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WUR at the Age of GenAI

Mapping Students' GenAI Literacy, Use, and Perceptions

2024-2025

AI-Generated





4TU. CENTRE FOR ENGINEERING EDUCATION

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EDUCATION AND LEARNING SCIENCES

CHAIR GROUP

Content

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Background

- AI tools are becoming an integral part of everyday life
- In education, the use of AI tools, particularly Generative AI (GenAI), is rapidly expanding as:
  - AI can adapt to individual student needs, providing tailored learning experiences
  - Automates administrative tasks, grading, and feedback, saving educators time
- It is crucial to understand how teachers perceive and use GenAI tools, as there are some concerns about AI in education, such as:
  - AI models may have biases or provide inaccurate or misleading information
  - Risk of plagiarism and reliance on AI-generated content instead of critical thinking
  - Could reduce human interaction, creativity, and traditional learning approaches
- This is essential for shaping university policies related to GenAI in education

Objectives

The main objectives of this project are:

- Delving into students' AI literacy knowledge
- Exploring students' experiences with GenAI tools
- Understanding students' perceptions of using GenAI tools

GenAI and AI literacy

GenAI:

- a subset of AI, focuses on generating new, original content by learning patterns from existing data via using deep learning techniques, systems like GPT models (Brown et al., 2020)

AI literacy:

- the ability to comprehend the fundamental principles and concepts of AI-driven technologies
- includes knowing and understanding AI, using and applying AI, creating and evaluating AI, and addressing ethical considerations (Ng et al., 2021)

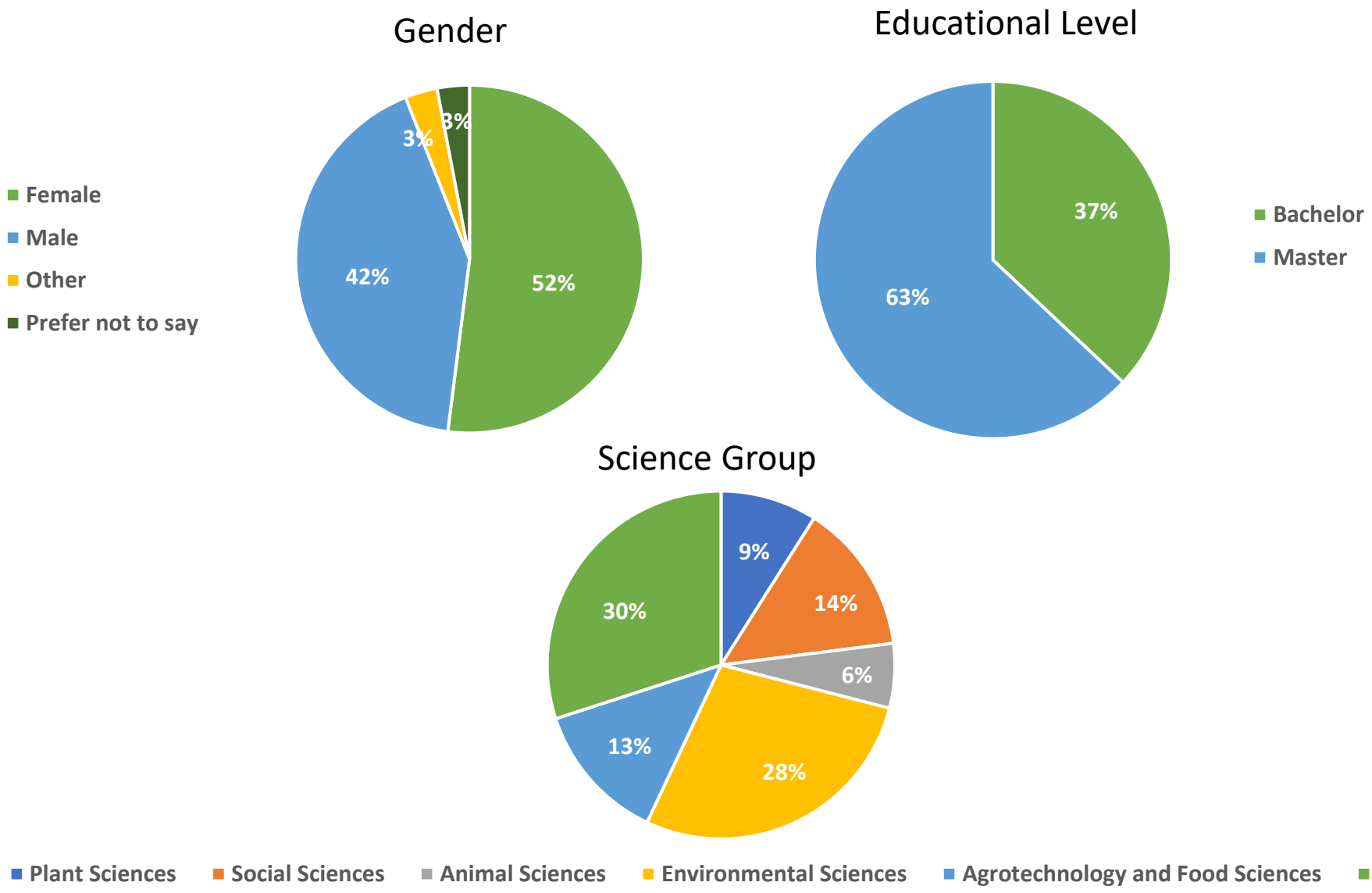
Methods

- Method: Survey-based Study
- Targeted Group: WUR students
- N of Participants: 764
  - **Gender**:
    Female (398), Male (321), Prefer not to say (9), Other (9)
  - **Field of Study:**
    Plant Sciences (70), Social Sciences (107), Animal Sciences (43), Environmental Sciences (213), Agrotechnology & Food Sciences (97), Other (233)
  - **Education Level:**
    Bachelor (285), Master (479)
  - **Nationality:**
    Dutch (545), Non-Dutch (216)
  - **Year of Study:**
    1st year (246), 2nd year (265), 3rd year (153), 4thyear (63), Other (35)
  - **Age:**
    15-20 (160), 21-25 (481), 26-30 (92), 31-35 (15), 36-40 (8), 41-45 (8)
- Period of Attendance: Academic Year 2024
- Data Analysis: SPSS Software
- Analysis methods: Descriptive Analysis and Multivariate Analysis of Variance (MANOVA)

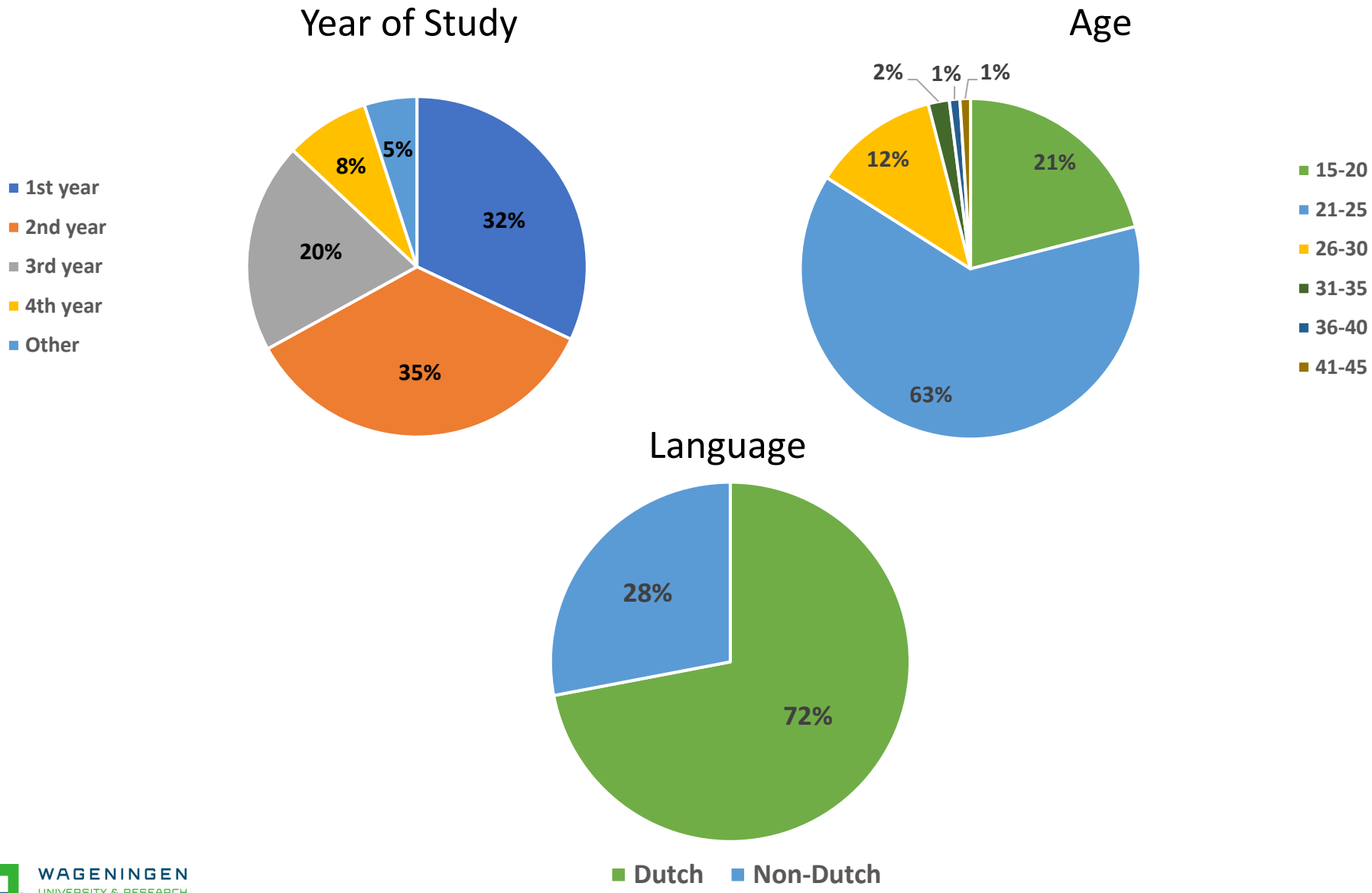
Results

- Demographic Information
- AI literacy: Overall knowledge
- AI literary: Female vs Male
- AI literacy: Science Groups
- AI literacy: Education Level
- Experiences with GenAI
- GenAI for teaching and learning
- Perceptions of using GenAI

