

# **Application of Statistical Process Control to Evaluate the Effectiveness of Replacing Ordinary Plumbing Fixtures in an Educational Institution**

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## **Abstract**

Water conservation is a theme of great importance and it is directly associated to quality of life. Within this context, water saving plumbing fixtures are options for consumption reduction. This study will assess whether the replacement of ordinary taps with water saving plumbing fixtures in a university campus is effective. With this goal, CUSUM control charts (Cumulative Sum) and the EWMA chart (Exponentially Weighted Moving Average) were applied. These charts are suitable to monitor processes subject to small changes, and the decision concerning the statistical control state is based on information accumulated from previous samples and not only on the last of them. With these charts, it is possible to identify the moment in time in which a change in the process occurs. The study was divided into two stages: measuring before the intervention and after the replacement of ordinary taps with water saving devices. Both CUSUM and EWMA charts indicate that after the equipment replacement there is a reduction in water consumption.

**Keywords:** Water consumption, CUSUM, EWMA.