The purpose of this research was to compare the parameter estimators in terms of empirical unbiasedness, consistency, and efficiency of the means and variances of mathematics achievement scores obtained from multi-stage random sampling employing different techniques: stratified sampling, two-stage stratified sampling, and cluster sampling, each of which were also compared between simple and systematic sampling techniques.  The sampling techniques were investigated under three different sample sizes which were computed from three percentages of confidence levels : 90% (785), 95% (1,070) and 99% (1,664)

Monte Carlo simulation was employed for this study.  The simulations were made on the real data, the score of 7,298 Pratom Suksa six students in the academic year 2536; with 1,000 repetitions for each case.
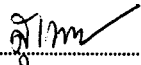
The major findings were as follows :
1.   The means obtained from different techniques were unbiased except for the small sample size (785) using the cluster sampling technique.
2.   The consistency of the means were found on every sampling technique.
3.   The highest relative efficiency of the means was the stratified technique followed by the systematic random sampling technique.  The stratified technique followed by the simple random sampling technique was the second.  The lowest relative efficiency of the means obtained from the cluster sampling technique.
4.   When the stratified technique was employed at the first stage.  The estimators obtained from the systematic random sampling technique at the last stage have shown higher properties (unbiasedness, consistency, and relative efficiency), than the technique using simple random sampling at the last stage.

When the cluster technique was employed at the first stage, it was found that the properties of estimators obtained from the simple random sampling technique at the last stage were higher than those obtained from systematic random sampling technique.