researcher attempted to provide a meaningful description of the differences between the sites. In this quest, the researcher assigned a different colour code to each cluster, examined survey questions for commonality of responses within a group yet different responses between groups and labeled the clusters accordingly. The

following variables were chosen as meaningful descriptors: geographical representation, total production, employee size, product type, and degree of unionization.[73] A description of each cluster is provided in Table 7.

Table 7: Description of Clusters

Cluster 1:	♦ predominantly New Zealand sites (4 of 6 sites are New Zealand sites; 1 of 6 are Alberta sites; and 1 of 6 are Interior BC sites) ♦ small average number of employees per site (114 employees) ♦ mix of specialty and commodity wood products (produces an average of 75.8% commodity wood products and 22.5% specialty wood products) ♦ non-unionized sites (an average of 75.9% are non-unionized sites)
Cluster 2:	♦ predominantly Western Canada sites (3 of 7 sites are Alberta sites; 3 of 7 are Interior BC sites; and 1 of 7 are New Zealand sites) ♦ large average number of employees per site (227 employees) ♦ commodity wood products (produces an average of 99.3% commodity wood products) ♦ unionized sites (an average of 79.57% are unionized sites)
Cluster 3:	♦ predominantly Interior BC sites (4 of 7 sites are Interior BC sites; 1 of 7 are Alberta sites; and 2 of 7 are New Zealand sites) ♦ moderately large average number of employees per site (181 employees) ♦ mix of specialty and commodity wood products (produces an average of 64.3% commodity wood products and 35% specialty wood products) ♦ unionized sites (an average of 72.3% are unionized sites)

It is interesting that STATISTICA clustered sites within the same region, even though the geographic region was not specified as a variable in the clustering process. This leads the researcher to believe that in fact, sawmills in Western Canada differ significantly from sawmills in New Zealand.

In summary, the first cluster is described as small, New Zealand dominant, non-unionized sawmills that produce some specialty wood products. The second cluster is described as large, Western Canada dominant, unionized sawmill that produce commodity wood products. The

[73] That is, the F test value in the ANOVA procedures exceeded the F critical value.

third cluster includes moderately large, Interior BC, unionized sawmills that largely produce specialty wood products.

Since the analysis of the variance procedure used above can only show whether or not a difference exists among the three clusters, the Scheffe test was used to identify which groups had significantly different means (Bluman, 2001). With respect to the type of products produced, for example, significant differences of the mean were found only between Interior BC and Western Canada dominant sites and not between Interior BC and New Zealand or Western Canada and New Zealand dominant sites. The Scheffe test also concluded that the mean for employee size was significantly different between Western Canada and New Zealand dominant sites, but not between Interior BC and New Zealand; or between Interior BC and Western Canada dominant groups. The degree of unionization between the Interior BC and New Zealand, and between Western Canada and New Zealand dominant sites were significantly different; but not between Interior BC and Western Canada dominant groups.

The differences in the means for a number of the dimensions used to profile the sawmills were not significant. One of the reasons may have been the small sample size of 27 sites. Within group variances were, for the most part, large and the between group variances were small. Some examples of where the means appeared to be different but were not statistically significant were as follows:

- average production levels differed between Interior BC, Western Canada and New Zealand dominant groupings (i.e. 106.2, 182.6 and 77.6 MMBF, respectively)
- an average of 71%, 57% and 50% of the sites follow corporate directive, respectively
- degree of influence the corporate office had on decisions pertaining to training content differed (2.42, 1.57 and 2.16, respectively)[74]
- degree of influence the corporate office had on decisions pertaining to program evaluations varied in the three groups (2.14, 1.57 and 1.33 points[75], respectively)

[74] A value of 1 equals site makes all decisions, 2 signifies site makes most decisions, and 3 equals corporate and site have equal input on training decisions.
[75] A value of 1 indicates that site makes all decisions and 5 indicates corporate makes all decisions.

- respondents had different views on providing employees with on-the-job opportunities to use their new skills (2.71, 2.43 and 1.83, respectively)[76]
- respondents had different views on hiring criteria where knowledge is more important than the ability to learn (3.57, 4.14, 4.83, respectively)

Hence, a larger sample size may have provided more meaningful clusters.

The Euclidean distances were used to assess the magnitude of differences between the clusters. Table 7 shows that the largest difference existed between the New Zealand and Western Canada dominant clusters (648.09). The New Zealand and Interior BC clusters were also shown to be quite different and not surprisingly, the Western Canada and Interior BC clusters were shown to be more alike.

Table 8: Euclidean Distances Between Clusters

	No. 1	No. 2	No. 3
No. 1	0	648.0859985	508.9920349
No. 2	25.45753288	0	122.9638062
No. 3	22.56085205	11.08890438	0

Multiple discriminant analysis was also used to identify the independent variables that best discriminate between sawmills having a strong training culturé and those that do not. It was then used to determine which variables best predict whether solid wood manufacturing site had a strong training culture. The objective was to help companies determine the factors that affect their commitment to training and adjust their strategies accordingly. However, given the small sample size, significant results could not be derived.

[76] A value of 1 indicates a strong agreement, 3 indicates no opinion, and 5 signifies strong disagreement.

CHAPTER 4

DISCUSSION AND CONCLUSION

4 DISCUSSION

The following discussion links the results from the survey to the literature review and objectives of the study. A similar layout to the results section is presented here:

Objective 1: Define corporate training policies and determine the success of implementation at the sawmill site level

Training Policy

- Degree of formalization
- Extent of decentralization
- Training objectives

Objective 2: Determine the degree of the company's investment and commitment to training

Hendry's Model

- Business strategies and competitive pressures
- External labour market
- Internal labour market
- Internal actors and systems
- External support for training

Training Budget

- The human capital model

Objective 3: Determine the types of training programs for management and staff

Training Model

- Needs assessment phase
- Design and delivery phase
- Evaluation phase

Objective 4: Define the desired skills set required by the company

Skills Requirements

- Critical conceptual and communications skills
- Critical technical and workplace training skills
- Critical computer skills
- Critical communications skills

Recommendations for Further Research

Conclusion

Objective 1: Define corporate training policies and determine the success of implementation at the sawmill site level

4.1 TRAINING POLICY

4.1.1 Degree of Formalization

As mentioned in **Section 3.1.2.2**, the less corporate influence on training decisions, the greater the need for more formalized training policies. A majority of Western Canada respondents had a formal training policy where about three-quarters of the site respondents followed corporate directives. The high level of formal training policies in this case induces consistency across the organization since Western Canada sites make most of their own training decisions. On the other hand, New Zealand companies have managed to maintain an informal training policy even though their site respondents indicated fairly decentralized training decisions (Figure 7). None of the respondents indicated a formal training department given the decentralized training function.

4.1.2 Extent of Decentralization

Training decisions were predominately made by the site or all at the site level (Figures 6 and 7). Even though decisions were largely decentralized, commonality in the types of decisions requiring corporate influence existed between site and corporate respondents. It appears that the

corporate office was involved in the delivery, content and program evaluation for training as a means to ensure consistency across the organization. Logically, all sites autonomously made decisions with respect to who will be trained and the decision to train given their direct supervisory responsibilities and intimacy with the production requirements.

4.1.3 Objectives for Training

Both Western Canada and New Zealand respondents tended to focus their training objectives on the operations (i.e. the people and the machines) of the company. They focused on improving work performance and keeping abreast of new technologies. New Zealand companies selected "improve product/service quality" as their third most important training objective. They went so far as including customer complaints to measure the impact of training (Figure 19), whereas Western Canada sites used this measure to a much lesser extent.

The overall training objectives identified by sites were in congruence with the corporate respondents (Figures 8 and 9) of the company[1]. The top three objectives, in order of most important to third most important, were: improve work performance, improve productivity, and keep abreast of new technologies. The site respondents top three objectives, in the same order, were: improve safety, improve work performance, and improve quality. This may infer that the training objective pertaining to improve work performance were clearly communicated and implemented at the site level. However, the fact that the sites rated "improve safety" as the most important training objective but was not ranked by corporate respondents as one of the overall top three objectives demonstrates that their objectives need to be better communicated or linked.

Other examples that compare the types of corporate training policies to site implementation (i.e. training delivery, skills needs assessments, etc.) are detailed in the results portion of the thesis paper.

[1] In order to compare the aggregate corporate to site results, total evaluation points were combined for both Western Canada and New Zealand corporate respondents, and again for Interior BC, Alberta and New Zealand sites, on each training objective.

Objective 2: Determine the degree of the company's investment and commitment to training

4.2 HENDRY'S MODEL

There is no doubt that managers in all regions perceive training as an investment. They demonstrated a commitment to improving the employee's performance and building a highly skilled and motivated workforce. However, there was concern for the lack of corporate direction and lack of financial resources to implement training. Hendry's model (as described in **Section 1.5.2**) is used in the following sub-section to identify possible factors that affected the commitment to training. Once again, these factors include: business strategies, external labour market, internal labour market, internal actors and systems, and external support for training.

4.2.1 Business strategies and competitive pressures

Strong global competition, oversupply of low value commodities, and the decline of traditional exports have all influenced the direction of the production and market strategies within the company. Primary manufacturing companies have developed new products, adopted advanced machinery and equipment, and altered their production processes, all to improve productivity and cut costs. Discussions with sawmill managers in the three regions revealed that some sawmills have introduced engineered wood products into their production processes, while others had intentions of producing more specialty wood products and customized products in the future.

With these market and product changes, respondents have encouraged employees to develop new knowledge (Figures 35, 36 and 39), invested in upgrading the skills of their skilled labour employees and general labourers (Figure 22) and implemented the related technical competencies training (Figure 23). They have also used training tools that were suitable for flexible manufacturing and project team work, including cross training, training for teamwork, and transferable skills training (Figure 18). Supporting this, **Section 3.1.5** and Figures 24 to 34 demonstrate that many employee groups were trained in both generic and specific skills.

Although there is no direct evidence, results from the survey suggest that training objectives and skills needs were not well linked to the overall business strategies. Firstly, no respondents stated that an increase to market access was one of the three most important training objectives. Secondly, a majority of skills needs assessments were performed by sites less than one year in advance (Figure 12). If training needs were truly linked with the overall business strategies, they would be parallel to the long-term focus of the divisions within the company (e.g. research and development, marketing, product development, etc.). It is highly unlikely that corporate strategies are developed less than one year in advance!

