

■ 사례연구

Practical Activities of Education and Consulting to Improve Product Quality in a Small-medium Woollen-yarn Manufacture

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Abstract

Even though the woollen-yarn-making process as a whole has received much attention from customers in recent years, but yet there exist many problems to improve quality, productivity, and working environment in a small-medium woollen-yarn manufacture.

To achieve the aim for improvement of quality and productivity, we have performed a period of education and training for workers. And thus this paper reports a study carried out them in the company located in near Pusan. Also, this paper describes a study how has a small-medium company introduced the education for the workers by authors. Among the possible outcome of this study is that the company does encounter considerable difficulties in the education and training. But to improve the quality and productivity, we assert that the company has to overcome these courses. We all recognize that the employer has been prepared for education and training to improve the employees' working conditions for a long time.

1. Introduction

In recent years, the management of quality has emerged as a major business strategy in many organizations, driven primarily by the increasing demands of customers for improved products and services (1991). To reach at a satisfied level of quality management, we are attentive to be built the minded organization

between top manager and the whole employees.

Positive quality attitudes in a company are primarily represented by the very intangible but extremely important spirit of "quality-mindedness" extending from top management right through to the whole employees (1961). We assure that such attitudes have developed through education and training to improve quality and productivity. Whatever is new and first about the total education and training, program is successfully introduced step by step to the whole employees so as to obtain its willing acceptance, cooperation, and participation.

The basic management objective for quality education may, therefore, be readily formulated. This objective may be stated as the development for personnel-in all functions and at all levels of those attitudes, knowledges, and those skills in quality which may contribute to production of company products at minimum cost consistent with full customer satisfaction (1961).

Thus we asserted to be introduced that the most effective education and training courses for improvement of quality and productivity are those which are quality-problem-centered rather than quality-theory-centered within the field. We found out through this survey that the workers do their quality job better, and also their objective is the dissemination of principles and practices for solving the basic and down-to-earth quality issues rather than the dissemination of the broad and general theories for quality discussion only.

2. Approach to Improvement of Quality and Productivity

The main objective of quality improvement is to place the needs and requirements of customer at the forefront of company's quality improvement strategy. This stems from increasing consumer awareness and expectations for improved products and/or services. Despite the different company interpretations and descriptions of the introduction and development of a quality improvement process, it is evident that they, in fact, passed through the same basic stages (1991).

Among several stages, we are mentioned about the articles of awareness, education and training. Awareness is the first stage that involves a realization by a company that a problem exists. It may be present in the organizational structure, in its culture or in the products or services offered to the customer.

The next stage involves a period of education and training. In large companies even though a long-range program of education and training is necessary, but in the small-medium company a short-range program is more necessary rather than a long-range one. In general a course in the practice of quality-control techniques

for foremen, inspectors, and others whose daily work requires new and better education and training.

For the small-medium company that can not develop its own in-company education and training in quality control, we offered the basic seven management tools through education and training. We have performed off-the-job course of two types : the first is 2 times a month; the second is that a shift has 5 times for education and training. Now the company is operated as 3 shifts. These courses will be taken over a period of 6 to 7 months until October in 1994. Although many of these courses have a basic statistical quality-control orientation, some have become broader in scope to include consideration of technical aspects at woollen spinning process.

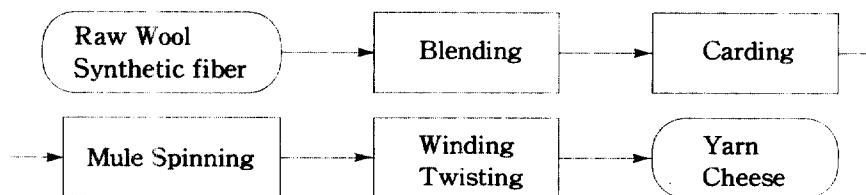
We consultants may sometimes be profitably employed both in the early days of quality-control training, when the quality-control component has not yet developed sufficient competency to direct the programs (1961). It is well recognized that one of the most important contributory factors to the establishment of an effective quality improvement process is the employees' involvement and participation.

3. Company Background

While woollen carding and spinning have developed continuously if slowly over the last century, this is a processing system that is still wool-oriented and produces yarns that are in wide demand for its woollen texture and bulk properties (1986).

The small-medium company that we have studied for several months adopts the woollen spinning system. Today, the woollen spinning system often utilizes medium level wool fibers which are usually mixed with a certain percentage of synthetic fiber and these are processed to make relatively inexpensive, fairly weak, soft, full yarns which are valuable where bulk and softness are required [7].

The manufacturing process of this company describes in <Figure 1>. Among the processes in <Figure 1>, especially carding and mule spinning are very important to determine the product quality. Also their systems are very complex to control and difficult to adjust. Therefore the technical knowledges and quality control are required to adjust the operational conditions at these processes.



< Figure 1 > Woollen yarn manufacturing process

4. Strategy for Product Quality

Quality is a relative measure of product goodness, and quality standards may fluctuate depending on customer requirements and on product availability. If the product is better than the standards, manufacturing costs may be prohibitive. If the product is below the standards, then performance may be impaired, and customer acceptance may decline (1978).

The priority objective of any business producing a product must be product quality. The customers' demand for perfection today is perhaps greater than it has ever been before. In developing a strategy for improving product quality, it will be shown that quality awareness and control of quality must begin when a product is conceived and does not end until the product is purchased by the customer (1984).

