

A RESEARCH ON WORKERS SELECTION AND TRAINING IN APPAREL INDUSTRY

HAZIR GİYİM SEKTÖRÜNDE İŞÇİ SEÇİMİ VE EĞİTİMİ ÜZERİNE BİR ARAŞTIRMA

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ABSTRACT

Unproductive and unqualified working increases the labor costs and decreases the competitiveness. Companies can improve their competitiveness by organizing a training department and selecting relevant workers and training them with a suitable training program. This study was carried out in a jean factory in three stages: 1. during recruitment 2. after training program 3. Two months later after training. The relations among the results of aptitude, pin board and shape tests were evaluated with SPSS program. The effects of mostly considered recruitment factors, such as age, sex, education, on personnel selection tests and the results of training programs were examined. Furthermore, the consistence of the selection tests and the training programs and their effects on the workers' performance were discussed.

Key Words: Apparel industry, Training of sewing operator, Operator selection tests, Recruitment, Human resource management.

ÖZET

Verimsiz ve kalitesiz çalışma işgücü maliyetini daha da yükseltmekte ve işletmelerin rekabet şansını azaltmaktadır. İşletmeler kendi bünyelerinde eğitim bölümü oluşturup, işe uygun işçileri seçip, uygun bir eğitim programı uygulayıp, işçilerini eğiterek işletmelerinin rekabet edebilirliğini arttırabilirler.

Bu çalışmada, kot üreten bir hazır giyim işletmesinde, işe alım sırasında uygulanan kavrama, iğne ve şekil tablası testleri sonunda alınan puanlarla, işe alım sonrasında uygulanan teorik ve pratik eğitim sonucunda alınan puanlar arasındaki ilişkiler SPSS programı yardımıyla istatistiksel olarak değerlendirilmiştir. Değerlendirmede hazır giyim sektöründe işçilerin seçiminde en önemli parametrelerden sayılan yaş, cinsiyet, eğitim faktörlerinin, işçi alımında uygulanan testlere ve seçilen adaylara verilen teorik ve pratik eğitimlere etkileri incelenmiştir. Ayrıca seçim testlerinin ve eğitim programlarının birbirleriyle uyumu ve başarı durumuna etkisi tartışılmıştır.

Anahtar Kelimeler: Hazır giyim sektörü, Dikiş operatörü eğitimi, İşçi seçim testleri, İşe alma, İnsan kaynakları yönetimi.

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1. INTRODUCTION

Apparel industry has an important role on Turkey's economy with its employment effect and foreign currency income via exporting.

It is the fact that the changes in the world trade politics force the apparel industry in terms of price. Apparel industry is labor intensive. Therefore it is difficult to cope with the labor costs in the Far East Countries.

Unproductive and unqualified working increases the labor costs and decreases the competitiveness.

The requirement of trained labor force is mostly provided from the other factories and sometimes from the training courses organized by some public organizations. The expected capabilities of the sewing operators differ from company to company and department to department. For this reason, companies may not benefit enough from these already trained operators. Especially, training of sewing operators in the same way is significant for quality of the products.

Working efficiently, training, research and development activities, producing

qualified and value added products are the tactics used in the global environment. Human resource management is one of the ways of having competitiveness. (1)

Recruiting the operators according to their talents or training before the job is important for increasing the individual performance to the edge. (2)

Personnel differences among operators vary the individual efficiency. (3) Operator selection is needed for recruitment of the most appropriate candidates for the job.

There is a relationship between the results of the psychomotor tests that analyze the coordination of the movements of the operators and their job performance. 4) The skills of the operators can be developed and they can work efficiently. (5) Psychotechnics is used conventionally during personnel selection in various industries. However, in Turkey, the psychotechnic methods and tests are not used in personnel selection and recruiting in the apparel industry. (6)

Companies can influence their competitiveness by establishing their own training department, by recruiting appropriate operators for the job and by training them with a suitable program. Improving quality and productivity via training will ensure the decreasing of costs.

In this study, the statistical relationship among the results of aptitude, pin board and shape tests, which are applied before recruitment, and the results of theoretic and practical training, that are applied after recruitment, were evaluated. The purpose of this study is to check the consistency between operator selection tests and the training programs in terms of factors such as age, sex, education.

