# Perceptions and Expectations of Teacher Candidate Japanese University Students Regarding Conversational and Generative AI

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## 1. Introduction

### 1.1. Our team introduction

We, the three presenters, are members of the The Uehiro Research and Development Office for Moral Education at Tokyo Gakugei University.

The office was established in fiscal year 2022 with a donation from The Uehiro Foundation on Ethics and Education. Its purpose is to promote research and training aimed at enabling school teachers to practice diverse teaching methods for moral education classes, thereby advancing and enriching moral and ethical education.

## 1.1. Our team introduction

Our promotion office consists of a chief supervisor, office director, office members, collaborating professors within the university, and external research collaborators.

This research was conducted with the support of The Uehiro Research and Development Office for Moral Education.

The Uehiro
Research and Development Office
for Moral Education

## 1.2. Important Questions in the Ara of AI

**Do you think it is morally good for K-12 students, university students and teachers to use AI in schools?**

## 1.3. Background of the research

The development of conversational and generative AI (CGAI; ChatGPT, Gemini and Copilot, etc.) has been rapidly advancing, making these tools widely accessible to the general public at low or no cost. In the industrial and business sectors, the effective use of AI is considered key to increasing productivity and fostering innovation.

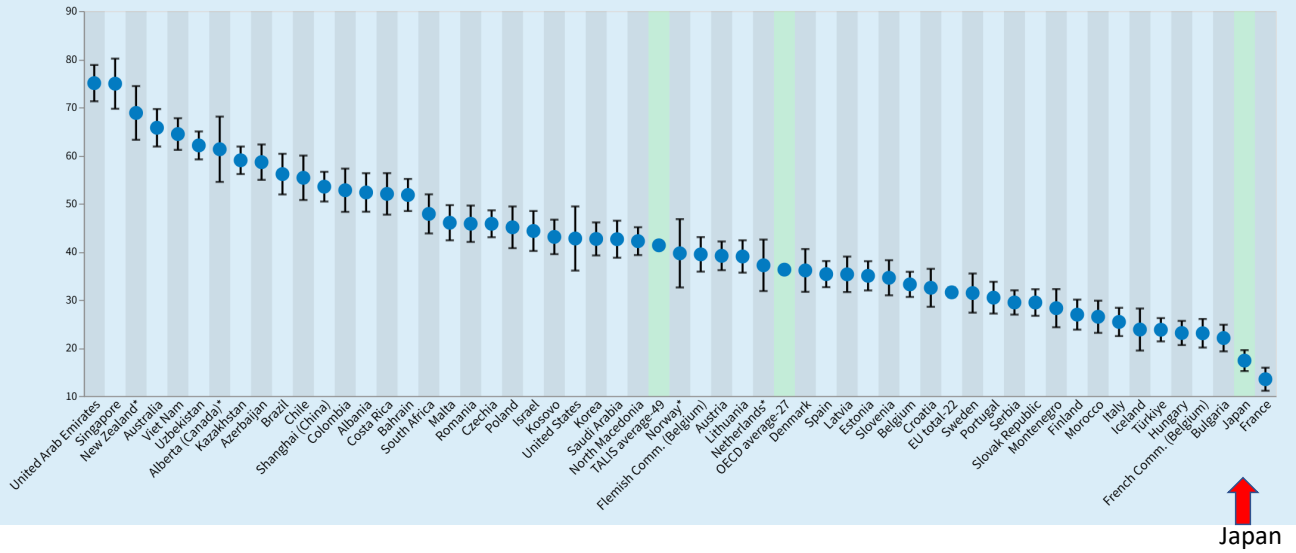
## 1.3. Background of the research

However, at least in Japan, there is a somewhat cautious attitude towards the use of CGAI in education, as it carries the risk of being detrimental to the development of competencies in students, and teachers.

The purpose of this study is to clarify the perceptions and expectations of Japanese teacher candidate university students regarding CGAI.

## TALIS2024(OECD Teaching and Learning International Survey, 2025):

"During the last 12 months, have you used artificial intelligence in your teaching or to facilitate student learning?"




# 2. Methods

## 2.1. Participants

### Total Participants:

1,522 undergraduate students (teacher candidate)

Annual Breakdown:

2023: 536 students

2024: 491 students

2025: 495 students

All participants were enrolled in a mandatory teacher-training course titled "Instructional Methods for Moral Education."

## 2.2. 1. Survey question: 2023, 2024 and 2025

Knowledge & Usage frequency:

Students' familiarity with(knowledge) and experience using CGAI (4-point scale)

Usage situations:

The specific situations in which they used it (free text responses)

Impressions of CGAI :

Their positive and negative impressions of CGAI (6-point scale and free text responses )

## 2.2. 2. Survey question: 2025 only

AI education required in schools:

The types of AI education they believe are necessary in schools (multiple choice)

Opinion of elementary school students using AI:

Their opinions on elementary school students using AI. Agree or disagree? (Choose one option), and reason (free text response).

