

**"An Analysis of the Relationship Between Employee Cross Training  
and Base Pay in a Merit-Pay Environment"**

**By**

**Thomas G. Huffcutt**

**A Research Paper**

**Submitted in Partial Fulfillment of the  
Requirements for the  
Master of Science Degree in  
Training and Development**

**Approved for the Completion of 4 Semester Credits  
TRHRD-735 Field Problem in Training and Development**

---

**Dr. Joseph A. Benkowski**

**Research Advisor**

**The Graduate School  
University of Wisconsin-Stout  
July, 2002**

The Graduate School  
University of Wisconsin-Stout  
Menomonie, WI 54751

**ABSTRACT**

**Huffcutt, Thomas G.**

**(Writer)**

**" An Analysis of the Relationship Between Employee Cross Training  
and Base Pay in a Merit-Pay Environment"**

**(Title)**

**Training and Development  
(Graduate Major)**

**Dr. Joseph A. Benkowski  
(Research Advisor)**

**July/2002**

**(Month/Year)**

**31**

**(No. of Pages)**

**American Psychological Association (APA) Publication Manual  
(Name of Style Manual Used in this Study)**

The researcher is employed at a large manufacturing facility in the Midwest. This organization is subject to typical market forces – sometimes business is good, sometimes not. Because demand can fluctuate, the organization prefers to have a flexible, adaptable workforce. Therefore, employee cross training is viewed as a desirable goal. However, in a busy production environment, supervisors frequently see cross training as a luxury they cannot afford. They feel pressure to assign

employees to the machines and processes they are best at, in order to meet production schedules. In this environment, employees often have to insist that they become cross trained, and not very many take this initiative.

This organization also believes in "merit pay." That is, individual pay increases are indexed to employee performance, rather than tenure with the company. Therefore, the more productive an employee is, the higher their pay increases are. Although there is a very strong correlation between organizational tenure and pay, it is expected that over time the employees that are the most consistently productive would be paid higher than their peers with similar tenure.

If it's true that the more cross trained an employee is, the more effective they are to the organization, it would follow then that the more cross trained an employee is, the higher their base pay is. If it can be shown that cross training leads to higher pay in this specific manufacturing location, more employees at this organization may insist that they be cross trained, which is ultimately good for the organization. It might also be possible to generalize these results to other organizations.

## TABLE OF CONTENTS

Abstract-----	ii
Table of Contents-----	iv
List of Tables-----	vi
 CHAPTER ONE – INTRODUCTION	
Statement of Problem-----	1
Limitations-----	2
Assumptions-----	3
Definition of Terms-----	4
Summary-----	5
 CHAPTER TWO – REVIEW OF LITERATURE	
Overview-----	6
Cross Training--The Organization's Perspective-----	6
Cross Training--The Employee's Perspective-----	9
Implications for Research Project-----	11
 CHAPTER THREE – METHODOLOGY	
Research Design-----	13
Data Collection-----	14
Data Analysis-----	15
Summary-----	15
 CHAPTER FOUR – RESEARCH RESULTS	
Overall Findings-----	16

Effects of Demographics-----	18
Gender-----	19
Age-----	20
Tenure-----	23
Overall Conclusion-----	25
CHAPTER FIVE – DISCUSSION AND RECOMMENDATIONS	
Explanation of Findings and Ideas for Further Research-----	26
Alternative Ideas for Promoting Cross Training-----	27
REFERENCES-----	29

## LIST OF TABLES

Table 1 Overall Results-----	17
Table 2 Effect of Gender-----	20
Table 3 Effect of Age-----	22
Table 4 Effect of Tenure-----	24

## **CHAPTER ONE**

### **INTRODUCTION**

#### **Statement of Problem**

The researcher is employed at a manufacturing company in the Midwest that employs roughly 1000 people, 750 of whom are involved in the actual manufacture of the product. This organization is subject to typical market forces – sometimes business is good, sometimes not. Because demand can fluctuate, the organization prefers to have a flexible, adaptable workforce. Therefore, employee cross training is viewed as a desirable goal. However, in a busy production environment, supervisors frequently see cross training as a luxury they cannot afford. They feel pressure to assign employees to the machines and processes they are best at, in order to meet production schedules. In this environment, employees often have to insist that they become cross trained, and not very many take this initiative.