2. MATERIAL AND METHOD

The study was carried out in a jean company in Afyon during its foundation in three stages. In first stage, three operator selection tests were applied. In the second stage, the successful ones have been undergone theoretic and practical trainings. In the last stage, the results of operator selection tests and theoretic and practical test were evaluated.

Age, sex and education level of the recruited operators were examined with the personnel selection tests, theoretic and practical training results with variance analysis in %95 CI via SPSS statistical evaluation program. Also, the effects of all personnel selection tests and training programs on the operators' performance, intercompatibility of the personnel selection tests with training programs were examined via variance analysis.

T tests were applied to compare the effects of age, education level and sex factors on the average results of personnel selection tests, theoretic and practical training.

2.1. Sewing Operator Selection Tests

Three different tests were applied for the purpose of appraising the working capacity of the candidates who passed the interview.

2.1.1. Pin Board Test

Movements and speed of the fingers are important while sewing small pieces. Pin board test measures the skill of doing fine works accurately.

The pin board includes 10 horizontal lines, 5 vertical lines and totally 50 holes. Firstly, the candidate takes 3 pins and places these three pins to each hole one by one from left to right in three minutes. At the end of the test, the filled holes are counted. The same procedure is done for the other hand. Pin board test is seen in Figure 1.



Figure 1. Pin Board Test

2.1.2. Shape Test

In apparel industry, the cloth pieces have to be matched and placed on the machine rapidly and accurately. The purpose of the shape test is to analyze the intelligence and ability of establishing spatial relationships. This test consists test A and test B. In test A, the candidate has to place the shapes into the suitable spaces with one hand as soon as possible. B test contains half shapes of test A. Two hands can be used in test B. Performance of the candidate is determined by the time passed during the test. Figure 2 and 3 shows the test A and test B.



Figure 2. Shape Test A

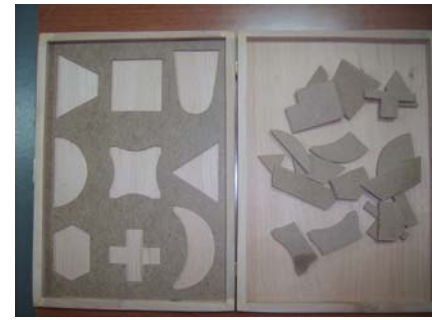


Figure 3. Shape Test B

2.1.3 Aptitude Test

Understanding work-related instructions to detect the defects is very important in the apparel industry. Aptitude test measures the mathematical and practical intelligence of the candidate. These skills show the ability of evaluating the events systematically and noticing relationships among them. This test includes 18 questions. Every question has a box with nine squares. There are figures in eight of them and ninth is empty. The candidate is expected to see the relations among eight squares and fill the ninth square with the right figure. There is a sample question in Figure 4a and b.

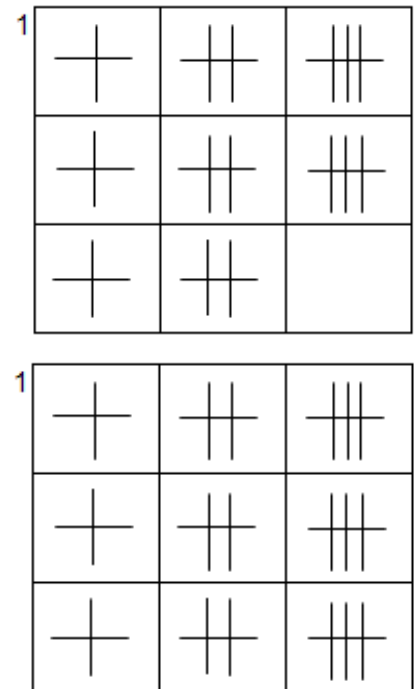


Figure 4. a) Sample Aptitude Test Question b) Answer of Sample Aptitude Test Question)

Total point of the test is 30. The candidates who take out of 16 points are considered successful.

2.2. Theoretic and Practical Training

In this study, theoretic and practical training programs have been arranged firstly. Training durations were planned for one week.

During theoretic training, the operators were informed about work flow in jean manufacturing, accessories, apparatus, product quality, sewing machines and sewing threads. At the end of the theoretic training, they were tested. Minimum 50 points was accepted as lower limit.

In practical training, operators learnt to use sewing machines. They practiced hand-foot coordination on the machine, sewing without thread on circular figures printed on papers, sewing parallel, angular and curvilinear on fabric with thread. The time periods for each application was registered the operators were rated over 100 point according to the quality and speed of those applications.

