جامعة مصر للمعلوماتية
EGYPT UNIVERSITY OF INFORMATICS

Egypt University of Informatics
Computer and Information Systems
Data Analysis Course

The Analysis of Generative AI use and its effect on creativity and problem solving for CS students

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Introduction

Generative AI tools Like GBT and Cursor are transforming how we approach and solve problems especially as cs students as well as it drives students to innovate more and think outside the box. These tools provide efficiency and inspiration for future projects (but do they really?), this report explores how generative AI tools impact Problem solving and innovation for cs students currently enrolled in EUI and Aims at answering the question is generative AI really a tool that drives innovation or does it affect creativity of students by making them very reliant on it?

Research Question

How does the use of generative AI tools correlate with the creativity and problem-solving aspect of Computing and Information Sciences students at EUI?

Hypothesis

I hypothesized that using generative AI tools enhances creativity and problem solving skills among CIS students by opening their horizons and providing them with new experiences and perspectives since Afterall it's just a tool.

Population of Interest:

All of computer science students currently enrolled at Egypt University of Informatics this was chosen because CIS students are most likely to use generative AI tools in their daily lives be it from academic progress to working on personal projects.

Sampling Method:

I used a convenience sampling method by sending the link on WhatsApp announcement groups for CIS students in EUI. I used this approach because its the most practical way to sample for my selected population and due to its feasibility aspect

Bias Identification:

In designing this survey, I identified that I was an AI enthusiast with the assumption that AI enhances creativity, to minimize my bias towards this i didnt use any wording the format of questions that might sway the responder into answering in a certain way, and took demographic data from users to identify any cofounding factors (like gender) as well as explained response options to make sure theyre all levelled. CIS students might be inclined to think positively about AI use since it can automate repetitive tasks, so this is something to watch out for.

Survey Questions:

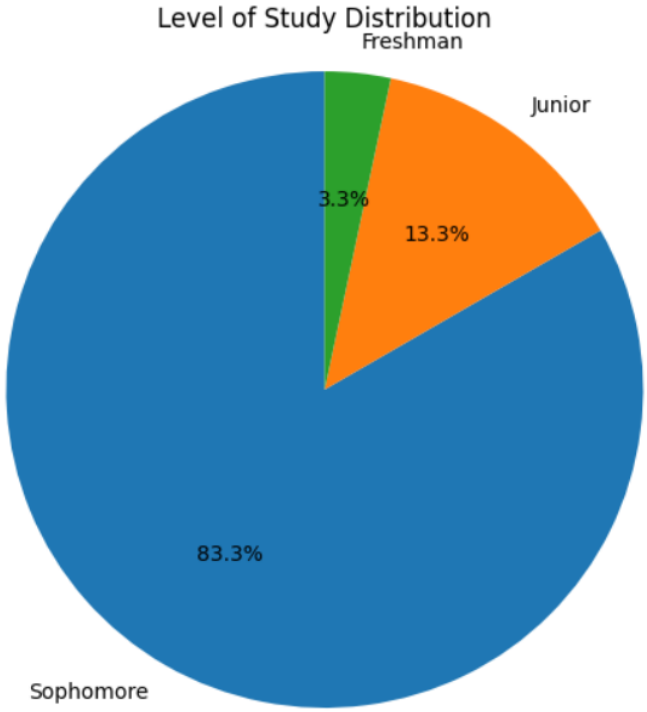
- Gender

- How often do you use generative AI tools (e.g. GPT, Cursor) for your CS coursework or personal projects?
- On a scale of 1–5, how accurate do you find generative AI tools when assisting with your CS work?
- How much do you rely on generative AI tools to complete your CS coursework or projects?
- What's your current level of study?
- On a scale of 1–5, how often do you work on CS tasks that require creative thinking (e.g., designing algorithms, building unique projects)?
- How has generative AI influenced your approach to solving coding problems (like LeetCode, Codeforces)
- How has generative AI influenced your ability to generate innovative or unconventional solutions in CS problem-solving?
- On a scale of 1–5, how confident are you in completing a CS assignment (like a coding project) without using generative AI tools?