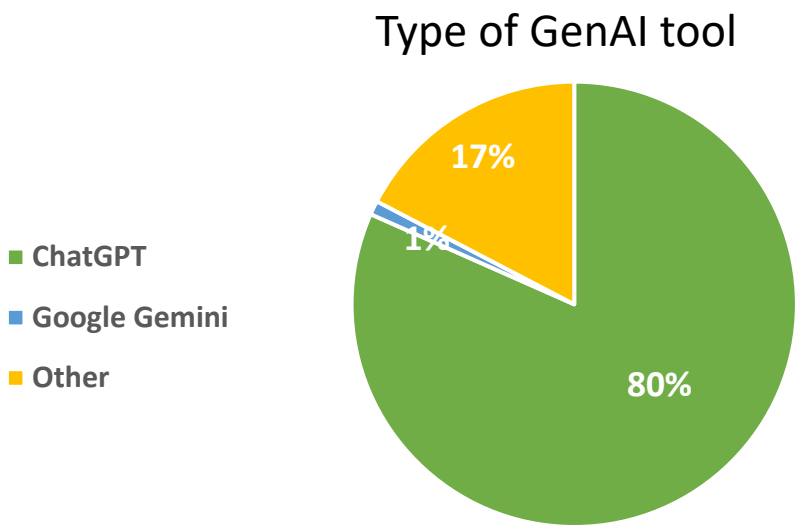
Demographic Information

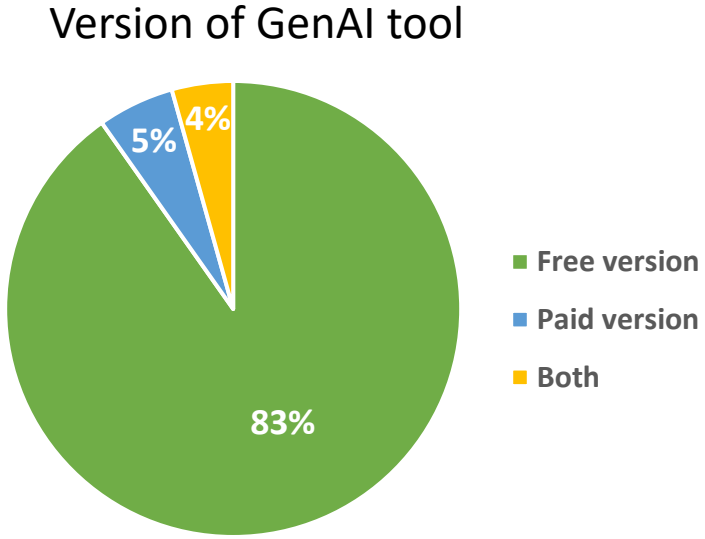


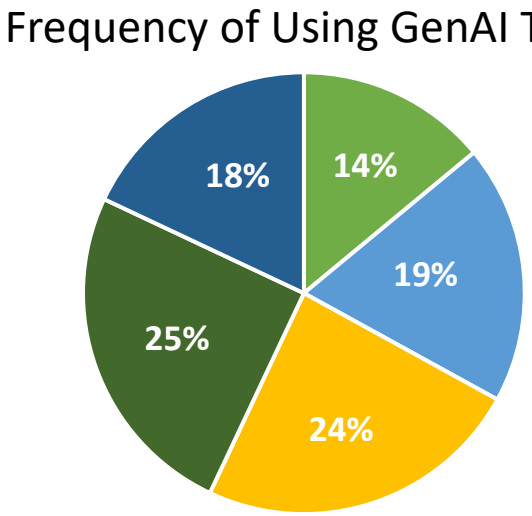
Demographic Information #continued



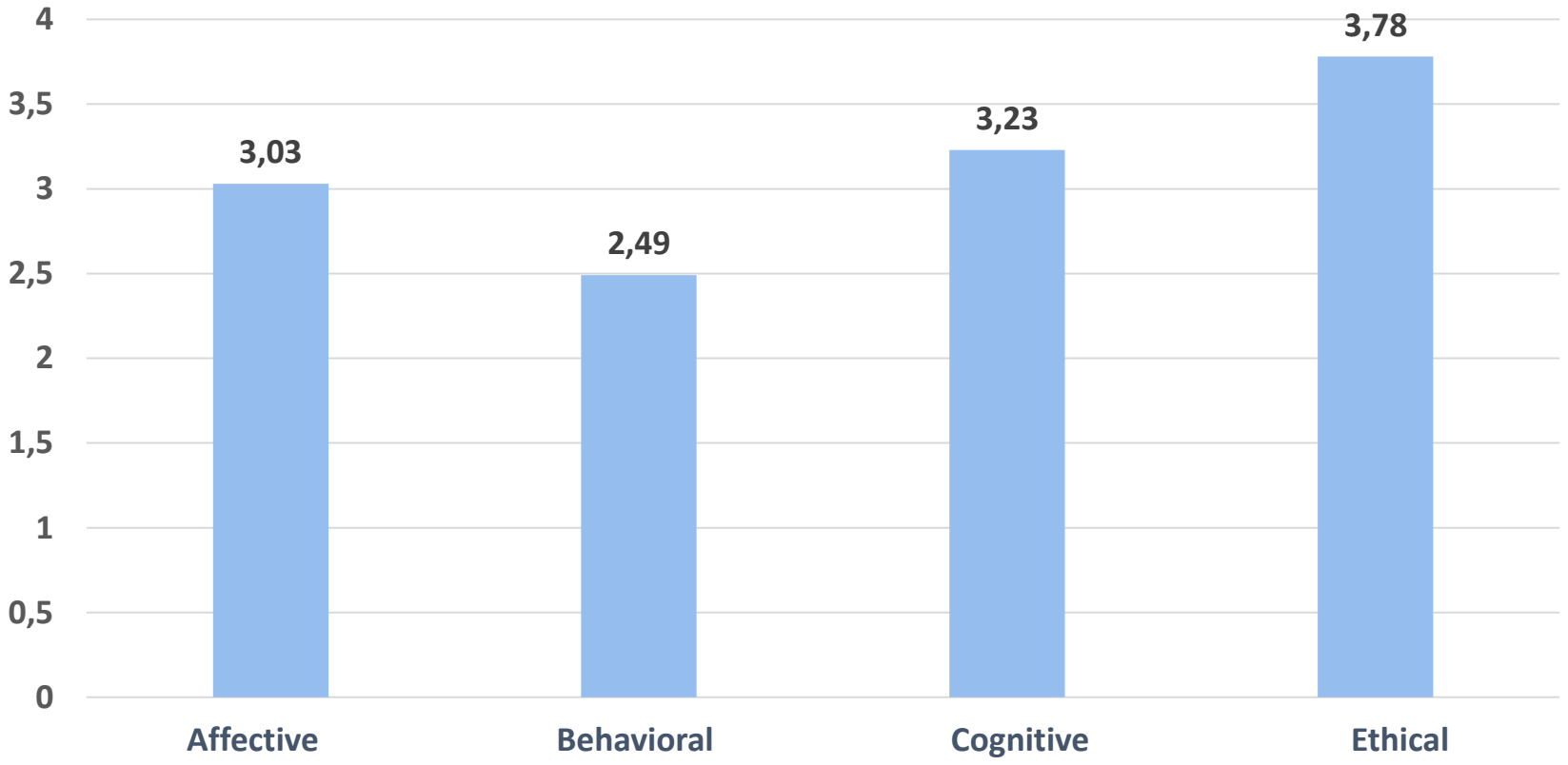
Experiences with GenAI







AI Literacy



Students perceived themselves high in the ethical aspect of AI literacy, suggesting a strong (self)awareness of the ethical considerations associated with AI use.

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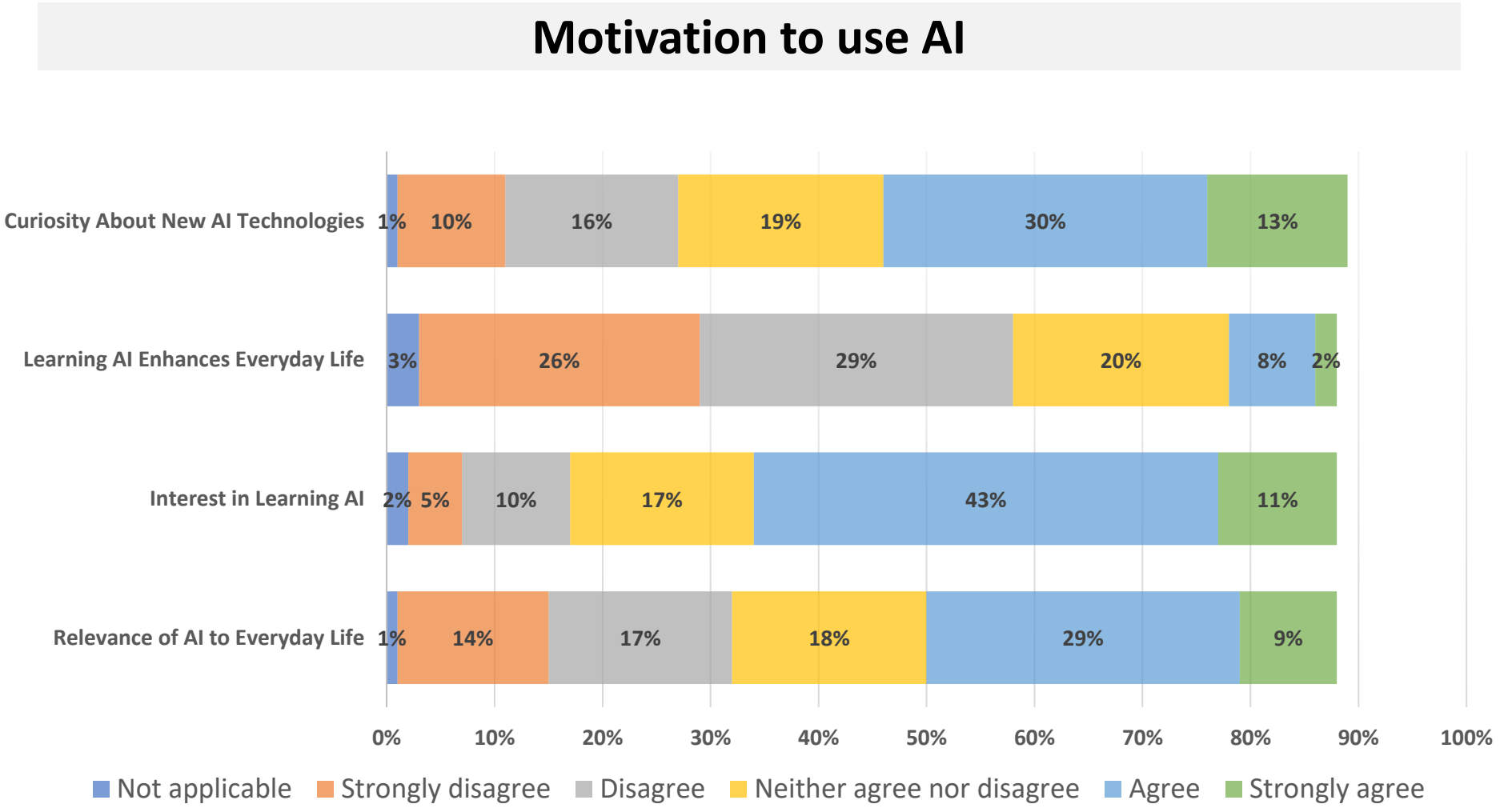
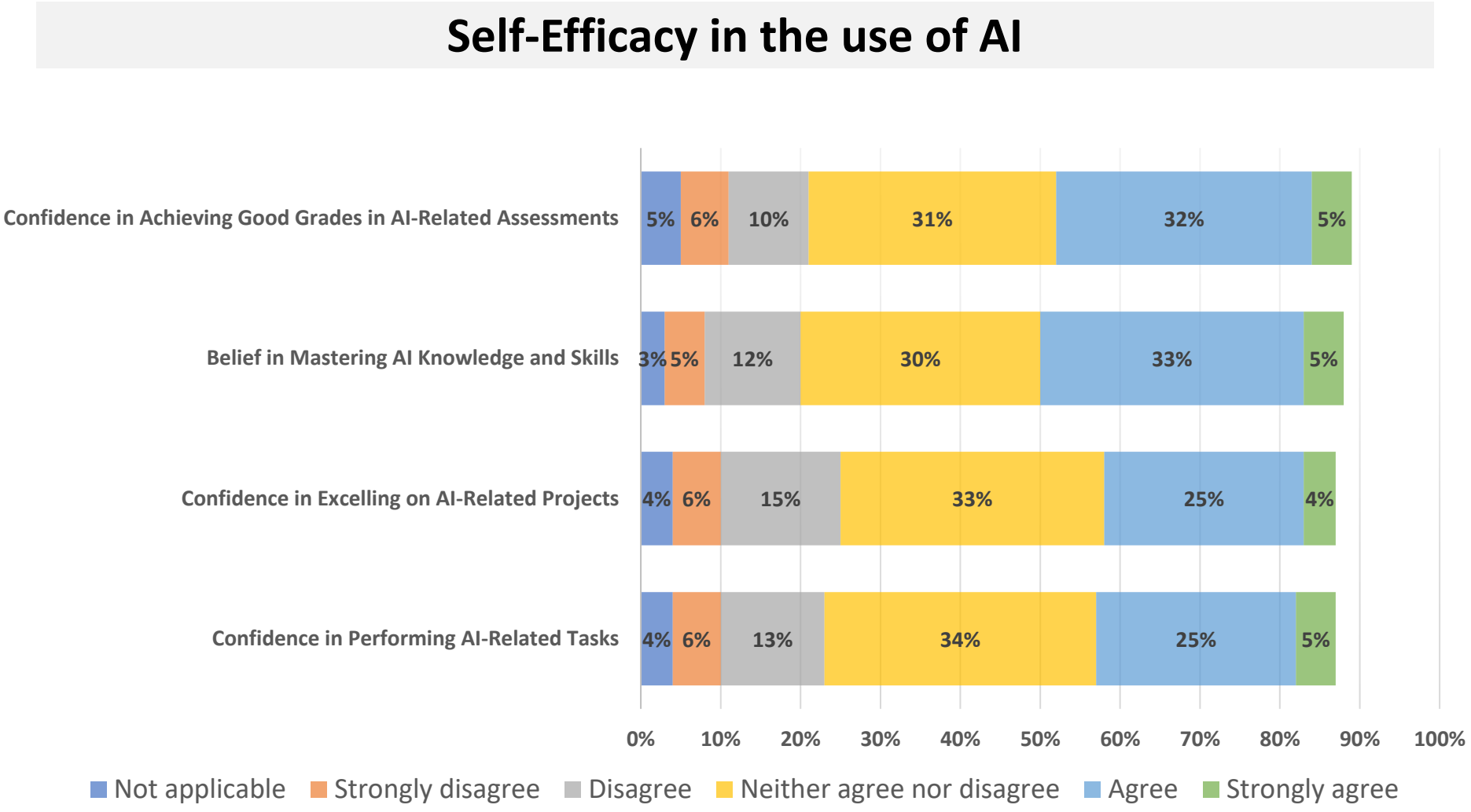
Note: Answering scale: 1 (Strongly Disagree) to 5 (Strongly Agree)