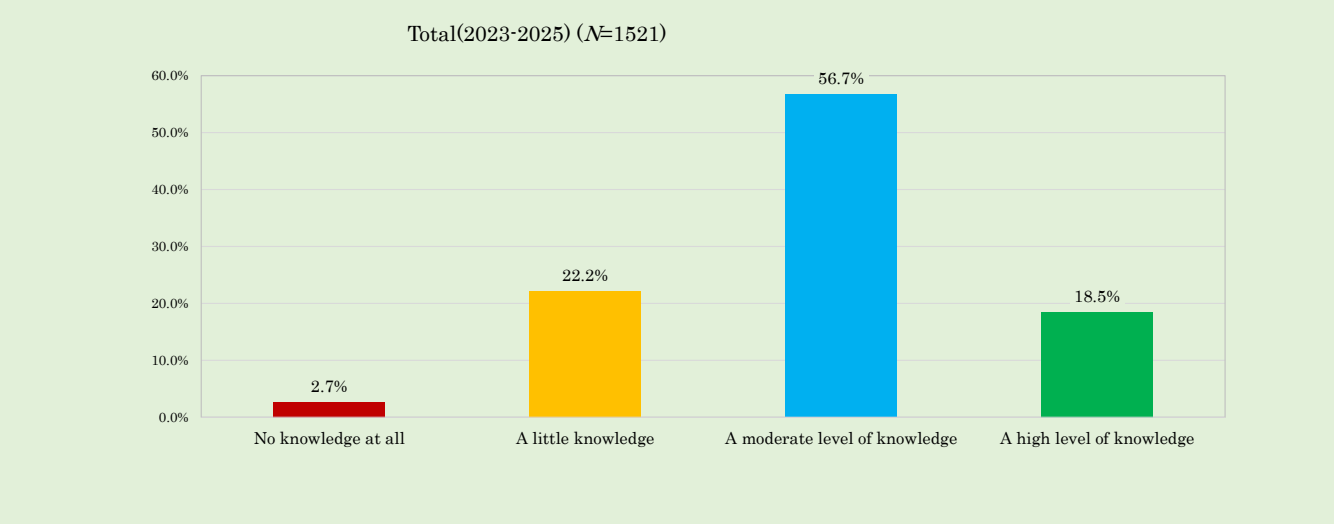
## 2.3. Procedure & Statistical Analysis

The survey was conducted during the latter half of the spring semester each year. Students enrolled in the course were invited to participate. Data collection was carried out using Google Forms, and students were asked to complete the survey during class sessions.

Quantitative data were analyzed using R version 4.3.3. Textual data were analyzed using Python version 3.11.7. The textual data, originally collected in the Japanese language, were analyzed and subsequently translated into English for presentation purposes.

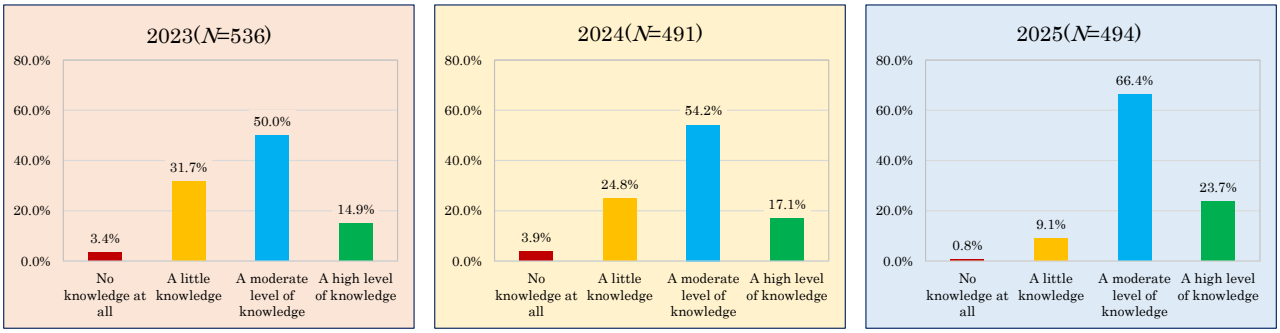
## 3. Results
### 3.1. Comparison by year
#### 3.1.1.1. Familiarity with CGAI : Total years

**Do you have any knowledge or familiarity with CGAI? (4-point scale)**



# 3.1.1.2. Familiarity with CGAI : Comparison by year

**Do you have any knowledge or familiarity with CGAI? (4-point scale)**

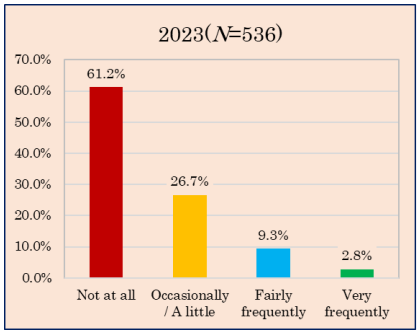


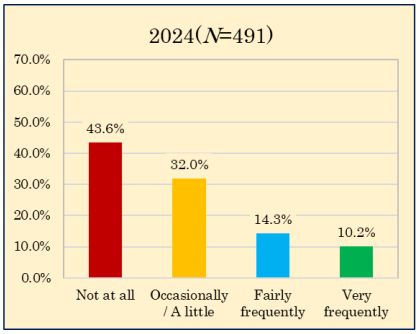

# 3.1.2.1. Usage frequency of CGAI : Total years

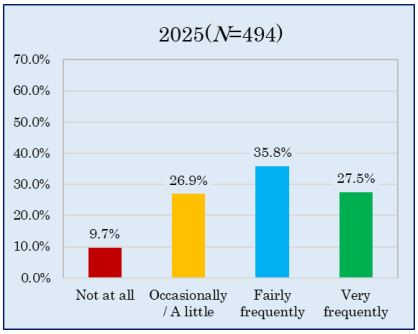
**How frequently do you use CGAI, including the free version, in your daily life?** (4-point scale)

