Scenario Based question – 95% confidence interval

Formative exercise

An HR organisation wishes to introduce a new set of training programs to increase the work efficiency of their employees. To do this, the organisation hires 3 vendors such that each vendor will train a group of employees with a one-week program. It is assumed that the employees across the three groups have same work efficiencies before the start of the program. The following table summarises the scores obtained post the one-week training. Each group has 8 employees.

Now, find out the mean efficiency of each vendor and determine which vendor shows a higher significance of improvement in employee efficiency statistically at the 95% level.

Group 1 scores (Vendor 1)	**Group 2 scores (Vendor 2)**	**Group 3 scores (Vendor 3)**
45	61	35
29	53	21
56	41	33
52	58	27
45	53	22
45	47	26
41	44	30
Adapted from: Rakshir, S. (2019). R for Beginners. India: McGraw Hill.		

Statistical Analysis:

Null Hypothesis (H0): The means of the three vendors are equal.

Alternative Hypothesis (H1): At least one vendor's mean is different.

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Group 1 scores (Vendor 1)	7	313	44.71429	73.57143
Group 2 scores (Vendor 2)	7	357	51	53.66667
Group 3 scores (Vendor 3)	7	194	27.71429	27.90476

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	2031.714	2	1015.857	19.64365	2.98489E-05	3.554557

Within Groups	930.8571	18	51.71429
Total	2962.571	20	

Group 2 appears to have the highest mean score of work efficiency compared to groups 1 and 3. This suggests that vendor 2 where had the better training program. The statistical test (ANOVA) demonstrated a p-value of less than 0.05 which means that the null hypothesis is rejected, and the alternative hypothesis is accepted.

To conclude vendor 2 shows a higher significance of improvement in employee efficiency than the other vendors.