In summary, companies have recognized the need to train their employees in new product development, machine operations and management processes. They also demonstrated a commitment to developing their workforce skills. However, their training focus is much too short-term and need to be more integrated with the overall long-term visions of the company.

4.2.2 External labour market

As mentioned in **Section 1.6.1**, there is a shortage of skilled labour supply for sawmills in the three regions. This shortage has hampered their plans to expand operations or get into new product markets. A low number of forestry graduates, lack of basic skills, and ability to attract and retain skilled people were some of the challenges generally faced by sawmill managers. In response to this, respondents have implemented mentoring programs, on-the-job training, re-employment and retraining strategies (Figures 15, 16, and 18).

It appears that New Zealand sites more widely used some of these training tools than Western Canada sites. This may suggest an acute labour supply problem in New Zealand's forest industry and provide reasons for their higher dependence of contract employees (Figure 4). Moreover, sites in all three regions were committed to attracting and retaining qualified employees as one of their most important training objectives (Figures 8 and 9). At the corporate level, New Zealand respondents were the only companies to have this as one of their top three objectives. In summary, sites have adopted more flexible training methods in response to the shortage of skilled labour.

4.2.3 Internal labour market

The downsizing and rationalization of corporate divisions have led many companies to decentralize their organizational structures. Evidence of this trend was seen in **Section 3.1.1.4**, which concludes that Interior BC and New Zealand sites had fairly decentralized organizational structures. However, the success of restructuring depends on the company's commitment in helping the employees develop into their new, often broader, roles. In this case, the level of commitment can be examined by the degree Western Canada and New Zealand companies encouraged their employees to expand their knowledge, the extent training was made accessible to their employees (i.e. financial and time), and how many opportunities employees had to learn on-the-job.

Figures 35, 36 and 39 demonstrated that both companies and sites encouraged employees to acquire new knowledge and provided for on-the-job opportunities to use their newly acquired skills. In addition, the companies invested in their in-house trainers and direct supervisors to train their employees (Figure 18) and widely used teamwork, on-the-job training, cross training, and retraining programs to expand their employees' skills.

Examining the most important training objectives provided yet another indicator of the company's commitment to training. Improving employees work performance was chosen as the most important training objectives in the three regions (Figures 8 and 9). This was backed by their immense use of employee performance measures and productivity reports to evaluate training (Figure 19). However, time constraints and financial resources were seen as a major barrier to training their employees (Figure 10).

Since such a large number of site respondents identified time constraints and lack of financial resources as a major limiting factor to training, the following questions are asked that challenge a company's true commitment to training:

- Are there performance measures in place to ensure managers are held accountable for employee development?
- Do managers see training as a priority?
- Does the strategic team support training by ensuring its link to the overall business strategies?
- Do supervisors schedule the time to train their employees when implementing new production processes?
- When purchasing new machinery and equipment, is employee training considered in the overall cost of capital?
- Are provisions made for supplier training? (The answer to the last question, however, may have been provided in Figure 18).

In summary, a company's commitment to training seemed almost hypocritical. On the one hand, corporate and site respondents demonstrated a strong commitment to training. This was evident in their training objectives, delivery methods, and evaluation tools that focused on the employee's work performance. On the other hand, companies did not provide the time or enough financial resources to training their employees.

4.2.4 Internal Actors and Systems (e.g. training culture)

Unions, management systems, and support from managers and supervisors often play a major role in the level of training within a company. With respect to unions, the collective agreement for British Columbia's forest products industry, for example, specifies the provisions for technological change and includes job descriptions for several positions. These provisions may limit management's ability to train employees in new equipment and operations. Moreover, the level of trust between union and management affects a company's ability to gain union support for training. A lack of union support was evident in both Interior BC and Alberta sites (Figure 10).

In general, the existence of quality, work design, and other management processes (e.g. TQM, TPM, SAP) in sawmills positively affects a company's commitment to training. This is because of the thorough documentation requirements and strict performance measures built into these systems. Although not directly stated in the survey, these systems were likely in place in many sawmills since respondents indicated the need to improve product quality as one of the most important training objective. They also identified quality standard measures (Figure 19) and had

a high degree of workplace training for several of their employee groups (Figure 28). Conversations with industry consultants also confirmed that these systems were in place. All of these observations signify a high level of commitment to training.

In summary, the use of quality management, safety and management information systems all positively affected the degree of commitment to training. However, lack of union, management, or corporate support for training (i.e. time and financial) negatively impacted a company's investment in training.

4.2.5 External Support for Training

About three-quarters of all corporate respondents had a separate training budget and were committed to increasing their training budget for the year 2000[2]. Despite the increase in the corporate training budget, site respondents indicated that one of the major limitations to training was a lack of financial resources (Figure 10). In fact, 8 of 21 site respondents said they planned to reduce their training budget from 1998 to 1999. This may infer that during economic downtimes, one of the first things that get cut is the training budget.

Section 3.1.3.1 points out that sawmills received very little funds from outside the company (i.e. unions, government, other funding agencies). Although there are several sources of funding for the general forest industry in British Columbia, grants appear to be more directed to the secondary manufacturing sector or to smaller companies. For example, Technology BC provides financial support (averaging about $100,000) to early-stage companies for applied research and development projects (Science Council of British Columbia, 2000). Moreover, Forest Renewal BC provides financial support to sustainable forest management and value-added sector projects, but does not directly support primary manufacturing training. Rather, their focus is on providing re-employment services to long-term forest-sector workers (particularly from the primary manufacturing sector) who face permanent displacement (Science Council of British Columbia,

[2] Note that only three of the five Western Canada and four out of six New Zealand corporate respondents provided information pertaining to the 2000 corporate training budget. Two of five Western Canada and two of six New Zealand corporate respondents provided figures for the 2001 training budget and was therefore not used in this discussion.

2000). The lack of external financial support for training may explain the large use of customer supplier training in Alberta and Interior BC (Figure 18).

Although not apparent in the survey results, New Zealand companies receive substantial support from the government indirectly through Forest Industries Training.[3] A training budget of about $1.4 million was allocated to the solid wood processing sector for the year 2000, where 68% of the total was provided by the government. The organization increased its training budget to $1.5 million for the year 2001, of which 65% was funded by the government. A training budget is also allocated to the pulp and paper and wood panels sectors, which have a total training budget of $450,000 and $337,000 for the year 2001, respectively (Siegfried, 2001). The fact that New Zealand site respondents indicated that no funds were received from the government may indicate an unawareness of the source of the training funds.

The fact that sites in each region ranked "improve safety" as one of their most important training objectives illustrates the impact of health and safety legislation on training (Figure 9). For example, legislation in the three regions dictates that companies must have trained health and safety representatives within the company and that all employees in direct contact with machine operations or chemicals be trained in preventative health and safety measures. Hence, safety legislation positively affects the commitment to training in the three regions.

Although New Zealand sites were predominantly non-unionized at the time of surveying, the new Employment Relations Act (2000) may change the proportion of unionized employees in the future. Whether New Zealand companies experience a lack of union support will depend on how their labour-management relations evolve. In addition, the new employment relations law allows unions to freely enter company premises to deal with safety and health matters affecting members. Employees are also eligible for up to five days of paid employee relations education leave if the purpose of training is to improve relations among unions, employees and employers and promote good faith behavior. These conditions will likely increase the level of employee

[3] Forest Industries Training is a training organization responsible for setting national training standards and qualifications for all forest industries in New Zealand (Forest Industries Training, 2000). They develop training programs and arrange delivery, many of which are seminars and workshops. Most of the courses developed by the organization is jointly funded by government and industry. In some cases, Forest Industries Training subsidizes the cost of training to those companies wishing to develop or delivery programs in-house.

training. Moreover, employees covered by a collective agreement will continue to be employed by the company for the term of the agreement, unless the employee is dismissed for just cause (New Zealand Government, 2000). This provision may infer an increase in the use of re-employment/retraining programs by New Zealand sites.

4.3 TRAINING BUDGET

4.3.1 The Human Capital Model

According to the human capital model (**Section 1.5.4.1**), the level of commitment to training depends on the company's perception of training. Figures 35, 36 and 39 demonstrate that companies in all three regions had strong attitudes towards training as an investment.

The model also specifies the type of training firms will pay for (e.g. specific versus general). It states that firms tend not to pay for general training because they fear employees will be poached by rival companies (Stevens and Walsh, 1991; Hum and Simpson, 1996; Campbell, 1991; Becker, 1964). However, company's may see general training as inexpensive insurance to retain workers (Becker, 1964).

Section 3.1.5 demonstrates that the companies provided for both generic and specific training. Figure 23 illustrates that companies allocated about three-quarters of their training budget to specific training (e.g. workplace training, computer training, and technical training) and about a quarter to generic skills training, such as performance competencies and basic skills training. In addition, Figures 35, 36 and 39 show that, on average, corporate respondents somewhat agreed that specific training is being replaced by more generic training. This may be explained by the fact that corporate human resources tends to pay for more generic training. Both corporate and site respondents also identified generic skills training as an important requirement for almost all employee groups (Figures 24 to 34). In summary, companies and sites verified the importance of having a flexible, skilled workforce.

One problem with the human capital model is that the return on investment can not be easily quantified, and is therefore not often used. However, site respondents showed some efforts to

measure the financial impact of training. Over thirty percent of the Alberta sites and about 15% of both Interior BC and New Zealand sites actually implemented return on investment measures (Figure 19).

Objective 3: Determine the types of training programs for management and staff

4.4 THE TRAINING MODEL

McShane's training model was used to determine the elements of the training program (**Section 1.5.6**): needs assessments, training design, development and delivery, and evaluation measures.

4.4.1 Needs Assessments

Much energy has been put into upgrading technology in an effort to increase productivity and a site's capacity. In some cases, the implementation of this technology takes place over years. In comparison, the skills needs assessment process is predominantly conducted less than one year in advance. It is therefore evident that project managers and divisional managers do not include the skills needs of the workforce into the implementation equation.

Even though the planning time was less than ideal, skills needs were collected from a variety of sources. As mentioned in **Section 3.1.4.1**, New Zealand respondents had a formal skills needs assessment process whereas Western Canada respondents collected this information informally. Respondents in all three regions collected information from supervisors, line managers and employees. They also obtained information from an advisory committee (Figure 13 and 14) which shows a more collaborative method of identifying needs.

