



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

Name(s) Ilang M. Guiroy	Project Number S0311
Project Title Quantitative EEG as an Identifier of Learning Modality	
Abstract Objectives/Goals In the current educational system, students who are highly modal learners miss out on a portion of their education. One feasible solution offered to this dilemma is for the educational system to adapt to the learning modality of the student with the use of a quantitative measure of her learning modality. Methods/Materials This study offers a new method that uses the measure of mental focus while a person is being taught in different learning modalities in order to create a numerical measure using brain waves. Twenty students with a mean age of sixteen were included in the study. Each subject was given an assessment, which stimulated learning in three modalities: auditory, tactile/kinesthetic and visual. While learning, the subject's frontal lobe brain activity was monitored using electroencephalograph (EEG) sensors. Brainwave data were processed in real time by a computer software program using a ratio derived from theta and alpha brainwaves as a measure of mental focus (Quantitative EEG (QEEG)). Results In this study, QEEG identified a preferred learning modality 86% of the time indicating that the learning modality of a student can be identified from brainwave activity. Conclusions/Discussion This quantitative EEG identifier of learning modality will offer educators a new set of tools to adapt their teaching to match the needs of the students.	
Summary Statement Quantitative EEG can be used to identify learning modality correctly 86% of the time.	
Help Received Lee Learning Center provided sensors and testing site, Linda and Mike Lee acted as sounding boards for ideas, and Dave Murray aided with the statistical analysis.	