This organization also believes in "merit pay." That is, individual pay increases are indexed to employee performance, rather than tenure with the company. Therefore, the more productive an employee is, the higher their pay increases are. Although there is a very strong correlation between organizational tenure and pay, it is expected that over time the employees that are the most consistently productive would be paid higher than their peers with similar tenure.

If it is true that the more cross trained an employee is, the more effective they are to the organization, it would follow then that the more cross trained an employee is, the higher their base pay is. If it can be shown that cross training leads to higher pay in this specific manufacturing location, more employees at this organization may insist that they be cross trained, which is ultimately good for the organization. It might also be possible to generalize these results to other organizations.

To learn if cross training does in fact lead to higher base pay, the researcher will perform a static group comparison as described by Leedy & Ormrod, 2001(p. 240). The study includes data that shows the level of cross training in select employee groups, plus base pay data and average tenure data for the same group. The researcher believes that if it can be shown that the former has a positive effect on pay (after adjusting for tenure), it may be easier to persuade individual employees to take the initiative to seek cross training, to the ultimate benefit of the organization.

### **Limitations**

This study is limited to the manufacturing organization described earlier. In addition, it will focus on production employees only. It may also be true that the relationship between cross training and base pay would apply to non-factory workers as well. However, customer quality requirements dictate that the training of factory employees be extensively documented. Therefore, it's easier to quantify the level of training in this

employee group. Finally, this study will be limited to a specific point in time, the first fiscal half of calendar 2002.

### **Assumptions**

The study includes a number of key assumptions. The first is the most fundamental -- it is assumed that a greater level of cross training does in fact lead to higher individual performance. Similarly, it is assumed that individual employees perform at different levels -- they're not all the same. The third main assumption is that training is equally effective across different production departments. Poor quality training could result in poor employee performance, even if the individual has been extensively cross trained. The fourth assumption is that supervisors differentiate between individuals when determining the size of individual pay increases. If a supervisor gives the same increase to all employees regardless of performance, then there will be no differences in base pay rates between employees. Next, it is assumed that each individual has entered the organization with the same base skill level, and at the same starting wage level. If an individual were to enter the organization with a great deal of skill acquired elsewhere, or if individuals were hired at different wage rates, results would be skewed. Another key assumption is that tenure with the organization also has a positive effect on pay. Pay increases are normally delivered annually, and nearly every employee receives at least a modest pay increase each year. That means a marginal tenured employee could be paid more than a new employee who's an excellent

worker. This tenure effect must therefore be considered in the study. A final assumption is that cross training opportunities are uniformly available to everyone in the study group. That is, each individual production department in the study offers the same cross training opportunities to its workers.

### **Definition of Terms**

There are a number of key technical terms that appear throughout this paper. They are defined below.

**Merit Pay:** The amount of an individual's annual pay increase is indexed to their individual performance (Milkovich & Newman, 1984).

**Trained:** Have received instruction in performing a specific process, and has demonstrated competency in controlled conditions (Milkovich & Newman, 1984).

**Cross Trained:** Trained in more than one process in a specific department (Campbell, 1999).

**Pay:** Base hourly wage rate (Hays, 1999).

**Pay for Skills:** Individuals receive extra pay for each specific skill that is acquired (Wiscombe, 2001).

**Tenure:** Time (in years) that an individual has worked at the study organization (Milkovich & Newman, 1984).

**Department:** The specific production department the employee works in (Milkovich & Newman, 1984).

**Turnover:** An employee resigns their employment and leaves the company (Milkovich & Newman, 1984).

### **Summary**

As stated at the outset of this paper, it is generally believed in the research organization that employees who are cross trained tend to be more flexible and valuable to the organization. But in a busy production environment, supervisors frequently see cross training as a luxury they can't afford. Employees often have to insist that they be cross trained, and not very many take this initiative. If it can be shown that cross training leads to higher pay, more employees may insist that they be cross trained, which is ultimately good for the organization.

