Ethiopian Literacy Rate Analysis & Personalized Learning using Deep Learning

**Background:** Education is the pillar that makes other sustainable development goals productive and achievable(Saini et al., 2023). Furthermore, quality education is part of the Sustainable Development Goals (SDGs)(Saini et al., 2023). However, the literacy rate must be assessed to determine how effectively certain groups access quality education. To ensure quality education, it is essential to analyze the inclusiveness of the education provided from various perspectives(Urata et al., 2023). This requires a data-driven assessment of Ethiopia's education quality through literacy testing.

Modern education is evolving into a personalized learning experience that adapts to better understand learner behavior. Consequently, developed countries are embracing data-driven approaches to education, demonstrating that technology is rapidly advancing the education system in these nations. However, education in developing countries faces numerous challenges, including security issues, instability, economic difficulties, and a lack of technological advancements(Asfaw et al., 2023). The gap in technology use between developed and developing countries has resulted in an exponentially increasing divide.

**Objective:** The main objective of this project is to develop an AI-driven system for assessing literacy levels and adapting teaching methods to enhance individual reading and writing skills. To meet this main objective, this project will answer the following questions: (1) How do we prepare the dataset from a real-world problem? (2) What are the students' literacy levels about meeting the SDGs? (3) To what extent will the identified gaps in different groups affect the attainment of the SDGs? (4) How do we develop a model that enhances education to meet the SDGs? (5) How do we deploy a system using a developed model and test it?

**Methods:** The dataset will be acquired from The Humanitarian Data Exchange and MOE, [data.humdata.org](https://data.humdata.org/dataset/ethiopian_primary-secondary_school_population_by_gender). The file extension of our data was a .csv file extension. Starting with [data acquisition](https://s3.us-east-1.amazonaws.com/hdx-production-filestore/resources/d875aa06-f53b-4b0f-93f2-01f307172a37/ethiopian_primarysecondary_school_population_by_gender.csv?AWSAccessKeyId=AKIAXYC32WNAR4IVQZNB&Signature=zdeM5E0ri%2BPBeX4CDOqHE0YzrZc%3D&Expires=1743538013), we will perform data pre-processing, analysis, model development, testing, and system development. Deep learning algorithms have the power to discover hidden patterns within complex datasets. The accuracy of deep learning algorithms will be compared on our dataset. The highly performing algorithm will be used for the model development. The system will be developed from the model. To do so, the following front-end and back-end materials will be used: Python, Django, and SQLite.

**Expected Outcome:** We are going to analyze different variables from our dataset, which are directly related to the Sustainable Development Goals, or against them, by enhancing quality education. Based on our findings, we recommend them to policymakers and enable our model to work on the problem using a personalized tutor to meet the SDGs.

**Reference**

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