Affective Aspect of AI Literacy



Affective Aspect of AI Literacy



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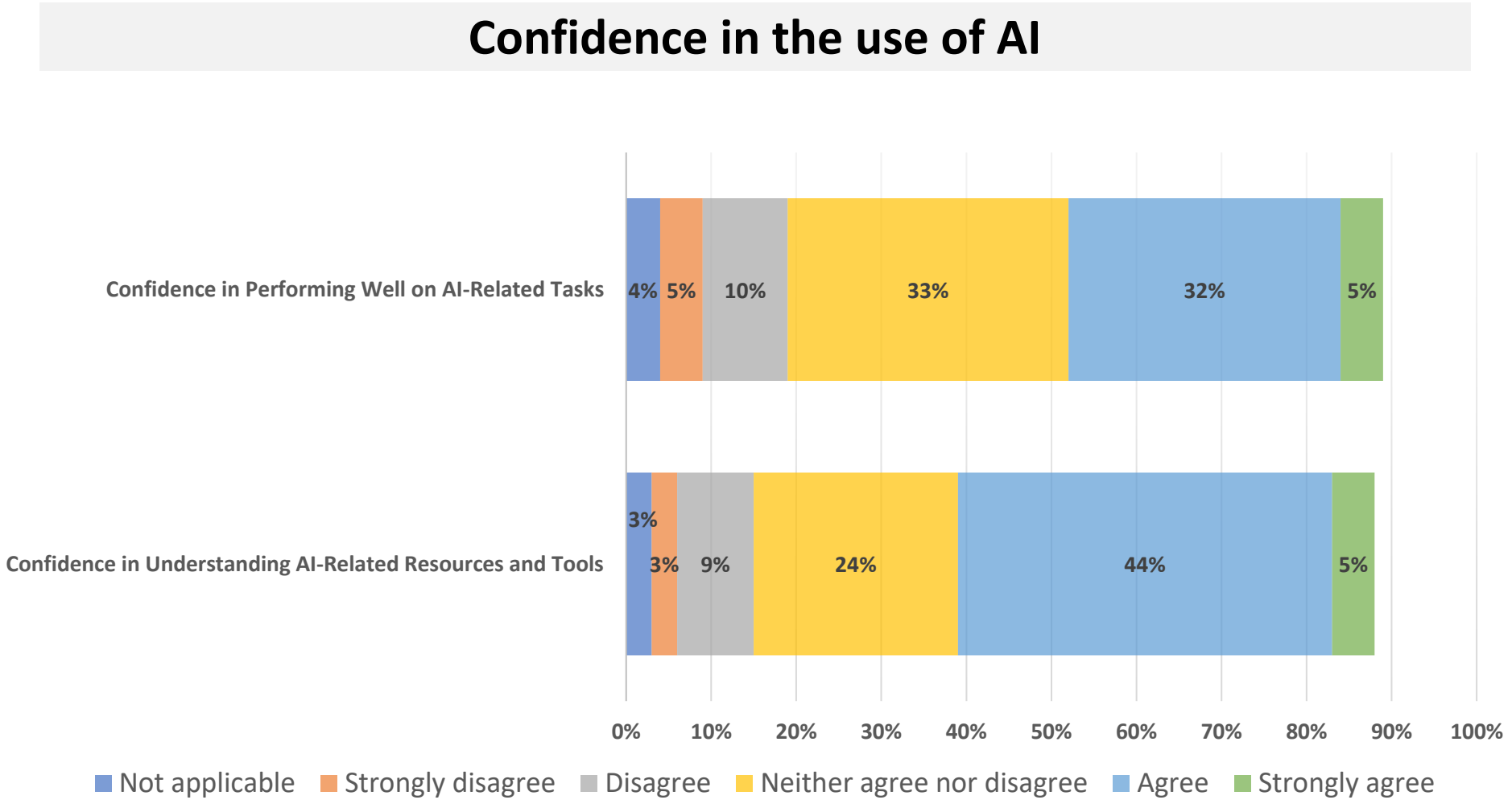
Affective Aspect of AI Literacy



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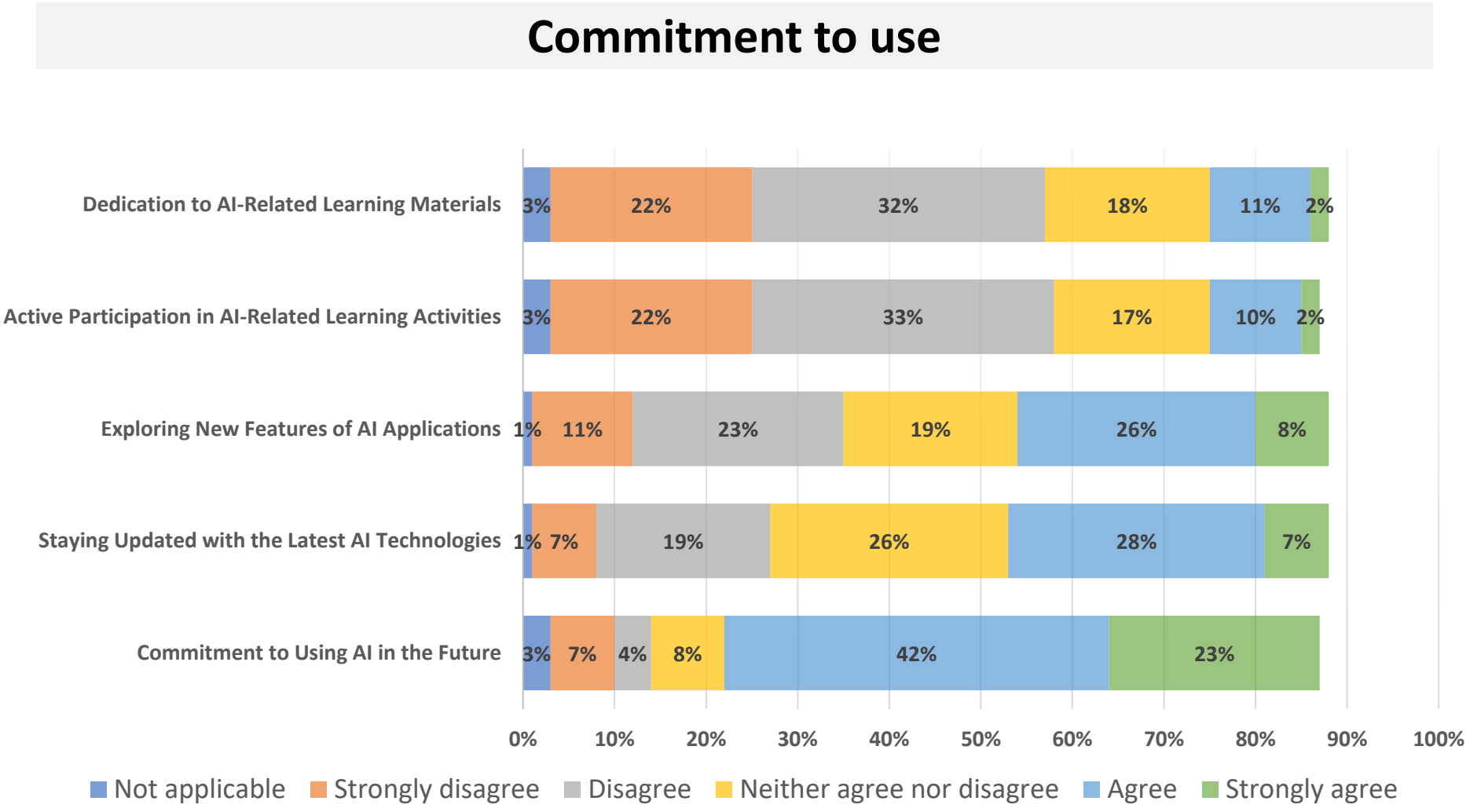
Main Remarks #Affective

- Students perceived themselves as interested and curious about learning and using AI.
- Students perceived themselves as moderately confident about understanding and performing AI-related tasks.
- Students perceived themselves as either neutral or having moderate self-efficacy in mastering AI-related tasks.

Behavioral Aspect of AI Literacy



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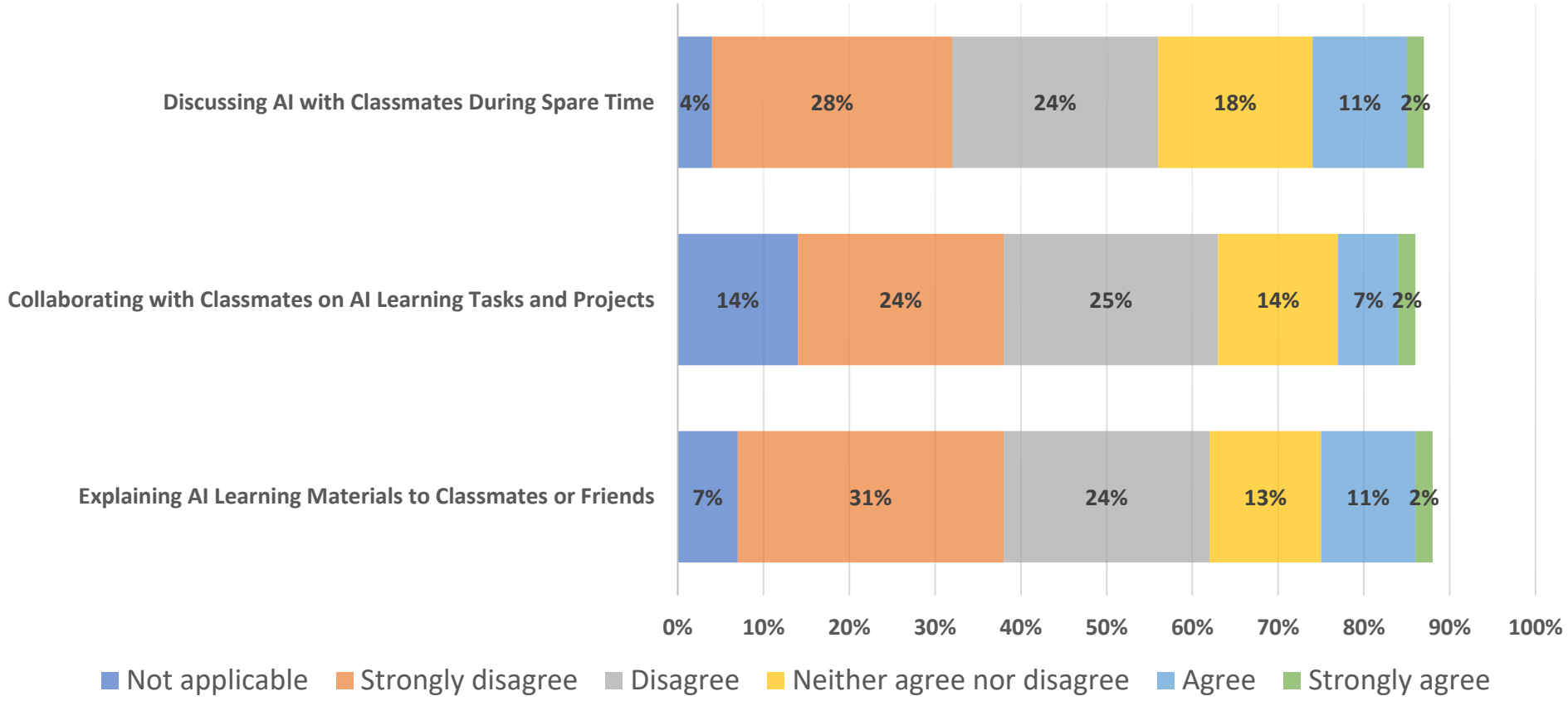
Behavioral Aspect of AI Literacy

Collaboration to use AI



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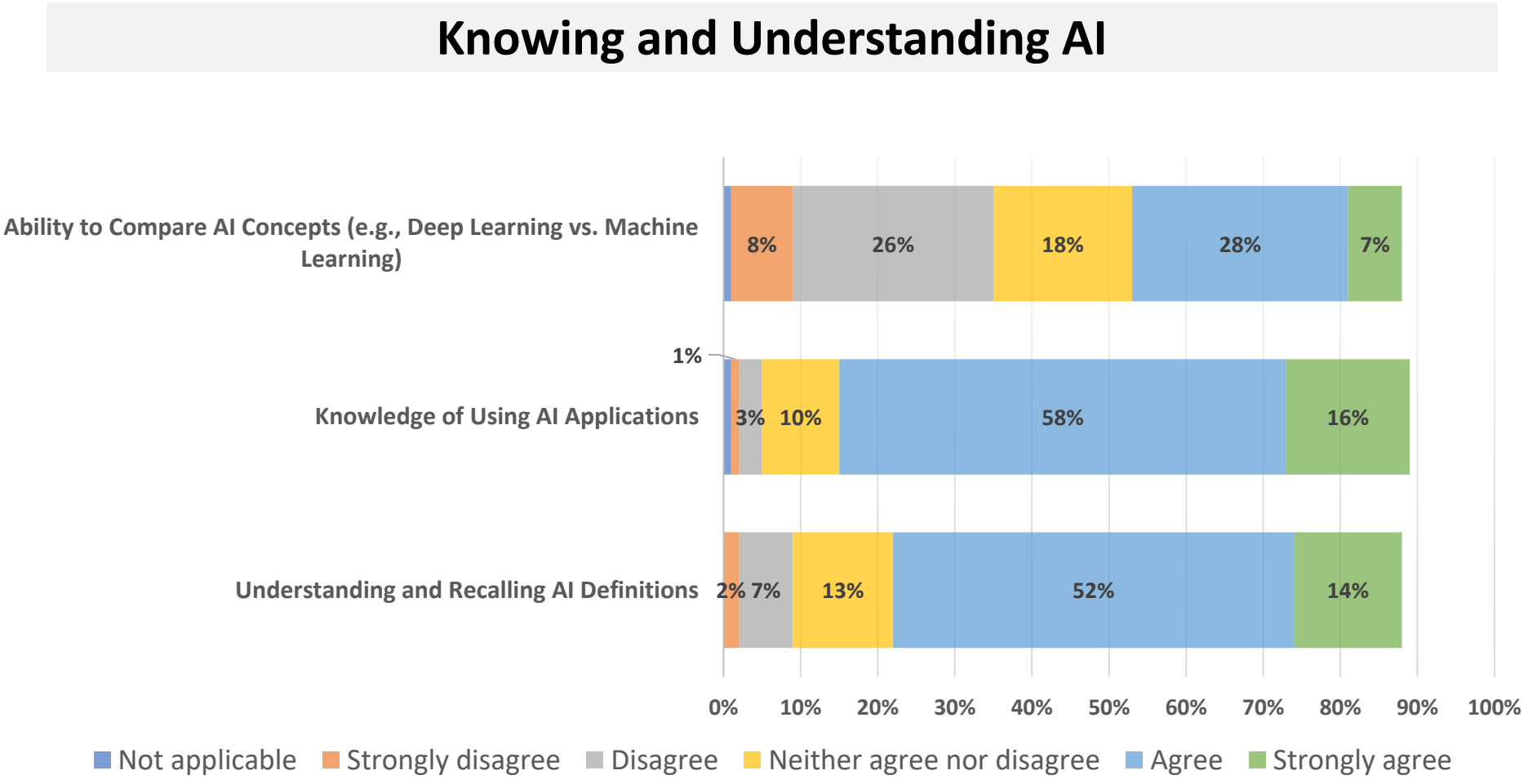
Main Remarks #Behavioral