# 3.1.2.2. Usage frequency of CGAI : Comparison by year

**How frequently do you use CGAI, including the free version, in your daily life?** (4-point scale)

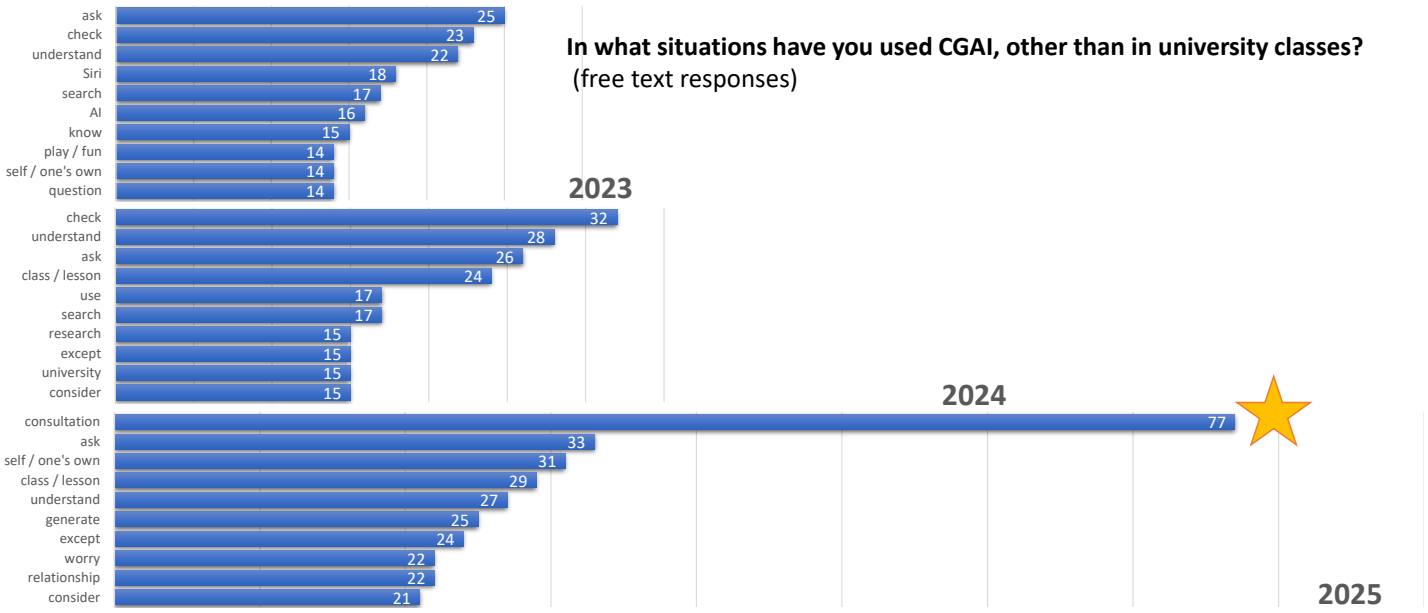


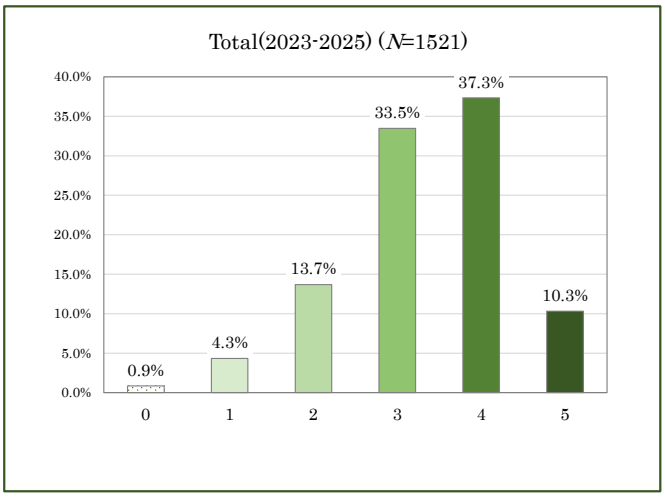

# 3.1.3. Usage situations: Comparison on frequent words by year

**In what situations have you used CGAI, other than in university classes?** (free text responses)



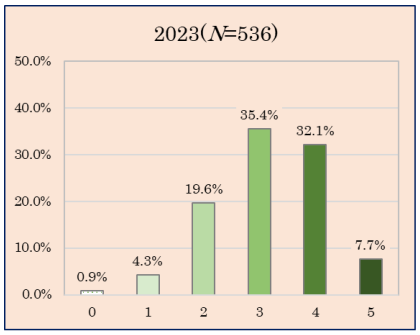
# 3.1.4.1. Positive impression of CGAI: Total years

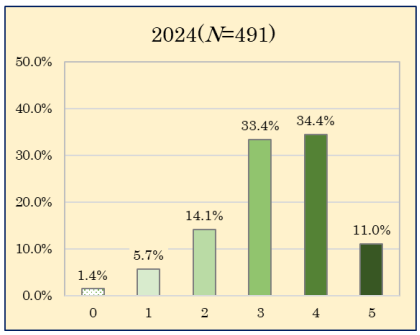
**To what extent do you have a positive impression of "CGAI "?** (6-point scale)

