The potential of utilizing generative AI in literacy education

Kyoto Municipal Horikawa Highschool

What is Literacy rate?

Definition: **Reading and writing** with understanding a short simple statement
Age: 15+
World literacy rate：88% (2024)

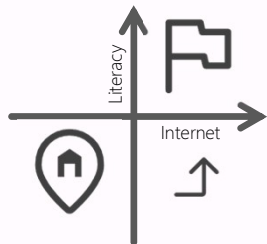About **976.8 million** people are currently in a state of illiteracy. [1]

Development of AI

ChatGPT   ＊ Claude
◇ Gemini   Microsoft Copilot

Generative AI ✕ Literacy Education ?

Positive correlation ; Internet penetration rates / Literacy rates [2]

Africa etc. : **limited access** to personal devices and school-based digital equipment
poor internet connectivity

<International Telecommunication Union's (ITU) policy aim>
100% internet connectivity in schools by 2030 [3]

Internet use for education

4 QUALITY EDUCATION — Aim to improve **literacy rates** by utilizing **generative AI** in **primary educational institutions**

Effect of KitKit School in literacy [4]

KitKit School   Traditional Education

Early **G**rade **R**eading **A**ssessment

1. Syllables Sound Fluency
2. Familiar Word
3. Invented Word
4. Oral Reading Fluency
5. Reading Comprehension
6. Listening Comprehension
7. Writing - Dictation

Average gains of the treatment group were **4 to 5 times greater** than the control group

	KitKit School		Traditional Education
Flexibility in learning pace	◎		△
Flexibility of space	◎		△
Burden on teachers	◎		✕
Offline use	○		◎
Time flexibility	◎		△

Validation

Target: **Morocco**

The rate of internet access for educational purposes in primary schools remained at around 75% from 2017 to 2024.

Calculation

Factors affecting changes in the literate population: International migration, Deaths of literate people, Primary education
(Number of people who acquire literacy through primary education)= (Increase in the literate population) – (Number of deaths among literate people) + (International migration of literate people)
(Number of people completing primary education over a 10-year period) = Σ (Population at the age corresponding to the final grade of primary education)✕(Net primary school enrollment rate),2014–24
(Population that completed primary education but remains illiterate) = (Number of primary education completers over 10 years) – (Number of people who acquired literacy through primary education)
A perfect score (14 points total across both components) is defined as the criterion for literacy.
(Total writing and reading score)= (Average score on the writing and reading test) ✕ (Number of participants)
(Per-capita total score)= (Total writing and reading score) / (Number of participants evaluated)
(Learning effect of AI)= (Number of months required to achieve a perfect score using KitKit) / (Number of months required by the control group to achieve a perfect score)
(Time-constraint ratio)= (Duration of primary education: 60 months) / (Number of months required to acquire literacy using KitKit)
(Effect of generative AI in primary education)= (Time-constraint ratio) ✕ (Learning effect)
(Increase in the educated population due to AI)= (Effect size of generative AI in primary education) ✕ (Population that completed primary education but remains illiterate)
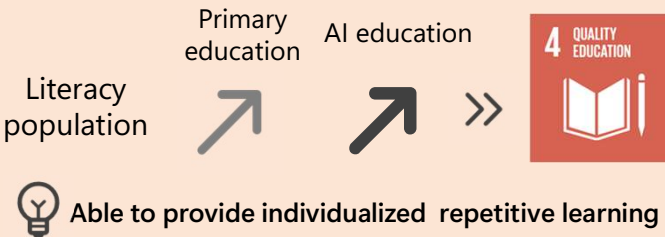
Data Source

net migration, primary school enrollment: world bank open data
population: population pyramid open data
Illiterate population, school internet rate, age specific literacy rate, last age population of primary school: UIS data
KitKit: Global Learning XPRIZE Field Test Data Report Kitkit School [4]

Result

Increase : **866,166**

	Present Situation	AI Education
Literacy rate	80.38% >	**82.66%**
Gain in primary education	61.43% >	**73.91%**

Discussion

Literacy population → Primary education → AI education ≫ 4 QUALITY EDUCATION

💡 **Able to provide individualized repetitive learning**

Future Tasks

- Validity of the calculation
- Certainty of internet penetration
- Support for unsupported language
- Introducing in areas with low enrollment rates

References

[1]UNESCO International Literacy Late 2025
[2]Explaining Education Level and Internet Penetration
[3]Economic Reasoning - Worldwide Analysis from 2000 through 2010
[4] Global Learning XPRIZE Field Test Data Report Kitkit School