Industrial Engineering and Applications
L.-C. Tang (Ed.)

doi:10.3233/ATDE230089

The Factors Influenced to Trimming Skill in Pineapples Productivity

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Abstract. The goal of this study is to identify the key factors that influence the development of trimming skills in a fruit canning factory by collecting data over a three-month period and selecting 10 staff members from the pineapple trimming section as the group sample. The research tool is the questionnaire. We studied the sample group by questioning the key factors, for instance, training satisfaction, stress, and self-motivation. The questionnaire responses indicate that the sample group is satisfied with the training program and the training process; however, despite their greater capacity for trimming pineapple, the sample group found themselves stressed at work due to concerns that the results of trimming pineapple would not meet the factory's expectations. However, after the training, the results show that productivity is increased by an average +35.00% and defects are decreased by an average -30.00% compared to normal business without training.

Keywords. Trimming skill training, Pineapples, Productivity

1. Introduction

The COVID-19 pandemic has a wide impact on almost every industry, especially the food industry. The obvious effect is that consumers change their behavior, especially when it comes to eating healthy foods that build immunity and keep them healthy, and they choose safer foods to cook and clean with. The food industry is an industry that is very important to Thailand's economy, in terms of production value, employment, and export. Moreover, the potential food production value is high for both domestic and international consumption. As Thailand's economy improves and becomes more competitive, increased productivity is required to gain the largest market share in the same business. That means that businesses must have high performance from their human resources by hiring the right people, properly training them, creating the best work environment, and constantly improving employee performance. These business factors matter to every company.

According to the above paragraph, this research is based on improving employees' performance, which will significantly increase productivity, especially as we focus on developing the "trim pineapple skill" for the team. By creating a better work

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environment, a proper process (a way of working), clearer knowledge, and more efficiency.

It is very beneficial to do the training; certainly, it increases productivity, and reduces defects in the process of trimming pineapples, also improves problem-solving skills and leadership abilities. According to Julalak Paka et al. [1] studied the development of pineapple preparation skills in the pineapple preparation process. The researcher applied the feedforward and feedback training technique to do the exercise, increase the skill, and give the advice. According to the findings, using the feed forward and feedback technique and training 23 staff members from the production line resulted in the development of skills to the expected standard. Within 60 days, productivity increased by +34.60% due to increased capacity, and defect rates decreased by -14.46% on average when compared to the current work procedure. Furthermore, Akaradej Maichan [2] investigated the factors influencing employee work efficiency in the production line machinery installation industry in Songkhla province. In addition, Jeenal Vora et al. [3] used virtual reality technology for in-flight visual inspection training, and a research study by Alexander John Clemons [4] was conducted in the field of visual inspection processes in the foundry industry. The research indicates that investments in training employees in quality control, safety, material requirements planning, and soft skills are worthwhile. As a result, organizations benefit from knowledge-driven revenue cycles, innovation, and creativity. All of which are shown in Figure 1 [4].

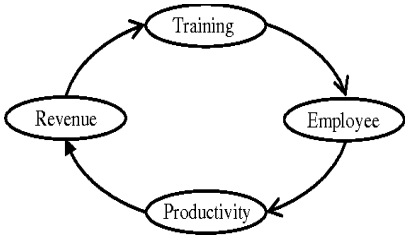

Figure 1. Relationship Cycle [4]

There are many studies focused on how to improve and recommend how to evaluate the production value, but only a few studies were taken out to find out the factors that influenced the productivity. Likewise, Chalit Thanitsorn [5] conducted a study on the factors that affect the practices of continual improvement activities. These factors include employee participation in the Kaizen report of employee communication, and employee training with questionnaires. The results of the analysis found that the difference in work experience and educational level directly impacted the practice of the improvement activities. Krisada Chienwattanasuk [6] conducted a study on the motivation of employees at work and the effect of motivation on employees' work performance. The results indicated that employees will have diverse opinions and motivation levels based on their different demographic profiles (gender, age, marital status, income, and work experiences). also a substantial attitude in terms of success, acceptance, and responsibility. As a result, the goal of this study is to identify the key factors that influence pineapple trimming skill, which will undoubtedly improve productivity. The feedforward and feedback, including peer-assisted learning, have been used to increase skill in the pineapple trimming process. This study involved the sample group (10 staff) who worked in the trimming section for 3 months.