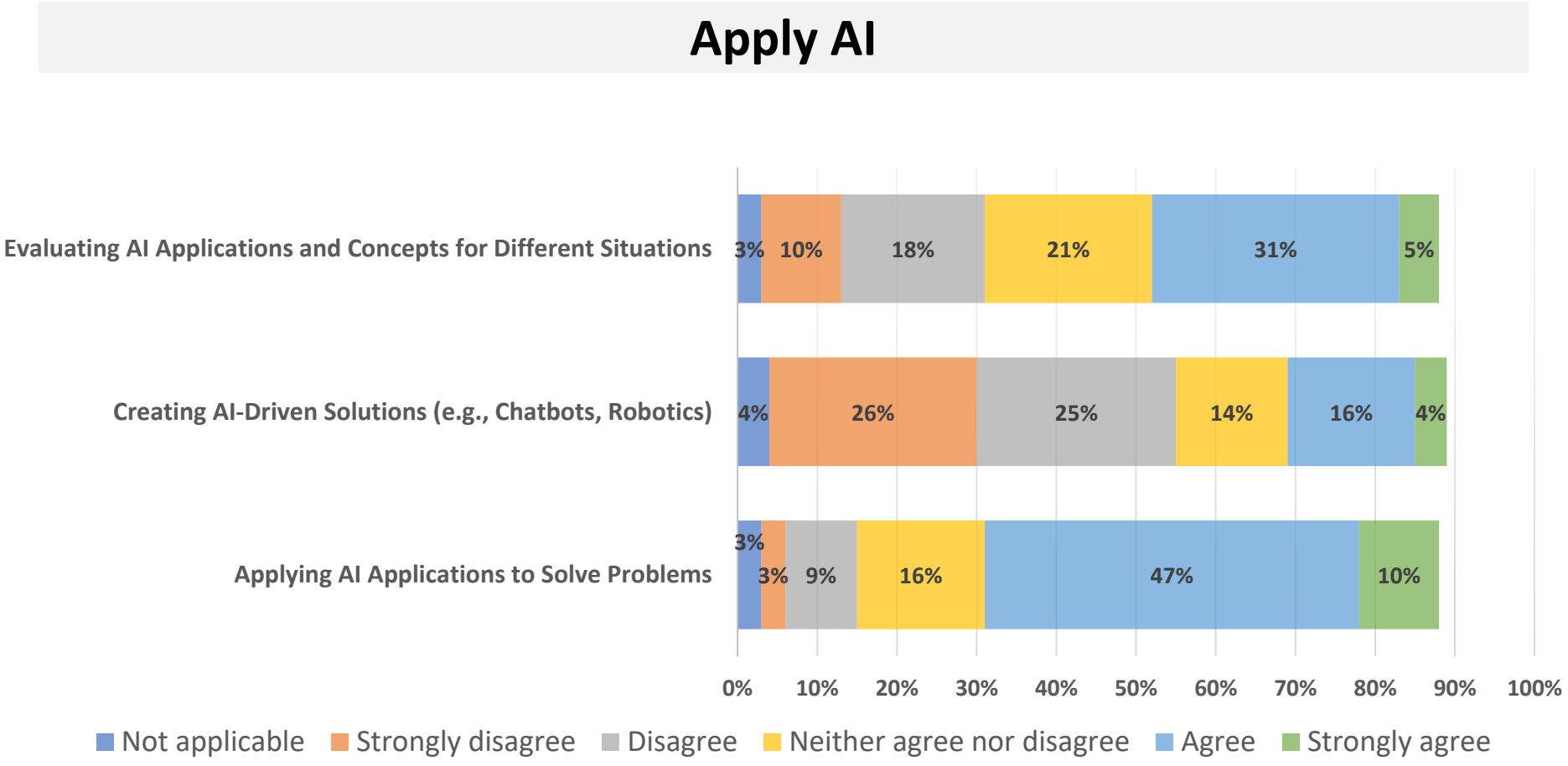
- While students perceived a strong commitment to using AI in the future, their perceived active participation, collaboration, and dedication to current AI learning activities remained moderate or low.

To improve students' engagement with AI, incentivizing discussions, and promoting the practical benefits of AI learning can help bridge the gap between interest and action.

Cognitive Aspect of AI Literacy



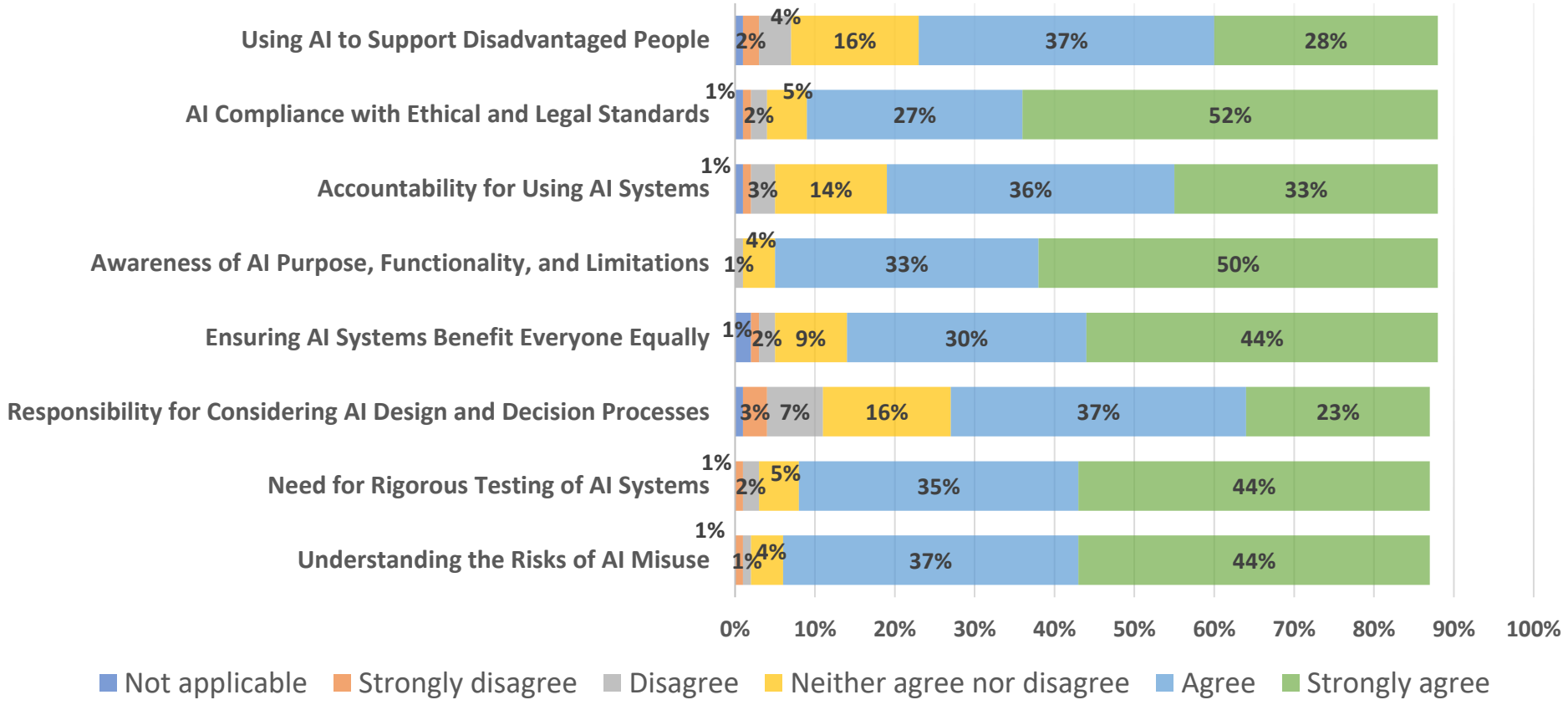
Cognitive Aspect of AI Literacy



Main Remarks #Cognitive

- Most students perceived themselves as confident about foundational AI knowledge and applying AI to solve problems.
- Most students perceived a lack of knowledge about advanced skills like comparing concepts, evaluating for different contexts, and creating AI-driven solutions.

Ethical Aspect of AI Literacy



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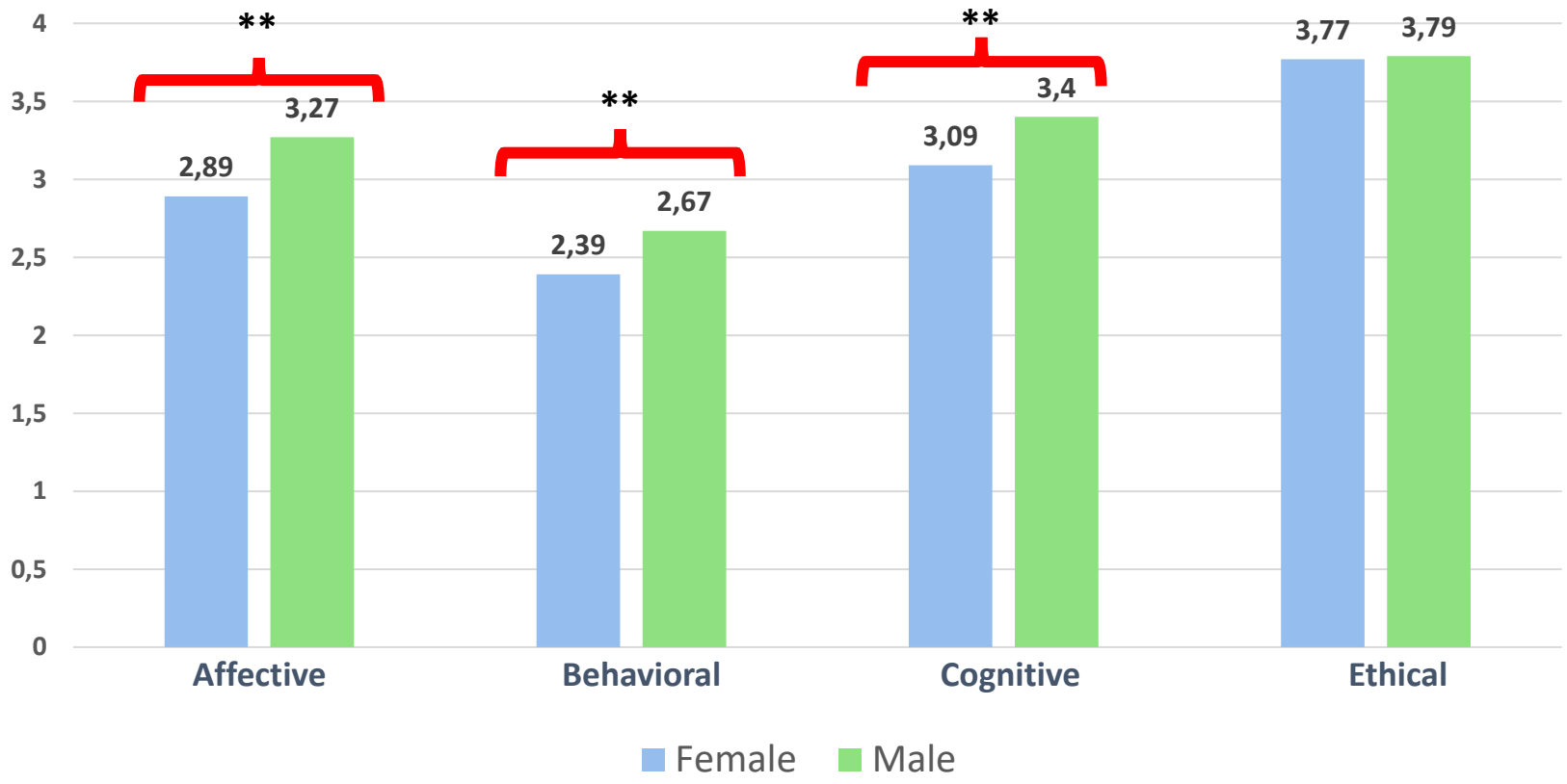
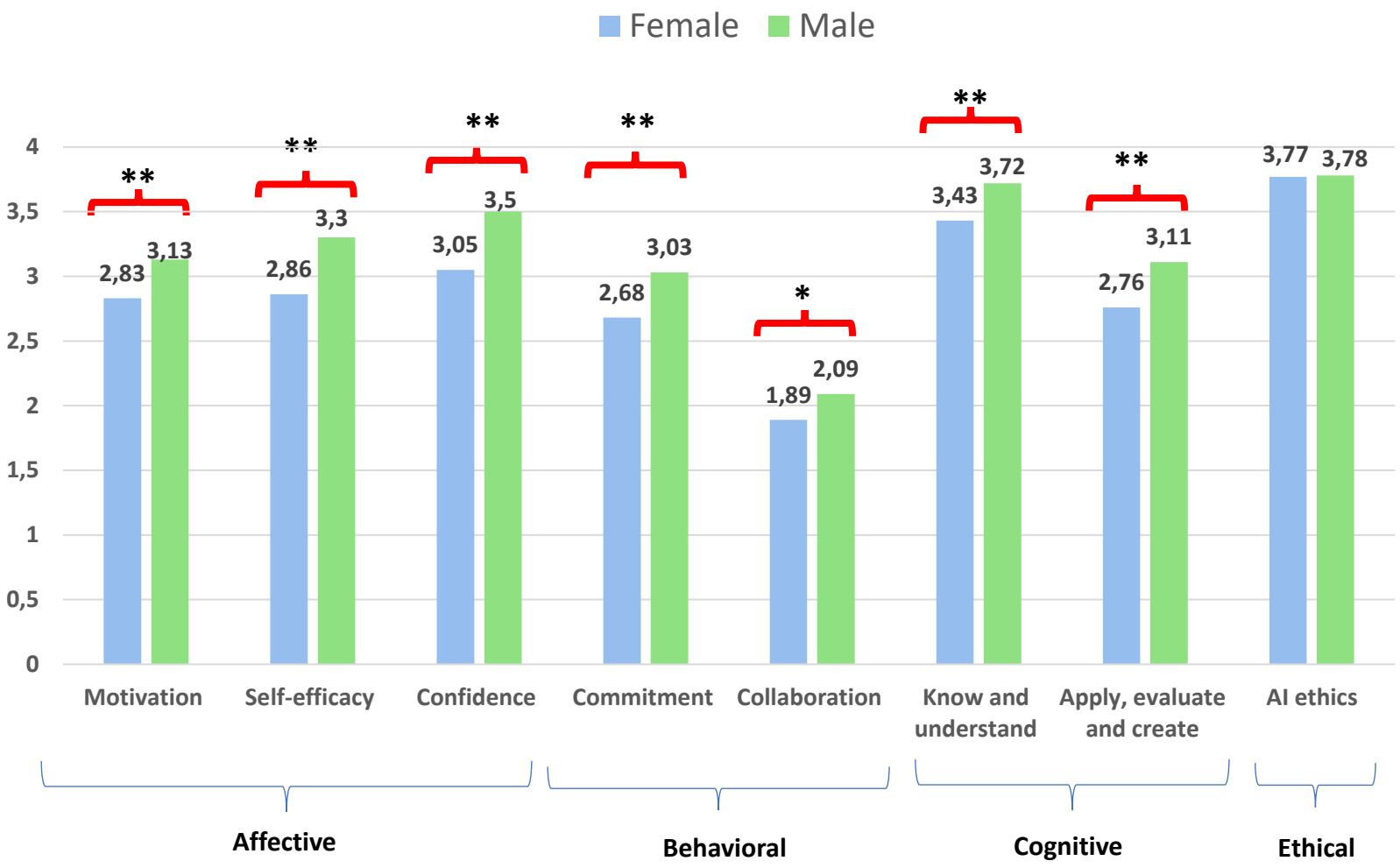
Main Remarks #Ethical

