

A Pilot Use of a Customised Generative AI Platform to Aid the Production of English Language Reading Comprehension Assessment

Presentation Outline

- Use of AI Technology in Item Generation
- Item Writing for Reading Assessments
- Generative AI for Reading Assessments
- Summary

Use of AI Technology in Item Generation

From Generic to Specialised

- Development of Large Language Models (LLMs)
- Recent studies on the use of ChatGPT in the generation of
 - reading passages (Bezirhan and von Davier, 2023)
 - reading comprehension multiple-choice items (Lin and Chen, 2024)
- ... *the results revealed that **carefully designed prompts with adequate audience information** GPT-3 can generate passages that align with the difficulty level of human-authored passages.*

From Generic to Specialised

- Customised generative AI platform
- Model specificity (use of training materials / AI model selection)
- Cognitive complexity
- Interface design
- Item metrics (type-token index, Flesch Reading Ease score)
- IP and security measures (material created not used for further training)
- AI-Human hybrid item development approach

Item Writing for Reading Assessments

Reading Text and Items

Reading Text



Items

- Genre
- Text type
- Topic
- Format and style
- Organisation
- Sentence structure
- Vocabulary
- Word count

- Skill
- Question type
- Question intent
- Level of difficulty
- Clarity and unambiguity
- Diagnostic feedback

Anatomy of an Item

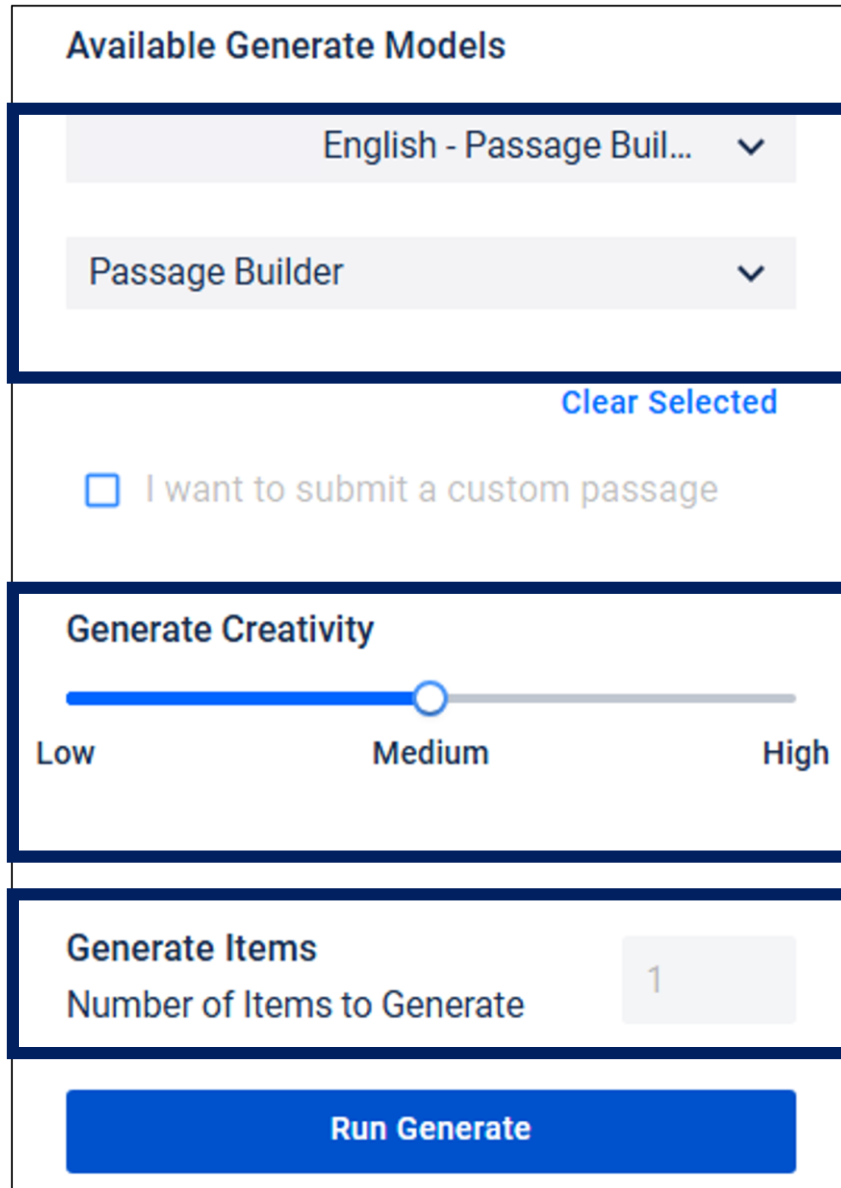
1. Who is the author of the book? ← **Stem**