2. Theory

2.1. Learner Progress

In this research, the feedforward [7], feedback, and peer assisted methods are applied. The Feed Forward method is designed to prepare trainees for the next assignment by providing information or describing what needs to be communicated to them and understanding the activity that is important to them. While the feedback is focused on current performance (and may simply justify the grade awarded), it also provides information on the relationship between the activity and their training goals. This enables them to evaluate their progress, identify gaps or misconceptions in their knowledge, and take remedial action that is generated by tutors, peers, mentors, supervisors, a computer, or self-assessment.

2.2. Peer Assisted Learning Strategy (PSL)

Peer assisted learning strategy (PSL) [9] means organizing learning activities in pairs or small groups. This is to encourage students to participate in activities and help each other by becoming teachers and learners. This will help with gaining knowledge and understanding of the lesson. The teacher's role is limited to providing advice and organizing activities that are appropriate for the students

3. Mathodology

The researcher will observe and follow up on the evaluation of a specific sample group. The sample group must be willing to test and ready to develop themselves. They are selected as follows: 10 people worked on the production line in the pineapple eye cutting section, which consisted of one rack, Rail 5 Size 70. They have passed the preliminary test that there is an understanding of eye pecking and are ready to cooperate in collecting results to find trimming skill training for employees to increase productivity. (Fig 2 and 3)

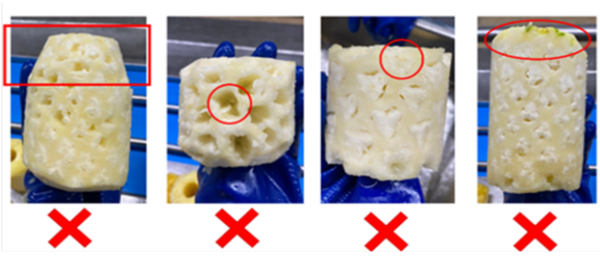

Figure 2. Example of defective pineapple.

Figure 3. Example of processed pineapple.

The feed forward is the provision of context for what one wants to communicate prior to that communication. In activity, feedforward creates expectations for the sample group. When an expected experience occurs, this provides confirmatory feedback. People with a peer supporter can share knowledge and experiences during training by being deployed to teach and staying close to people who work in the pineapple trimming process. The general information provided by questionnaires and the respondents' satisfaction, such as with the training program, are key factors that influence employee skill training in industry. In addition, the Department of Mental Health Stress Scale (SPST-20) [10],[11] 20 items to measure stress or feelings about events that may affect employee skill training. The question format is a 5-level approximation (Rating Scale).

3.1. Flowchart or Workflow

Figure 4 indicates the details mentioned in this experiment as well as the procedures for collecting data and testing learners for analysis. .

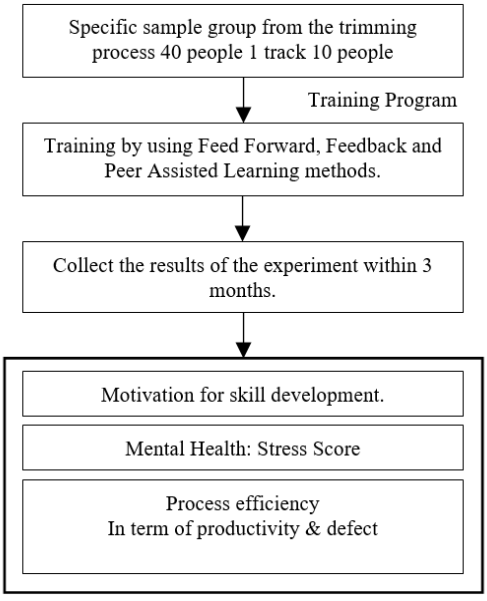

Figure 4. Flow Chart or Workflow

3.2. Collecting the Data of Staff's Performance

Collect the variable data that impacts on the staff's capacity as followed: Julalak Paka et al [1]

- "Capacity" means the amount of product that can produce by using measurement unit as piece per hour and transform to piece per minute for plotting the graphs.
- "Defect" means the waste of pineapple flesh (pineapple shreds) from peel and tweak the eyes process which is calculated in percentage from the formula as shown below and the result is in percentage of raw material defect.

3.3. Equations

Equations to Find the Defect Result in the workpiece that the sample recorded (1)

$$D = \frac{x - \left(x \times \frac{w}{t}\right)}{f} \tag{1}$$

Explanation
D = Defect value (Percentage)
x = Weight of pineapple shreds from peel and tweak the eyes process (Kilograms)
w = Count of pineapple that is defected (piece)
t = Total pineapple that comes in the process (piece)
f = Count of good pineapple after process (piece)

3.4. Training Station Layout

The pineapple peel slides down the conveyor belt. The crew will then cut the pineapple afterwards. The staff will remove the remaining of the pineapple's green skin, prick out the eye, clean it, and then release it onto the belt as shown in the image.