- Most students perceived themselves as aware of the importance of ethics in AI use.
- Most students perceived high awareness of AI risks and biases.
- Most students perceived themselves as highly aware of AI accountability.
- Most students perceived themselves as highly aware of AI limitations.

AI Literacy: Male vs Female



AI Literacy: Male vs Female #continued



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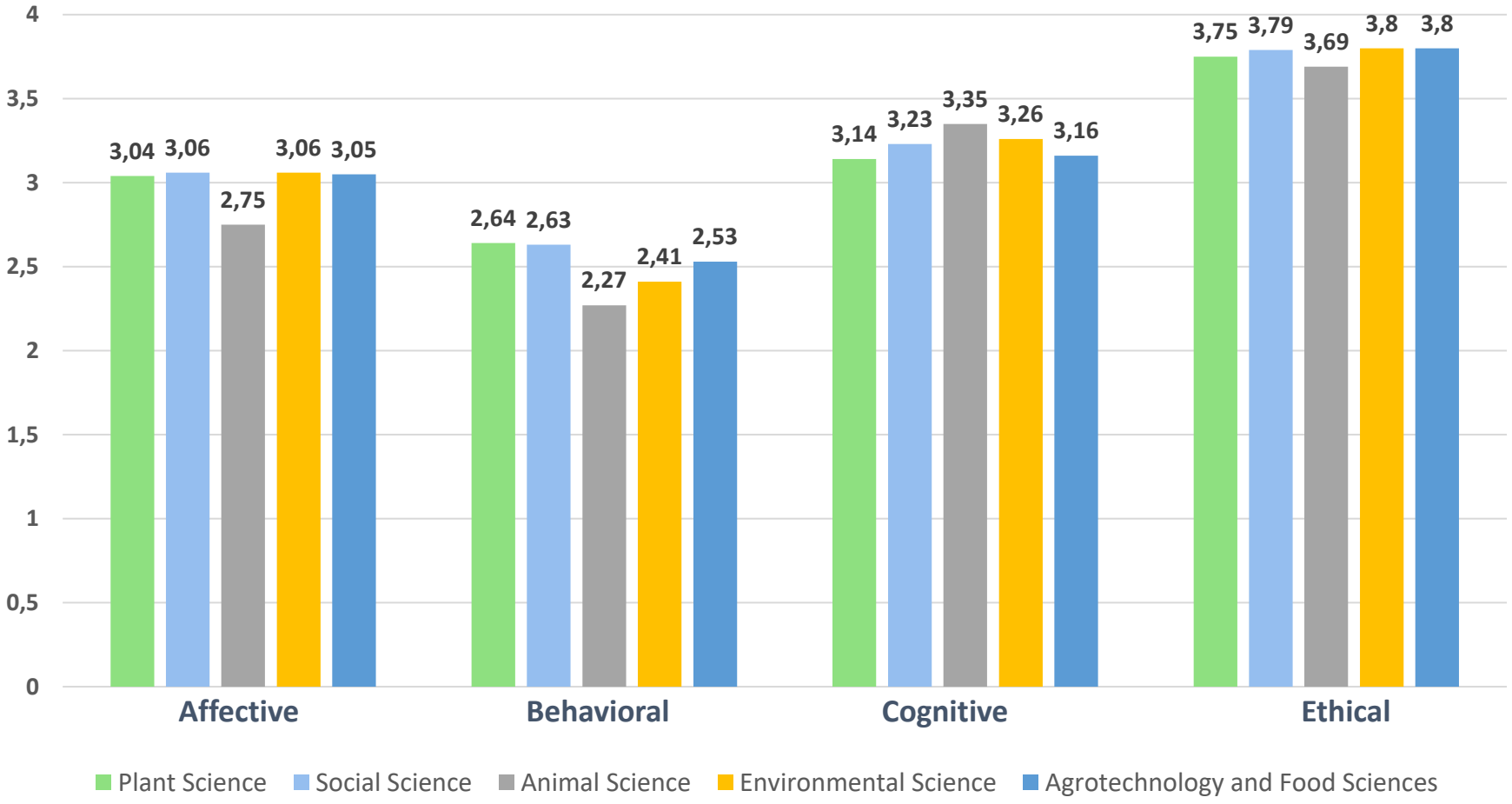
Main Remarks #Gender

- Male students perceived themselves significantly higher than female students regarding the affective, behavioral, and cognitive aspects of AI literacy.
- However, in terms of the ethical aspect of AI literacy, male and female students perceived themselves at an almost similar level.

Question - Do we need to take differences found into account for support and/or policy?

AI Literacy: Science Groups



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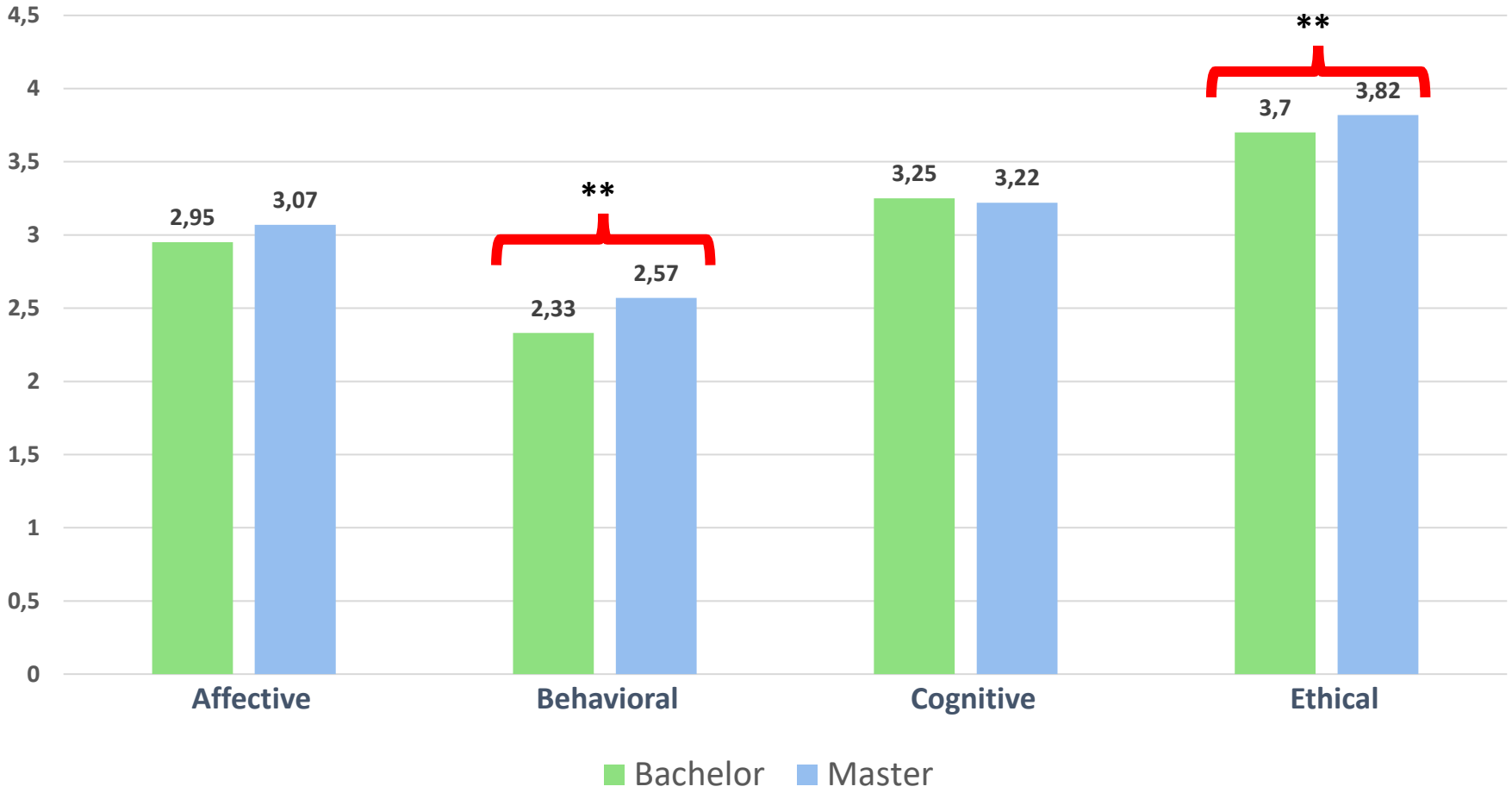
Main Remarks #Science Groups

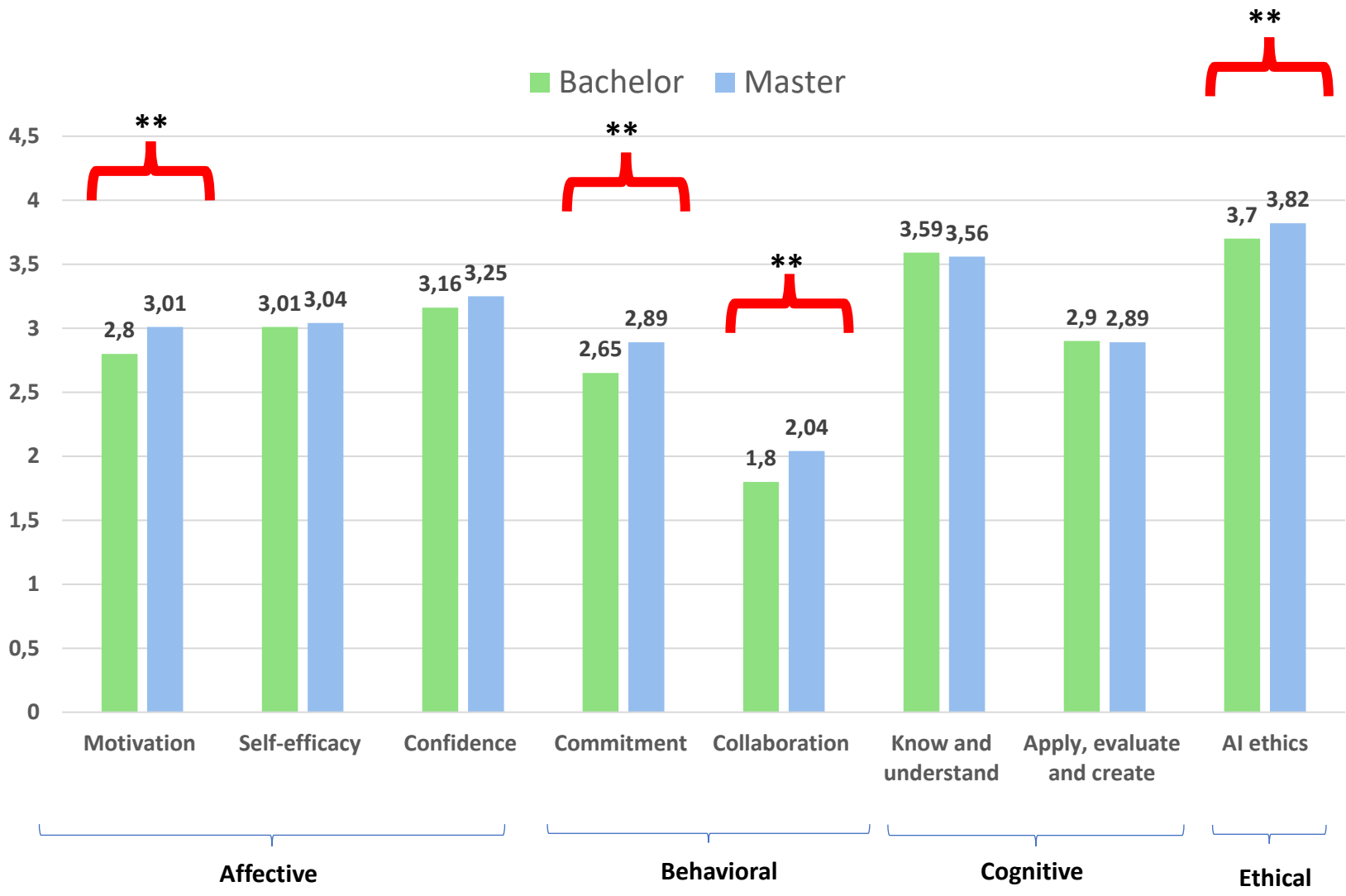
- Students' perceived AI literacy knowledge in four aspects of AI literacy did not significantly differ between different science groups at WUR.
- However, students in all four departments, scored themselves rather low regarding the behavioral aspect of AI literacy.