The three levels of needs assessments in the training model outlined in **Section 1.5.6.1** provides a basis for evaluating the respondents' performance against each level. The first level of identifying needs is the business or organizational needs analysis. Respondents moderately performed at this level, as described in **Section 4.2.1**. Several observations confirm that companies had a strong level of needs assessments at the operational and individual levels,

which involves a study of the knowledge, skills and abilities required for successful performance on the job. The fact that almost all companies chose "improve work performance" and "improve productivity" as one of their top three important training objectives; collected information directly from employees and supervisors; and used employee performance measures to assess the impact of training indicates their strong interest in successful performance on the job. The third level – training needs, individual, or person – was also evident in all regions given the wide use and importance of employee performance measures (Figures 9 and 19).

4.4.2 Design, Development and Delivery

In response to changing market conditions, respondents have adopted both traditional training and "flexible" training,[4] such as "just-in-time" or on-the-job training (Figure 15, 16, and 18). At the traditional end of the spectrum, corporate respondents identified seminars/workshops and training at an educational institution as the second and third most widely used methods of training delivery. Interestingly, trainers at an educational or training institution were not widely used. At the "flexible" end of the spectrum, companies and sites extensively used on-the-job training. Cross-training, computer-based training, training for teamwork, re-employment/retraining strategies, mentoring and self-directed learning were also employed.[5] Given the large proportion of this type of training, in-house trainers and supervisors were one of the most widely used trainers by both corporate and site respondents.

4.4.3 Evaluation Phase

Based on the Robinson and Robinson's Training for Impact model (**Appendix 6**), the four levels of evaluation--reaction, learning, behavior, and operational levels (Robinson and Robinson, 1990)—were employed by the companies and sites. Overall, respondents measured training at the behavior stage. They used employee performance measures, quality standards, and productivity reports. Although not frequently used, some of the respondents went in so far as

[4] "Flexible" training is the term used to describe the types of training commonly found in the organizational learning paradigm, as described in Section 1.5.6.2.

[5] With the shortage of skilled labour, it is likely that companies will focus on more formal succession planning and implement more developmental training, such as mentoring programs. Computer-based training may become more commonplace with the advances in technology.

measuring training at the operational level. For example, about one-fifth of all sites and only 10% of all corporate respondents measured training by ROI. In addition, over a third of New Zealand sites relied on customer complaints.

The second tenet of Brinkerhoff's model (**Appendix 5**) states that evaluation results must constantly be fed into other stages of the training process (Brinkerhoff, 1987). This appears to be true since the three most widely used measures -- employee performance, quality standards, and productivity reports—are well-linked to the three most important corporate training objectives – improve employee performance, quality, and productivity.

Section 1.5.6.4 states that only 5% of all courses were subjected to a return on investment evaluation in 1993 (McIntyre, 1994). Results show that the forest industry has significantly outperformed this figure seven years later. About 10% of all corporate respondents and 19% of site respondents use ROI as a measure of the impact of training. Because of the difficulty of quantifying the benefits of training, it was one of the least used method of evaluation.

Overall, solid wood manufacturing companies and sites had effective training delivery methods in place. They also showed some level of integration between the phases of the training model, but needed to better link their training programs to their business strategies. In response to the changing market conditions, companies indicated the importance of providing more non-traditional skills for their employee groups, as indicated in **Section 3.1.5**. For example, office/clerical and technical employees were trained in performance competencies, managers had a large proportion of computer skills training, and labourers had a high level of basic skills training.

It is difficult to assess, though, whether the skills identified by the respondents were well-linked to the overall training objectives of the company: improve safety, improve employee performance, and improve quality given the short-term skills assessment plan. However, the types of skills sought by the company seemed to match the training delivery methods. For example, transferable skills training, cross training, and training for teamwork were likely used for acquiring the generic skills. On-the-job training and seminars/workshops were more

appropriate for the specific skills training (e.g. technical skills and workplace training), and seminars and workshops were appropriate for the performance competencies training.

Objective 4: Define the desired skills set required by the company

4.5 SKILLS REQUIREMENTS

Technological upgrades in the sawmills, development of new products and markets, closer relations with customers, and decentralization of the corporate functions have all expanded the tasks and skill demands of the employees. This is apparent in Figures 24 to 34 that show a combination of specific and generic skills training for each employee group. Five critical skills were identified across the employee groups: critical technical and workplace skills, conceptual and communication skills, and computer skills.

4.5.1 Critical technical and workplace skills

The greater application of robotics technologies and system-wide optimization and control techniques in sawmills may explain the large extent of technical skills training and workplace training for many of the employee groups, as described in **Section 3.1.5**. In particular, one of the most important skills for trades workers was technical skills training given their responsibilities to keep production going and to diagnose malfunctions or machine breakdowns. The large proportion of the corporate training budget (Figure 23) allocated to technical skill training, followed by workplace training, support the importance of these skills.

It is therefore likely that technical training in the products and services of the company and its customers were provided to the site employees. New Zealand sites largely used customer complaints to measure the impact of training (Figure 19), and Alberta sites had a large proportion of customers/suppliers training (Figure 18). Firms may see more of this type of training as the human resources function becomes more integrated with the overall objectives of the company.

In summary, the largest proportion of the budget was allocated to technical skills training and almost all employee groups required this skill to succeed in the future. In particular, the emphasis of technical and workplace training on technical and trades employees confirms the Training and Development 1993 Survey results, where technical knowledge, interpersonal, quality management and customer service skills were the most important skills for professional and technical employees (McIntyre, 1994). It also confirms the results found in Bratkovich and Miller study on educational needs of innovative Ohio sawmill operators (Bratkovich and Miller, 1993).

4.5.2 Critical conceptual and communications skills

The large degree of cross-training, mentoring, training for teamwork, and transferable skills training at all sites suggest that employees require more frequent communication with other divisional members and more direct contact with their clients or customers. They also imply a matrix structure that involves intricate management systems and interpretation of complex information. These changes have demanded performance competencies in all management employees[6] and to a lesser extent, line workers[7].

4.5.3 Critical computer skills

With the onset of advanced technologies, management systems and computerized operations in the sawmills, it is to no surprise that a large proportion of corporate respondents said that computer skills were important for all employee groups except labourers. In particular, New Zealand respondents did not state the requirement of computer skills training for their labourers. This may come from New Zealand's highly labour-intensive sawmills. Sites generally agreed with corporate respondents but identified computer skills as less important skills for technical or trades employees.

[6] Includes i.e. management/professional, technical, and supervisory line workers.
[7] Includes labourers, trades and office/clerical.

In summary, the third largest proportion of the budget was allocated to performance competencies skills training. This skill was largely required for the technical, management/professional, and supervisory line workers. Survey results confirm the Training and Development 1993 Survey findings, where strategic planning, change management, and supervisory skills were critical skills for executives and management. It also confirms the study's technical and teamwork skills requirements for clerical and office employees (McIntyre, 1994), since respondents indicated performance competencies were important for line workers, although less significant. Results also support related research that reported marketing (Helligmann and Bergman1986; Sinclair, 1989; Ernst & Young, 1998), sawmill production (Ernst & Young, 1998), communications (Ernst & Young, 1998), and environmental constraints (Thomas, 1993) to be high priority training needs of forest products industry managers.

4.6 RECOMMENDATIONS FOR FURTHER RESEARCH

Training is only one small part of the entire human resources umbrella. Likewise, the solid wood manufacturing industry is only one component of the overall forest industry. A matrix of further research can therefore be recommended as follows:

	Training and Development	Recruitment & Selection	Performance Management	Employee/Labour Relations	Compensation	Health & Safety
Forest Resource Management						
Harvesting						
Primary Manufacturing			FURTHER RESEARCH			
Secondary Manufacturing						
Pulp and Paper						

Although not shown, the matrix contains a third dimension, the geographical focus. This may include the same regions in the thesis study—Interior BC, Alberta, and New Zealand, or an expansion into other regions (e.g. Japan, the US, or a country in the European Union). Since an entire lifetime can be devoted to studying each of these elements, the researcher recommends an expansion of the current study into other regions of the world. A comparative analysis with other regions would allow one to perform more conclusive multivariate statistical analysis given a larger sample.

Cluster analysis could be used to identify more meaningful groups of sawmills. Depending on the dimensions chosen, these groups may provide a benchmark for measuring and evaluating a company's training performance. In addition, multiple discriminant analysis could then be used to distinguish between sites that have a strong training culture and those that do not. Managers would then be able to focus their resources (particularly financial) on the elements that most contribute to having a strong training culture and successful business operations.

A similar study on training policies and practices could be conducted with one of the other segments of the forest industry. The secondary manufacturing industry is recommended since some companies, particularly in New Zealand, have integrated secondary manufacturing processes into their sawmills. This would reveal interesting comparisons of training objectives, delivery methods, skills requirements, and other issues.

Since training is closely tied to employee performance and compensation, further research should be conducted in these fields. In particular, a description of the current compensation and performance management practices in the solid wood manufacturing industry would allow companies to examine the extent that employee performance measures are tied to compensation, training, and the overall business strategies. Incongruencies would be identified to allow for better integration, and hence, result in more effective means of measuring management/employee performance and compensation. They would then be in a better position to establish more "bottom-line" results from training, which is the next recommendation.

Overwhelmingly, a large proportion of site managers said that the next steps for improving training would be to establish better and more measurable training evaluation tools. Doing so would help them sell the benefits of training to the strategic planning committee. Research should therefore be directed towards the development of a training model that brings in a metric to training and links these training measures to the key performance indicators of the company. Metrics may include:

- increase in production (MMBF processed per hour)
- decrease in computer/machine downtime (minutes/day)
- decrease in number of accidents/injuries per week/month
- increase in sales revenue (number of new recruits/customers/week)

- decrease in number of employee grievances or customer complaints per month
- increase in productivity per hour/day (output per employee may include time to produce reports or number of reports, forms processed, new products created, etc.)
- decrease in waste, defects, or rejects per hour
- decrease in employee turnover per month
- decrease in maintenance costs per month

Building on Hendry's model, the last recommendation is an examination on how a region's education policies and training structure (i.e. types of training institutions, strategic alliances, etc.) affect the training policies/programs and supply of labour in the solid wood manufacturing industry. This would help companies plan for more effective training tools, identify potential funding, or strategic alliance options for training and skills development.

5 CONCLUSION

On average, Western Canada companies produced almost five times more lumber and had significantly higher sales than New Zealand companies. Western Canada sites also had, on average, more employees per site and a significantly higher proportion of unionized employees (over two thirds) than New Zealand sites (less than a quarter). Interestingly, New Zealand sites extensively used contract employees (22%) where Western Canada sites scarcely used them.