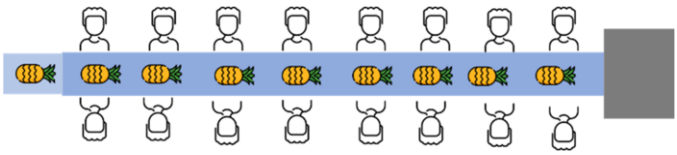

Figure 5. Schematic diagram of the process of chain pecking pineapple eye.

4. Result and Discussion

M. Measures of Satisfaction with the Employee Training Program

4.1. Satisfaction from Data Collections I

In terms of satisfaction with the training program throughout the course of three sessions, it was at a reasonable level. According to Table I, the average values were 3.16, 3.16, and 3.10, respectively. When averaging the three projects' satisfaction ratings, the averages were 3.07, 3.07, 3.32, 2.98 and 3.05, respectively, which can be shown in the graph as follows in Fig 6.

Table 1. Mean and the standard deviation of the satisfaction data for the training program

Satisfaction with the training program	**No 1**		
	$\bar{X}$	***S.D.***	***Result***
1 You have an understand of the procedures and goals of training for self-development.	3.17	0.77	Moderate
2 Appropriateness of the training period.	3.10	0.70	Moderate
3 Appropriateness of the training period.	3.32	0.99	Moderate
4 Suitability of the media, including the demonstration equipment	3.07	0.93	Moderate
5 Arrangement of training steps.	3.12	0.68	Moderate
Total	3.16	0.81	Moderate
Satisfaction with the training program	**No 2**		
	$\bar{X}$	***S.D.***	***Result***
1 You have an understand of the procedures and goals of training for self-development.	3.27	0.71	Moderate
2 Appropriateness of the training period.	3.12	0.71	Moderate
3 Appropriateness of the training period.	3.29	0.96	Moderate
4 Suitability of the media, including the demonstration equipment.	3.10	0.83	Moderate
5 Arrangement of training steps.	3.00	0.67	Moderate
Total	3.16	0.78	Moderate
Satisfaction with the training program	**No 3**		
	$\bar{X}$	***S.D.***	***Result***
1 You have an understand of the procedures and goals of training for self-development.	3.07	0.75	Moderate
2 Appropriateness of the training period.	3.07	0.72	Moderate
3 Appropriateness of the training period.	3.32	0.93	Moderate
4 Suitability of the media, including the demonstration equipment.	2.98	0.91	Moderate
5 Arrangement of training steps.	3.05	0.67	Moderate
Total	3.10	0.80	Moderate

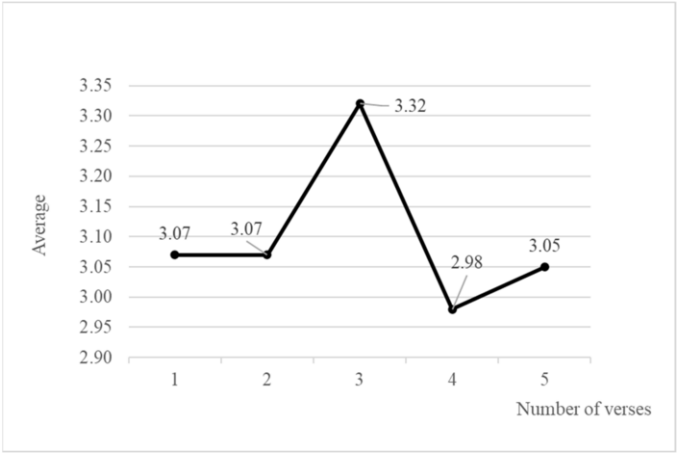

Figure 6. Satisfaction with the training program.

4.2. Satisfaction from Data Collections II

The satisfaction with the training program in terms of administrative staff, speakers, and coordinators, including 3 times, was at a moderate level. After categorizing each item, the mean values were 3.26, 3.22, and 3.12, respectively. It was found that.