Emphasis on behavioral aspect of AI literacy through project-based activities and collaboration across disciplines could enhance students' practical engagement with AI tools.

AI Literacy: Education Levels



AI Literacy: Education Levels #continued



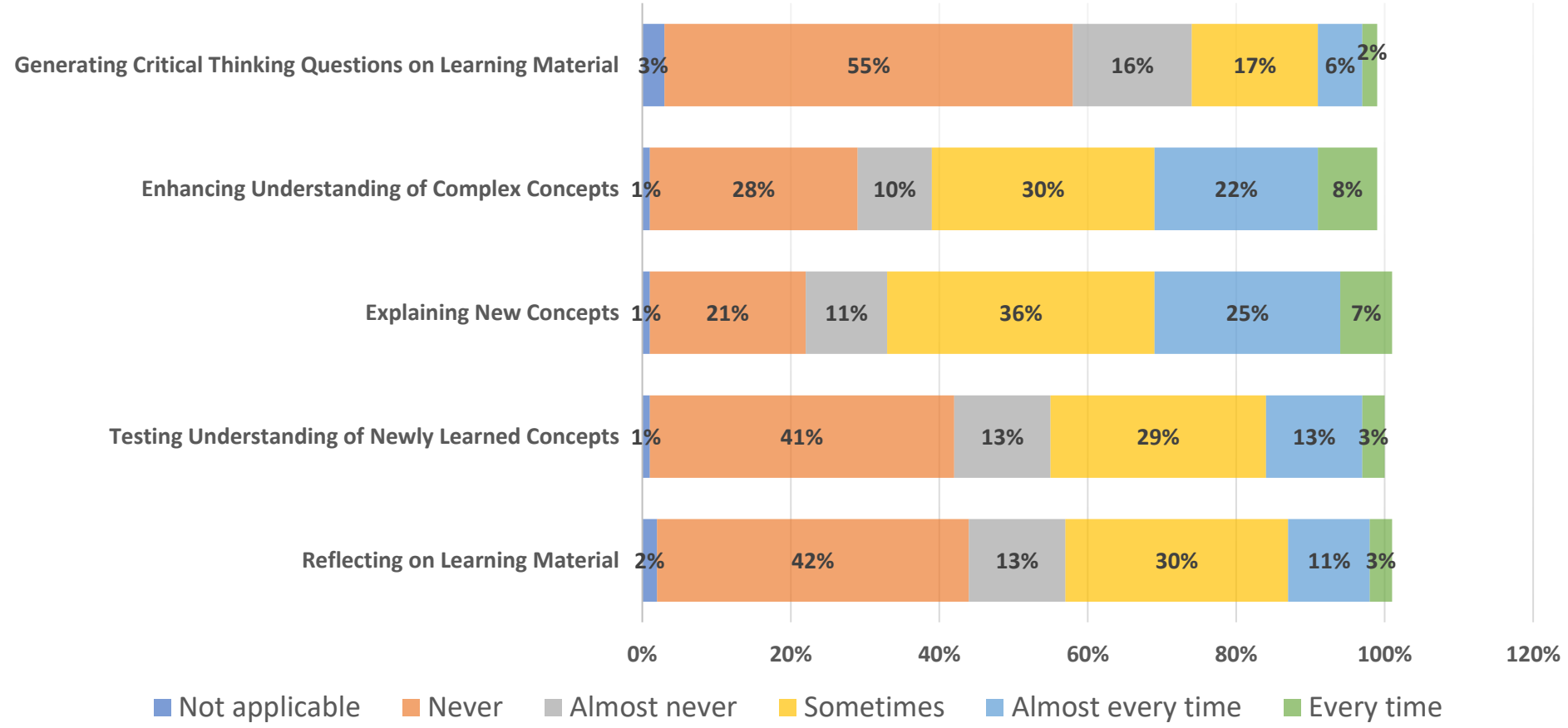
Main Remarks #Education Level

- Master students scored themselves significantly higher than bachelor students in terms of the behavioral and ethical aspects of AI literacy.
- This significance was mainly related to motivation to use, commitment to use, collaboration in AI use, and AI ethics.
- Both bachelor and master students scored themselves rather low regarding the behavioral aspect of AI literacy.

Question – Is there a need to improve students', in particular, bachelor students', AI literacy regarding the behavioral aspect?

GenAI for Learning

For Critical Thinking, Understanding Concepts, Reflection



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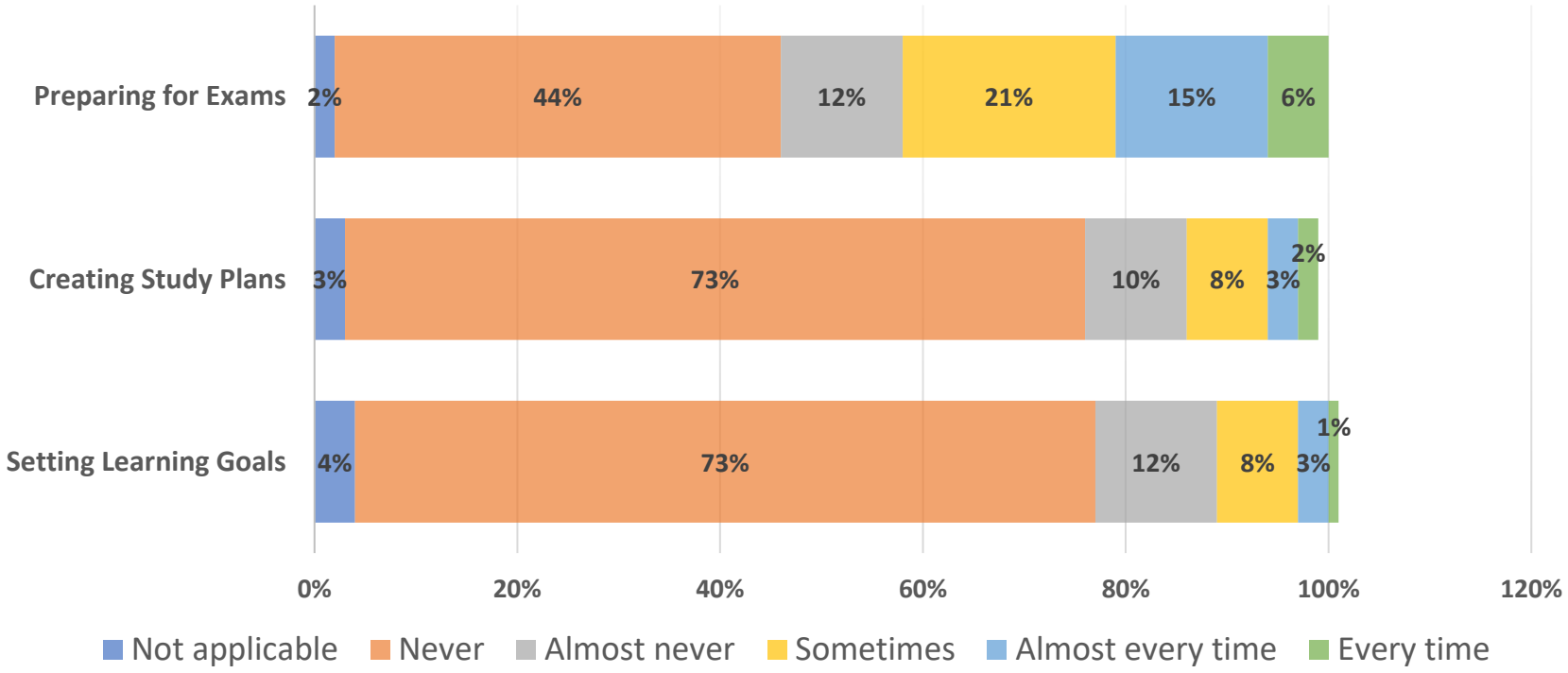
GenAI for Learning #continued

For Preparing Exam, Study Plans, and Setting Goals



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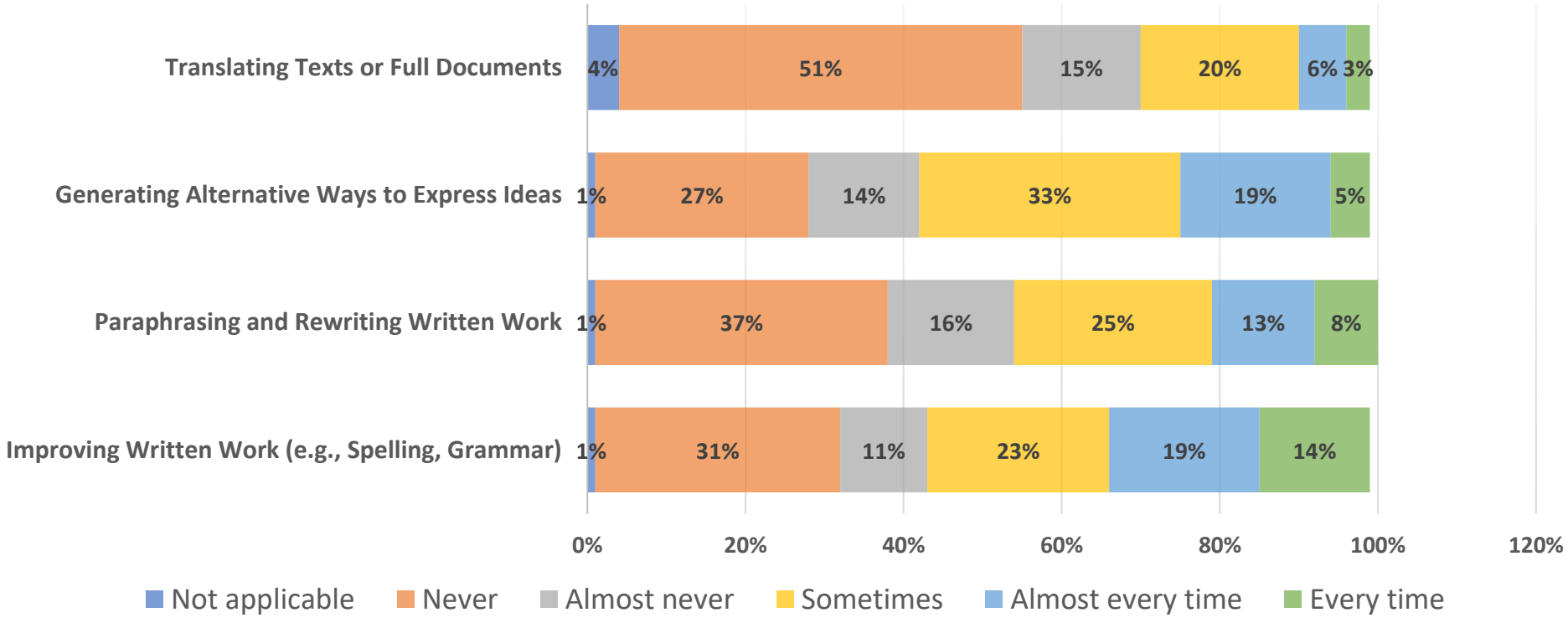
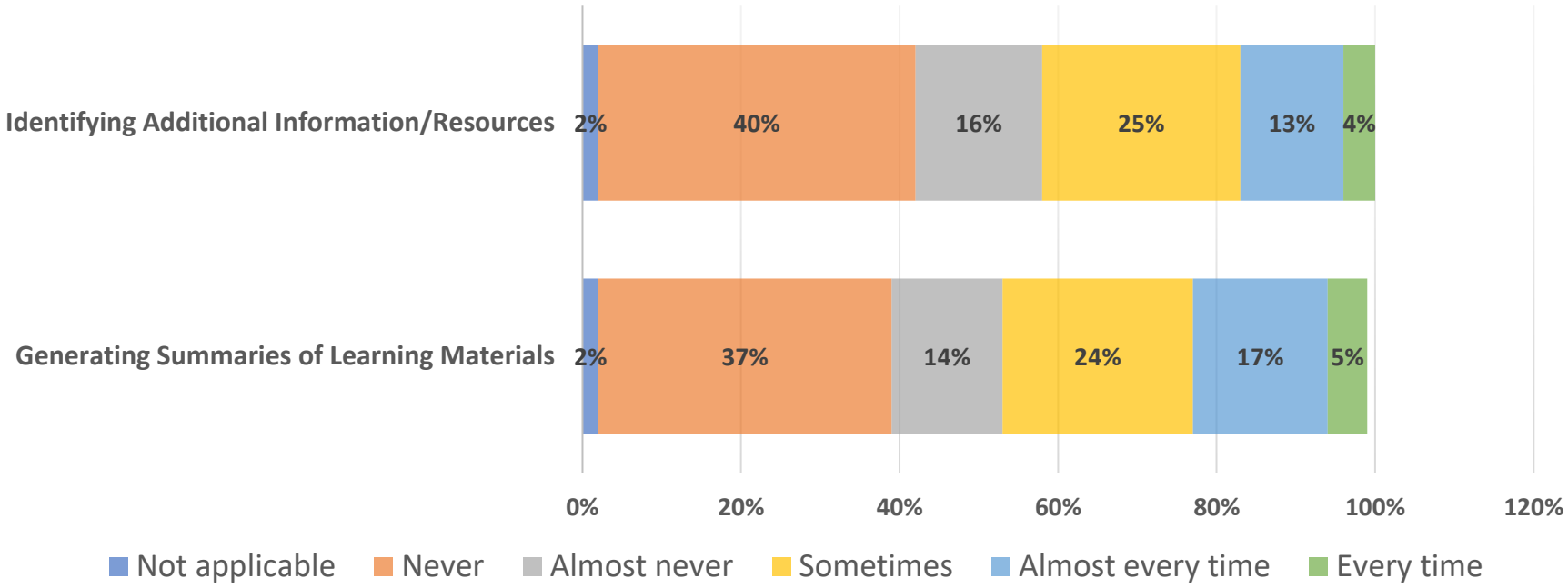
GenAI for Learning #continued