## CHAPTER TWO

### REVIEW OF LITURATURE

#### Overview

In conducting a literature review on this topic, the researcher looked for previous work in several general areas – cross training, skills-based pay, workforce flexibility, pay-for-performance, and other similar topics. The researcher was interested in finding out the answers to several related questions, including: Is cross training in fact desirable? If so, for whom? – The employer? The employee? Both? Neither? If cross training is in fact desirable, what then are the costs? The results of this review are presented below.

#### **Cross Training--The Organization's Perspective**

There is plenty of popular business literature that advocates cross training. Organizational benefits that are listed include cost savings, reduced turnover, and increased productivity, quality, customer satisfaction and innovation (Benfari, Orth & Wilkenson, 1986; Pojidaeff, 1995). And there is a lot of empirical evidence that shows cross training does indeed pay off for organizations. In a study sponsored by the U.S. military (Baranski, McCann, Pigeau & Thompson, 2000), cross training was shown to be effective in situations where groups were expected to be "re-configured," i.e., when group members are lost and new ones need to be assimilated. In the military this might be a battlefield loss, but for a

civilian organization, cross training can help prevent the negative effects of normal employee turnover. If employees are cross trained, a team member that leaves the organization can be more easily replaced by a co-worker. However, this same study suggested that cross training does not necessarily lead to a great leap in performance over a non-cross trained group when group membership was static. The cross trained group tended to perform slightly better, but there was the additional cost of rotating and training its members on multiple tasks. Other studies report quantitative performance improvement as a result of cross training. One study cited such gains as a 77% reduction in manufacturing defects, output improvements of 30 – 40%, and yield improvements of around 20%, all as a result of a "multi-skilled" workforce (Dalton, 1998). Although this study did not appear to adequately control for other factors that may have affected these results, cross training did appear to be a major factor.

Additional organizational benefits are documented in the area of work teams. Although work teams involve a lot more than just cross trained members, cross training is a fundamental tenet of teams. Work teams have become a more popular organizational structure the past decade or so, and many organizational improvements have been credited to teams. For example, companies like Motorola, Ford, General Electric and 3M all attribute much of their recent success to work teams (Katzenbach & Smith, 1993). Teams (and by extension cross training) have had a positive effect on company innovation, responsiveness, quality

and profitability. However, not everyone is so enamored with teams. Peter Drucker, who was recognized as an early advocate of work teams, is now less enthused with the concept. In a recent interview, Drucker says that teams have not fulfilled their promise for a couple of reasons. First, he feels that organizations rarely exhibit teamwork at the top of the hierarchy. This attitude permeates the organization, and makes it harder for true teamwork to occur. Other studies support this view (Jolly & Recardo, 1997). Second, teams need very clear goals and expectations. Drucker feels that in the real world of organizations, teams rarely get the necessary guidance to perform to their potential (Verespej, 1998).

Despite Drucker's criticism of work teams, it does appear that cross training itself can be beneficial, at least from the organization's perspective. However, other studies point out the costs of cross training workers. One in particular described the high cost of learning and forgetting (Krajewski & McCreery, 1999; Bowman & Hottenstein, 1998). The study did not dispute the benefits of a cross trained workforce, but it did point out the high potential costs. For example, training workers in multiple tasks can reduce the number of task experts, thereby reducing the overall efficiency of the unit. In an industrial setting, it has been shown that if workers were cross trained on more than two or three skills, performance of the system began to suffer (Bowman & Hottenstein, 1998). There's also the high cost of forgetting – i.e., if a worker doesn't perform a task often enough to remember it, the task has to be re-learned each time,

again reducing overall efficiency. In an environment where tasks are relatively simple and where workers can be rotated frequently, the costs described above are minimized. But if these conditions do not exist, the costs of cross training for an organization may outweigh the benefits.