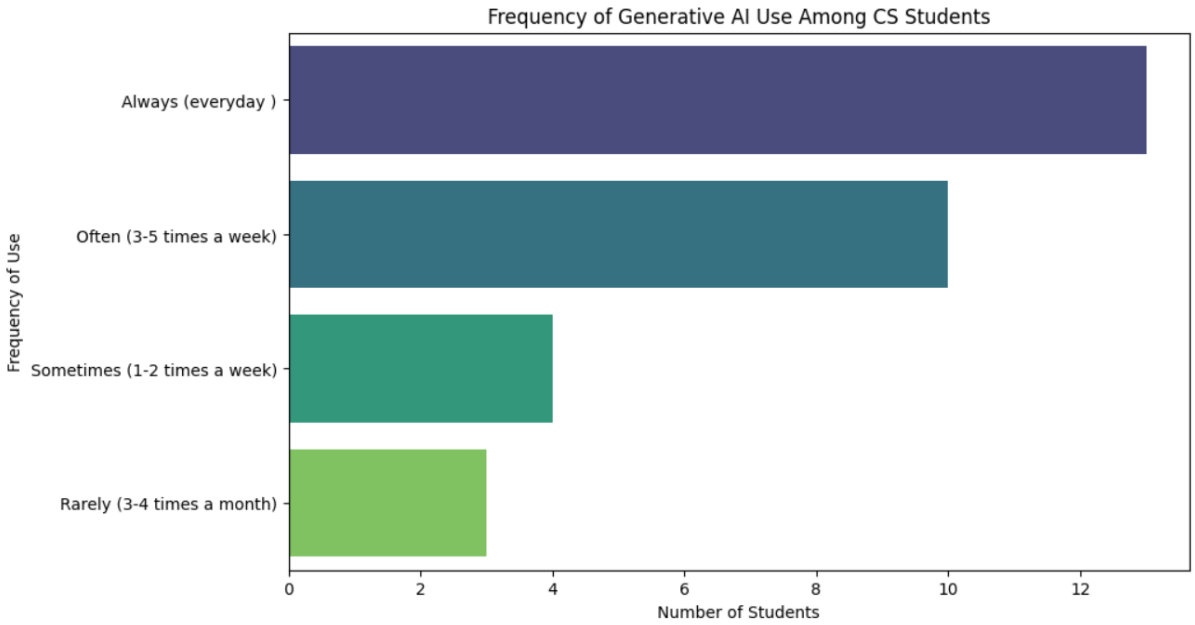
Online survey link: https://forms.gle/pi6tVKvJydcpHcWTA

Number of samples collected: 30

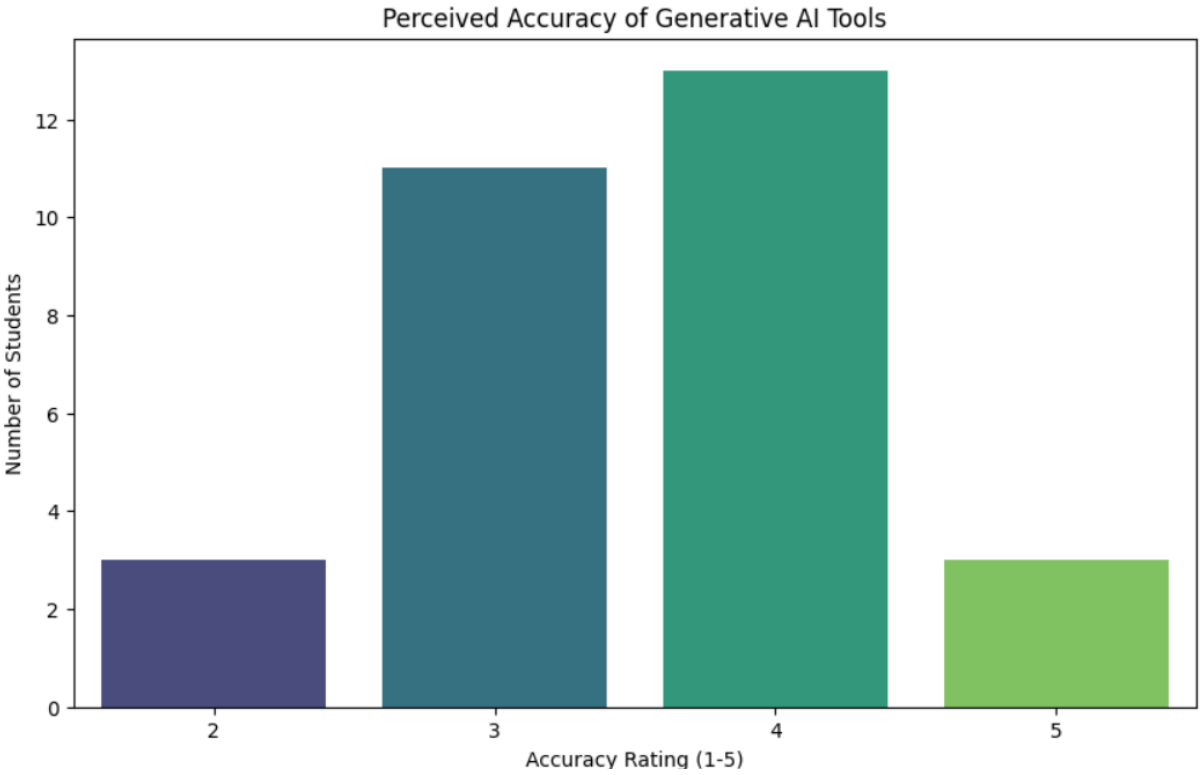
Analysis:



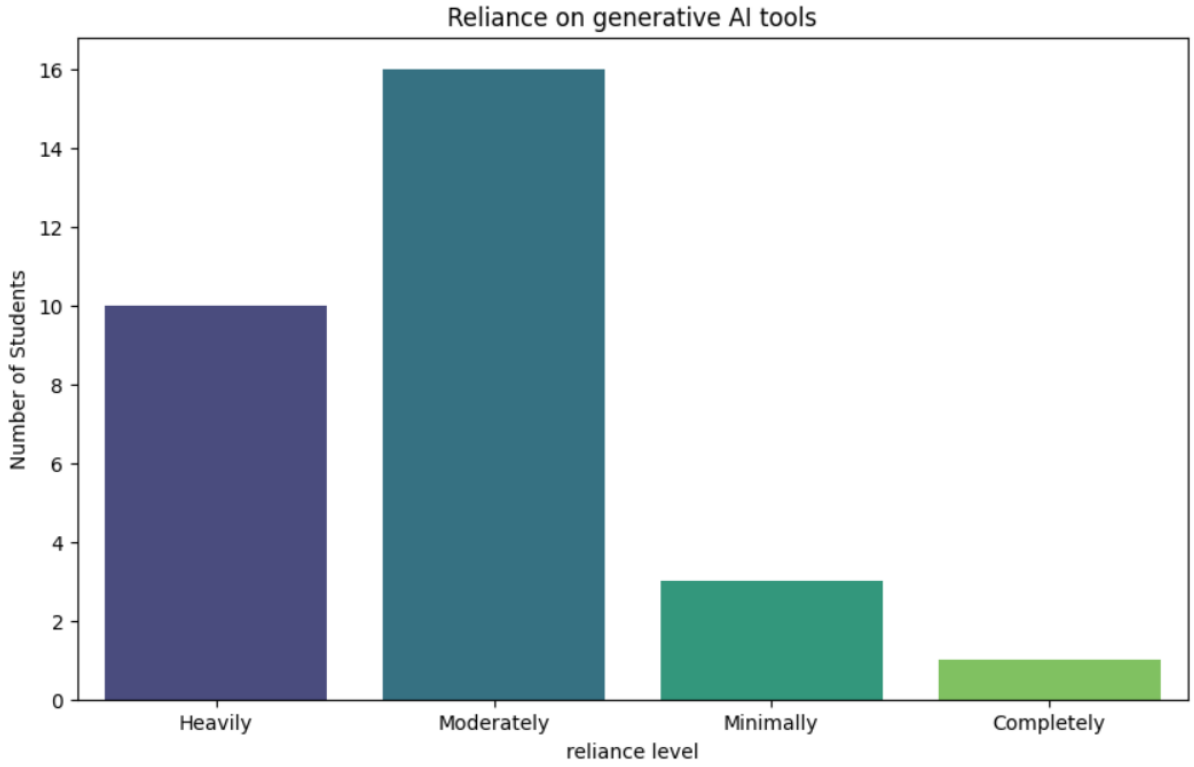
This shows how sophomores dominate the data set at 83% of the data this might make the data not fully representative of the CIS students as a whole as it skews heavily towards sophomores with limited experience compared to juniors and seniors