- Options** {
- ☐ A. Amy Lam
 - ☐ B. Derek Chu
 - ☒ C. Fiona Koo
 - ☐ D. James Lee
- Key / Correct Answer** ←
- Distractors** {
-

Generative AI

For Reading Assessments

Customised Generative AI Platform



The interface is titled "Available Generate Models". It contains three main sections highlighted by blue boxes:

- Section 1:** A dropdown menu showing "English - Passage Buil..." and another dropdown menu showing "Passage Builder". Below these is a "Clear Selected" link.
- Section 2:** A checkbox labeled "I want to submit a custom passage" which is currently unchecked.
- Section 3:** A "Generate Creativity" slider ranging from "Low" to "High", with the slider positioned at "Medium".

Below these sections is a "Generate Items" section with a text input field labeled "Number of Items to Generate" containing the value "1". At the bottom is a blue button labeled "Run Generate".

1

Available generate models:
1. passage builder
2. item set

2

Generate creativity

3

No. of items to generate

Generate Model: Passage Builder

Passage Builder

Save Passage

A fun day at the beach

1

Actions

Selected ☒

Story; introduction, Mr Lee and his kids, Sammy and Lily; 30 words

2

One sunny day, Mr. Lee decided to take his kids, Sammy and Lily, to the beach. He packed a picnic, their swimwear, towels, and a beach ball.

27 words

Item Outline Metrics Comments Metadata

Item Metrics

3

Word Count	27.0
Type-Token Ratio	0.9
Flesch Reading Ease	88.0
Flesch-Kincaid Grade Level	3.2
Coleman-Liau Index	3.8

Generate Model: Item Set

a selection
of question
intents



Scanning for specific information

Skimming for gist

Sequencing events

Identifying main ideas

Identifying details that support a main idea

Making inferences

Working out the meaning of unknown words by recognizing prefixes and suffixes

Predicting the likely development of the text

Understanding the connection between ideas by identifying a range of cohesive devices

Recognizing key words in a sentence

Predicting the content using the book covers, picture cues, prior knowledge and personal experience

Predicting the meaning of unfamiliar words by using picture cues and contextual clues

Recognizing formulaic or common expressions

Recognizing repetitive language patterns

Understanding the functions of basic punctuation

Locating words in English dictionaries

Locating information in simple price lists, charts and directories

Obtaining information about the reading materials from the blurbs, glossaries, book covers, tables of contents

Locating vocabulary in the word cards or word charts

Making word cards or word books under different topics for reference

Using picture dictionaries or word books to check meaning and spelling

Rhyme

item-set-1c1e34f3

Click above to edit item set title. 128 characters max.

Flesch-Kincaid Grade Level 4.84

363 words

10 No Image

0 Items added

0 Items hidden

☐ Item ordering

Passages

Comments

^ A fun day at the beach

Grade Level 4.84363 words

It was a beautiful Sunday morning. The Lee family decided to have a day out at Shek O Beach. Their car zoomed along the highway, and in no time they arrived at the beach.

"Beep beep!" Mr. Lee honked the car horn as they parked at the beach parking lot. The children, Sammy and Lily, couldn't wait to get out of the car. They tumbled out with their buckets and spades, ready for a fun day in the sun.

In their picnic basket, Mrs. Lee packed lunch: yummy sandwiches, juicy watermelon, and cold lemonade. For fun, they had brought a frisbee, a beach ball and Sammy's new kite.

To protect from the sun, they had sunblock, hats, and a large beach umbrella. The kids, Sammy and Lily, were very excited. They quickly found a spot, spread the beach mats, and placed the umbrella in the sand.

Sammy and Lily darted off to the water's edge with their buckets and spades. "Look, Mum, I've found a crab!" shouted Sammy, holding out his bucket with a small crab scrambling at the bottom. Lily built a sandcastle, intricately shaping the towers and walls.

Which of the following items did the Lee family NOT bring to the beach?

