



**EFFECTS OF INSTRUCTION USING THE 4MAT SYSTEM ON CHEMISTRY
ACADEMIC ACHIEVEMENT AND REASONING ABILITY
OF THE TENTH GRADE STUDENTS, BHUTAN**

**BY
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The objectives of this research were to investigate the effects of instruction using the 4MAT System on "Acids, Bases, and Salts" in Chemistry on the tenth grade students' academic achievement and reasoning ability. One group experiment with pretest and posttest design was adopted to study the effects. The subjects of the study were 31 students from one the four sections of the tenth grade which was selected purposively with the assumption that the subjects had relatively varied learning abilities. The research instruments were academic achievement test, reasoning ability test and lesson plans. The statistics used for data analysis were mean, standard deviation, and dependent paired sample t-test. By applying the paired sample t-test on the means of academic achievement tests, it showed a significant increase in the mean gain at .05 levels. Similarly, result of paired sample t-test for reasoning ability showed significant difference at .05 of the pretest and posttest means. It was concluded that the 4MAT System was effective in improving the academic achievement and reasoning ability in teaching "Acids, Bases, and Salts" in Chemistry.

Student's Signature: Thesis Advisor's Signature: