



UNIVERSITI
TEKNOLOGI
MARA

Institut
Pengajian
Siswazah

THE DOCTORAL RESEARCH ABSTRACTS

Volume: 14, October 2018

14th
ISSUE



Name : NAZRE BIN ABDUL RASHID

Title : LEARNER'S BRAIN ELECTROECEPTALOGRAM SUBBANDS FOR KOLB'S LEARNING STYLE CLASSIFICATION

Supervisor : PROF. IR. TS. DR. HJ. MOHD NASIR TAIB (MS)

Learning has been connected specifically to a human brain whereby brain's capacities such as thinking, short and long term memory are considered among the most critical modalities of learners. On the other hand, Learning Style (LS) had been widely accepted in education domain with the emergence of several LS models. Nevertheless, the models used only questionnaire-based Learning Style Inventory (LSI) in the LS determination process which exposed to inaccuracy. As such, this research proposes a new method whereby Electroencephalogram (EEG) signals are used hand-in-hand with the traditional LSI for Kolb's LS classification establishment. The research also aimed to determine the EEG sub-bands that could best classify the Kolb's LS and outline their characteristics. A total of 131 subjects were classified into their particular Kolb's LS of Diverger (n=33), Assimilator (n=36), Converger (n=32) or Accommodator (n=30) using the Kolb's Learning Style Inventory (KLSI) Workbook 3.1 by Haygroup®. Then, the subjects EEG signals were acquired using WaveRider Pro hardware and its accompanying software, Waveware. The EEG signals were recorded in the baseline condition of Open Eyes and Close Eyes at the frontal area of the scalp that divided to left and right position. For analysis, the signals were processed and generated as a Baseline Summative EEG (BSE) datasets. Statistical Analysis of SPSS 16 namely Descriptive Analysis, Normality Test,

One-Way ANOVA and TwoStep Cluster Analysis were used to analyse the BSE. Beta Left, Beta Right, Alpha Left, Alpha Right, Theta Left, Theta Right, Delta Left and Delta Right in Open Eyes and Close Eyes were examined in term of its Means, Standard Deviation, Skewness and Kurtosis. Next, normal distribution of each sub-band was looked into using the Shapiro-Wilk test. The sub-bands were also tested using One-Way ANOVA for Means comparison between LS groups. Based on the ANOVA and Post-Hoc Tukey Honest Significant Difference (HSD) result, it has been found that the sub-bands of Theta Left and Delta Left in Open Eyes and Beta Left and Delta Left in Close Eyes were the best classifier for Kolb's LS. The output of TwoStep Cluster Analysis proved the selection was correct as LS were 100% classified by these sub-bands dependent to the particular Kolb's LS. On top of that, the research had established that the LS Accommodator is the best classified LS by the selected sub-bands. In a nutshell, the research has successfully pointed-out the best EEG sub-bands that could be utilized in Kolb's LS classification.