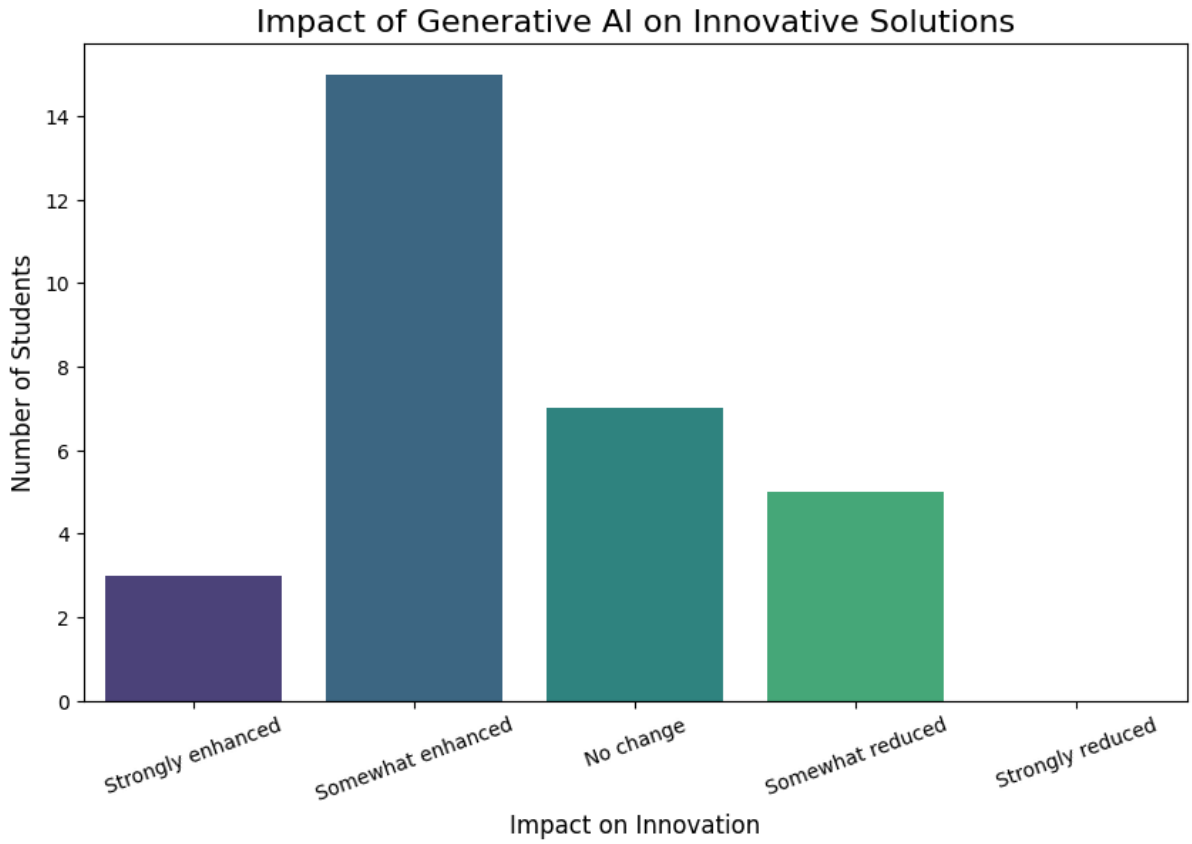
This shows how frequent students use AI in their day to day lives suggesting reliance and maybe more efficiency with repetitive tasks