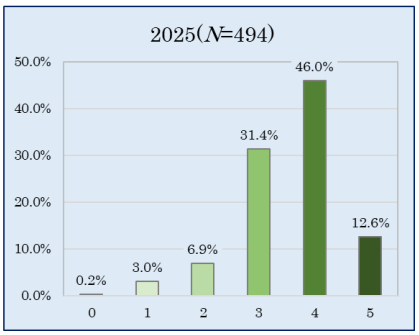



# 3.1.4.2. Positive impression of CGAI: Comparison by year

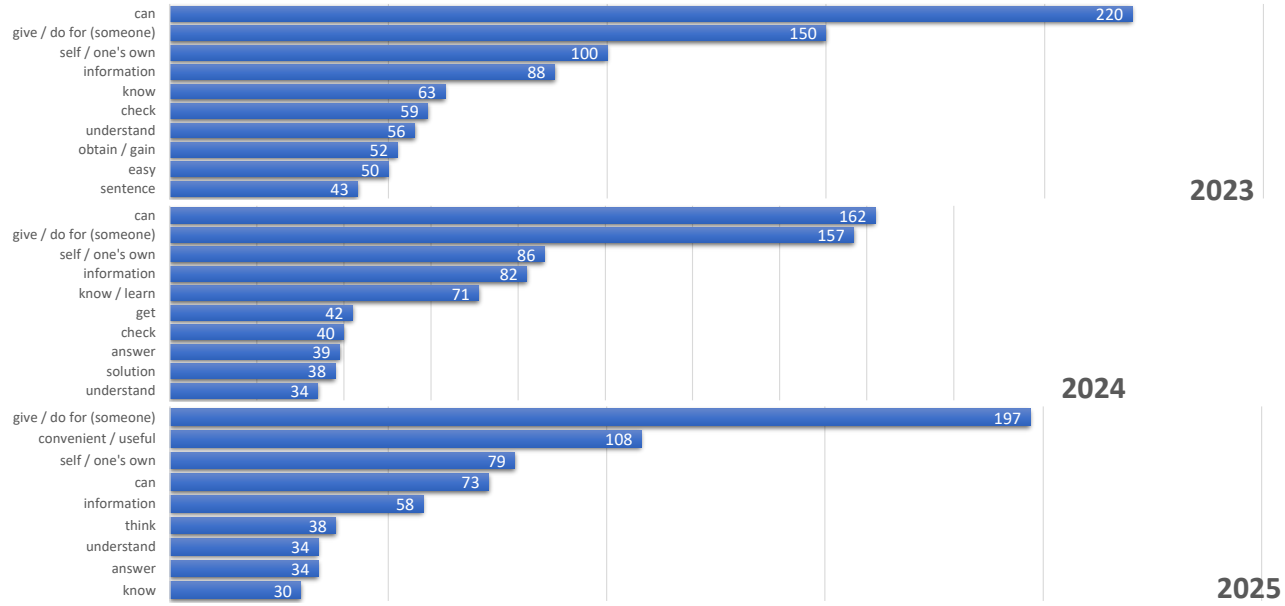
**To what extent do you have a positive impression of "CGAI "?** (6-point scale)