### **Cross Training--The Employee's Perspective**

It appears that cross training can be good for the organization, as long as certain conditions exist. But what about those actually being cross trained, the workers themselves? As it turns out, there is plenty of literature that advocates cross training from the employee's perspective. One study cited improved worker safety as a direct benefit of cross training (Dalton, 1998). Work team advocates also list worker benefits such as skill acquisition, which is rewarding in itself, but also has the benefit of making the employee more attractive to other potential employers (Jolly & Recardo, 1997). However, although hard to quantify, by far the most frequent benefit cited is simple job satisfaction. One paper described several organizations that are increasing their investment in employee development, thereby making jobs more meaningful, with the ultimate aim of trying to stem employee turnover (Cappelli, 2000). Other studies also note the "psychological" benefits of cross training to workers (Campell, 1999). However, despite the stated advantages to cross training from an employee's perspective, at least one study showed that rather than feeling "enriched," employees actually viewed attempts at cross-training as simply a scheme to get them to do more work (Jenner,

1998). In this environment, employees were highly suspicious of management motives, and thus were resistant to cross training. Another article cited a perceived unequal distribution of work as a drawback to cross training from an employee's perspective (Cramer, 1999).

One other area where cross training is described as potentially beneficial for employees is skills-based pay. As the name implies, skills-based pay is the idea of rewarding employees for achieving greater levels of competency around specific skills. In most examples of skills-based pay, competency levels are defined, along with the specific reward for achieving the competency. The idea of course is that by providing incentives for employees to achieve greater skills, they will in fact do so. The organization then enjoys greater performance as a result. But does it really work that way? The evidence is mixed (Franklin, 1999; Hollensbe, 2000).

One organization cited a return-on-equity improvement from 7% to 10.5% after implementing a pay-for-skills program (Wiscombe, 2001). However, detractors of such programs insist that they undermine teamwork, pitting co-workers against each other. Many examples were cited from organizations that abandoned such programs. In one organization managers argued over who would pay for a simple computer, because no one wanted it on their P&L's (i.e., Profit & Loss statements). In another example, a company's managers "begged" to discontinue a pay-for-performance program because craftsmen were stealing parts from

each other to make quota (Hays, 1999). Another study cited a phenomena called the "over-justification effect," which held that over time, people may actually perform a task less well and less frequently, simply because they're paid for it. In other words, a person who does something simply for enjoyment (say painting), may do it less well and less frequently, if it's something they must do for pay (Lea & Snelders, 1996).

### **Implications for Research Project**

Despite the contradictions of previous research, there seem to be several general conclusions that can be made:

- Cross training can benefit an organization under certain conditions.
- Cross training can also benefit employees.
- There are costs to cross training that must be considered before pursuing cross training as a strategy.
- A pay-for-skills program may be effective in certain organizations.

The organization the researcher is studying has fairly high employee turnover, and production tasks are relatively simple. Therefore, as research has shown, it seems likely that it would benefit from an extensively cross trained workforce. As stated earlier however, time constraints often mean that employees must insist on being cross trained, and not many do. The organization does not have a specific method of paying for skills. However, it does have "merit pay," which means that at

least in theory, the better overall performers get the highest pay increases. If it's true that the more cross trained an employee is, the more effective they are to the organization, it would follow then that the more cross trained an employee is, the higher their base pay is. If it can be shown that cross training leads to higher pay in this specific manufacturing location, more employees at this organization may insist that they be cross trained, benefiting the organization as well as themselves.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **Research Design**

This study focused on a manufacturing facility that employs roughly 1000 people. About 750 employees are in the manufacturing group, and about 500 of these employees actually produce the product. This is the population that was studied.