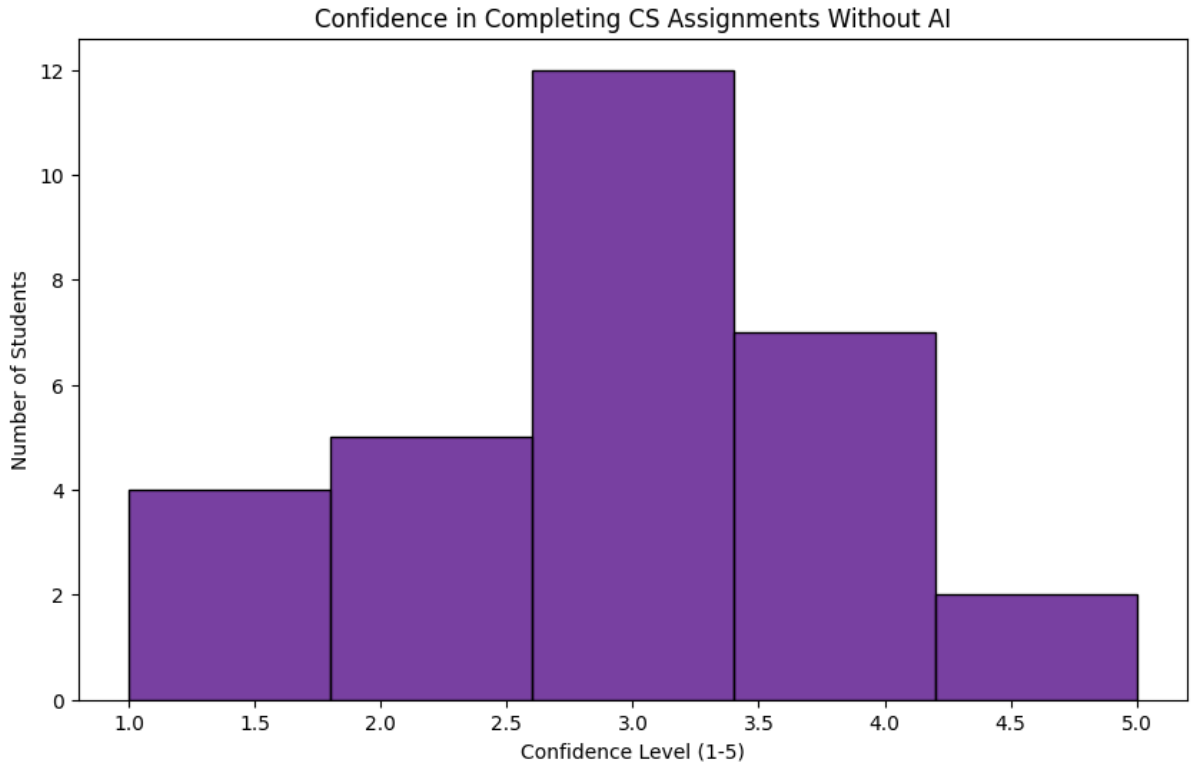
This shows how students perceive AI to be in terms of accuracy and the data show them mostly to be very accurate in answering questions or their needs



This graph shows the level of reliance of students on generative AI tools and displays how heavy most of CIS students rely on AI for questions

