The Application of Machine Learning in Evaluating the Effectiveness of Customized AI-Based Lessons for Teaching Fundamental Concepts in Mathematics and Statistics

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Abstract

We use statistical analysis and machine learning techniques (e.g. Support Vector Machines, Logistic Regression, Decision Trees, and Multiple Regression) to test the effectiveness of modern customized lessons (generated using multiple AI tools and applications) for teaching/learning of fundamental mathematical/statistical concepts. A customized data dashboard is used to monitor the performance of individuals using these visual tools and techniques for learning.

We compare the effectiveness of two different methods in teaching/learning of various fundamental concepts in mathematics/statistics: The traditional method where the concept is presented in an abstract form versus a proposed modern/AI-based method where the abstract concept is blended with humorous/meaningful/interesting stories based on important/relevant facts/data.

With the emergence of various advanced software and AI tools, teaching the computational part of mathematics has become less important and deep understanding of fundamental mathematical/statistical concepts has instead become more important. Developing an analytical mind for logical decision making based on important facts/data is the backbone of democracy in any society. We hope that this study leads to more awareness about the importance of effective teaching/learning of fundamental concepts of mathematics/statistics and its impact on society.

Keywords

Machine learning, Effectiveness of customized AI-based lessons, Fundamental concepts in mathematics/statistics.