Strong global competition, oversupply of low value commodities, and the decline of traditional exports have all influenced the direction of the production, market and human resources strategies within the company. Primary manufacturing companies have developed new products, adopted advanced machinery and equipment, altered their production processes, and retrained employees, all to improve productivity and cut costs.

With respect to training policies, a majority of Western Canada respondents had a formal training policy where about three-quarters of the site respondents followed corporate directives. On the other hand, New Zealand's training policies were largely informal. In either case, respondents indicated largely decentralized training decisions.

Western Canada and New Zealand corporate respondents indicated a similar degree of corporate influence on training decisions. In both Western Canada and New Zealand, training decisions were predominately made by the site or all at the site level. Overall, Western Canada corporate respondents indicated a stronger corporate influence in each of the training decisions than did its sites. On the contrary, New Zealand companies were in agreement with the amount of corporate influence on training decisions. New Zealand sites also had a much stronger corporate influence than Western Canada sites for decisions pertaining to the training budget. Alberta sites made almost all their own decisions regarding training program evaluation.

Both Western Canada and New Zealand respondents tended to focus their training objectives on the operations (i.e. the people and the machines) of the company. The overall training objectives identified by sites were in congruence with the corporate respondents. The top three objectives,

in order of importance, were: improve work performance, improve productivity, and keep abreast of new technologies. The site respondents top three objectives were: improve safety, improve work performance, and improve quality. Results from the survey suggest that training objectives and programs were not well linked to the overall business strategies.
Overall, corporate respondents were not significantly different from site respondents with respect to their attitudes and behaviors towards training. Both perceived training as an investment, provided on-the-job opportunities to employees to use their new skills, and encouraged employees to develop new knowledge. They both had more neutral views on rewarding employees for training, involving them in the development of new training programs, and replacing specific training by more generic training. Corporate and site respondents believed that when recruiting, the ability to learn was just as or more important than knowledge.

The downsizing and rationalization of corporate divisions have led many companies to decentralize their organizational structures. However, the success of restructuring depends on the company's commitment to employee development. On average, almost all corporate and site respondents perceived training as an investment. New Zealand sites had significantly stronger perceptions than Western Canada sites. They also encouraged employees to acquire new knowledge and provided for on-the-job opportunities to use their newly acquired skills.

In addition, the companies invested in their in-house trainers and direct supervisors to train their employees and widely used teamwork, on-the-job training, cross training, and retraining programs to expand their employees' skills. This was backed by their immense use of employee performance measures and productivity reports to evaluate training. However, time constraints and financial resources were seen as a major barrier to training their employees. This may call for more self-directed learning in the future (i.e. employees learning specific skills on their own time). It is also likely that training providers and managers will be held accountable for employee training and concrete benefits of training (e.g. ROI). Other limitations included a lack of union support, low employee morale and lack of corporate direction.

A vast majority of Western Canada and New Zealand corporate respondents indicated they had a separate training budget. With the forestry slump in the late 1990's, the corporate training budget dropped in Western Canadian companies between 1998 and 1999 but respondents said

they would increase their spending significantly in 2000. This may infer that during economic downswings, one of the first things that get cut is the training budget. However, at the site level, all three regions, on average, had increased their training budgets between 1998 and 1999.

Almost all site respondents said they received their training funds from the sawmill site and hardly any funds from outside the company. Although there are several sources of funding for the general forest industry in British Columbia, grants appear to be more directed to the secondary manufacturing sector or to smaller companies. This target needs to be revisited if the goal is to unite the secondary and primary manufacturing industries.

Overall, corporate and site respondents appeared to have neutral views on rewarding their employees. This demonstrates a room for improvement. For example, performance management systems could encourage employee development through "competency-based pay" plans or other financial incentives. Interestingly, Alberta sites, on average, rewarded employees for training despite a lack of financial resources as one of the most important factors that limit their ability to provide training.

Much energy has been put into upgrading technology in an effort to increase productivity and a site's capacity. However, assessing skills needs at the business level was only moderately performed. Western Canada companies evaluated their skills needs on a longer-term basis than New Zealand companies. Compared to the corporate respondents, sites had a shorter time frame for evaluating skill needs. Almost 70% of the Interior BC and almost all New Zealand site respondents assessed their skills needs less than a year in advance. As a saving grace, skills needs assessments at the operational and individual levels were widely used (e.g. employee performance measures, productivity reports, etc.).

Even though the planning time was less than ideal, skills needs were collected from a variety of sources. Respondents in all three regions collected information from supervisors, line managers and employees. They also obtained information from an advisory committee which shows a more collaborative method of identifying needs. New Zealand respondents collected skills needs formally whereas Western Canada respondents collected this information informally.

In response to changing market conditions, respondents have adopted both traditional training and "flexible" training. At the traditional end of the spectrum, corporate respondents identified seminars/workshops and training institutions as the second and third most widely used methods of training delivery. At the other end of the spectrum, companies and sites most widely used on-the-job training. Cross-training, computer-based training, training for teamwork, re-employment/retraining strategies, mentoring and self-directed learning were also employed. Given the large proportion of this type of training, in-house trainers and direct supervisors were the most widely used trainers by both corporate and site respondents.

Overall, respondents used employee performance measures, quality standards, and productivity reports to evaluate the impact of training. These measures appeared to be well-linked to the three most important corporate training objectives – improve employee performance, quality, and productivity. At the corporate level, New Zealand respondents were the only companies to measure the ROI in training. However, at the site level, all three regions used ROI. Because of the difficulty of quantifying the benefits of training, it was the least commonly used method of evaluation.

There appears to be a trend towards more non-traditional skills training for each employee group. For example, office/clerical and technical employees were trained in performance competencies, managers had a large proportion of computer skills training, and labourers had a high level of basic skills training. It is difficult to assess, though, whether these skills needs were linked to the overall objectives of the company. However, the skills needs seem to be well linked to training delivery methods.

On the same note, corporate and site respondents provided for both generic and specific training. Companies allocated about three-quarters of their training budget to specific training (e.g. workplace training, computer training, and technical training) and about a quarter to generic skills training, such as performance competencies and basic skills training. Both corporate and site respondents also identified generic skills training as an important requirement for almost all employee groups.

Five critical skills were identified across the employee groups: critical technical and workplace skills, conceptual and communication skills, and computer skills. The greater application of robotics technologies and system-wide optimization and control techniques in sawmills may explain the large extent of technical skills training and workplace training for many of the employee groups. The large degree of cross-training, mentoring, training for teamwork, and transferable training in all sites suggest that employees require more frequent communication with other divisional members and more direct contact with their clients or customers. Because the advanced technologies and management systems are largely computerized in the sawmills, a large proportion of corporate respondents said that computer skills were important for all employees except labourers.

Most sawmill respondents said that site operations improved in the last three years as a result of training. These improvements may be due to the establishment of a more collaborative method of identifying training needs and on-site training delivery. In an effort to improve training within the company, about half of the respondents indicated that they needed to do more effective succession planning, better link training needs to overall business strategies and develop more results-oriented evaluation measures, such as return on investment. Respondents also indicated a need to standardize training across the company, regulate training records and processes, and establish a formal tracking process.

Hopefully, all these action plans will actually transpire. There is no point in climbing a mountain to get to the middle. Why be content with that when there are so many opportunities with effective, results-oriented, well-integrated training strategies and programs?

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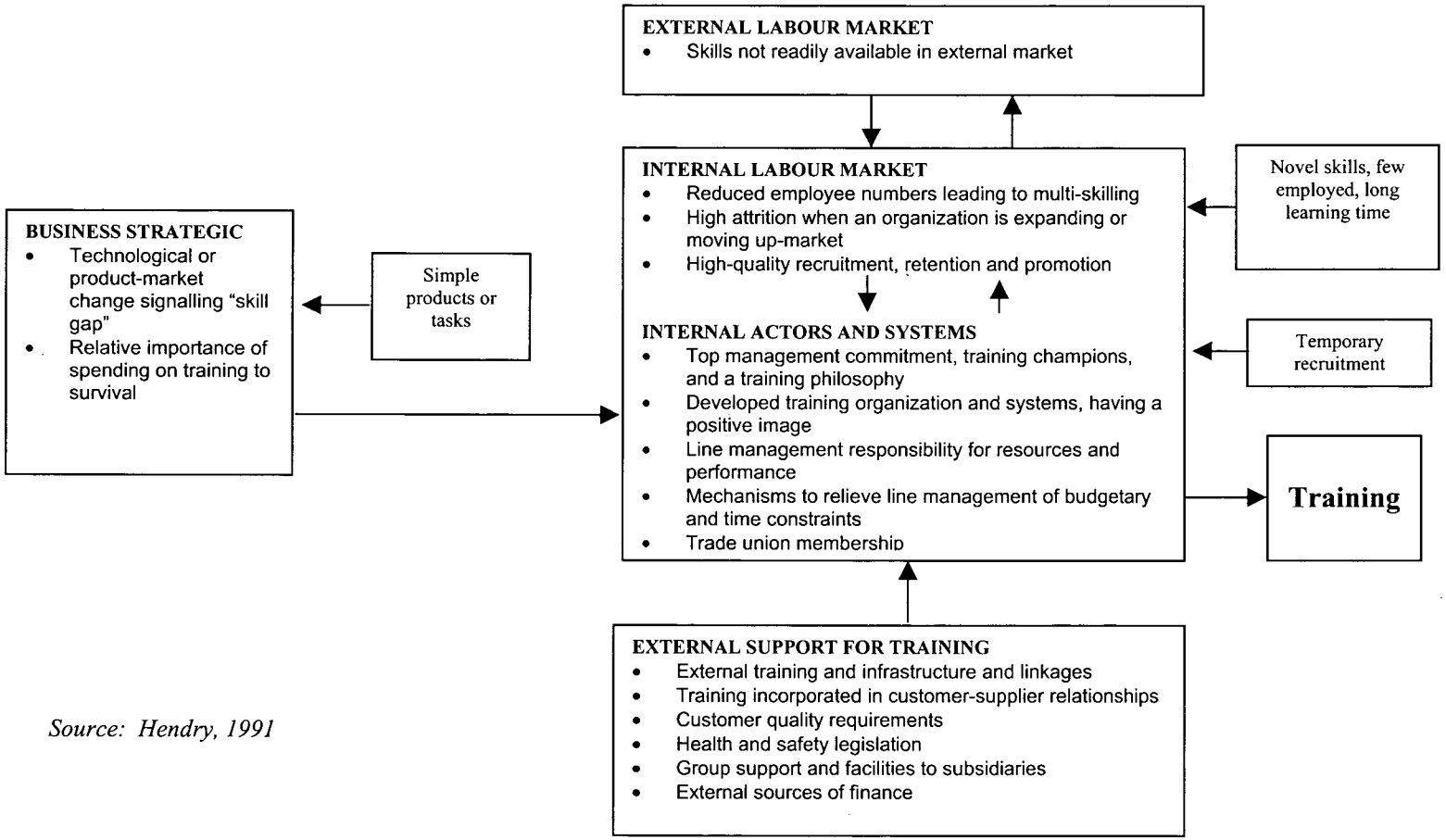
APPENDICES