The research question to be answered is: Does more cross training lead to higher pay for individuals who work in a merit-based pay environment? And if so, does this relationship hold across different demographic slices of the population, such as gender, age and/or experience levels? To answer this question, the researcher used a static group comparison research design, as shown in Leedy & Ormrod, 2001. In this design, the treatment was cross training, and the observation was base pay rate. In addition, since individual pay rates are assumed to be very strongly correlated with tenure, the effect of tenure was controlled for to ensure the validity of the study,

To determine if cross training was uniform across different demographic groups, the data was segmented into separate groups for gender, age and tenure (race was originally considered, but 98.5% of the employees in the study group turned out to be Caucasian, so it was dropped). For each of these sub groups, the average pay rates of the

cross trained and non-cross trained groups were compared, and the effects of tenure considered.

For the purposes of this study, it was important to define the precise meaning of "cross trained." The organization being studied had eight different departments an employee could be assigned to. Within each department, there were multiple production processes or "jobs" that an employee could be trained on – individual departments had as few as nine processes and as many as seventeen. Once an employee is trained on a job they must demonstrate their competence in one of several ways, depending on the job. This could be a written test, or they could actually perform the task(s) for the benefit of a training technician. At any rate, once they've demonstrated competence, they are "certified." In this study, employees were considered to be cross trained if they were certified in at least 50% of the processes in their assigned department.

### **Data Collection**

Once the employees in the overall study population were assigned to their appropriate groups, the next step was to collect wage and demographic data. Each individual's base hourly pay is stored in the company's payroll system, from where it could be readily obtained. Demographic data was available from the company's Human Resources Information System, where it was also readily accessible.

### **Data Analysis**

Once cross-training and demographic data was obtained, it was a matter of analyzing the data to determine what relationship exists (if any) between cross training and pay, and if there were any other effects from demographic factors. To do this, the researcher compared the mean pay rates and tenure for each of the different study groups. If there was a wage rate gap between the cross trained group and non-cross trained group that was not accounted for by tenure, the researcher could conclude the difference was attributable to cross training.

### **Summary**

The research hypothesis is that there will be a positive relationship between level of cross training and base hourly pay. Further, this relationship would be expected to hold for different genders, and across different age and experience levels. The statistical analysis described above was used to help determine if this was in fact true.

## **CHAPTER FOUR**

### **RESEARCH RESULTS**

#### **Overall Findings**

The study group consisted of 463 production employees working in one of seven different departments. Each department consists of multiple processes or "jobs" that an employee may be asked to do. The total number of jobs in each department ranged from 9 to 17. In the study group, employees were trained in as few as one process, and as many as 16. For the purposes of this study, an employee was considered to be cross trained if they were trained in 50% or more of the jobs in their department.

Defining it this way, 154 employees (33%) turned out to be cross trained and 309 (67%) were not considered to be cross trained. The average hourly pay rates for the two groups turned out to be \$10.42 and 10.21 respectively, a difference of roughly 2%. Therefore, a quick look at the data suggests that there is in fact a premium paid for being cross trained. However, this initial glance at the data does not account for potential differences in tenure, which is a major driver of an employee's hourly pay rate. To better understand which employee groups tend to be more cross trained, and what effect cross training has on hourly pay, the researcher looked at the demographic composition of the study

population. Average tenure was also included for each segment of the study population.

The following table shows the data breakdown for the overall population:

Table 1

Effect of Cross Training on Pay (Overall)

N=463	<u>Cross Trained</u>	<u>Non-Cross Trained</u>
N	154	309
% Cross Trained	33.3%	
Average Pay	\$10.42	\$10.21
Cross Train Premium	2.06%	
Average Tenure (years)	5.93	5.30
Tenure Difference (years)	.63	
Tenure Effect	1.9 - 3.2%	

In this table, the "Cross Train Premium" is the percentage difference between the average pay of the cross trained group, and the non-cross trained group – in this case 2.06%. "Tenure Difference" is the difference in average tenure between the cross trained and non-cross trained groups, in years. "Tenure Effect" is the expected effect that tenure alone would have on the average pay rates of the study population. This is determined as follows: The study organization has had an average merit pay budget of 3 – 5% the past several years. That means that time

alone would cause overall payroll costs (and the average pay rate) to increase by 3 – 5% per year. The range in the table is calculated by taking the "Tenure Differential" by 3 – 5%. In this example, the tenure effect of 1.9 – 3.2% is arrived at by multiplying .63 by 3 – 5%.