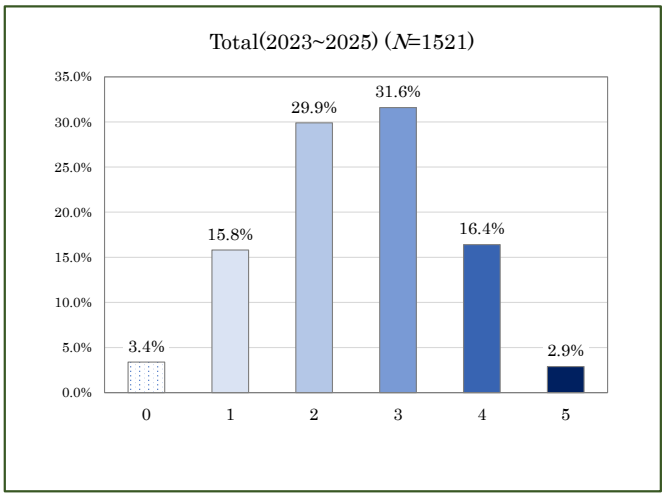



# 3.1.4.3. Reasons of positive impression of CGAI: Comparison on frequent words by year



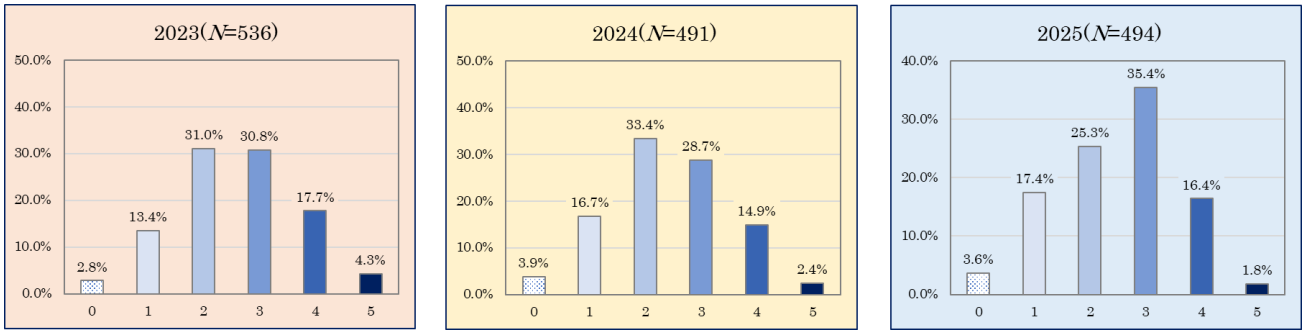

# 3.1.5.1. Negative impression of CGAI: Total years

**To what extent do you have a negative impression of CGAI?** (6-point scale)

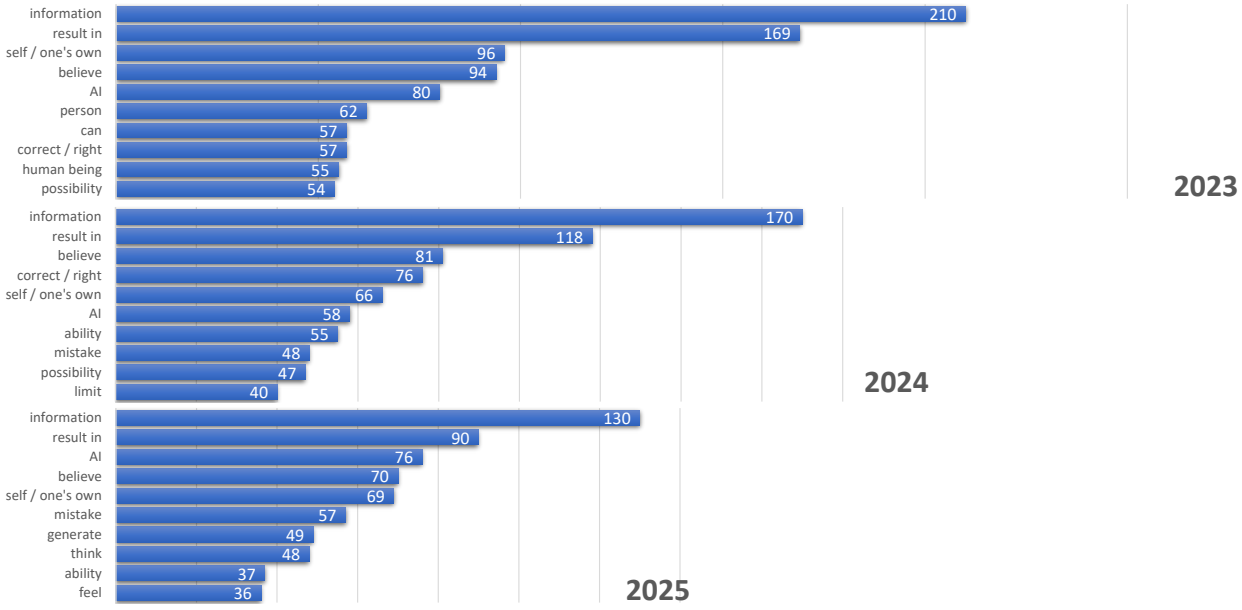


# 3.1.5.2. Negative impression of CGAI : Comparison by year

**To what extent do you have a negative impression of CGAI?** (6-point scale)




# 3.1.5.3. Reasons of negative impression of CGAI: Comparison on frequent words by year

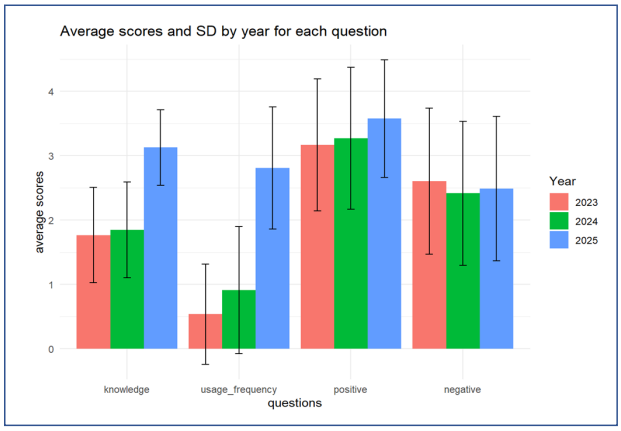


# 3.1.6. A two-way analysis of variance (ANOVA) on question items and yearly difference

A two-way analysis of variance (ANOVA) was conducted to examine the main effects of item type and year, as well as the interaction between item type and year. The results showed that the main effects of item and year, and their interaction effect, were all statistically significant.

**Subsequent comparisons of each item across years revealed the following trends:**

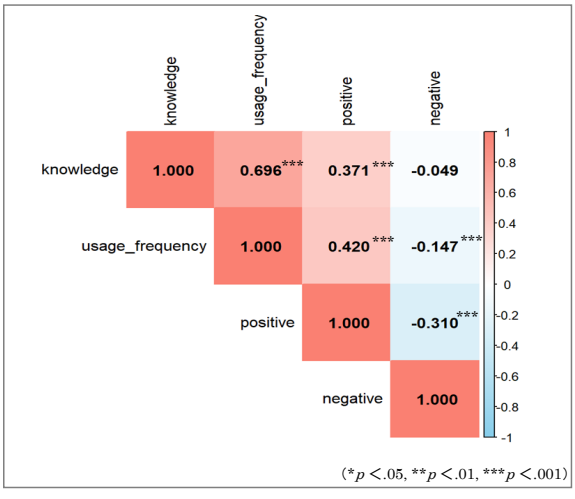
- Knowledge of AI (knowledge) and Frequency of Use (usage_frequency) increased sharply in 2025.
- Positive Impression (positive) showed a gradual increase over the years.
- Negative Impression (negative) remained almost unchanged throughout the researched period.