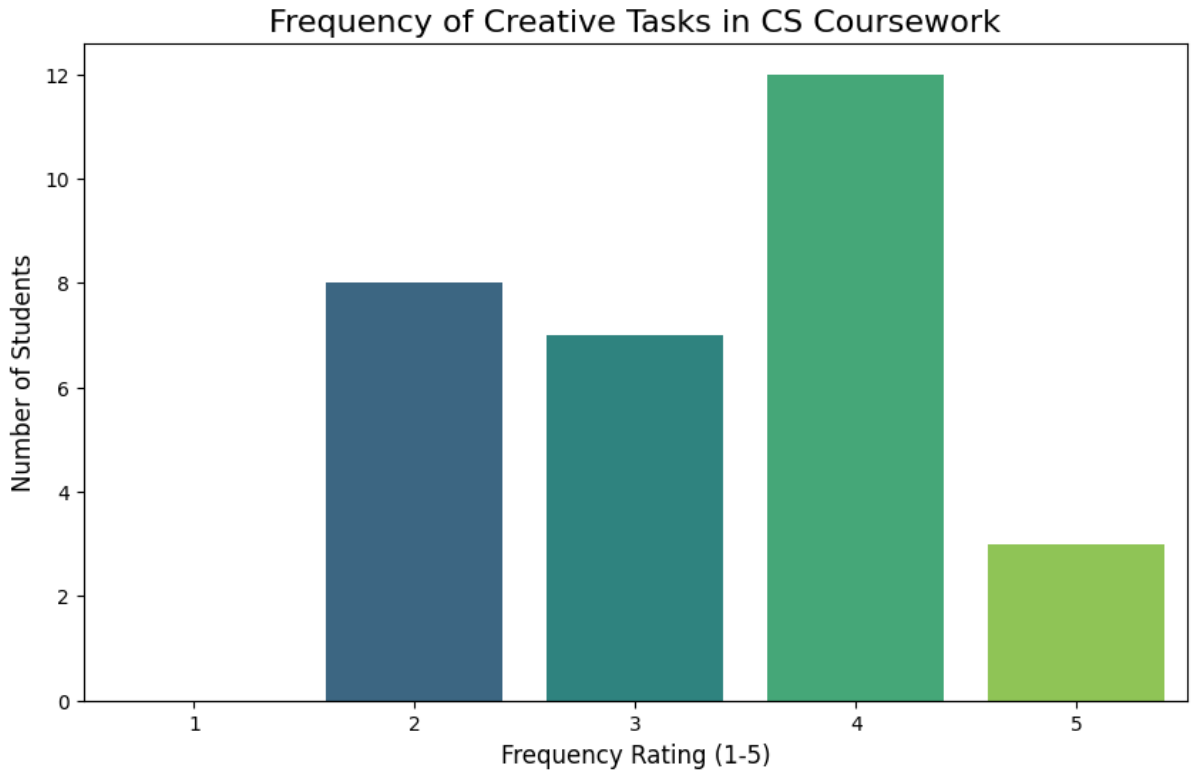


This how the students believe AI impacted their innovation and creative thinking showing the students to believe that AI enhanced their innovation.