The first observation that can be made is that, although the entire cross trained group makes a premium of about 2% over the non-cross trained group, they also average about 7 months more tenure with the organization. That means that seven months of tenure would equate to a little over half a full year's increase. As can be seen in the table, the expected "tenure effect" of seven months of service is 1.9 —3.2%, and 2% falls well within this range. Therefore, it is logical to conclude that the pay premium the cross trained group receives is not a result of cross training, and is simply a function of time on the job.

### **Effects of Demographics**

But what happens when the data is broken down further? Do certain groups (e.g., men) get cross trained at a higher rate at the expense of others? And if so, even though cross training seems to have no effect on pay from a macro perspective, are there sub groups (e.g., older employees) that do in fact make more money if they're cross trained? The following tables slice the data into finer segments, using gender, age and tenure with the company.

## Gender

Looking first at table 2 (following page), it's clear that women are cross trained at a higher rate than men (35.9% vs. 27.7%). But to what effect? In the case of men, average pay is actually less for the cross trained group. But as with the overall group, this seems to be explained by average tenure. Men who are cross trained also average about four months less seniority than their counterparts ( $.32 * 12$  months), which creates an expected tenure effect of negative 1.0 – 1.6%. Since the actual pay difference of -.39% falls above this range, cross training may actually have a positive effect. But the difference is so tiny ( a penny or two) as to be essentially meaningless. Women on the other hand, seem to receive a cross training premium of 3.5%. But this number falls within the range of the tenure effect (2.8– 4.6%), so the effect of cross training here is also minimal or non-existent.

Table 2

Effect of Cross Training on Pay (Gender)

<u>N=463 Trained</u>	<u>Cross Trained</u>		<u>Non-Cross</u>	
	Men	Women	Men	Women
N	41	113	107	202
% Cross Trained	27.7%	35.9%		
Average Pay	\$10.17	\$10.60	\$10.21	\$10.24
Cross Train Premium	(.39)%	3.5%		
Average Tenure (years)	4.56	6.48	4.88	5.56
Tenure Difference (years)	(.32)	.92		
Tenure Effect	(1.0-1.6)%	2.8-4.6%		

Note: Brackets ( ) denotes negative number.

**Age**

Looking at table 3 (page 22), about 36 - 37% of all production employees below the age of 50 are cross trained. However, after age 50 it drops off quite a bit (to 24.4%). So is this age discrimination, where older workers are denied cross training opportunities to the detriment of their pay? It appears not – although older cross trained workers enjoy a significant pay premium over their non-cross trained peers (9.4%), once again the entire premium can be attributed to tenure. The over 50 cross trained group has a 2.51 year tenure advantage on their peers, creating

an expected tenure effect of 7.5 – 12.6%, explaining the 9.4% premium the cross trained group receives. In fact, in all age categories the effect of cross training is muted by tenure. In the case of those under 30 the cross training premium is entirely explained by tenure, for 41-50 years olds there is a tiny premium for cross training (the pay difference of -.56% is not quite as bad as tenure alone would predict), and for 31-40 year olds, the cross trained group actually did slightly worse after the effect of tenure was considered (-.57% pay difference is worse than the negative .2 - .4% expected range).

Table 3

Effect of Cross Training on Pay (Age)

N=463	<u>Cross Trained</u>				<u>Non-Cross Trained</u>			
	Age (years)	<=30	31-40	41-50	>50	<=30	31-40	41-50
N	37	43	42	32	65	73	72	99
% Cross Trained	36.3%	37.1%	36.8%	24.4%				
Average Pay	\$10.25	\$10.38	\$10.56	\$11.40	\$9.58	\$10.44	\$10.62	\$10.42
Cross Train Premium	6.99%	(.57)%	(.56)%	9.4%				
Average Tenure (years)	4.89	5.19	5.97	8.56	3.28	5.26	6.39	6.05
Tenure Difference (years)	1.61	(.07)	(.42)	2.51				
Tenure Effect	4.8-8.1%	(0.2-0.4)%	(1.3-2.1)%	7.5-12.6%				

Note: Brackets ( ) denotes negative number.