Appendix 1

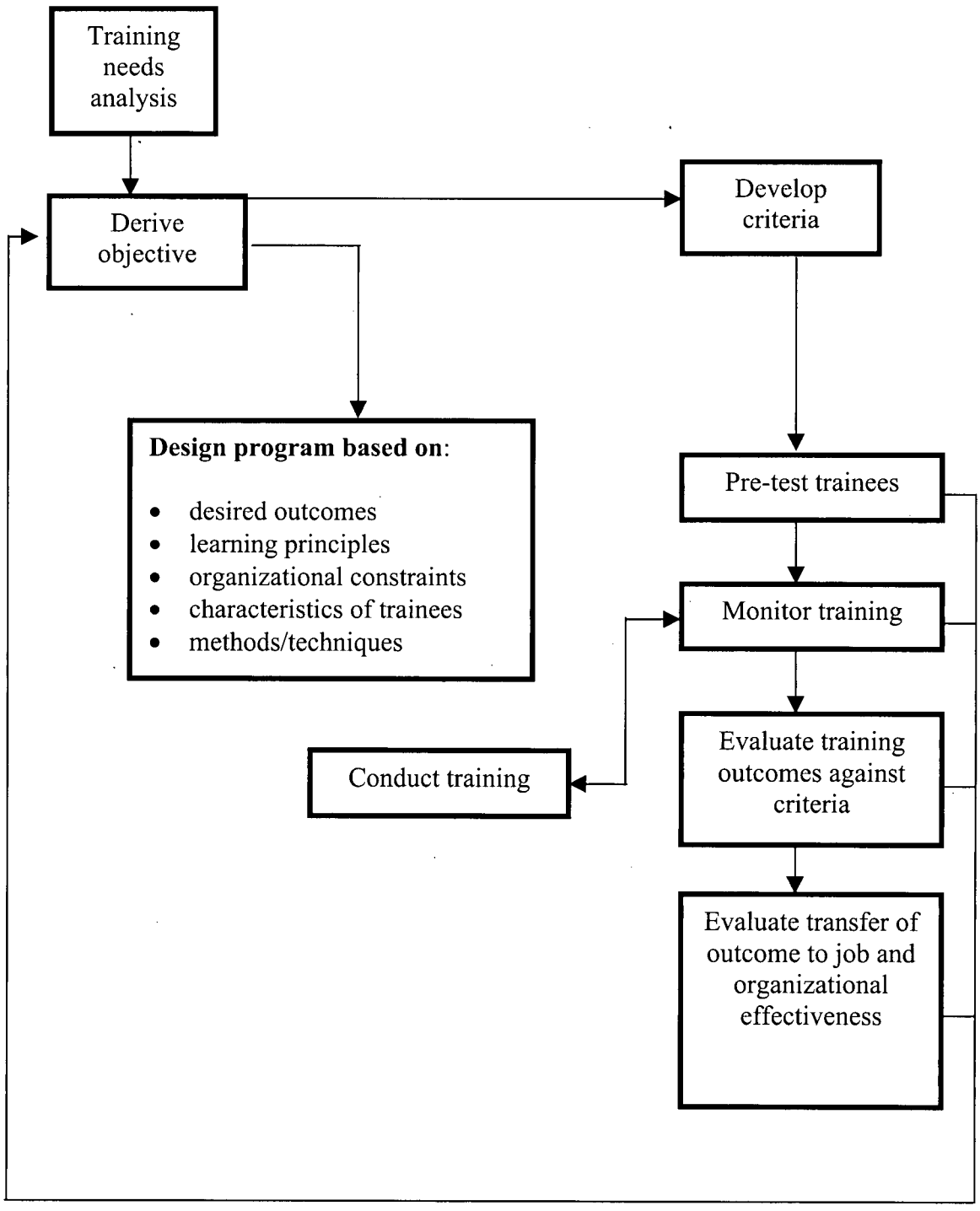
HENDRY'S MODEL OF THE INTERACTION OF POSITIVE AND NEGATIVE FACTORS ON TRAINING



Source: Hendry, 1991

Appendix 2

McSHANE'S TRAINING MODEL



Source: Human Resources Management: A Diagnostic Approach by McShane, 1994. Originally adapted and modified from Training: Program and Development and Evaluation by I.L. Goldstein, Copyright 1974 by Wadsworth Publishing Company Inc.

Appendix 3

Training Evaluation Models

1. Kirkpatrick's model 1983

Kirkpatrick's model of evaluation is the most familiar and most commonly used model for training evaluation. It contains four levels at which data can be collected to measure the effectiveness of training: reaction, learning, behavior, and results (**Appendix 4**). He also provides several guidelines in his study for performing effective evaluations at each level of evaluation (Kirkpatrick, 1994).

2. Brinkerhoff's six stage model

Brinkerhoff's model of evaluation is based on six stages: It is also based on several important tenets. The first of these is that the goal of training evaluation is to determine how training has impacted business results. The second tenet of the model is that evaluation is a cyclical process **(See Appendix 5)**. Evaluation results are constantly fed into the other stages of the training process. The last tenet is that both financial data and anecdotes about the success of training are rich sources of information to determine the impact of training (Brinkerhoff, 1987).

This model contains similar elements to Kirkpatrick's model. Brinkerhoff's third stage is much like Kirpatrick's first level, reaction. Also, levels 4 and 5 (i.e. evaluate learning and usage and learning effects) are like Kirkpatrick's learning and behavior levels, respectively. The final stage of the model evaluates the payoffs of the program. It seeks to determine the impact of training, if the identified training needs have been met, and whether it was worth it. Organizational audits, surveys, performance records, and cost-benefit comparisons are used to measure impact (Brinkerhoff, 1987). Less direct measures may include percentage loss of yield, product returns and productivity per person below target (Hendry, 1991).

3. Robinson and Robinson's training for impact model

Traditionally, training measures were based on the number of courses developed, courses offered in catalogues, and employees taking training programs. Evaluation relied primarily on the reaction of participants, using questionnaires (e.g. smile sheets) to evaluate a trainer's performance. However, the role of the training professional is now becoming consultative, whose focus expands to include performance management in addition to training (Robinson and Robinson, 1990).

Similar to the two previous models, Robinson and Robinson's Training for Impact model includes the collection of data at the reaction, learning, behavior, and operational levels **(See Appendix 6)**. What differs, however, is the importance of identifying a business need and

potential clients, forming a collaborative relationship with clients, and reporting to clients (Robinson and Robinson, 1990).

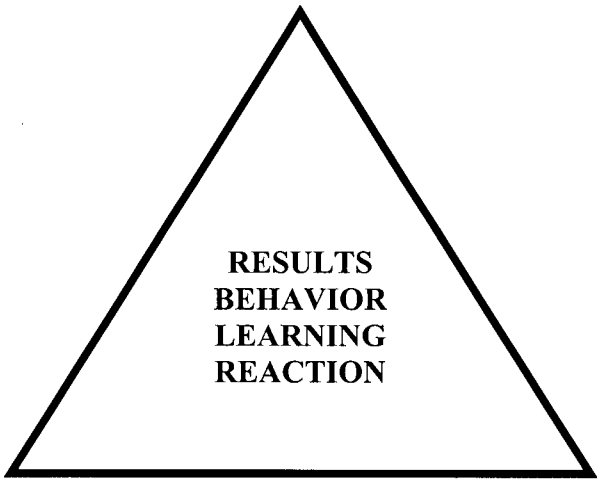
4. Phillips' Level 5 Return on Investment (ROI) Model

Phillips' Level 5 ROI Model is an expansion of the models presented thus far. It is an evaluation method that compares the costs of a program to its benefits. Prior to implementing a training program, ROI can be calculated much like a cost benefit analysis. In particular, benefits are calculated using estimates of what change in performance or business measures is anticipated (Phillips, 1995).

The evolution of the Kirkpatrick model in the early 1960's to the Robinson and Robinson model of the 1990's has demonstrated the trend toward a more collaborative method of identifying needs and establishing measures of business impact long before training occurs. What is important in any evaluation, though, is that the tools measure what they are intended to measure and that they are reliable. This next section briefly describes the importance of each and some of the challenges associated with the impact of training.

Appendix 4

THE FOUR LEVELS OF EVALUATION OF KIRKPATRICK'S MODEL



1. **Reaction**

   This level measures the participant's opinions and attitudes towards content, process, instructor and value of the training experience. Information is often obtained by a questionnaire.

2. **Learning**

   This level measures how much a participant has learned in the program. Examples of learning evaluations include written tests and skills test or employees job performance measures before and after training.

3. **Behavior**

   This level assesses the degree to which behaviours have actually changed as a result of a training program. It is typically measured 3 to 6 months after training to see if transfer of learning has occurred. Examples include surveying past participants or 360-degree assessments.