Using a range of reading strategies to understand the meaning of simple texts with the help of cues

Scanning for specific information

No Image

14 words

Item

Comments

Metadata

Add to Set +

Hide

Clone

Delete

Item Stem:↻

Which of the following items did the Lee family NOT bring to the beach?

Options:↻

Option ordering

(A) Sandwiches

☐ Key

☐ Distractor

☒ Excluded

Add Rationale

(B) Lemonade

Using a range of reading strategies to understand the meaning of simple texts with the help of cues

Making inferences

No Image

26 words

Item

Comments

Metadata

Add to Set +

Hide

Clone

Delete

Item Stem: ↺

👍 🗨

Why did Lily say "There goes my fabulous castle!"?

Options: ↺

☐ Option ordering

(A) Mr. Lee fell onto her sandcastle.

☒ Key ☐ Distractor ☐ Excluded Add Rationale ▾

(B) Sammy knocked her sandcastle over.

☐ Key ☒ Distractor ☐ Excluded Hide Rationale ▲

Rationale

Sammy built the sandcastle with Lily.

✕

Add Another

Poem

Version 1



Prompt: A poem with 3 stanzas about Chinese New Year

Stanza 1

In the heart of winter, joy is alive,
As Chinese New Year does arrive.
Red lanterns hanging high and bright,
Fill homes with warmth and light.

Stanza 2

Lucky money in red envelopes bring,
A chance for children's laughter to ring.
Dragon and lion dances in the streets,
To happy drums and cymbal beats.

Stanza 3

Firecrackers frighten the old Nian away,
Welcoming in the New Year's Day.
A time for family, food, and fun,
Chinese New Year, a new cycle's begun.

Poem

Version 1



Prompt: A poem with 3 stanzas about Chinese New Year

Stanza 1

In the heart of winter, joy is alive,
As Chinese New Year does arrive.
Red lanterns hanging high and bright,
Fill homes with warmth and light.

Stanza 2

Lucky money in red envelopes bring,
A chance for children's laughter to ring.
Dragon and lion dances in the streets,
To happy drums and **cymbal** beats.

Stanza 3

Firecrackers frighten the **old Nian** away,
Welcoming in the New Year's Day.
A time for family, food, and fun,
Chinese New Year, a new cycle's begun.

Poem ...Version 5

Prompt: A poem with 3 stanzas about Chinese New Year

Stanza 1

Families gather from far and near,
To celebrate the Lunar New Year.
With laughter, blessings and good cheer,
They bid goodbye to the passing year.

Stanza 2

Firecrackers burn so bright,
Filling the darkness with colorful light.
Dragon dances take flight,
In the shimmering night, a spectacular sight.

Stanza 3

Enjoying feasts of so many flavors,
Sharing tales of the past years' labors.
Happy faces, warm embraces,
Celebrating New Year's graces.

Poem ...Version 5

Prompt: A poem with 3 stanzas about Chinese New Year

Stanza 1

Families gather from far and near,
To celebrate the Lunar New Year.
With laughter, blessings and good cheer,
They bid goodbye to the passing year.

Stanza 2

Firecrackers burn so bright,
Filling the darkness with colorful light.
Dragon dances take flight,
In the shimmering night, a spectacular sight.

Stanza 3

Enjoying feasts of so many flavors,
Sharing tales of the past years' labors.
Happy faces, warm embraces,
Celebrating New Year's graces.

Poem

Stanza 1

New prompt: A poem about Chinese New Year; first stanza about what people do to prepare for it

Version 1

Chinese New Year is here,
Clean the house, spread the cheer.
Out with the old, in with the new,
Make space for the blessings to come
through

Version 2

Two weeks before Chinese New Year
begins,
Washes and brushes and tidy up bins.
Houses are cleaned from bottom to top,
In every home, work doesn't stop.

Poem

Stanza 1

New prompt: A poem about Chinese New Year; first stanza about what people do to prepare for it

Version 1

Chinese New Year is here,
Clean the house, spread the cheer.
Out with the old, in with the new,
Make space for the blessings to come through

Version 2

Two weeks before Chinese New Year
begins,
Washes and brushes and tidy up bins.
Houses are cleaned from bottom to top,
In every home, work doesn't stop.

Poem

Stanza 2

New prompt: Second stanza about what people do the night before Chinese New Year; add a simile

Version 1

On New Year's Eve, as lively as a street fair,
Families gather from here and there.
Tables filled with food, exquisite and rare,
This is a time to laugh and share.