3. RESEARCH RESULTS

146 candidates applied for the job and 39 of them failed in the personnel selection test as they got less than 16 points. Therefore, only the test results of the other 107 selected candidates were evaluated.

3.1. Results of Operator Selection Tests

3.1.1 Effect of Education on Operator Selection Test

20 of 107 candidates were from primary school, 44 were from grade school and the rest were from high school graduates.

The graphic of results according to education level is seen in Figure 5. The average points of education groups were compared binary as primary school-high school and grade school-high school graduates. p value was less than 0,05 ($p < 0,05$) in both two comparisons. This means that the difference between average points is significant. The difference between the average points of primary school and grade school graduates is not important. ($p > 0,05$)

3.1.2. Effect of Age on Operator Selection Tests

The birth years of the 107 candidates ranged from 1972 to 1991. They were divided into 4 groups. The results showed that the age of operators had

no effect on operation selection test results.

3.1.3. Effect of Sex on Operator Selection Tests

There were 34 female and 73 male in the group. The average points that women and men got from personnel selection tests were nearly the same ($p > 0,05$). It can be said that the difference between the average results of women and men is not significant.

3.2. Results of Theoretic Training

3.2.1. Effect of Education on Theoretic Training

The grade school graduates were the most successful group after theoretic training. According to binary comparisons of high school-grade school and primary school-grade school, p values were greater than 0,05 for the differences between the average points of the binary groups. This result showed the education level does not have a significant effect on the results.

3.2.2. Effect of Age on Theoretic Training

There was no correlation between age and theoretic exam results.

3.2.3. Effect of Sex on Theoretic Training

Female and male candidates got approximate average points. P value was greater than 0,05 ($p > 0,05$). That means sex has no effect on the theoretic training results. As a result, age, education level and sex have no

effect on theoretic exam results individually. The candidates can be successful in the theoretic training exam if they work devotedly.

3.2. Results of Practical Training

The selected 107 candidates were trained practically and have been observed for 5 days. At the end of the practical training, sewing speed and sewing quality of the candidates were evaluated by over 100 points. The effects of age, sex and education on practical training results were given.

3.3.1. Effect of Education on Practical Training

When the candidates were grouped according to their education, it was seen that the practical training evaluation results of the groups were very similar. The highest point was got by high school graduates and the least by primary school graduates. According t test, $p > 0,05$. Therefore, there has not been any correlation between education and practical training.

3.3.2. Effect of Age on Practical Training

Those candidates born between the years 1976-1978 and 1989-1991 were more successful in practical training. The ones born in 1972-1975 interval got the least point. Provided results showed there was no regular trend between the intervals so it can be said that age is not an indicative parameter for the success. The effect of age on the results of theoretic and practical trainings was similar.

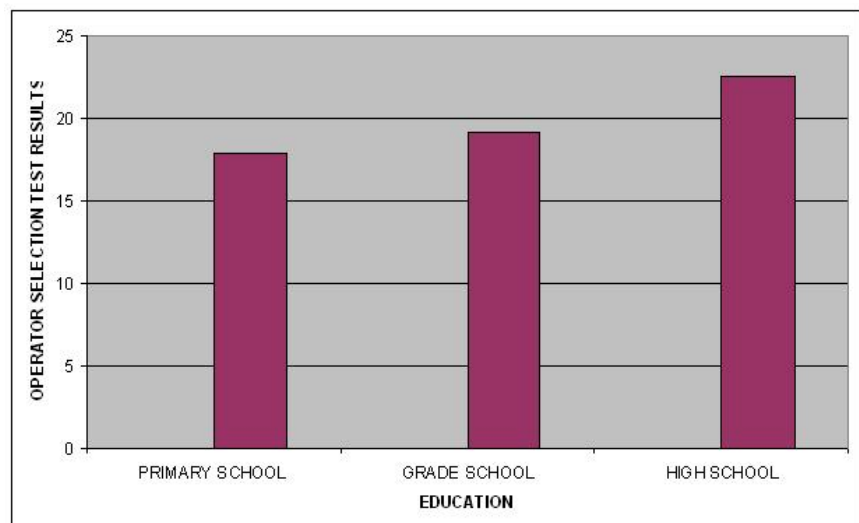


Figure 5. Relation between Operator Selection Test Results and Education

3.3.3. Effect of Sex on Practical Training

Although the male got a little higher average point than female, the t test results showed that the difference between the average results is not significant. ($p > 0,05$)