For Writing, Translation, and Brainstorming

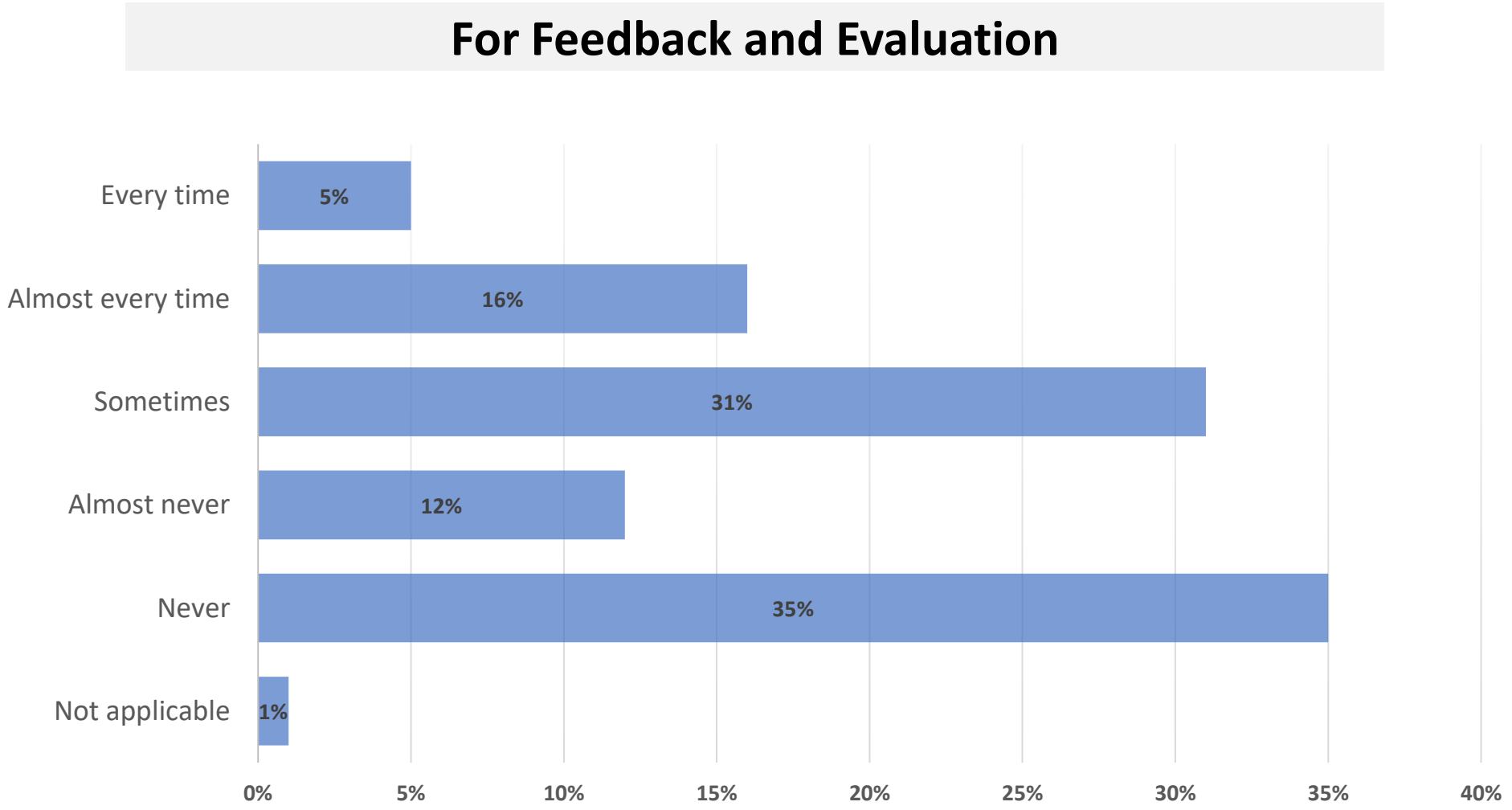


GenAI for Learning #continued

For Information Identification and Summarizing

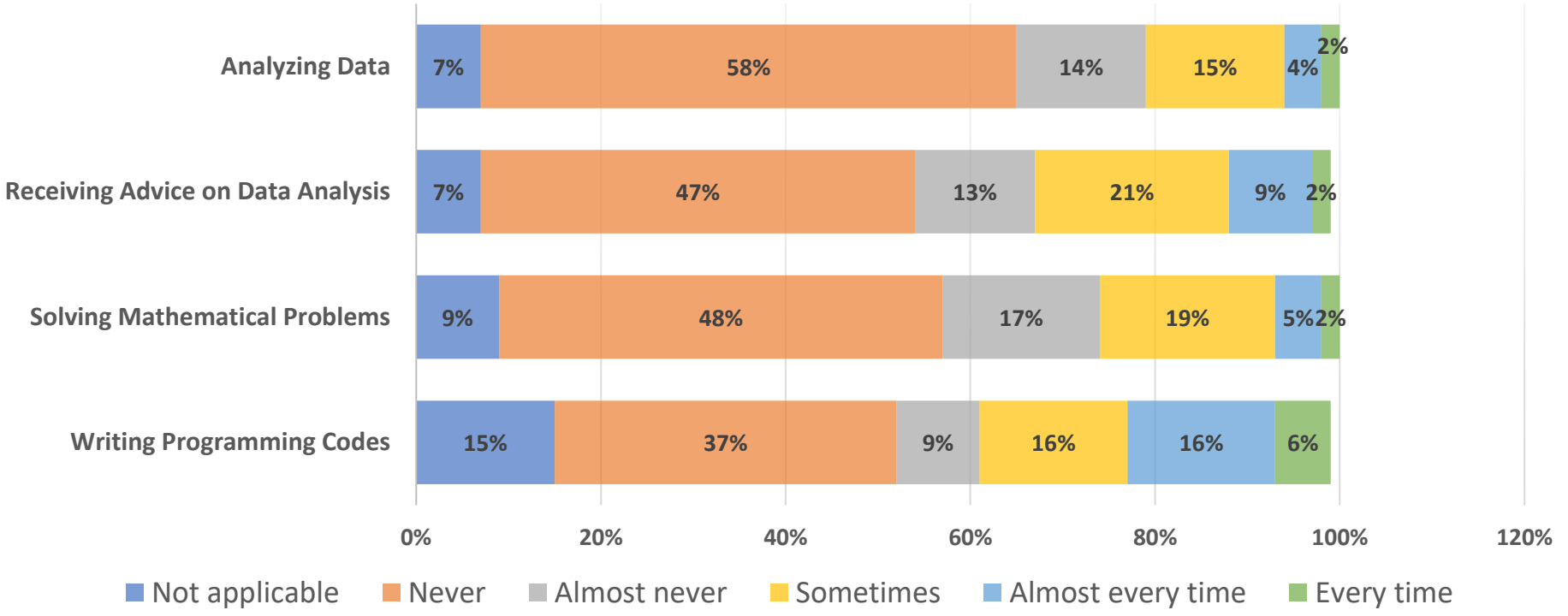


GenAI for Learning #continued



GenAI for Learning #continued

For Statistics, Data Analysis and Programming



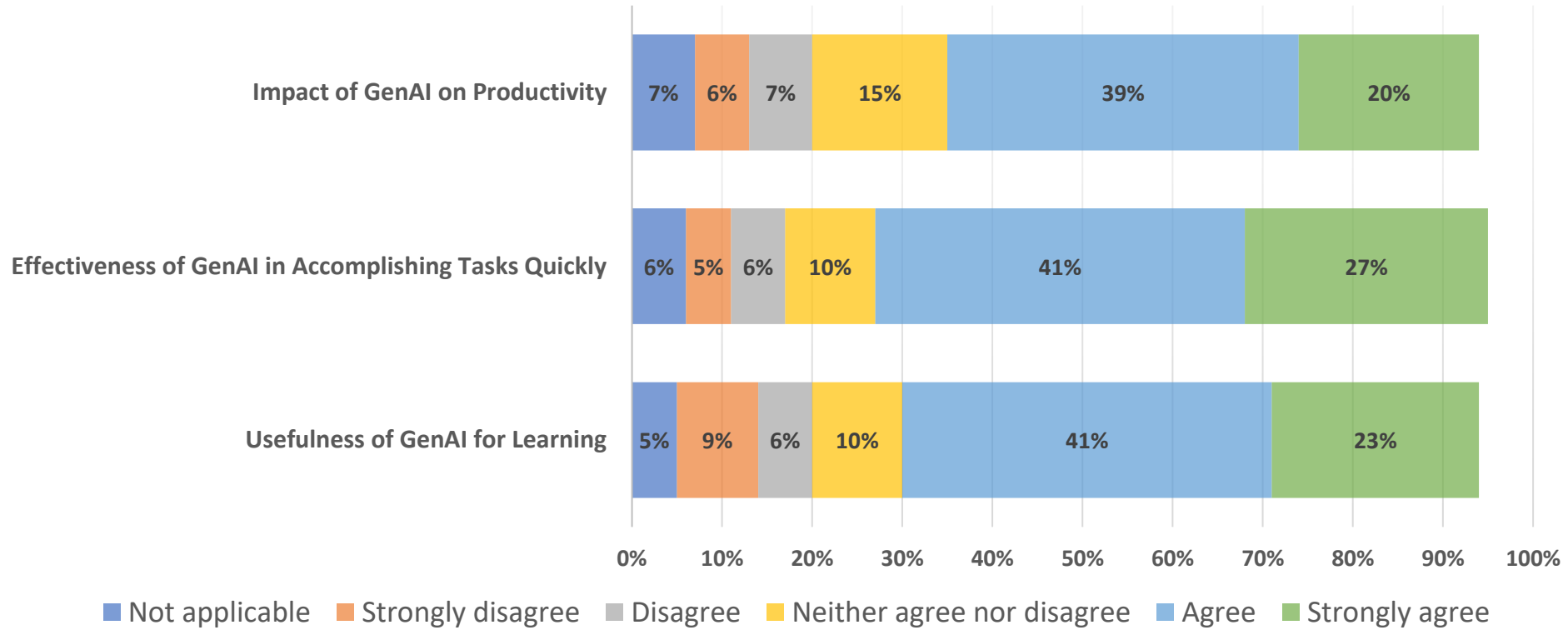
Main Remarks #GenAI for Learning

- Students perceived the free version of ChatGPT as the most commonly used GenAI tool.
- A significant number of students perceived that they hardly use GenAI tools for learning purposes.
- Students perceived occasional use of GenAI for writing assistance.

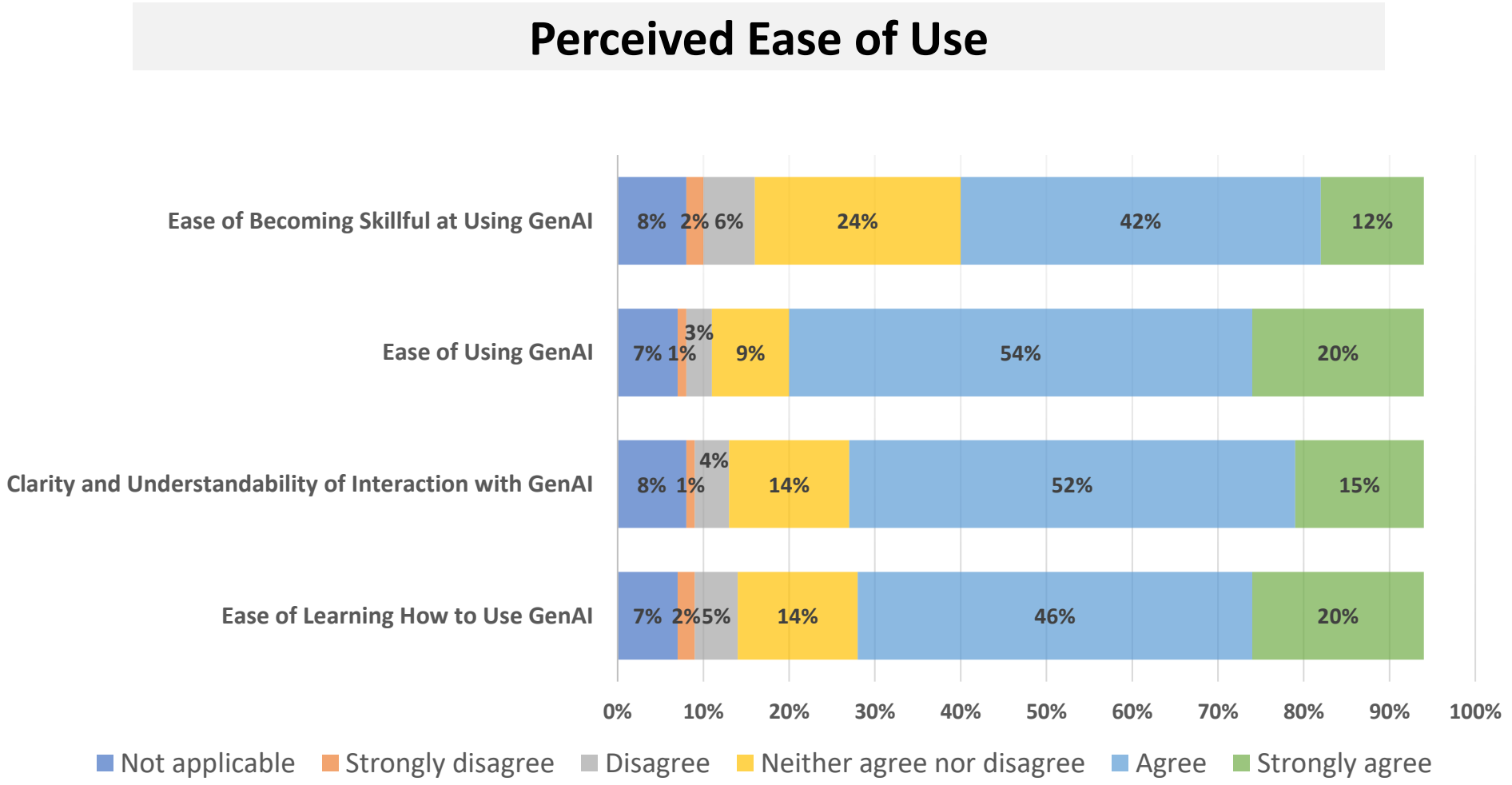
These findings suggest a need to increase awareness of how GenAI can support academic tasks and provide training on effectively integrating it into students' learning workflows.

