The program design of EEG analysis for e-learning

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ABSTRACT

In recent years, the exploration of Context-Aware Learning has been mainly through the use of technology of sensors, wireless communication and mobile devices to proceed to the suitable learning. The existing researches of Context-Aware Learning are mostly of mobile learning, using sensor components such as GPS that can detect geographic locations and RFID that can identify objects, to perceive the learner ’ s external conditions. Basically, the mentioned sensor components are all functioning to catch the perception of the learner ’ s external conditions, and feed the perceived data into digital learning system for interactions. The relevant studies are all confined to how to integrate the external conditions of the learner ’ s geographic location or the learner ’ s identity into the interactive digital learning environment. Rarely explored and created are the digital learning environment that actively perceives the learner ’ s internal conditions such as the physical and mental statuses and the learning capacity, to strengthen the existing Context-Aware Learning environment and to effectively improve individual or group learning interests and efficiency. The idea of this research was based on cognitive neuroscience; by colleting learners ’ brain waves with EEG sensors, Learning Energy Index (LEI) was established by using a brain-wave learning energy analysis program. LEI may provide learners the evidences of learning effects during online learning. This research analyzed and discussed all the different EEG properties during learners ’ diverse learning, and it also discussed the differences in EEG of traditional textbook-learning and that of multimedia-material learning. Additionally, this research also reviewed literature related to the ideas of if sports are advantageous for learning and if Game-based Learning is Positive Learning.

Keywords : Context-Aware Learning、EEG、Cognitive Neuroscience、Game – based Learning

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