Version 2

On New Year's Eve families together dine,
Feasting on food, rich and fine.
Like bees around a honey pot,
Everyone is busy, hot and hot.

Poem

Stanza 2

New prompt: Second stanza about what people do the night before Chinese New Year; add a simile

Version 1

On New Year's Eve, as lively as a street fair,

Families gather from here and there.

Tables filled with food, exquisite and rare,

This is a time to laugh and share.

Version 2

On New Year's Eve families together dine,

Feasting on food, rich and fine.

Like bees around a honey pot,

Everyone is busy, hot and hot.

Poem

Stanza 2

New prompt: Second stanza about what people do the night before Chinese New Year; add a simile

Version 1

On New Year's Eve, as lively as a street fair,

Families gather from here and there.

Tables filled with food, exquisite and rare,

This is a time to laugh and share.

Version 2

On New Year's Eve families together dine,

Feasting on food, rich and fine.

Like bees around a honey pot,

Everyone is busy, hot and hot.

Poem

Stanza 3

New prompt: Last stanza about the first day of Chinese New Year; add onomatopoeia and personification

Version 1

First day of the year, loud booms and bangs.

Firecrackers announce the start with a clang.

‘Kung Hei Fat Choi!’ shouts the morning sun,
Welcoming a new year full of fun.

Version 2

On New Year’s Day, everyone wears new clothes.

‘Ding Dong, Ding Dong,’ the church bell tolls.

People greet each other with bows,
As the New Year joyfully grows.

Poem

Stanza 3

New prompt: Last stanza about the first day of Chinese New Year; add onomatopoeia and personification

Version 1

First day of the year, loud booms and bangs.

Firecrackers announce the start with a clang.

'Kung Hei Fat Choi!' shouts the morning sun,

Welcoming a new year full of fun.

Version 2

On New Year's Day, everyone wears new clothes.

'Ding Dong, Ding Dong,' **the church bell** tolls.

People greet each other with bows,
As the New Year joyfully grows.

Poem

Stanza 3

New prompt: Last stanza about the first day of Chinese New Year; add onomatopoeia and personification

Version 1

First day of the year, loud booms and bangs.

Firecrackers announce the start with a clang.

'Kung Hei Fat Choi!' shouts the morning sun,

Welcoming a new year full of fun.

Version 2

On New Year's Day, everyone wears new clothes.

'Ding Dong, Ding Dong,' the church bell tolls.

People greet each other with bows,
As the New Year joyfully grows.

Poem

Combined

Stanza 1

Two weeks before Chinese New Year begins,
Washes and brushes and tidy up bins.
Houses are cleaned from bottom to top,
In every home, work doesn't stop.

Stanza 2

On New Year's Eve families together dine,
Feasting on food, rich and fine.
Like bees around a honey pot,
Everyone is busy, hot and hot.

Stanza 3

First day of the year, loud booms and bangs.
Firecrackers announce the start with a clang.
'Kung Hei Fat Choi!' shouts the morning sun,
Welcoming a new year full of fun.

Item Generation

Question intent: Specific information

Q1. According to the poem, when does the family dine together?

- ☐ A. Two weeks before Chinese New Year
- ☐ B. At the start of Chinese New Year
- ☐ C. On New Year's Eve
- ☐ D. In the morning of the first day
- ☐ E. After firecrackers are lit
- ☐ F. In the afternoon of New Year's Day
- ☐ G. Anytime they want
- ☐ H. Everyday of Chinese New Year

Item Generation

Question intent: Specific information

Q1. According to the poem,
when does the family dine together?

- ☐ A. Two weeks before Chinese New Year
- ☐ B. At the start of Chinese New Year
- ☒ C. **On New Year's Eve**
- ☐ D. In the morning of the first day
- ☐ E. After firecrackers are lit
- ☐ F. In the afternoon of New Year's Day
- ☐ G. Anytime they want
- ☐ H. Everyday of Chinese New Year

Stanza 1

Two weeks before Chinese New Year begins,
Washes and brushes and tidy up bins.
Houses are cleaned from bottom to top,
In every home, work doesn't stop.

Stanza 2

On New Year's Eve families together dine,
Feasting on food, rich and fine.
Like bees around a honey pot,
Everyone is busy, hot and hot.

