



SINGAPORE UNIVERSITY OF  
TECHNOLOGY AND DESIGN

**Rethinking Education and Learning**

**Developing a Personalised Learning Experience for Improving Writing Skills**

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## Problem

Traditional paradigms of a “one size fits all” educational approach in writing fall short in addressing the unique learning needs of students. This causes unstrategic learning outcomes that are frustrating for students and teachers alike.

## Solution

Modern adaptive learning systems tailor learning experiences to the unique needs of students to improve writing skills<sup>1</sup> based on their learning preferences, topics of interest and writing abilities and style. The user journey is outlined below.

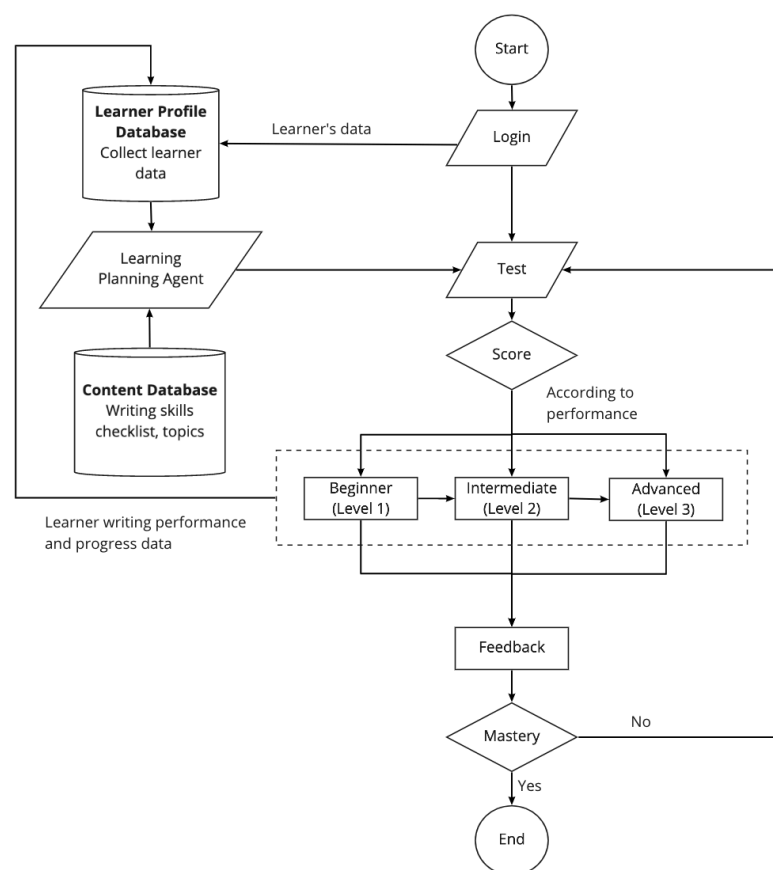


Figure 1: Data flow diagram

<sup>1</sup>[https://www.researchgate.net/publication/319217963\\_Designing\\_an\\_Adaptive\\_Learning\\_Environment\\_to\\_Improve\\_Writing\\_Skills\\_and\\_Usability\\_for\\_EFL\\_Students\\_at\\_the\\_Faculty\\_of\\_Education](https://www.researchgate.net/publication/319217963_Designing_an_Adaptive_Learning_Environment_to_Improve_Writing_Skills_and_Usability_for_EFL_Students_at_the_Faculty_of_Education)

The system's learning planning agent generates questions based on the learner's knowledge and preferences. It then identifies gaps in the written submission and gives personalised feedback following a skills checklist:

1. Content-related skills (topic sentence, supporting sentences, appropriate conclusion, relevancy, adequacy of content)
2. Style-related skills (cohesion, coherence, word choice, expression quality, sentence structure variety)
3. Spelling and punctuation
4. Grammar (verb tenses, phrasal verbs, prepositions, etc)

The mastery of writing skills is achieved through "levelling up" in meeting the skills checklist. Feedback includes recommending sample essays, resources such as videos or readings depending on learning styles and topics of interest, and suggesting ways to improve writing in the form of synonyms, sentence structure, and more.

## **Data Sets**

ASAP-AEG dataset<sup>2</sup> with over 13000 essays across 8 prompts could be in used to train and test systems in generating questions and grading essays based on content, style, organisation and more<sup>3</sup>. The BEA Shared Task – 2019 dataset could also be used for training spelling, punctuation, grammatical and word choice errors corrections.<sup>4</sup>

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<sup>2</sup> <https://www.kaggle.com/c/asap-aes/data>

<sup>3</sup> <https://www.aclweb.org/anthology/L18-1187.pdf>

<sup>4</sup> [http://nlpprogress.com/english/grammatical\\_error\\_correction.html](http://nlpprogress.com/english/grammatical_error_correction.html)