3.4 Comparison of Operator Selection Tests, Theoretic and Practical Training

3.4.1 Variance Analysis between Theoretic Training and Operator Selection Tests Results

The coherence between the results of theoretic training and personnel selection tests were examined by variance analysis. According to variance analysis results as shown in Table 1, sig value

is 0,406 and it is greater than 0,05 in%95 CI. This means there was no statistically significant difference between personnel selection test results and theoretic training results. Furthermore, as seen in Figure 6, two results intersect each other at some points and this also proves the compatibility of results. In other words, the ones, who succeeded in personnel selection tests, also succeeded in the theoretic training.

3.4.2. Relation between Practical Training and Operator Selection Tests

According to variance analysis results, in Table 2, sig value is 0,592 and it is greater than 0,05 in%95 CI. Thus, there is no statistically significant difference between personnel selection test results and practical training

results. Intersection points in Figure 7, verifies the compatibility of results. The candidates, who succeeded in personnel selection tests, also succeeded in the practical training.

3.4.3. Relation between Theoretic and Practical Training

According to the variance analysis of theoretic and practical training results, made in %95 CI, sig value is 0,156 and $\text{sig} > 0,05$. Therefore, the difference between the average results of the theoretic and practical training is not important. Furthermore, as seen Figure 8, it is seen that there are intersection points of the two results. This shows that the two results conform to each other and the candidates who are successful in the theoretic training are also successful in the practical training.

Table 1. Variance Analysis Table of Theoretic Training and Operator Selection Tests

Dependent Variable: PUAN					
	Sum of Squares	df	Mean Square	F	Sig.
Contrast	1,820E-02	1	1,820E-02	,692	,406
Error	5,786	220	2,630E-02		

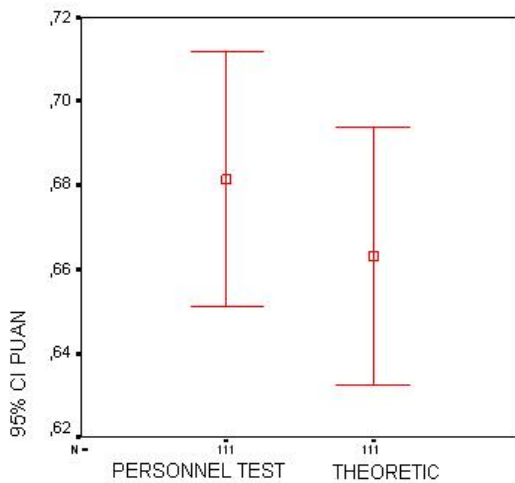


Figure 6. Analysis of Variance Graphic of Theoretic Training and Worker Selection Tests

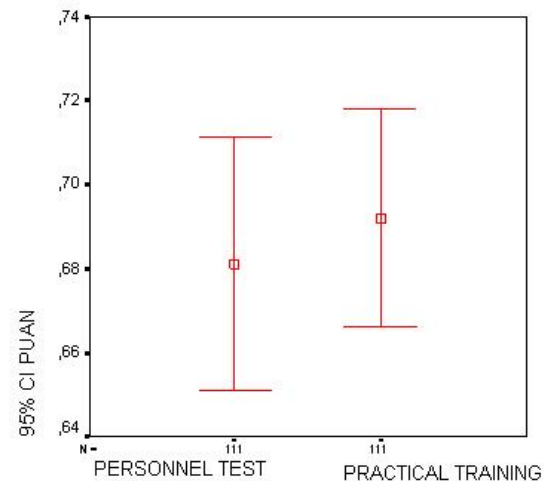


Figure 7. Variance Analysis Graphic between Practical Training and Operator Selection Tests

Table 2. Variance Analysis Table between Practical Training and Worker Selection Tests

Dependent Variable: PUAN					
	Sum of Squares	df	Mean Square	F	Sig.
Contrast	6,486E-03	1	6,486E-03	,289	,592
Error	4,943	220	2,247E-02		

Table 3. Variance Analysis Table between Theoretic Training and Practical Training

Dependent Variable: PUAN					
	Sum of Squares	df	Mean Square	F	Sig.
Contrast	464,149	1	464,149	2,027	,156
Error	50366,198	220	228,937		