# 3.1.7. Correlation Analysis of Variables

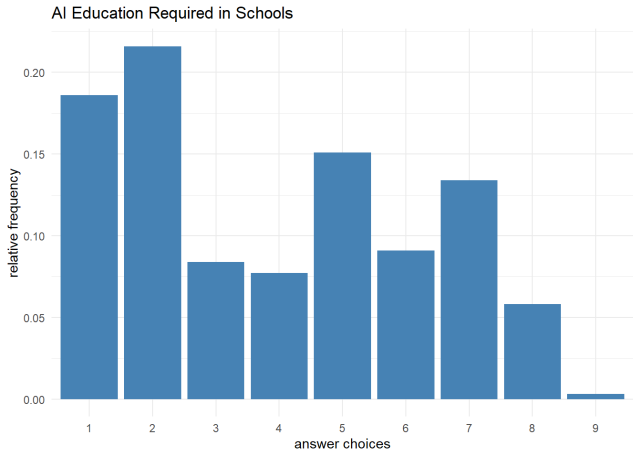
The results of the correlation analysis revealed the following relationships among the variables:

- There was a **strong positive correlation** between **frequency of use** and **knowledge of AI**.
- **Frequency of use** and **knowledge of AI** both showed **moderate positive correlations** with **positive impression**.
- **Positive impression** and **negative impression** showed a **moderate negative correlation**.
- **Frequency of use of AI** showed **weak negative correlations** with **negative impression**.



## 3.2. Results of data analysis based on measurements taken only in 2025.
## 3.2.1. AI education required in schools (multiple choice)

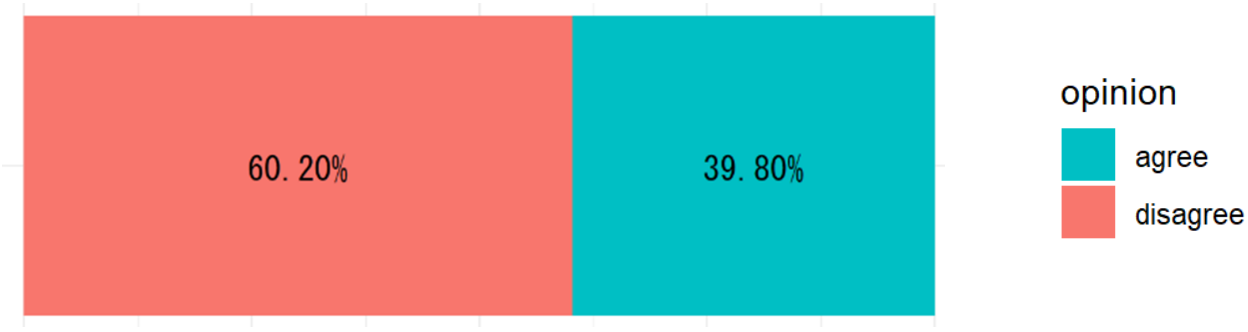
| No. | Options | Counts | % |
|---|---|---|---|
| 1 | Acquiring AI Literacy (Understanding how AI works, how to use it, and its limitations) | 276 | 18.6 |
| 2 | Developing the ability to discern the correctness of information (not blindly trusting generative AI's answers) | 321 | 21.6 |
| 3 | Fostering the ability to independently formulate questions and think (discovering issues and formulating prompts) | 125 | 8.4 |
| 4 | Developing creativity and expressive skills (generating new things in collaboration with AI) | 114 | 7.7 |
| 5 | Fostering the ability to make correct judgments about AI usage (considering ethical issues) | 224 | 15.1 |
| 6 | Developing the ability to discuss and cooperate with others (engaging in actual human interaction) | 135 | 9.1 |
| 7 | Thinking about "human qualities" that AI cannot replicate (such as sensibility and empathy) | 199 | 13.4 |
| 8 | Fostering the ability to understand others' emotions and values (imagining diverse perspectives and empathizing) | 86 | 5.8 |
| 9 | Others | 5 | 0.3 |




The necessity of learning Information Literacy
(e.g., information verification, AI usage, and limitations)