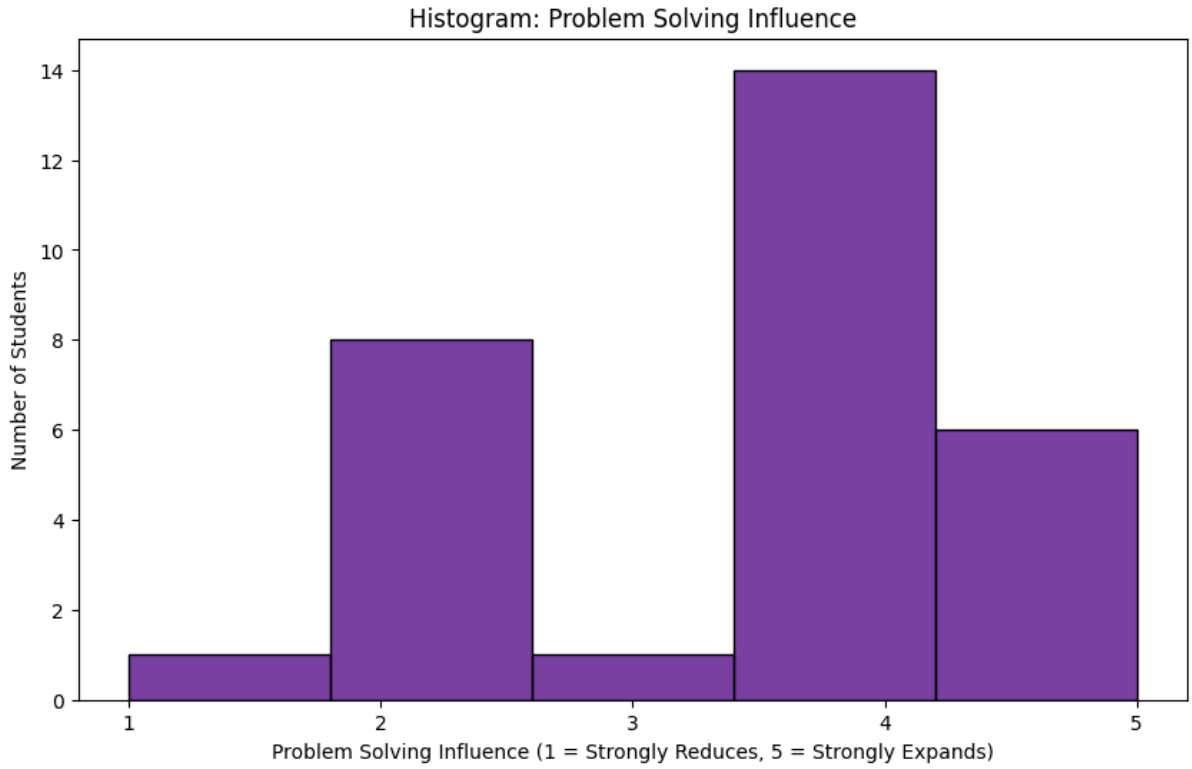


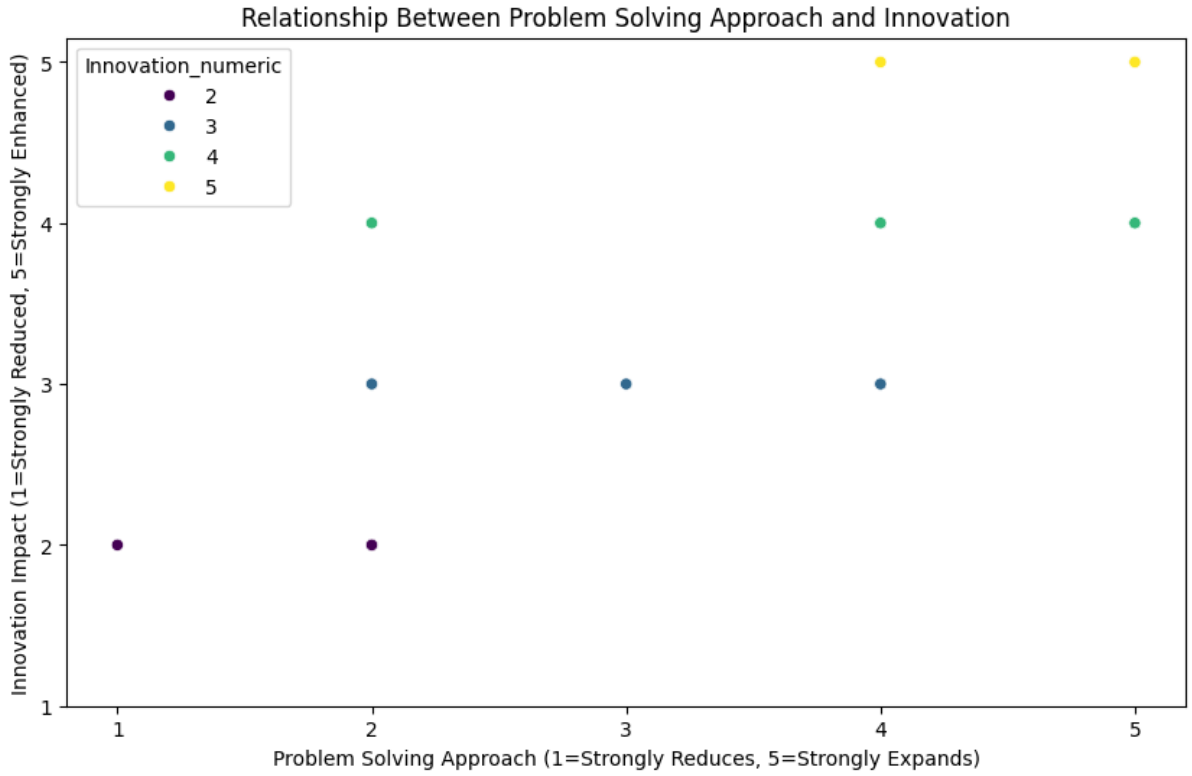
This shows how are students confident in their skills without the use of AI showing mostly a

normally distributed factor indicating students are moderately confident in doing tasks without AI.