Perceptions of GenAI Use

Perceived Productivity, Effectiveness, and Usefulness



Perceptions of GenAI Use #continued



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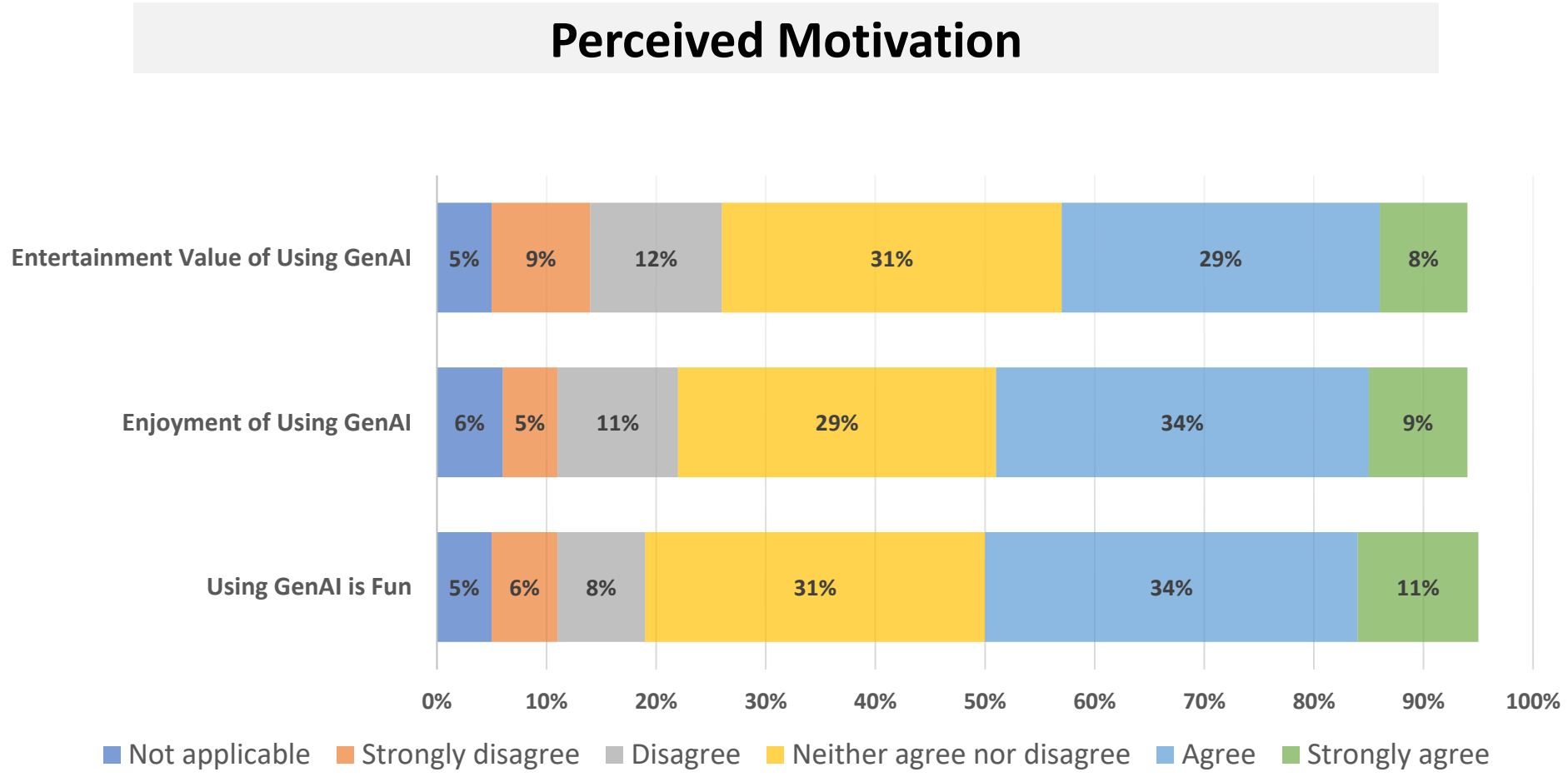
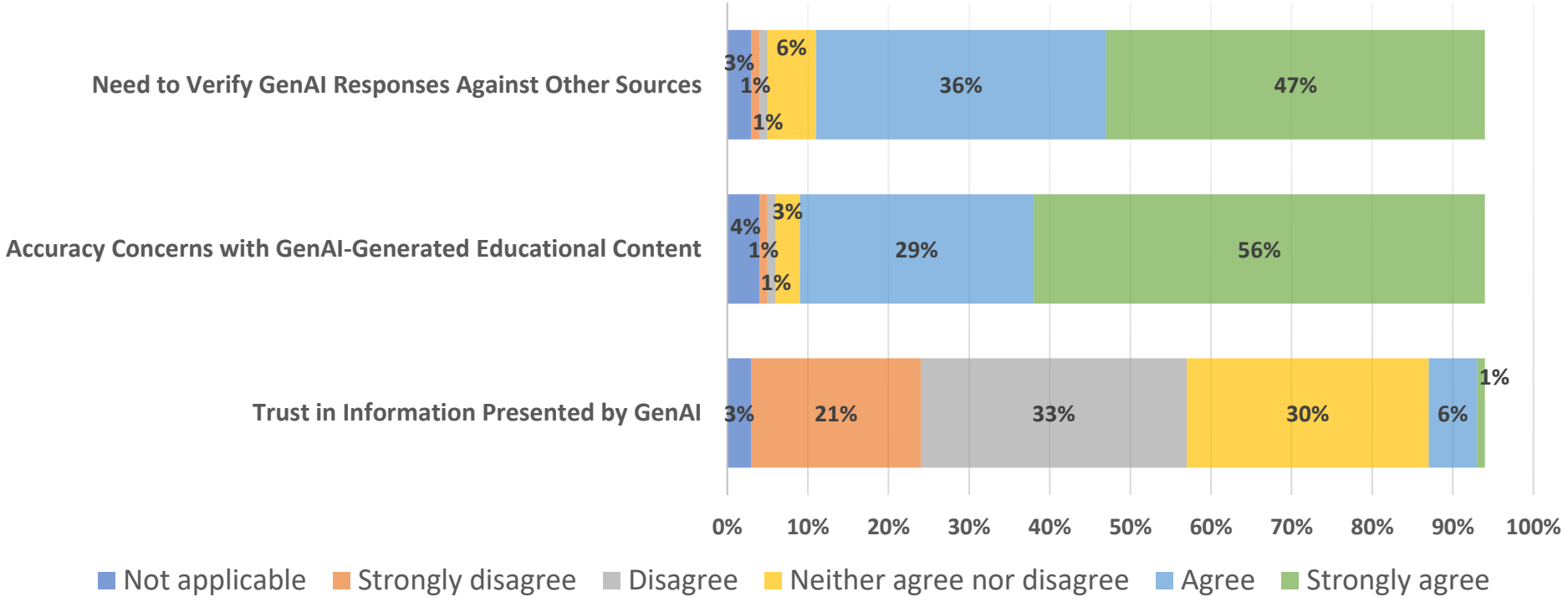
Perceptions of GenAI Use #continued

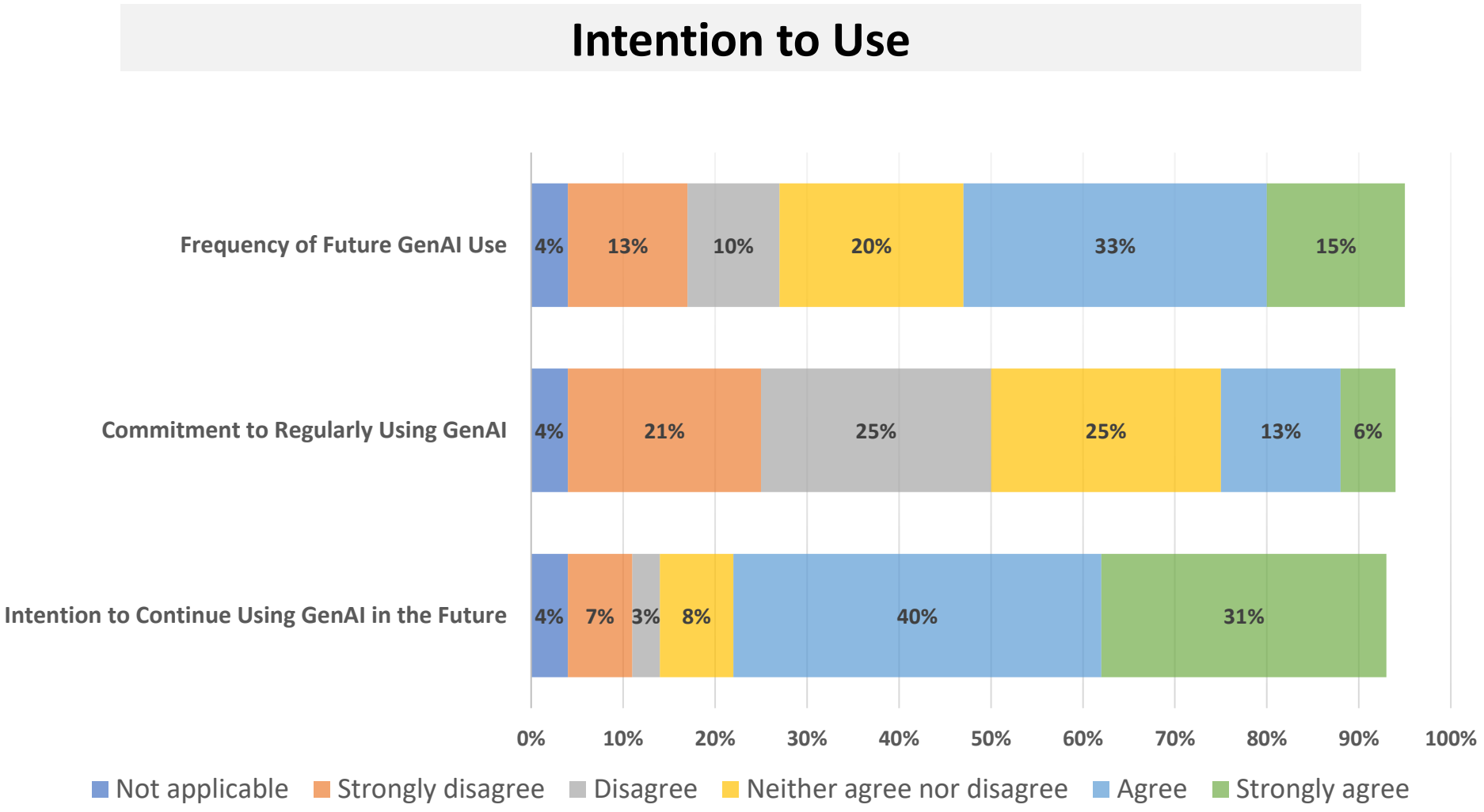


Perceptions of GenAI Use #continued

Perceived Trust and Accuracy



Perceptions of GenAI Use #continued



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Main Remarks #GenAI Perceptions

- Students perceived themselves as having a high intention to use GenAI in the future.
- While students perceived GenAI as useful, user-friendly, and beneficial for productivity and learning, they reported concerns about trust and reliability.

To maximize AI impact on students, efforts could focus on addressing students' concerns, increasing their engagement, and demonstrating the GenAI potential to enhance learning outcomes.

Conclusion

- Among students who used GenAI, ChatGPT was perceived as the most frequently utilized tool.
- While students were motivated and confident about GenAI, they did not often use it for learning purposes.
- While students perceived GenAI as easy to use, useful, and user-friendly, they did not highly trust its generation and outputs.
- Students perceived themselves as having a high awareness of the ethical aspects of AI use.
- The difference in perceived knowledge between male and female students could be considered in support and policy decisions.
- Bachelor students might need more support in improving AI literacy, particularly regarding the behavioral aspect.





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