## Tenure

The last segment of data analyzed is displayed in table 4 (see following page), examines the effect of different tenure levels. In other words, is it possible that new employees or long service employees are cross trained at a higher rate relative to their peers? And if so, to what effect? As with age, longer service employees tended to be cross trained at lower rates than the overall average (27.7% vs. 33.3% overall). So are longer service employees being taken for granted by denying them the training opportunities afforded newer employees, to the detriment of their pay? By now it is no longer a surprise that the answer is no. The more senior employees in this study (i.e., those with over 15 years of service) did receive a small pay premium over their non-cross trained peers of .30%. However, the expected tenure effect was slightly higher than this (.7 – 1.2%), meaning the cross trained group was actually paid a few pennies lower than their peers after the tenure effect was considered. Further, in each of the other three tenure groups, the pay premium for cross training was entirely explained by tenure.

Table 4

Effect of Cross Training on Pay (Tenure)

N=463	<u>Cross Trained</u>				<u>Non-Cross Trained</u>			
	<u>&lt;=5</u>	<u>6-10</u>	<u>11-15</u>	<u>&gt;15</u>	<u>&lt;=5</u>	<u>6-10</u>	<u>11-15</u>	<u>&gt;15</u>
Tenure (years)								
N	96	40	12	6	200	77	16	16
% Cross Trained	32.4%	34.2%	42.9%	27.7%				
Average Pay	\$9.85	\$10.90	\$12.67	\$13.17	\$9.53	\$10.99	\$12.38	\$13.13
Cross Train Premium	3.36%	(.82)%	2.34%	.30%				
Average Tenure (years)	4.21	6.33	12.83	17.67	3.27	6.58	12.63	17.44
Tenure Difference (years)	.94	(.25)	.45	.23				
Tenure Effect	2.8-4.7%	(0.8-1.3)%	1.4-2.6%	.7-1.2%				

Note: Brackets ( ) denotes negative number.

### Overall Conclusion

The bottom line in viewing the data is that cross training seems to have no effect at all on pay in the research organization. Although many of the data comparisons that were studied did appear to show a pay premium for cross trained employees, that premium could be explained by differences in average tenure with the organization. Therefore, the research hypothesis is rejected -- cross training does **not** lead to higher pay in the research organization.

## **CHAPTER FIVE**

### **DISCUSSION AND RECOMMENDATIONS**

#### **Explanation of Findings and Ideas for Further Research**

It seems very clear from the research results that cross training has no appreciable effect on employee pay. This is counter to the research hypothesis, and a surprising result. The question now is why?

The first possibility is that one or more of the key research assumptions did not hold. For example, maybe cross training does not actually lead to greater individual performance after all. A cross trained employee would be more versatile for sure, but maybe supervisors value and reward other factors, such as loyalty, longevity or interpersonal skills. Or perhaps supervisors do not actually differentiate between different levels of performance at pay increase time. It may be difficult for a supervisor to look an employee in the eye and tell them they're getting a small pay increase because they're not performing as well as their peers. It could be that supervisors avoid this potential confrontation by giving every employee the same pay increase, regardless of performance. The fact is, any of the basic research assumptions listed earlier could be flawed, which could be determined with further research.

Another possible explanation is that supervisors value other things besides cross training. As shown in the literature review, one of the costs of cross training is losing expertise as employees are rotated. Perhaps

supervisors place a lot of value in their employees who are "experts," i.e., those who may not be cross trained in a lot of jobs, but are very good at the few jobs they are trained in. If this is true, supervisors may be rewarding this group of employees with higher increases, eliminating any pay premium that a cross trained employee would receive. This too could be investigated with further research.

Another possible explanation is that the line between cross trained and not cross trained was improperly drawn. As stated earlier, the researcher defined a cross trained employee as one who's been qualified in at least 50% of the jobs or processes in a department. Perhaps cross training does have a positive effect on pay after all, but perhaps the effect does not show up until an employee is trained in 75% of the processes in an area. Again, this is a question that warrants further study.

