A Study for the Development of Automated Essay Scoring (AES) in Malaysian English Test Environment

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Abstract—**Automated Essay Scoring (AES) is the use of specialized computer programs to assign grades to essays written in an educational assessment context. It is developed to overcome time, cost, and reliability issues in writing assessment. Most of the contemporary AES are *"western"* proprietary product, designed for native English speakers, where the source code is not made available to public and the assessment criteria may tend to be associated with the scoring rubrics of a particular English test context. Therefore, such AES may not be appropriate to be directly adopted in Malaysia context. There is no actual software development work found in building an AES for Malaysian English test environment. As such, this work is carried out as the study for formulating the requirement of a local AES, targeted for Malaysia's essay assessment environment. In our work, we assessed a well-known AES called LightSide for determining its suitability in our local context. We use various Machine Learning technique provided by LightSide to predict the score of Malaysian University English Test (MUET) essays; and compare its performance, i.e. the percentage of exact agreement of LightSide with the human score of the essays. Besides, we review and discuss the theoretical aspect of the AES, i.e. its state-of-the-art, reliability and validity requirement. The finding in this paper will be used as the basis of our future work in developing a local AES, namely Intelligent Essay Grader (IEG), for Malaysian English test environment.**

Keywords—**Automated Essay Scoring (AES), Innovative Computing, Intelligent System in Education, Natural Language Processing, Artificial Intelligence**

I. INTRODUCTION

Automated Essay Scoring (AES) is defined as the computer technology that evaluates and scores the written prose [1]. AES is developed with the objective to overcome time, cost, and reliability issues in writing assessment. As an example, it can be employed in low-stakes classroom assessment for easing the teachers in their essay marking routine. On the other aspect, it can be adopted in the large-scale high-stakes assessment, for the sake of reliability, where the AES can be served as the second or third rater.

The advancement of Information Technology, namely the Internet and Artificial Intelligence facilitates the growing interest in AES application. While the former provides the common platform to submit digitized text for assessment; the later formulates the corresponding algorithm for such assessment. The state-of-the-art in AES reached its fever pitch few years ago, as illustrated by two events below:

- In April 2013, EdX, the MIT and Harvard's Massive Open Online Course (MOOC) Federation announced that they will use a machine-based AES application to assess written work in their MOOCs [2].
- In February 2012, the Hewlett Foundation sponsored an Automated Student Assessment Prize (ASAP) competition on Kaggle, calling for data scientists to develop fast, effective and affordable solutions for automated grading of student-written essays [3].