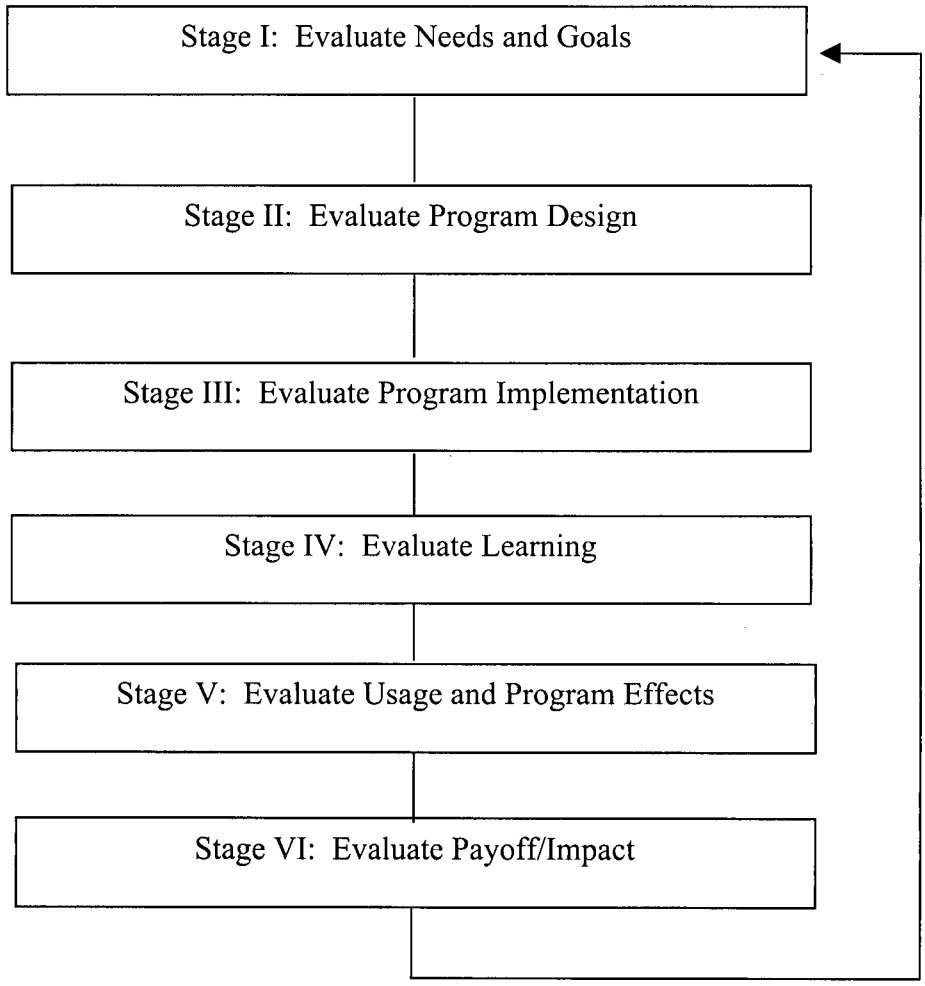
4. **Results**

   This level of evaluation measures the change in organizational indicators, such as productivity and safety measures, as a result of training. The ability to obtain clear evidence of the training impact, however, is difficult.

Source: Kirkpatrick, 1959, 1960, 1994

Appendix 5

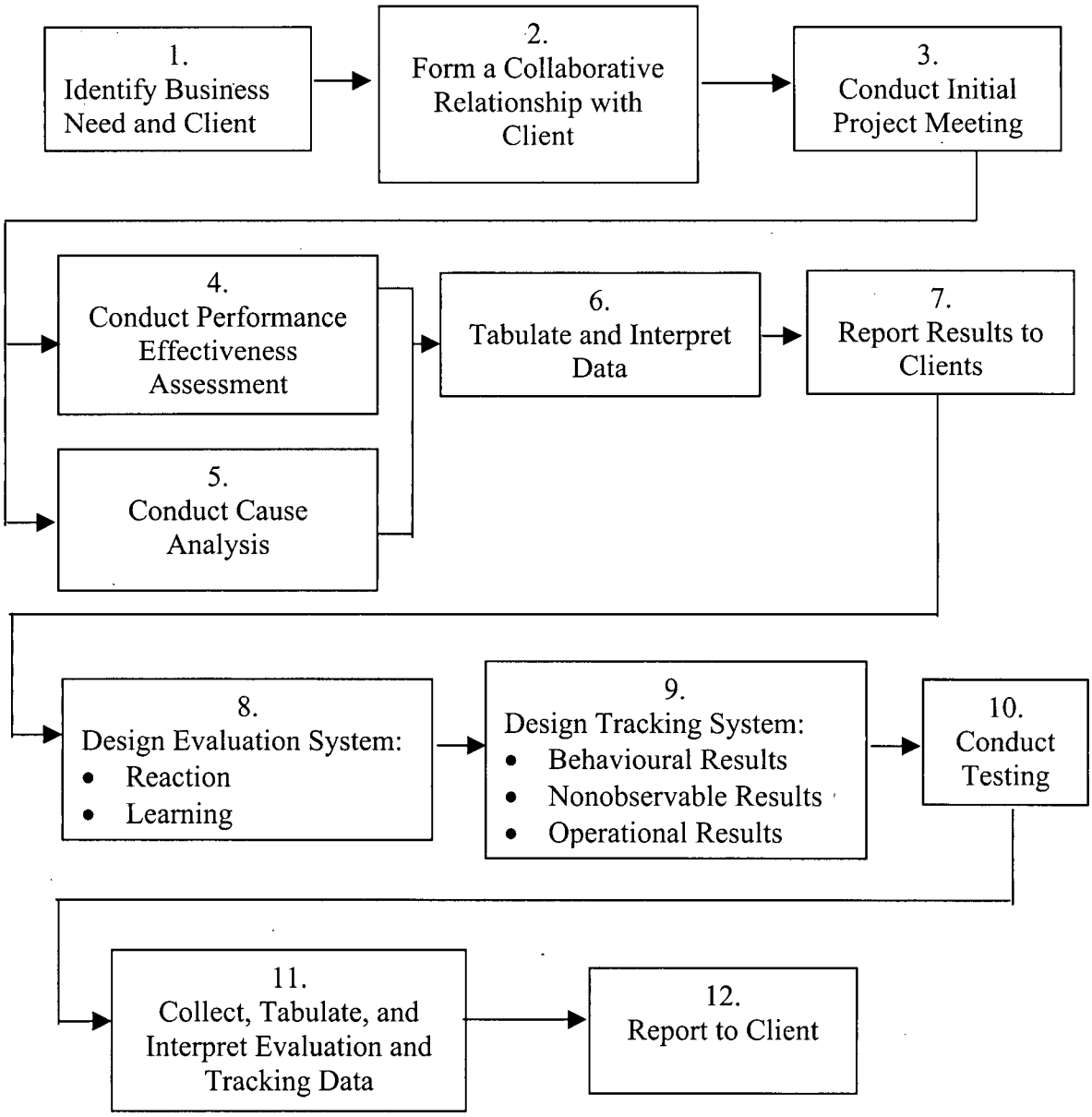
BRINKERHOFF'S (1987) SIX-STAGE MODEL OF EVALUATION



Source: Brinkerhoff, 1987

Appendix 6

ROBINSON AND ROBINSON'S TRAINING FOR IMPACT MODEL



Source: Robinson and Robinson, 1990

Appendix 7

CRITICAL TRAINING AND DEVELOPMENT CHALLENGES FOR MAJOR EMPLOYEE GROUPS (in rank order)

Executive
1. Leadership
2. Strategic Planning
3. Managing Change

Management
1. Leadership
2. Managing change
3. Management and supervisory skills

Professional and Technical
1. Technical knowledge and skills
2. Interpersonal skills
3. Quality and customer service

Sales and Marketing
1. Sales and negotiating skills
2. Quality and customer service
3. Technical knowledge and skills

Clerical and Office
1. Technical skills
2. Quality and customer service
3. Teamwork and teambuilding

Production
1. Technical skills
2. Quality and continuous improvement
3. Teamwork and teambuilding

Service
1. Quality and customer service
2. Technical skills
3. Quality and continuous improvement

Trades
1. Technical skills
2. Trades upgrade
3. Quality and continuous improvement

Source: The Conference Board of Canada, 1994

Appendix 8

GLOSSARY OF TERMS USED IN SURVEY

Basic skills	The simplest level of skills that are required by most employees in an organization. These may include mathematics and literacy skills.
Computer-based training	Courses that are designed on the computer or Internet where the learner follows a series of carefully planned steps or a series of instructions to learn a specific skill or task. It can be either self-directed or in a classroom setting.
Computer skills	These skills include the use of software and hardware applications, including programming, computer-controlled machine operation programs, operating systems, etc.
Conferences	A meeting which is organized on a particular subject or problem where learners are expected to discuss the issues and reach a conclusion. Usually a leader provides guidance and feedback. These conferences usually last a few days and may have a series of workshops and seminars or trade fairs.
Cross-training	Cross-training is usually done when one employee relieves another during daily breaks, holidays, sick days, etc. or when fast-track managers are groomed for general management positions.
Employee turnover	A measure of the number of employees leaving a company within a given period, usually done on a monthly or annual basis.
Employee performance measures	Evaluations of an employee's work performance against some pre-established goals and objectives. Training may be done if employees do not meet their targets because they lack the required skills and/or knowledge.
Internal re-employment/ retraining strategies	Employees who return to work after a period of lay-off or disability are trained in new skills and placed in positions that are different from what they were previously doing.
Labour (*for corporate survey*)	This definition is for question number 24. It includes all labourers and office/clerical employees.
Lecture series	A speech or planned talk(s) on a chosen subject, usually for the purpose of instructing others. These lecture series are often delivered by video.
Management employees (*for corporate survey*)	This is for question number 24. It includes all managers, supervisory line workers (e.g. lead hand, foreperson) and professional staff (e.g. marketing, accounting, etc.).
Mentoring programs	Employees are matched with a person who has significantly more experience and knowledge than their own. It may include transferring high potential employees through a variety of positions and locations in order to ensure broad exposure to a variety of responsibilities.

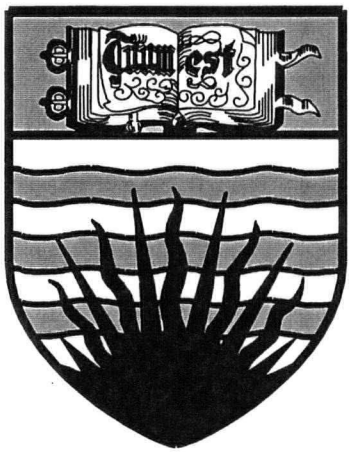
GLOSSARY CONTINUED:

On-the-job training opportunities	Employees are given opportunities to practice their newly acquired skills in the real work situation, where an experienced worker (e.g. work site trainer assessor) or the supervisor demonstrates the job. These may be done formally as in apprenticeship programs or informally.
Performance competencies	These are career development and personal skills such as leadership, time management, supervisory, and interpersonal skills.
Productivity reports	A measure of the company's total output production divided by the number of employees.
Return on investment	A measure of the company's net income divided by shareholder's equity.
Scientific employees (*for site survey*)	Includes lab technicians, research and development, quality control, etc.
Self-directed or self-paced training	Training that is completed on the employee's own initiative. Common forms of self-directed learning include correspondence courses, computer based training and reading through manuals.
Seminars/workshops	A class in which a trainer or facilitator and a small group of students discuss a specific topic. These are usually short in duration, usually a few hours to a few days in duration.
Skilled Labour (*for corporate survey*)	This is for question number 24. It includes skilled line workers and trades.
Technical competencies	These are job-specific skills such as machine operations, wood science, inventory management, etc.
Technical employees (*for corporate survey*)	This is for question number 24. It includes employees from the engineering, computer, and scientific disciplines.
Trades employees	These employees include qualified electrical and mechanical maintenance staff (e.g. fitters and turners, electricians). This category may also include unqualified but skilled line workers such as saw doctors, machinists, general maintenance, etc.
Training	A planned, systematic effort by the company to gain job-related behavior, knowledge, skills, motivation, and attitudes by employees in order to improve their performance and goal achievement.
Training for teamwork	A type of training where employees from different disciplines get together to learn new skills for the purpose of completing a project. This includes cross-functional work teams and multi-skilling.
Transferable skills	These are broad, non-job-specific skills that can apply to any occupation within the company. These may include: communications skills, organizational skills, teamwork, etc.
Workplace training	These skills include health and safety, quality control, employee orientation programs, etc.