### **Alternative Ideas for Promoting Cross Training**

Whatever the explanation, it was clear that cross training did not have a positive effect on employee pay at the research organization. However, as several studies referenced in the literature review have shown, cross training is beneficial to an organization given the right conditions (e.g., relatively routine tasks, workers can be frequently rotated). These conditions seem to apply to the research organization, so it is assumed the organization would benefit from cross trained employees. Yet, as this study has shown, cross training does not pay off

for individual employees in terms of a higher base wage. So how can cross training be promoted?

Perhaps this is a moot question. Maybe there is an optimal mix of cross trained employees and "experts," and perhaps the organization is already near optimal levels. It would be interesting and beneficial to learn if there is in fact an optimal way to blend cross trained and expert employees together. This is another potential area for further research.

The bottom line is that this study has clearly answered one question – cross training does not lead to higher wage rates at the research organization. But the study has raised many other interesting and relevant questions that warrant further research.

## REFERENCES

- Baranski, J. V., McCann, C., Pigeau, R. A., & Thompson, M. M. (2000). On the utility of experiential cross-training for team decision-making under time stress. *Ergonomics*, 8, 1095-1110.
- Benfari, R. C., Orth, C. D., & Wilkinson, H. E. (1986). Motivation theories: An integrated operational model. *SAM Advanced Management Journal, Autumn*, pp. 24-31.
- Bowman, S. A. & Hottenstein, M. P. (1998). Cross-training and worker flexibility: a review of DRC system research. *Journal of High Technology Management Research*, 2, p. 157.
- Campell, G. M. (1999). Cross-training of workers whose capabilities differ. *Management Science*, 5, p. 722.
- Cappelli, P. (2000). A market-driven approach to retaining talent. *Harvard Business Review*, 1, p. 103.
- Cramer, J. (1999). Overcoming Team Structure Saboteurs. *Selling*, 6, p. 4.
- Dalton, G. L. (1998). The collective stretch -- Is workforce flexibility delivering the goods? *Management Review*, 11, p. 54.
- Franklin, D. (1999). Earning through learning. *Credit Union Management*, 11, p. 56.
- Hays, S. (1999). Pros and cons of pay for performance. *Workforce*, 2, p. 68.

Hollensbe, E. C. (2000). Group pay-for-performance plans: The role of spontaneous goal setting. *Academy of Management Review*, 4, p. 864.

Jenner, E. A. (1998). A case study of nurses' roles, education and training needs associated with patient-focused care. *Journal of Advanced Nursing*, 5, p. 1087.

Jolly, J. & Recardo, R. (1997). Organizational Culture and Teams. *Advanced Management Journal*, 2, p. 4.

Katzenbach, J. R. & Smith, D. K. (1993). *The Wisdom of Teams* (1<sup>st</sup> ed.), Harvard Business School Press.

Krajewski, L. J. & McCreery, J. K. (1999). Improving performance in an assembly environment using workforce flexibility in an environment with learning and forgetting effects. *International Journal of Production Research*, 9, pp. 2031-2058.

Lea, S. E. & Snelders, H. M. (1996). Different kinds of work, different kinds of pay: An examination of the over justification effect. *Journal of Socio-Economics*, 4, p. 517.

Leedy, P.D. & Ormrod, J.E. (2001). *Practical Research--Planning and Design* (7<sup>th</sup> Ed.). Prentice-Hall, Inc.

Milkovich, G. T. & Newman, J. M. (1984). *Compensation* (1<sup>st</sup> ed.). Business Publications, Inc.

Pojidaeff, D. (1995). The core principles of participative management. *Journal for Quality and Participation*, 7, p. 44.

Verespej, M. (1998). Drucker Sours on Teams. *Industry Week*, 7, p. 16.

Wiscombe, J. (2001). Can pay for performance really work? *Workforce*, 8, p. 28.