Three factors determine product quality: design, manufacturing process and people. Among them, people determine product quality and are the most significant element in the entire life cycle of a product. So we have educated and trained for the workers to influence positively the quality of woollen yarns. To maximize quality awareness, we have had that the meeting of each shift can be used to communicate quality information as well as provide recognition for those who have made significant contributions to improve quality and productivity.

Quality control circle is an excellent example of how the participate management approach can create quality awareness, improve product quality and reduce cost while providing self-actualization and recognition for the workers involved. This company organization has not the extra division for quality control circle. We recommend that each quality control circle consists of 7 persons by each shift. We think the extra division for quality control circle is not necessary in this small-medium company. Three shifts are continually updated on all new information relating to the product and their working area. Management has been able to build a more effective working relationship with the employees while simultaneously improving quality, productivity and customer satisfaction.

5. Education within Industry

The greatest quality resource of a plant is conscientious workmanship. Essential, therefore, to the enlargement of quality control is the development of a real feeling of quality responsibility among all members of the company organization (1961). We think that the one of quality control purposes is focused at the manufacturing products of good quality. And so, the design, manufacture, and sale by a company of products of consistently good quality requires a high degree of effectiveness in at least three key characteristics of company personnel, i.e., their quality attitudes, their quality knowledges, and their quality skills. To develop these three characteristics, many companies have adopted various methods and tools for education within or outside industry. So we have educated the basic tools for quality control for workers to accomplish the given task for a period of time within industry. We have educated the basic tools for quality control, i.e., cause and-effect diagrams, checksheets, Pareto diagrams, frequency distribution table, histograms, scatter diagrams and control charts, etc. Education within industry is explained as the educational activities to be performed in a industrial position (1982). We have tried to provide the workers with the proper understanding and control tools that they may use to motivate their employees to do their best for the quality control and for maintenance their operating machines. We'd like to introduce several literatures to perform the education within industry at each industrial field, i.e., Takaya (1982), Sasaki (1982), Kuroiwa (1982), Shimoyamada (1990), Nakamura (1990), Tawara (1993), Hori (1993), etc.

6. Intermediate Reports

We have acquired the intermediate results through this survey as follows. <Table 1> shows the employees' service years working at this company. Today the small-medium companies have the various difficult problems to operate the facilities owing to 3D phenomena. Especially it is serious to hold the skilled workers at the field. We also found men's ages are 39.6 years and women's 29.9 years. The whole workers' average ages at the field are 34.8 years.

<Table 2> shows the workers' job satisfaction before education and training. In <Table 2> if we assume that the weight of very good is 3 points, good is 2 points, and not good is 1 point, we knew that men's job satisfaction is resulted with 2.545, women's 2.067 and total workers' 2.269.

<Table 3> shows the workers' job satisfaction after education and training. In <Table 3> if we assume that the weight of very good is 3 points, good is 2 points,

and not good is 1 point, we knew that men’s job satisfaction is resulted with 2.636, women’s 2.333 and total workers’ 2.478.

〈 Table 1 〉 Employees’ service years

service years	20-th ages		30-th ages		40-th ages		50-th ages		Total
	male	female	male	female	male	female	male	female	
less than one year	.	//// /	.	//	.	.	.	.	8 (32%)
less than three years	.	//	//	.	.	/	/	.	6 (24%)
less than five years	/	/	/	.	.	.	.	.	3 (12%)
more than five years	.	/	///	/	/	.	/	/	8 (32%)
	1	10	6	3	1	1	2	1	
Total	11		9		2		3		25 (100%)
	(44%)		(36%)		(8%)		(12%)		

Also we had surveyed that what to extent does workers understand the basic management seven tools. The results are as follows:

Tools	Before E. & T.	After E. & T.
· cause-and-effect diagrams	3 persons	18 persons
· checksheets	none	16
· Pareto diagrams	none	11
· histograms	none	15
· scatter diagrams	1 person	1
· control charts	2 persons	11

* Resulted numbers above describe multiple responses.

As compared with the above results, we have realized how important the education and training are for the small-medium company.

〈 Table 2 〉 Employees' job satisfaction(Before E. & T.)

Articles		20-thages		30-th ages		40-th ages		50-th ages		Total
		male	female	male	female	male	female	male	female	
job satisfaction	very good	/	.	//	//	/	.	//	.	8
	good	/	//// ////	////	/	.	/	.	/	17
	not good	.	/	.	.	.	.	.	.	1

〈 Table 3 〉 Employees' job satisfaction(After E. & T.)

Articles		20-thages		30-th ages		40-th ages		50-th ages		Total
		male	female	male	female	male	female	male	female	
job satisfaction	very good	.	/	///	///	//	.	//	.	11
	good	.	//////	////	/	.	.	.	.	12
	not good	.	.	.	.	.	.	.	.	0

7. Conclusions

This study had developed until October in 1994. And we acquired the satisfied and very useful results to educate workers for improvement product quality. We had realized how to educate and what to educate for workers in the small-medium industry. Prior to perform a certain education, we had to understand their working environments and job satisfactor. Because it is very important to understand their working environments and job satisfaction in order to build up the proper education program. Most of workers had understood the basic tools for quality control and tried to apply them with their job performace to improve the present status.

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