Analysis of Waubonsee Student CAAP Performance Versus National Test Data - 2004

To compare the mean of the local (Waubonsee) scores versus the National scores, we can use the following formula:

$$\triangle = \frac{\overline{X}_L - \overline{X}_N}{s_P} \text{ where } s_P = \sqrt{\frac{(s_L^2)(n_L) + (s_N^2)(n_N)}{n_L + n_N}}$$

$\overline{X}_L, s_L^2, n_L$	are, respectively, the mean, variance (standard deviation squared) and sample size for Waubonsee results; and
$\overline{X}_N, s_N^2, n_n$	are, respectively, the mean, variance (standard deviation squared) and sample size for National results.
s_P	is a pooled standard deviation.

If $\lvert\triangle\rvert < 0.25$,	the difference between the two means is negligible which is an indication that the local population is performing at the national average;
if $0.25 \leq \lvert\triangle\rvert < 0.5$,	there is a moderate difference between the two means; and
if $\lvert\triangle\rvert \geq 0.5$,	the difference between the two means is substantial.

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Writing Skills

$$\overline{X}_L = 61.9 \quad \overline{X}_N = 62.3$$
$$s_L = 4.3 \qquad s_N = 4.7$$
$$n_L = 55 \qquad n_N = 27,875$$
$$s_P = \sqrt{\frac{(4.3^2)(55) + (4.7^2)(27875)}{55 + 27875}} = 4.70$$
$$\triangle = \frac{61.9 - 62.3}{4.70} = -0.09$$

Since $|\triangle| < 0.25$, then we can say the difference between the two means is negligible. For the Writing Skills test, the Waubonsee students perform at the National mean.

Mathematics

$$\overline{X}_L = 56.6 \quad \overline{X}_N = 56.1$$
$$s_L = 3.4 \qquad s_N = 3.6$$
$$n_L = 21 \qquad n_N = 20,320$$
$$s_P = \sqrt{\frac{(3.4^2)(21) + (3.6^2)(20320)}{21 + 20320}} = 3.60$$
$$\triangle = \frac{56.6 - 56.1}{3.60} = .14$$

Since $|\triangle| < 0.25$, then we can say the difference between the two means is negligible. For the Mathematics test, the Waubonsee students perform at the National mean.

Reading

$$\overline{X}_L = 58.7 \quad \overline{X}_N = 60.4$$
$$s_L = 5.9 \qquad s_N = 5.3$$
$$n_L = 72 \qquad n_N = 27,446$$
$$s_P = \sqrt{\frac{(5.9^2)(72) + (5.3^2)(27446)}{72 + 27446}} = 5.30$$
$$\triangle = \frac{58.7 - 60.4}{5.30} = -0.32$$

Since $0.25 \leq |\triangle| < 0.5$, then we can say the difference between the two means is moderate. For the Reading test, the Waubonsee students seem to be performing moderately lower than the National mean.

Analysis of Waubonsee Student CAAP Performance Versus National Test Data - 2004

Critical Thinking

$$\overline{X}_L = 58.6 \quad \overline{X}_N = 60.5$$
$$s_L = 5.3 \quad s_N = 5.4$$
$$n_L = 87 \quad n_N = 20,970$$
$$s_P = \sqrt{\frac{(5.3^2)(87) + (5.4^2)(20970)}{87 + 20970}} = 5.40$$
$$\triangle = \frac{58.6.9 - 60.5}{5.40} = -0.35$$

Since $0.25 \leq |\triangle| < 0.5$, then we can say the difference between the two means is moderate. For the Critical Thinking test, the Waubonsee students seem to be performing moderately lower than the National mean.

Science

$$\overline{X}_L = 58.4 \quad \overline{X}_N = 59.0$$
$$s_L = 4.0 \quad s_N = 4.1$$
$$n_L = 180 \quad n_N = 17,675$$
$$s_P = \sqrt{\frac{(4.0^2)(180) + (4.1^2)(17675)}{180 + 17675}} = 4.10$$
$$\triangle = \frac{58.4 - 59.0}{4.10} = -0.15$$

Since $|\triangle| < 0.25$, then we can say the difference between the two means is negligible. For the Science test, the Waubonsee students perform at the National mean.