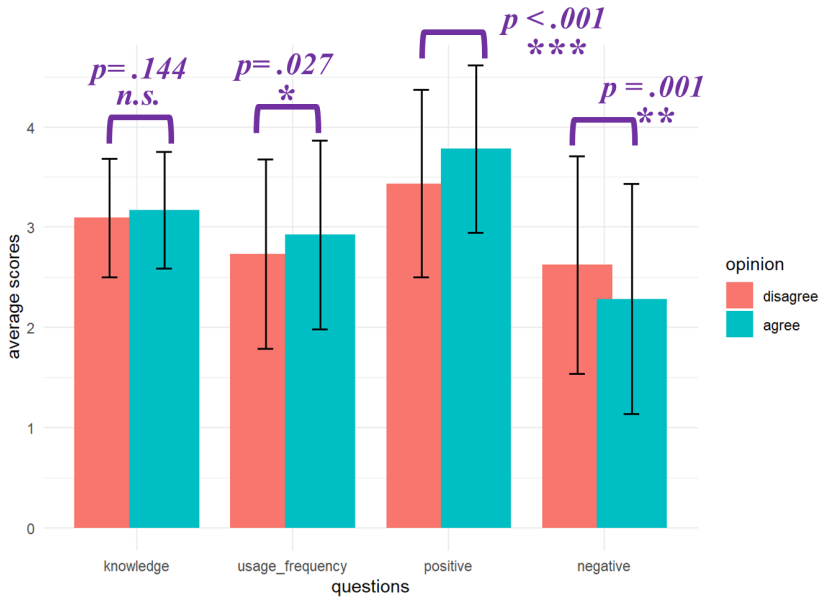
## 3.2.2.1 Opinions on elementary school students using AI.

**Do you agree or disagree with elementary school students using CGAI ?** (2025 only)




The disagree group was larger than the agree group.

# 3.2.2.2.Comparison of scores between the agree/disagree groups

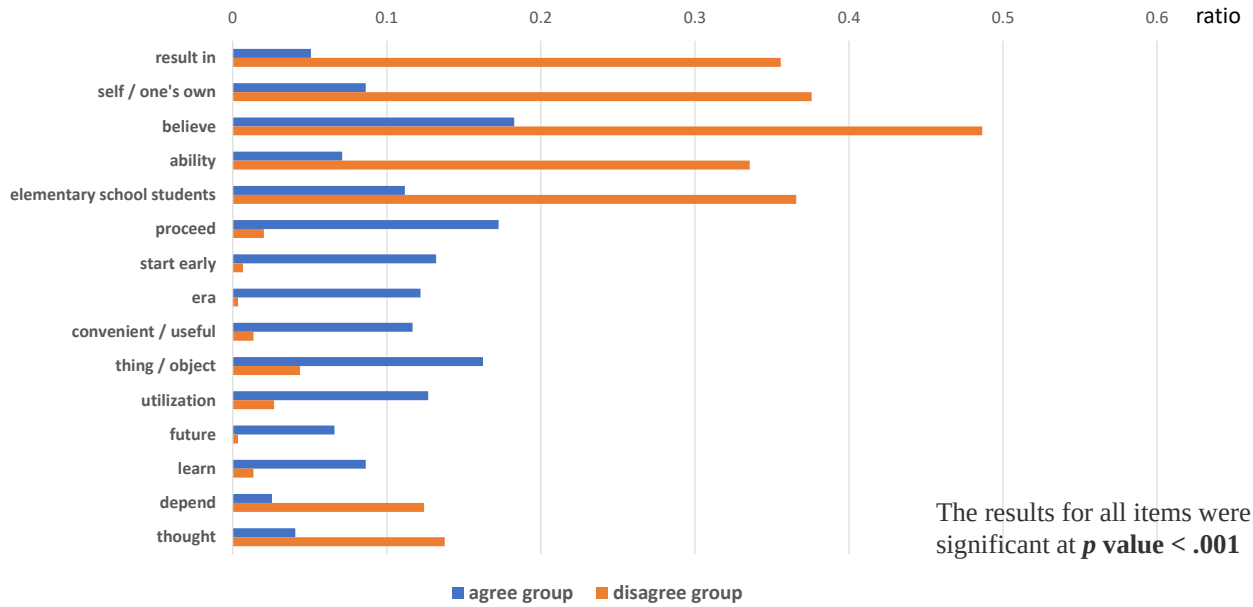



（Mean ± Standard Deviation）

- "Knowledge" did not differ between the two groups.
- The Agree group scored higher on "Usage Frequency" and "Positive Evaluation.“
- The Disagree group scored higher on "Negative Evaluation."

＊：$p < .05$　＊＊：$p < .01$　＊＊＊：$p < .001$

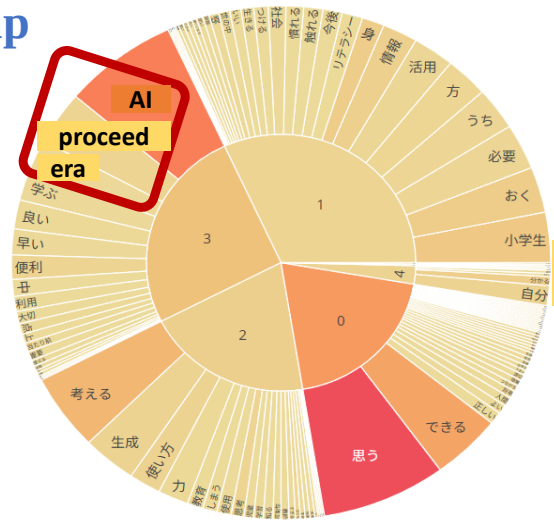
# 3.2.2.3. Comparison of words included in the reasons of the Agree and Disagree groups on using CGAI by elementary school students (ordered by ascending p-value)