Stanza 3

First day of the year, loud booms and bangs.
Firecrackers announce the start with a clang.
'Kung Hei Fat Choi!' shouts the morning sun,
Welcoming a new year full of fun.

Item Generation

Question intent: Specific information

Q1. According to the poem,
when does the family dine together?

- ☐ A. Two weeks before Chinese New Year
- ☒ B. On New Year's Eve
- ☐ C. In the morning of the first day
- ☐ D. After firecrackers are lit

Stanza 1

Two weeks before Chinese New Year begins,
Washes and brushes and tidy up bins.
Houses are cleaned from bottom to top,
In every home, work doesn't stop.

Stanza 2

On New Year's Eve families together dine,
Feasting on food, rich and fine.
Like bees around a honey pot,
Everyone is busy, hot and hot.

Stanza 3

First day of the year, loud booms and bangs.
Firecrackers announce the start with a clang.
'Kung Hei Fat Choi!' shouts the morning sun,
Welcoming a new year full of fun.

Item Generation

Question intent: Specific information



Q2. What happens on the first day of the year according to the poem?

- ☐ A. People go to work.
- ☐ B. Houses are cleaned.
- ☐ C. **Firecrackers are lit.**
- ☐ D. People have dinner.
- ☐ E. **The morning sun shouts.**
- ☐ F. People brush their teeth.
- ☐ G. The bins are tidied up.
- ☐ H. **People welcome the new year.**

Stanza 3

First day of the year, loud booms and bangs.
Firecrackers announce the start with a clang.
'Kung Hei Fat Choi!' shouts the morning sun,
Welcoming a new year full of fun.

Item Generation

Question intent: Inferencing



Q3. What happens on the first day of the Chinese New Year?

- ☐ A. The family cleans their house.
- ☐ B. There is a feast with the family.
- ☐ C. Firecrackers are set off.
- ☐ D. They wash and brush.
- ☐ E. They gather around a honey pot.
- ☐ F. Everyone shouts 'Kung Hei Fat Choi!'
- ☐ G. Everyone is busy, hot and hot.
- ☐ H. Families eat dinner together.

Stanza 3

First day of the year, loud booms and bangs.
Firecrackers announce the start with a clang.
'Kung Hei Fat Choi!' shouts the morning sun,
Welcoming a new year full of fun.

Item Generation

Question intent: Gist

Q4. What is this poem mainly about?

- ☐ A. New Year's Day
- ☐ B. Chinese New Year
- ☐ C. Christmas
- ☐ D. Thanksgiving
- ☐ E. Spring Cleaning
- ☐ F. Easter Sunday
- ☐ G. The Summer solstice
- ☐ H. Hanukkah

Stanza 1

Two weeks before Chinese New Year begins,
Washes and brushes and tidy up bins.
Houses are cleaned from bottom to top,
In every home, work doesn't stop.

Stanza 2

On New Year's Eve families together dine,
Feasting on food, rich and fine.
Like bees around a honey pot,
Everyone is busy, hot and hot.

Stanza 3

First day of the year, loud booms and bangs.
Firecrackers announce the start with a clang.
'Kung Hei Fat Choi!' shouts the morning sun,
Welcoming a new year full of fun.

Item Generation

Question intent: Main idea



Stanza 1

Two weeks before Chinese New Year begins,
Washes and brushes and tidy up bins.
Houses are cleaned from bottom to top,
In every home, work doesn't stop.

Q5. What is the main idea of this poem?

- ☐ A. A description of a family's morning routine
- ☐ B. Instructions for cleaning a house
- ☐ C. The celebration of Chinese New Year
- ☐ D. The process of making honey
- ☐ E. A guide on how to light firecrackers
- ☐ F. A description of a very hot day
- ☐ G. A noisy morning in a city
- ☐ H. The duties of a honey bee

Item Generation

Question intent: Main idea



Q5. What is Stanza 1 about?

(human input)

Stanza 1

Two weeks before Chinese New Year begins,
Washes and brushes and tidy up bins.
Houses are cleaned from bottom to top,
In every home, work doesn't stop.