Appendix 9

Corporate Survey

TRAINING IN THE SOLID WOOD MANUFACTURING INDUSTRY – CORPORATE SURVEY



Department of Wood Science
University of British Columbia

Training in the Solid Wood Manufacturing Industry – A Survey

We would like to start by asking you some general questions about your company. Please restrict your answers to only sawmills in the solid wood manufacturing industry. This would exclude pulp, paper and packaging. ***NOTE**: Financial data will be used in aggregate form only— no company specific information will be released.*

I. COMPANY INFORMATION

1. Please indicate your company's total **production** in 1998.

   _____ MMBF (millions of board feet) of lumber per year

2. Please indicate your company's total **sales revenue** (including all locations) in 1998. (*Remember, all questions are regarding **lumber products** only. Please check (✓) the appropriate category.*)

   _____ less than $10 million
   _____ between $10 million and $100 million
   _____ between $100.1 million and $250 million
   _____ between $250.1 million and $500 million
   _____ between $500.1 million and $750 million
   _____ between $750.1 million and $1 billion
   _____ over $1 billion

3. What proportion of your company's total products are: (T*otal should add up to 100%*)

   _____% Construction and commodity wood products (e.g. construction lumber, studs, etc.)
   _____% Specialty wood products (e.g. machine stress rated (MSR), custom cuts, metric cuts, etc.)
   _____% Other (please specify) _____
   100%

4. How many full–time equivalent sawmill **employees** does your company have?

   _____ # employees

The following section focuses on training policy and budget.

II. TRAINING

A) POLICY

5. Does your company have a: **formal training policy?** ❑ yes ❑ no
   distinct training department? ❑ yes ❑ no

6. If YES, what is your **corporate mission or strategic objective** for training? (*Please attach a copy of your training policy if available.*)

V. YOUR INFORMATION

If you would like to receive a free copy of the survey results, please fill in your contact information:

Company Name: _____

Contact Name: _____

Address: _____

City: _____ Province _____

Phone: _____ Fax: _____

E-mail: _____

THANK YOU FOR YOUR TIME AND CO-OPERATION IN COMPLETING THIS SURVEY. YOUR PARTICIPATION IS GREATLY APPRECIATED.

24. Please indicate the **TWO** employee groups you expect to receive the most training in the next two years. (*Please check (✓) the appropriate boxes below.*)

❑ Management ❑ Technical ❑ Skilled Labour ❑ Labour

25. How aware are you of your competitor's training programs? *(Please circle a number between 1 & 5.)*

Very aware 1 2 3 4 5 **Not at all aware**

26. Do you have any additional comments on training issues? (*Please attach a separate sheet if you need more space.*)

IV. SUMMARY

27. Please state your level of agreement with the following statements as they pertain to your training decisions: (For each statement, please circle a number between 1 and 5 indicating your level of agreement where 1 = strongly agree and 5 = strongly disagree).

Training is an investment.	1	2	3	4	5
Employees are rewarded for training.	1	2	3	4	5
Employees participate in the development of new training programs.	1	2	3	4	5
Employees are encouraged to develop new knowledge.	1	2	3	4	5
Specific training is being replaced by more general training.	1	2	3	4	5
When hiring, what they know is more important than their ability to learn.	1	2	3	4	5
Employees have on-the-job opportunities to use their new skills.	1	2	3	4	5

7. How do you measure the **impact of training**? (*Please check all that apply.*)

❑ Customer complaints ❑ Employee turnover ❑ Employee performance measures
❑ Productivity reports ❑ Quality standards ❑ Return on investment
❑ Measured by corporate office ❑ Impact of training is not measured

❑ Other (specify) _____

8. Please rank the **THREE** most widely used **methods of training delivery** at your company *(where 1 = most common method of delivery).*

_____ Seminars/workshops
_____ Mentor program
_____ Self-directed training
_____ On-the-job training
_____ Apprenticeships
_____ Lecture series conducted by video
_____ At an educational or training institution
_____ Conferences
_____ Computer-based training

_____ Other (please specify) _____

9. Please rank the **THREE** most widely used **trainers** at your company (*where 1 = most widely used trainer*).

_____ Trainers from government
_____ Trainers from educational institutions
_____ Trainers from other forestry companies
_____ Trainers from within the company
_____ Mentors
_____ Direct supervisor
_____ Training consultants

_____ Other (specify) _____

10. Where are **training decisions** made in your company? (*Please check (✓) only one box below.*)

❑ All at the corporate level
❑ Mostly corporate but some site involvement
❑ Equally between corporate and site
❑ Mostly site but some corporate involvement
❑ All at the site level

11. What **degree of influence** does your **corporate office** have on the following training decisions: (*Please circle the appropriate numbers below.*)

	Site makes all decisions	Site makes most decisions	Site and corporate have equal input	Corporate makes most decisions	Corp. makes all decisions
Training budget	1	2	3	4	5
Decision to do training	1	2	3	4	5
Delivery mode	1	2	3	4	5
Training content	1	2	3	4	5
Who will deliver training	1	2	3	4	5
Who will be trained	1	2	3	4	5
Training program evaluation	1	2	3	4	5

12. Please indicate how far in advance you usually **evaluate** the skills that you need: *(Please check (✓) one box.)*

- ❑ Less than 6 months
- ❑ 6 months but less than 1 year
- ❑ 1 year but less than 2 years
- ❑ 2 years but less than 3 years
- ❑ 3 years but less than 5 years
- ❑ 5 years and over

13. In the past five years, what are some factors that have **limited the success** of your training? *(Please attach a separate sheet if you require more space).*

14. What do you see as being the next steps to **improve training** in your company? *(Please attach a separate sheet if you require more space).*

B) BUDGET

*** Note that overall training budget should include health and safety training.*

15a. Does your company have a separate **training budget?** ❑ yes ❑ no

b. If YES, please indicate your **corporate training budget**** in:

1998 $_____ 2000 $_____

1999 $_____ 2001 $_____

Average for 1990's $_____

16. What percentage of **total sales** was devoted to employee training in **1998?** _____%

17. On average, what percentage of the **operating budget** would you expect a sawmill to spend on training? _____%

18. In terms of the total **company's training budget,** what percentage is spent in each of the following? *(Total should add up to 100%)*

_____% Management _____% Technical _____% Skilled Labour _____% Labour

19. What proportion of your company's training budget is committed to the following? *(Total should add up to 100%)*

_____% Basic skills (e.g. mathematics and literacy skills)
_____% Computer skills (e.g. software and hardware applications)
_____% Workplace training (e.g. health and safety, quality control, employee orientation)
_____% Performance competencies (e.g. leadership, time management, supervisory, interpersonal)
_____% Technical competencies (e.g. job-specific skills such as machine operations, wood science, inventory management, etc.)
_____% Other (specify) _____
_____% _____
100%

20. Please rank the **THREE** most important objectives for training *(where 1 = most important).*

_____ Improve work performance
_____ Attract and retain qualified employees
_____ Increase employee morale
_____ Keep abreast of new technologies
_____ Improve productivity
_____ Improve quality of products/services
_____ Improve safety
_____ Increase market access
_____ Other (specify) _____

The next section will help us evaluate the skills required in the solid wood industry.

III. SKILLS REQUIREMENTS

21a. Please rank the **THREE** most widely used methods your company uses to **identify training needs** *(where 1 = most frequently used).*

Information collected from employees _____
Information collected from supervisors/site managers _____
An advisory committee made up of managers and workers _____
Direct feedback from customers/clients _____
Consultant reports _____
Other (specify) _____ _____

b. Is information collected in an informal or formal manner? (please check *(✓)* only one.)

❑ Formal ❑ Informal

22. What percentage of your supervisors at the site level belongs to the following categories? *(Total should add up to 100%)*

_____% Management _____% Technical _____% Skilled Labour _____% Labour

23. For each group below, please check *(✓)* the **THREE** most important skills** your company requires to succeed in the future. *(For example, management may need priority training in giving performance reviews, coaching and supervising. Management may also need training on new computerized machinery where knowledge in software applications is required. Finally, management will be leading a new safety program in the future. See example below.)*

	Basic Skills	Computer Skills	Workplace Training	Technical Competencies	Performance Competencies
Example: Supervisory Line Worker		✓	✓		✓
Management					
Technical					
Trades (e.g. millwrights, pipefitters, electricians)					
Skilled Line Workers (e.g. machinists)					
Labourers					
Office/Clerical					

**For an explanation of skills, please see GLOSSARY.

Appendix 10

Site Survey

V. YOUR INFORMATION

If you would like to receive a free copy of the survey results, please fill in your contact information:

Company Name: _____

Contact Name: _____

Address: _____

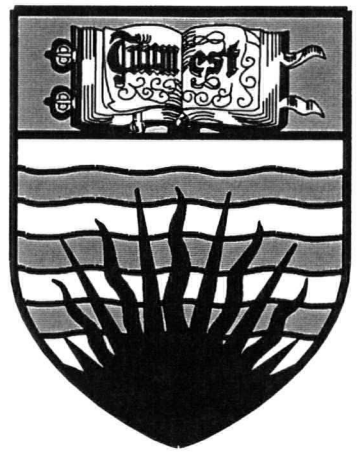
City: _____ Province _____

Phone: _____ Fax: _____

E-mail: _____

THANK YOU FOR YOUR TIME AND CO-OPERATION IN COMPLETING THIS SURVEY. YOUR PARTICIPATION IS GREATLY APPRECIATED.

