On Interdisciplinary Comparative Study of Analogical Feedback/Assessment Models Applied in Blended Learning Versus Computer Aided Learning using Artificial Neural Networks

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Abstract

This paper provides educationalists as well as researchers in computer science and engineering with a study of an interdisciplinary challenging pedagogical issue. More specifically, that presented study resulting in a set of interesting findings originated from adopted realistic Artificial Neural Network's (ANNs) modeling, which associated to two educational analogical feedback / assessment processes. This piece of research considers comparative analysis and evaluation study of an educational phenomenon issue for two diverse teaching/learning methodologies namely:{Blended Learning (BL), and Computer Aided Learning (CAL)}. More precisely, introduced issue of this work addresses the two summative and formative assessment processes applied in educational field practice. Accordingly, this issue concerned mainly with modeling of two practical field case studies considering the two items of educational feedback/assessment. In other words, assessment is used in many ways in education, a great deal of attention is now given to its use in helping teaching and learning, described as the two performance assessment items (summative and formative). These both are classified as: assessment for learning (A f L), or formative assessment. and assessment of learning (A O L),
or summative assessment. It is noticed that (A f L), did predict a substantial amount of course outcome and its validity observed to pave the way for diagnostic use and remedial teaching. However, (A O L) is focused on summarizing what students know or can do at certain times in order to report their academic progress, and achievement. Herein, two parametric factor values of ANN (gain, and learning rate factors), have been considered for the two suggested instructional methodologies. That is considered in order to compare, analyze, and evaluate dynamically two items of academic performance namely: (Academic achievement outcome & Learning convergence time) for both methodologies. Interestingly, after running of realistic ANN computer modeling for different numbers of neurons -that are contributing to learning process-results in a investigative, comprehensive, and innovative systematic analysis of individual students' differences. Finally, after performing perceptive evaluation comparing between two case studies of obtained experimental field results, two interesting findings have been concluded. Firstly, while comparing computed sets of statistical parameters, associated to the presented instructional methodologies (BL&CAL). that resulted in the observed analogy between both sets. Secondly, in the context of Feedback/Assessment performance, regarding both (BL& CAL) ; either Formative, or Summative feedback /assessments, have been observed to be well analogous to each other.

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**Index Terms**

- Computer Science
- Artificial Intelligence

**Keywords**

- Blended learning; Brain based learning; Computer Aided Learning; Neural Networks Modeling; Formative, and summative feedback /assessments.