Original prompt:

A poem about Chinese New Year;
first stanza about what people do
to prepare for it

- ☐ A. Celebrating the new year with fireworks
- ☐ B. Cooking delicious food for the new year
- ☐ C. Welcoming the sun on the new year
- ☐ D. Preparing for the new year by cleaning houses
- ☐ E. Eating dinner with family on New Year's Eve
- ☐ F. Shouting 'Kung Hei Fat Choi!' at sunrise
- ☐ G. Busy and hot environment during the new year
- ☐ H. Honey and bees in the new year

Item Generation

Question intent: Onomatopoeia

Q6. In line 4, 'loud booms and bangs' refer to the sound of _____.

- ☐ A. sweeping and cleaning
- ☐ B. feasting on food
- ☐ C. firecrackers
- ☐ D. people shouting
- ☐ E. honey bees
- ☐ F. clanging pots
- ☐ G. morning sun
- ☐ H. busy work

Stanza 3

First day of the year, loud booms and bangs.
Firecrackers announce the start with a clang.
'Kung Hei Fat Choi!' shouts the morning sun,
Welcoming a new year full of fun.

Item Generation

Question intent: Onomatopoeia

Q6. In line 4, 'loud booms and bangs' refer to the sound of _____.

- ☐ A. sweeping and cleaning
- ☐ B. feasting on food
- ☒ C. firecrackers
- ☐ D. people shouting
- ☐ E. honey bees
- ☐ F. clanging pots
- ☐ G. morning sun
- ☐ H. busy work

Stanza 3

First day of the year, loud booms and bangs.
Firecrackers announce the start with a clang.
'Kung Hei Fat Choi!' shouts the morning sun,
Welcoming a new year full of fun.

Item Generation

Question intent: Onomatopoeia

Q6. In line 4, 'loud booms and bangs' refer to the sound of _____.

- ☐ A. sweeping and cleaning
- ☒ C. firecrackers
- ☐ D. people shouting
- ☐ G. morning sun

Stanza 3

First day of the year, loud booms and bangs.

Firecrackers announce the start with a clang.

'Kung Hei Fat Choi!' shouts the morning sun,
Welcoming a new year full of fun.

Item Generation

Question intent: Onomatopoeia

Q6. In line 4, 'loud booms and bangs' refer to the sound of _____.

- ☐ A. **people** sweeping and cleaning
- ☒ C. firecrackers **bursting**
- ☐ D. people **laughing**
- ☐ G. morning sun **shouting**

Stanza 3

First day of the year, loud booms and bangs.
Firecrackers announce the start with a clang.
'Kung Hei Fat Choi!' shouts the morning sun,
Welcoming a new year full of fun.

Item Generation

Question intent: Onomatopoeia




Q6. In line 4, 'loud booms and bangs' refer to the sound of _____.

- ☐ A. people laughing
- ☐ B. people sweeping and cleaning
- ☒ C. firecrackers bursting
- ☐ D. morning sun shouting

Stanza 3

First day of the year, loud booms and bangs.
Firecrackers announce the start with a clang.
'Kung Hei Fat Choi!' shouts the morning sun,
Welcoming a new year full of fun.

Generated Texts

- Narrative texts (e.g. a story) 
- Informative texts (e.g. a notice)
- Exchanges (e.g. a personal letter) 
- Procedural texts (e.g. a recipe) 
- Explanatory texts (e.g. an explanation of how and why)
- Persuasive texts (e.g. a poster)

The North Pole Controversy

Who was the first person to reach the North Pole?

Robert Peary



OR

Frederick Cook



The North Pole Controversy

Prompt: Short passage about the first person to reach the North Pole

Robert Peary



Did you know that **Robert Peary** was the first person to reach the North Pole? This significant moment in history happened on the 6th of April, 1909. Peary was an American explorer who had dreamed of reaching the North Pole for years. He made several attempts to reach the North Pole, each time learning more about the harsh conditions there and how to survive.

The North Pole Controversy

Prompt 2: Short passage about Frederick A. Cook being the first person to reach the North Pole

Frederick A. Cook was an American explorer and physician who claimed to be the first man to reach the North Pole. On April 21, 1908, Cook announced that he had made it to the North Pole after a year-long trek... Despite the controversy, Cook's claim to be the first person to reach the North Pole remains a significant part of history.



Summary

Overall comments:

- Time-saving
- Great for generating ideas
- Useful for generating content-based questions
- A test developer's aid but not as a replacement (AI-human hybrid approach)

Summary

From the teacher's or assessor's end:

- Learn to write effective prompts
- Ensure the accuracy of the information
- Select reading materials and items that suit the assessment purpose
- Make judgment calls

Thank you!