TRAINING IN THE SOLID WOOD MANUFACTURING INDUSTRY – SITE SURVEY



Department of Wood Science
University of British Columbia

Training in the Solid Wood Manufacturing Industry – A Survey

We would like to start by asking you some general questions about your company. Please restrict your answers to only sawmills in the solid wood manufacturing industry. This would exclude pulp, paper and packaging. *NOTE: Financial data will be used in aggregate form only— no company specific information will be released.*

I. SITE INFORMATION

1. Please indicate your site's total **production** in 1998.

_____ MMBF (millions of board feet) of lumber per year

2. Please indicate your site's total **sales revenue** in 1998. (*Remember, all questions are regarding **lumber products** only. Please check (✓) the appropriate category below.*)

_____ less than $250,000
_____ between $250,000 and $500,000
_____ between $500,001 and $1,000,000
_____ between $1,000,001 and $10,000,000
_____ between $10,000,001 and $100,000,000
_____ over $100,000,001

3. What proportion of your site's total **products** are: (*Total should add up to 100%*)

_____% Construction and commodity wood products (e.g. construction lumber, studs, etc.)
_____% Specialty wood products (e.g. machine stress rated (MSR), custom cuts, metric cuts, etc.)
_____% Other (please specify) _____
100%

4a. How many **employees** does your sawmill site have? _____ # employees

b. Of that number in 4(a), what percentage of employees are: *(Total should add up to 100%)*

_____ % full-time _____ % part-time

c. Of that number in 4(a), what percentage of employees are: *(Total should add up to 100%)*

_____ % temporary _____ % permanent
_____ % other (specify) _____

d. Of that number in 4(a), what percentage of employees are: *(total should add up to 100%)*

_____ % in-house unionized _____ % in-house non-unionized _____ % contract

5. Please indicate the average proportion of employees at your site: (*Total should add up to 100%*)

Managerial/Professional	_____%
Engineering/Computer/Scientific	_____%
Trades (e.g. millwrights, pipefitters, electricians)	_____%
Supervisory Line Workers (e.g. lead hand, foreperson)	_____%
Skilled Line Workers (e.g. head sawyers, machinists, maintenance)	_____%
Labourers	_____%
Office/Clerical	_____%
TOTAL	**100%**

**For an explanation of skills, please see GLOSSARY.

25. Please indicate the **TWO** employee groups that received the most training in 1998. Which **TWO** groups will receive the most training in the next five years? (*Please check (✓) the appropriate boxes below.*)

	1998	1999 to 2004
Management/Professional		
Engineering/Computer/Scientific		
Trades		
Supervisory Line Workers		
Skilled Line Workers		
Labourers		
Office/Clerical		

26. Do you have any additional comments on training issues? (*Please attach a separate sheet if you require more space.*)

IV. SUMMARY

27. Please state your level of agreement with the following statements as they pertain to your training decisions: (For each statement, please circle a number between 1 and 5 indicating your level of agreement where 1 = strongly agree and 5 = strongly disagree).

Training is an investment.	1	2	3	4	5
Employees are rewarded for training.	1	2	3	4	5
Employees participate in the development of new training programs.	1	2	3	4	5
Employees are encouraged to develop new knowledge.	1	2	3	4	5
Specific training is being replaced by more general training.	1	2	3	4	5
When hiring, what they know is more important than their ability to learn.	1	2	3	4	5
Employees have on-the-job opportunities to use their new skills.	1	2	3	4	5

FOR A FREE COPY OF SURVEY RESULTS, SEE BACK.

21. Please rank the **THREE** most important objectives for training (*where 1 = most important*).

_____ Improve work performance
_____ Attract and retain qualified employees
_____ Increase employee morale
_____ Keep abreast of new technologies
_____ Improve productivity
_____ Improve quality of products/services
_____ Improve safety
_____ Increase market access
_____ Other (specify) _____

The next section will help us evaluate the skills required in the solid wood industry.

III. SKILLS REQUIREMENTS

22a. Please rank the **THREE** most widely used methods your company uses to **identify training needs** (*where 1 = most frequently used*).

Information collected from employees _____
Information collected from supervisors/site managers _____
An advisory committee made up of managers and workers _____
Direct feedback from customers/clients _____
Consultant reports _____
Other (specify)_____ _____

b. Is information collected in an informal or formal manner? (please check (✓) only one.)

❑ Formal ❑ Informal

23. What percentage of your supervisors at the site level belong to each of the following categories? (*Total should add up to 100%*)

_____% Management _____% Technical _____% Skilled Labour _____% Labour

24. What training is currently being implemented for each employee group below? Please check (✓) **TWO** skills each group is most widely trained in. (*For example, your foreperson may be trained in giving reviews, coaching and supervising. The foreperson may also be trained in new computerized machinery where knowledge in software applications is required. See example below.*)

	Basic Skills	Computer Skills	Workplace Training	Technical Competencies	Performance Competencies
Example: Supervisory Line Worker		✓			✓
Management/Professional					
Engineering/Computer/ Scientific					
Trades (e.g. millwrights, pipefitters, electricians)					
Supervisory Line Workers (e.g. lead hand, foreperson)					
Skilled Line Workers (e.g. head sawyers, machinists)					
Labourers					
Office/Clerical					

The following section focuses on training policy and budget.

II. TRAINING

A) POLICY

6a. Does any training at your site follow **corporate directives**? ❑ yes ❑ no

b. If YES, what proportion of courses implemented at the site follow corporate directive? (*Expressed as a % of total number courses offered at the site.*) _____%

c. Are the number of these courses expected to _____ in the next two years? (*Please check (✓) one box.*) ❑ increase ❑ decrease ❑ stay the same

7. Please indicate how far in advance you usually **plan** your **training programs**: (*Please check (✓) one box.*)

❑ Less than 6 months
❑ 6 months but less than 1 year
❑ 1 year but less than 2 years
❑ 2 years but less than 3 years
❑ 3 years but less than 5 years
❑ 5 years and over

8. How do you measure the **impact of training**? (*Please check (✓) all that apply.*)

❑ Customer complaints ❑ Employee turnover ❑ Employee performance measures
❑ Productivity reports ❑ Quality standards ❑ Return on investment
❑ Measured by corporate office ❑ Impact of training is not measured
❑ Other (specify) _____

9. Please rank the **THREE** most widely used **methods of training delivery** at your site (*where 1 = most common method of delivery*).

_____ Seminars/workshops
_____ Mentor program
_____ Self-directed training
_____ On-the-job training
_____ Apprenticeships
_____ Lecture series conducted by video
_____ At an educational or training institution
_____ Conferences
_____ Computer-based training
_____ Other (please specify) _____

10. Please rank the **THREE** most widely used **trainers** at your site (*where 1 = most widely used trainer*).

_____ Trainers from government
_____ Trainers from educational institutions
_____ Trainers from other forestry companies
_____ Trainers from within the company
_____ Mentors
_____ Direct supervisor
_____ Training consultants
_____ Other (specify) _____

11. Where are **training decisions** made at your site? *(Please check (✓) one box.)*

- ☐ All at the corporate level
- ☐ Mostly corporate but some site involvement
- ☐ Equally between corporate and site
- ☐ Mostly site but some corporate involvement
- ☐ All at the site level

12. What **degree of influence** does your site have on the following training decisions: *(Please circle the appropriate numbers below.)*

	Site makes all decisions	Site makes most decisions	Site and corporate have equal input	Corporate makes most decisions	Corp. makes all decisions
Training budget	1	2	3	4	5
Decision to do training	1	2	3	4	5
Delivery mode	1	2	3	4	5
Training content	1	2	3	4	5
Who will deliver training	1	2	3	4	5
Who will be trained	1	2	3	4	5
Training program evaluation	1	2	3	4	5

13. Please rank the **THREE** most important factors that limit your ability to provide training (*where 1 = most important factor*).

Lack of financial resources	_____
Lack of physical resources (e.g. space, qualified trainers, etc.)	_____
Conflict of corporate training goals with site requirements/objectives	_____
Time constraints (e.g. personnel have no time for training)	_____
Low employee morale, motivation, and confidence	_____
Lack of corporate direction for training	_____
Union/employee activities that do not support training	_____
Other (specify) _____	_____
_____	_____

☐ There are no limiting factors

14. Does your site use any of the following: *(Please check YES or NO for each item.)*

	YES	NO
Cross training		
Computer-based training		
Self-directed learning		
On-the-job training opportunities (e.g. apprenticeships)		
Formal mentoring programs		
Internal reemployment/retraining strategies		
Training for teamwork (e.g. cross-functional work teams)		
Course development with customers, suppliers, unions and vendors		
Courses that encourage transferable skills		

15. Overall, did site operations improve in the last three years as a result of training? *(Please circle a number between 1 & 5.)*

Improved dramatically 1 2 3 4 5 **Did not improve at all**

16. What do you see as being the next steps to **improve training** in your company? (*Please attach a separate sheet if you require more space.*)

_____

_____

_____

_____

_____

B) BUDGET

** *Note that overall training budget should include health and safety training.*

17a. What proportion of **allocated training funds** do you receive from each of the following? *(Total should add up to 100%)*

_____%	Sawmill site
_____%	Corporate office
_____%	Employee contribution
_____%	Union contribution
_____%	Federal/provincial government
_____%	Other (please specify) _____
100%	

b. If any training funds are received from corporate office, please indicate the degree of influence your site has on how these funds are spent. *(Please check (✓) one box.)*

- ☐ Site makes all decisions
- ☐ Site makes most decisions
- ☐ Site and corporate have equal input
- ☐ Corporate makes most decisions
- ☐ Corporate makes all decisions
- ☐ Site does not receive funds from corporate office

18. How much did your site spend on training in:

1998	$ _____
1999	$ _____
Average for 1990's	$ _____

19. What percentage of your **operating budget** was devoted to training your employees **1998**? _____%

20. In terms of your site's total training budget, what percentage is spent on each of the following? *(total should add up to 100%)*

➢ Managerial/Professional	_____%
➢ Engineering/Computer/Scientific	_____%
➢ Trades (e.g. millwrights, pipefitters, electricians)	_____%
➢ Supervisory Line Workers (e.g. lead hand, foreperson)	_____%
➢ Skilled Line Workers (e.g. head sawyers, machinists, maintenance)	_____%
➢ Labourers	_____%
➢ Office/Clerical	_____%
TOTAL	**100%**

Appendix 11

Survey Cover Letters