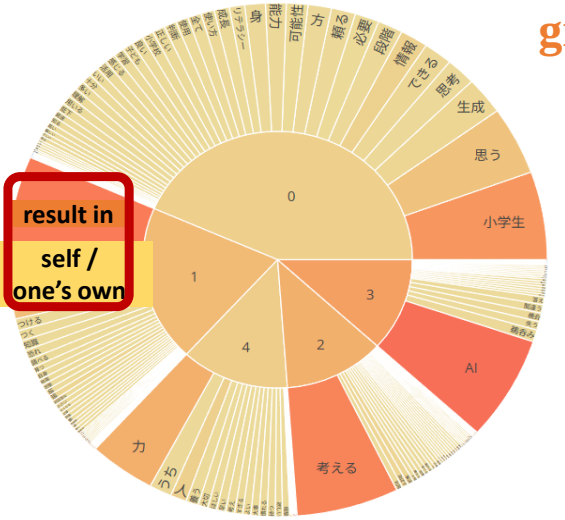

The results for all items were statistically significant at ***p* value < .001**

# 3.2.2.4. Sentiment sunburst chart of groups

**Agree group**




**Disagree group**




# 3.2.2.5. Comparison of the top 10 bigram word edge frequencies

**Agree group**

- In the era ahead, I believe it is crucial to utilize AI properly.
- I believe that, alongside learning the fundamentals of AI ethics, elementary school students should also proceed to learn about the use of AI.

| Word Pair | count |
|---|---|
| (think, AI) | 28 |
| (generate, AI) | 27 |
| (think, use) | 27 |
| (believe, AI) | 22 |
| (think, proceed) | 19 |
| (while still, AI) | 18 |
| (era, AI) | 17 |
| (think, for / in order to) | 16 |
| (AI, proceed) | 15 |
| (start early, AI) | 15 |

| Word Pair | count |
|---|---|
| (believe, self / one's own) | 91 |
| (believe, AI) | 69 |
| (result in, AI) | 61 |
| (believe, ability) | 58 |
| (result in, consider) | 58 |
| (generate, AI) | 50 |
| (result in, self / one's own) | 48 |
| (AI, self / one's own) | 47 |
| (believe, elementary school students) | 44 |
| (think, AI) | 44 |

**Disagree group**

- I think it will result in a decline in one's own ability to think for oneself.
- Since children have not yet developed firm opinions of their own, it may result in them uncritically accepting what generative AI says.

## 3.2.2.6. Comparison of the top 4 quadgram word edge frequencies

| Agree group | Word Quartet | count |
|---|---|---|
| | (AI, think, start early, elementary school students) | 21 |
| | (AI, believe, result in, elementary school students) | 17 |
| | (AI, believe, result in, use) | 17 |
| | (AI, believe, generate, use) | 16 |

- I believe that mastering the utilization of AI will be necessary in the future era, so I think it is a good idea for elementary school students to start early using it in elementary school.
- I think that if elementary school students start learning about the limitations of AI early on, it will help them understand the importance of being able to think for themselves .

| Disagree group | Word Quartet | count |
|---|---|---|
| | (AI, think, start early, elementary school students) | 32 |
| | (AI, believe, result in, elementary school students) | 32 |
| | (AI, believe, result in, use) | 30 |
| | (AI, for / in order to, result in, elementary school students) | 26 |

- I think that if elementary school students start depending on AI early, they won't develop the ability to think for themselves
- Because I think it's too early to start acquiring sufficient AI literacy for elementary school students, and I want to prioritize human relationships rather than interactions with AI.

## 3.2.2.7. Comparison of descriptions containing "One's Self" (Three Representative Statements Each)

### Agree group

- Because even elementary school students can use CGAI effectively to help deepening their learning and broaden their thought. For example, they can immediately ask questions about things they don't know or get ideas for writing compositions.
- Because it is a very useful tool for broadening their thought.
- Because I find it very convenient to use myself.

Reasons regarding **Convenience**

### Disagree group

- Because I believe that if elementary school students become accustomed to using AI, it may result in them neglecting to write compositions by themselves.
- Because I want elementary school students to develop the ability to gather information by carefully scrutinizing various materials themselves.
- Because I believe that relying completely on AI drastically reduces opportunities to acquire knowledge or think for themselves.

Reasons regarding **the Risk of Loss of Learning Opportunities**

## 3.2.3. Interim summary

- The **Agree group** tends to believe the following:
- It is important to use CGAI correctly in the future era.
- It is necessary to start becoming accustomed to CGAI early from the elementary school level.
- It is better to use CGAI because it is convenient.

- The **Disagree group** tends to believe the following:
- Utilizing CGAI from elementary school will result in them not thinking by themselves.
- Elementary school students will result in uncritically trusting information that CGAI says.
- At the elementary school level, emphasis should be placed on actual human interaction rather than engagement with “CGAI .”
- Using CGAI in elementary schools will result in the loss of necessary learning opportunities.

## 4. Conclusion

1. The knowledge of AI and frequency of its use among Japanese university students aspiring to become teachers have steadily increased over the past three years. Among the various purposes for which AI was used during this period, the most notable change was a sharp rise in its use for “consultations” in 2025..
2. The students’ positive impressions of AI have gradually increased year by year, while negative impressions remained almost unchanged throughout the study period.
3. The students believe it important particularly to learn "Information Literacy" regarding CGAI in school.
4. About six out of ten students disagree the use of CGAI at the elementary school level, and most of them cite the risk of essential learning opportunities being compromised—for example, the apprehension that students may stop thinking for themselves—as the reason.