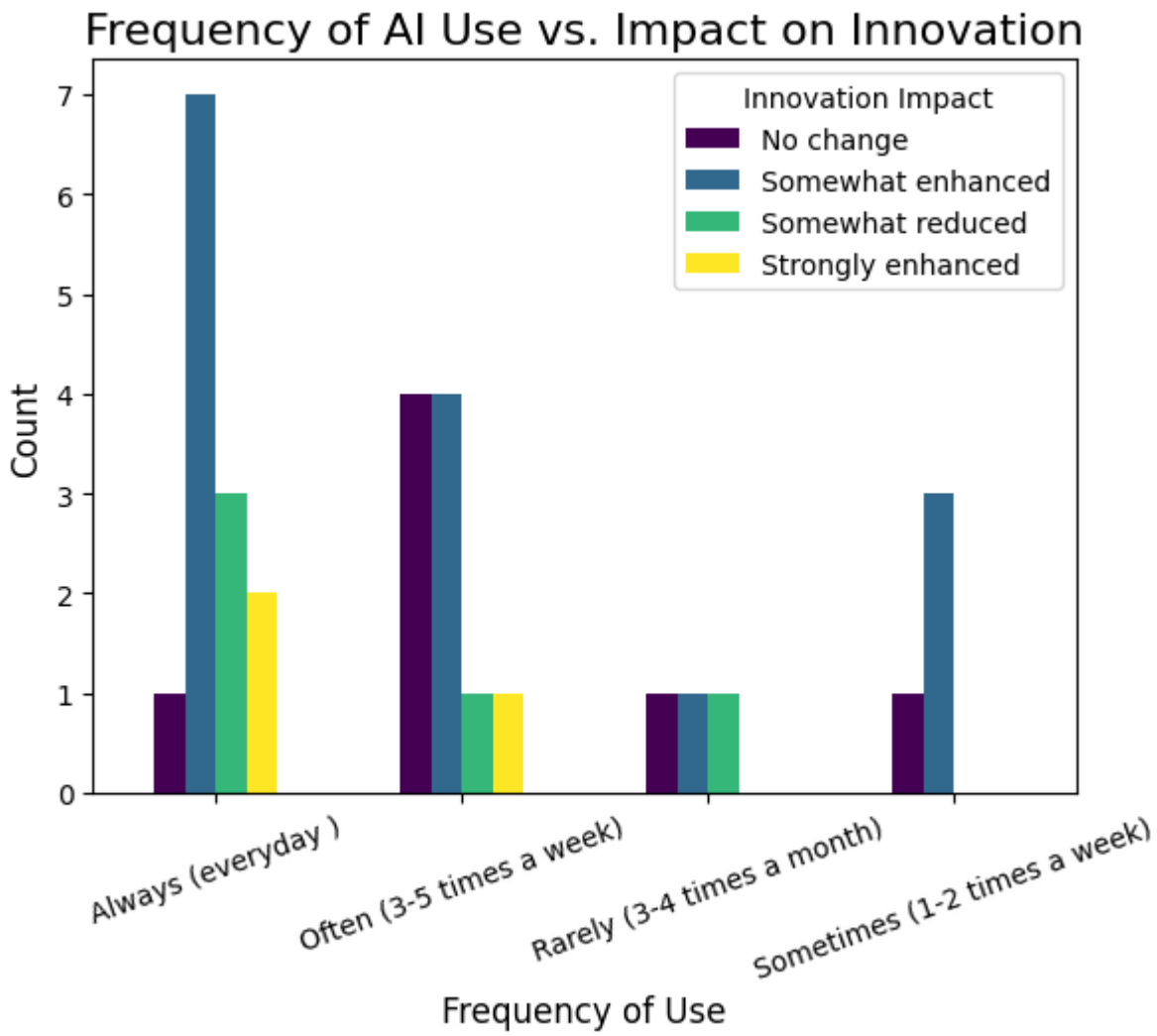


This graph shows how frequent the students work on creative tasks and project which is a variable that affects their impact and how they use genrative AI





this shows a positive correlation between how students perceive AI to impact their innovation and their problem-solving skills



This grouped bar chart shows the relationship between frequency of AI use and Impact on creativity and innovation

Conclusion

	percieved generative AI accuracy	Creative tasks	Confidence without AI
count	30.000000	30.000000	30.000000
mean	3.533333	3.333333	2.933333
std	0.819307	0.994236	1.112107
min	2.000000	2.000000	1.000000
25%	3.000000	2.250000	2.000000
50%	4.000000	3.500000	3.000000
75%	4.000000	4.000000	4.000000
max	5.000000	5.000000	5.000000

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Key Findings:
Average Confidence Without AI: 2.93
Average Perceived AI Accuracy: 3.53
Most Common Frequency of Use: Always (everyday )
Most Common Reliance Level: Moderately
Most Common Problem Solving Impact: Somewhat Expanded (AI gives hints, but I still think independently)
Most Common Innovation Impact: Somewhat enhanced
Correlation between Reliance and Confidence: -0.33
Correlation between Problem Solving Approach and Innovation: 0.72
Correlation between Frequency of Use and Innovation: 0.13
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For these key findings and stats the average confidence for students to solve problems or work on project without AI is 2.93 suggests a moderate of self assurance between students and students perceive AI to be moderately Accurate which affects their view on AI and how its helping them.

This survey of 30 CIS students at EUI provides insight into how frequently students use AI and most of them use it Everyday and thers a strong correlation between problem solving enhancement and innovation enhancement by AI 0.72 and little correlation between frequency of use and innovation (0.13)

Any potential issues

The sample size is very limited and mostly overtaken by sophmore studnets which affects their experiences compared to juniors, seniors or even freshmen which limits the correction of these data, and the convenience sampling method likely skewed the sample toward students active in WhatsApp groups, potentially missing less engaged CS students cofounding variables might affect the data like prior coding experience and perhaps exposure to AI tools from a young Age which will be addressed in a future project perhaps.