- The first time the respondents had their opinions about satisfaction with the training in terms of administrative staff, speakers, and coordinators, the mean was at a moderate level. The mean was 3.26 once classified in the first three items, and the respondents were satisfied with the subject. The speakers can clarify and answer questions clearly, the mean was 3.29. The knowledge gained from the content of the lecturer's work process It was at a moderate level; the mean was 3.27, and the ability to transfer knowledge and the suitability of the speakers were at a moderate level, the mean was 3.24.
- The second time the respondents had their opinions about satisfaction with the training program in terms of administrative staff, speakers, and coordinators, it was at a moderate level, and the mean was 3.22. Once classified in the first three items, the respondents were satisfied with the knowledge in the content of the speaker's work process and the ability to transfer knowledge at a moderate level, and the mean was 3.24. The speaker's ability to clarify and answer questions clearly, as well as their suitability, will determine their success. It was a moderate level, and the mean was 3.20..
- The third time, the respondents had their opinions about satisfaction with the training program in terms of the administrative staff, speakers, and coordinators. It was a moderate level, the mean was 3.12 once classified in the first three items, and the respondents were satisfied with the knowledge of the content of the speaker's work process. It was at a moderate level, and the mean was 3.29. The explanations provided by the speakers aid in clarifying and answering questions. It was a moderate level, and the mean was 3.12. the ability to transfer knowledge The mean was 3.05, indicating a moderate level. When the administrator, lecturer,

and coordinator collected data for three projects, the averages were 3.29, 3.05, 3.12, and 3.02, respectively. It can be expressed in Figure 7 as follows:

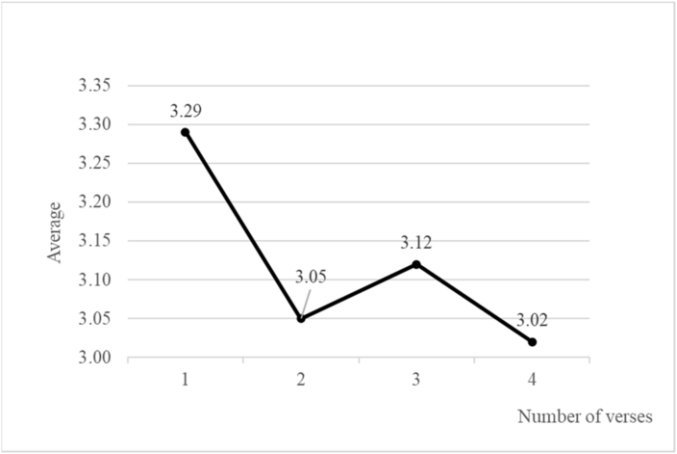

Figure 7. Satisfaction with the training program in term of administrative staff / speakers / coordinators.

In terms of satisfaction with the training program in terms of quality of training, including 3 sessions, it was at a moderate level. The mean values were 3.23, 3.16, and 3.19, respectively; once classified for each item, it was found that:

- The first time the respondents had their opinions in terms of satisfaction with the training program, The quality of training was moderate. Once classified in the top three items, the mean was 3.23. The respondents were satisfied with the subject matter. It can use what has been learned to improve your performance. It was at a moderate level, and the mean was 3.44. This is followed by participation in a training program, which can help improve your abilities. The mean was 3.37, and it was at a moderate level. acquired knowledge, concepts, and process improvement skills from training. It was at a moderate level, and the mean was 3.27.
- The second time the respondents were asked about their satisfaction with the training program. The quality of training was moderate, and the mean was 3.16 once, in the first three items, the respondents were classified as satisfied with the subject matter. It can use what has been learned to improve your performance. The mean was 3.27. To make it easier to understand, the speakers used media and teaching methods. It was at a moderate level, and the mean was 3.24. the knowledge, concepts, and process improvement skills they received from training. and the benefits from attending this training were moderate; the mean was 3.15.
- On the third occasion, the respondents gave their opinions in terms of satisfaction with the training program. The quality of training was moderate, and the mean was 3.19. In the first three items, the respondents were classified as satisfied with the subject matter. Participating in a training program can help develop your abilities. It was at a moderate level, and the mean was 3.37. This is followed by being able to apply what has been learned from training to improve your performance. It was at a moderate level, and the mean was 3.34. Participants acquired knowledge, concepts, and process improvement skills from training. It was at a moderate level,

and the means were 3.27, 3.20, 3.00 , 3.37, and 2.98, respectively. It can be shown as the graph that follows.

