

t-test

1. In calculating z-score we need
 - μ = population mean
 - σ = population standard deviation
 - When the standard deviation (σ) is not known, t-test is the alternative.

2. In **simple t-test** instead of σ , sample variance is used.
 - Sample variance (S^2) = $[SS/n-1] = [SS/df]$
 - $SS = \sum x^2 - ([\sum x]^2/n)$
 - SS = Sum of squared deviation

3. Instead of standard error σ_x , estimated standard error S_x is used.
 - Estimated standard error $S_x = S/(\sqrt{n}) = \sqrt{(S^2/n)}$
 - $t = [X - \mu]/S_x$
 - X = sample mean
 - μ = population mean (hypothesis mean)
 - S_x = estimated standard error from sample
 - The higher the the degree of freedom (df) (sample size) the closure the S^2 (sample variance) to the σ^2 (population variance)
 - Example:
 - I prefer PBL than Lecture
 - Response \rightarrow 1 = SA, 2 = A, **3** = UD, 4 = DA, 5 = SDA
 - From this example hypothesis mean (μ) = **3**
 - But μ can be getting from study that has been done by someone previously.

4. Independent measures t-test

- $t = [(X_1 - X_2) - (\mu_1 - \mu_2)] / (\text{standard error})$
- Pooled variance, $S^2_p = [SS_1 + SS_2] / [df_1 + df_2]$
- Two samples standard error, $S_{x_1 - x_2} = \sqrt{ [(S^2_p/n_1) + (S^2_p/n_1)] }$
- H_0 = there is no difference in the m=clinical performance of students attended traditional curriculum and PBL curriculum.