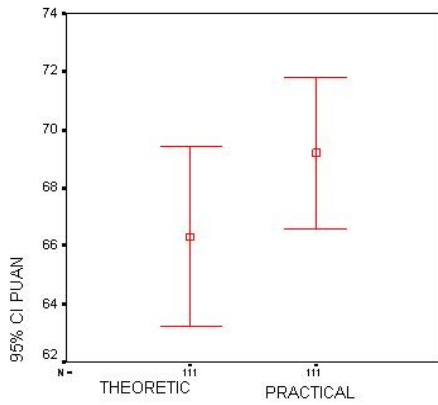


Figure 8. Variance Analysis Graphic between Theoretic Training and Practical Training

3.4.4. Evolution of Sewing Durations during Practical Training

The changes of sewing durations per day, for straight, circular, angular and curvilinear stitching are given below.

The average sewing duration of straight stitching decreased %27 in the second day and %36 in the third day compared to first day's average sewing duration.

The average sewing duration in curvilinear stitching decreased %19 in the second day and %59 in the third day compared to the first day's average sewing duration.

The average sewing duration of circular stitching decreased %22 in the second day and %30 in the third day compared to first day's average sewing duration.

The average sewing duration of angular stitching decreased %10 in the second day and %22 in the third day compared to first day's average sewing duration.

As it is seen above, the performance of the operators will get better as they gained experience.

3.5. Progress of the Operators Two Months after Training

After 2 months working, the progress of 40 candidates was evaluated by follow-up studies in terms quality and efficiency. The ratio of hourly output to

the expected unit per/hour was chosen as an evaluation method.

From 100-80 was evaluated very good, 79-65 good, 64-50 average, 49-30 poor, 29-0 bad over 100 points. The results of the levels of 2 candidates were very good, 18 were good, and 18 were medium and 2 were bad. When medium and above levels are considered, %95 of the candidates are successful.

4. CONCLUSION

As the apparel industry is labor intensive and productive and qualified manufacturing is important. In this study, the relation between personnel selection tests and trainings were examined. According to the results of variance analysis, personnel selection tests and theoretic and practical trainings assessments are compatible.

In other words, the candidates who were successful in the personnel selection tests were also successful in the both theoretic and practical trainings. Consequently, applying personnel selection tests after making interviews may contribute to select more appropriate operators for the job.

With regard to the study, education influences the result of the personnel selection test. However, grade school graduates were more successful in the theoretic training exam. To this respect, it can be said that education,

age and sex don't have effect on the success in the theoretic training solely. The success in the theoretic training depends on the individual performance and desire to learn.

There is no relationship among practical training, age and education. Vocational high school graduates were a little bit better then the others. This may be attributed to their practical applications in some lessons in the school.

Men got nearly the same results with the women but the apparel industry is women intensive. The reason for that may be due to social factors in Turkey.

Sewing times of straight, circular, curvilinear and angular stitching decreased %10-15 daily on average after practical training. Experience influences the operators' performance.

When 40 operators' performance was evaluated after two months, it was seen that %95 of the 40 operators seized the expected performance.

As the all results were associated with each other, it was precipitated that applying personnel selection tests and practical and theoretic training programs related with the job would increase the performance and would ensure its persistence.

REFERENCES

- (5)Woodard, G., Kincade, D. H., Owens S., Training of Expatriates in the Textile and Apparel Industries, *Clothing and Textiles Research Journal*,2002, vol.20; 227-237
- Silah,M., "İşletmelerde İşçi Seçme Ve İşe Yerleştirmede Psikoteknik Bir Uygulama Örneği: Giyim Sanayi Konfeksiyon Atölyelerinde Çalışacakların Seçiminde Form Lege Testi Uygulaması", *C.Ü. İktisadi ve İdari Bilimler Dergisi*, 2005, Cilt 6, Sayı 1
- Cascio, W.F., *Managing Human Resources: Productivity, Quality of Work Life, Profits*, Mcgraw-Hill, Sydney, Australia, 2002.
- Inskeep, G.C., "The Use of Psychomotor Tests to Select Some Negative Findings
- Sewing Machine Operators", *Personnel Psychology*, 1971, vol.24, 707-714.
- Ozlu, G. P., "Hazır Giyim Sektöründe Personel Seçim Sürecine İlişkin Bir Araştırma", *Tekstil ve Konfeksiyon*, 3/2006, 200-205

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