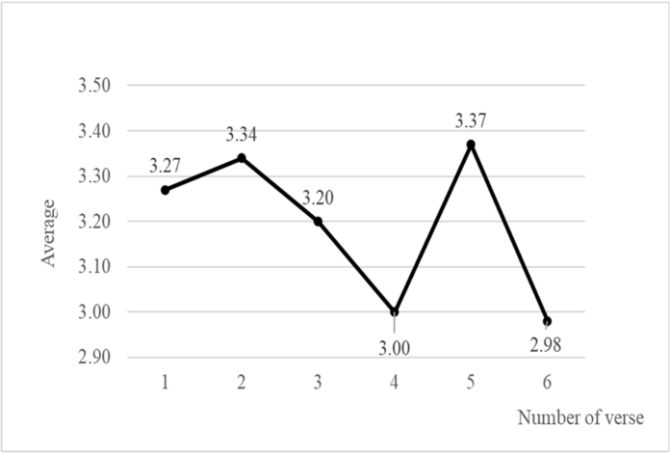

Figure 8. Satisfaction with the training program in terms of quality of training, it was at a moderate level.

In terms of satisfaction with the training program in terms of motivation for skill development, all three sessions were at a moderate level. The mean values were 3.34, 3.31, and 3.44, respectively. When classifying each item, it was found that:

The first time the respondents had their opinions in terms of satisfaction with the training program. The motivation for skill development was moderate, and the mean was 3.34. Once classified in the first three items, the respondents were satisfied with the subject matter. The family motivation was at a moderate level, and the mean was 3.56. The mean for training to help build skills for work in order to raise salary was 3.44.Improving themselves moderately, the mean was 3.39.

The second time the respondents were asked about their satisfaction with the training program. The motivation for skill development was at a moderate level, and the mean was 3.31 once the respondents were classified in the first three items, and were satisfied with the subject. The family motivation was at a good level, and the mean was 3.51. The age that still needs to develop skills was moderate, the mean was 3.34, and training contributed to the success of the operation. The average for self-development was 3.32.

A third of the respondents expressed their satisfaction with the training program. The motivation for skill development was at a moderate level, and the mean was 3.44. Once classified in the first three items, the respondents were satisfied with the subject matter. The family's motivation was at a good level, and the mean was 3.85. The self-development score was good, with a mean of 3.63. The training contributed to the success of the operation; the mean was 3.56. When averaging data on motivation for skill development for 3 times, the mean values were 3.39 , 3.45 , 3.64 , 3.32 , 3.18 , 3.39 , 3.24 and 3.32 respectively. It can be shown in graph as follows in Fig 9.

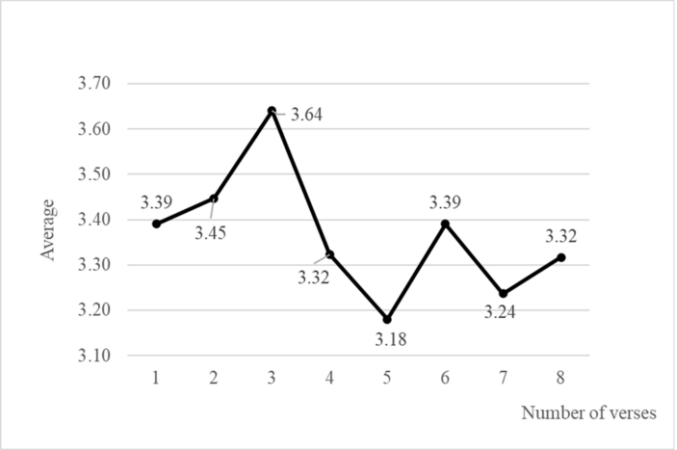

Figure 9. Satisfaction with the training program in terms of motivation for skill development.

4.3. Department of Mental Health Stress Measurement (SPST-20)

Figure 10 depicts the findings of a questionnaire-based study of stress among employees following training. The stress is displayed in 3 levels: yellow, red, and gray, but without stress, it is shown in blue. The results are shown in Fig. 10. There were high stress levels in April, followed by moderate stress levels, with employee mean scores of 63.1, 22.5, and 14.4%, respectively. In May, the employees had high, moderate, and severe stress levels, with employee averages of 58.2, 22.5, and 19.3%, respectively. And in June, the employees had high, severe, and moderate stress levels, with mean scores of 60.9, 21.9, and 17.2 %, respectively. From the experimental results, it was found that the employee's June was less stressful compared to April. This is the beginning of new training because employees still chop and are concerned about the technique and how the trainers train. As a result, employees have a high level of stress, but after about 1-2 months of training, the stress of each person is reduced because each person has a better understanding and adaptation of training methods that are consistent with their results. Process Efficiency in Terms of Productivity From April to June, the trend is upward.

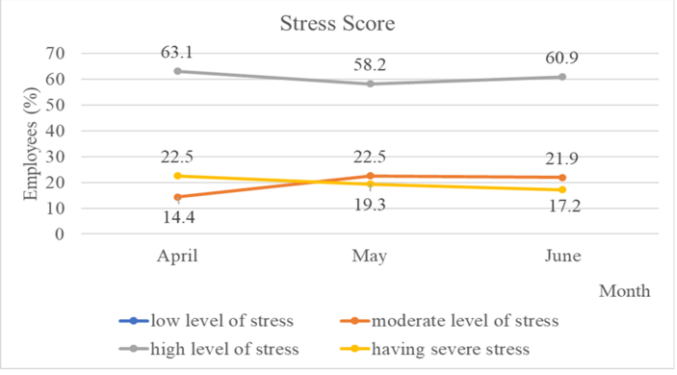

Figure 10. Department of Mental Health Stress Measurement (SPST-20) most respondents had high stress scores. 3 times.

4.4. Training and Productivity

After training, the employees use feed-forward, feedback, and peer-assisted learning methods. For example, Fig. 11 shows process efficiency in terms of productivity, which found that during the operations from April to June, the average productivity of the 10 employees increased from 5.7 pcs/min to 7 and 7.7 pcs/min, respectively. It has increased productivity by up to 35% compared to June and April. Meanwhile, during the operation from April to June, the average number of internal wastes in the process from the work of all 10 employees decreased from 1.18 results/minute to 0.96 and 0.83 results per minute, respectively. The productivity of in-process materials can reach 30%. (Fig 12).

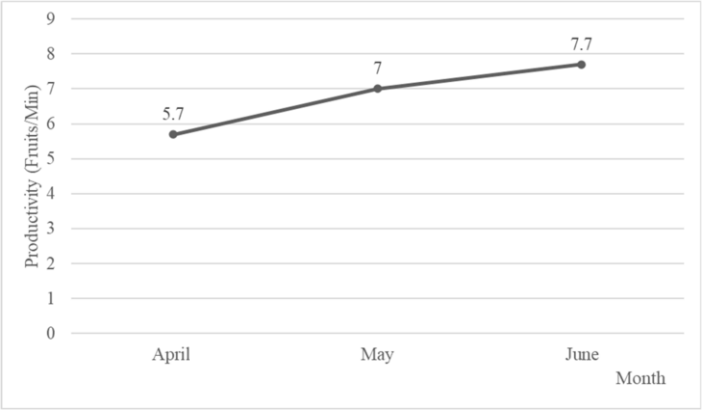

Figure 11. Process Efficiency in Term of Productivity.

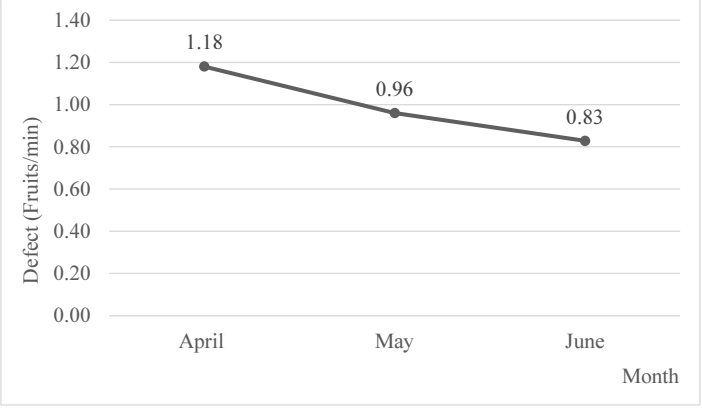

Figure 12. Process Efficiency in Term of Defect.

5. Conclusion

The feed-forward and feedback technique has proven to be the best way to train and develop the staff's skills. After the staff has been trained about the "peel and tweak the eyes" procedure, it increases the staff's performance. The result shows that they understand better, grow in their performance, and work more efficiently. Furthermore, productivity increases whether employees work the same amount of time or less. Most employees are satisfied with trimming skill training. The analysis revealed that the majority of the employees' stress levels were high during the initial training and then decreased. The key factor for success was the peer-assisted learning strategy, including feed-forward and feedback training techniques as well.

Acknowledgment

In conducting this research, I would like to thank all those who provided support and the establishments that have given me the opportunity to study. including all staff and staff who provide advice on how to work.

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