

Crutch or Coach?

Measuring Assistance Gap and Student Perceptions of GAI

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INTRODUCTION

Generative AI (GAI) can now write, explain, and debug code on request, which raises a question for every instructor who assigns work outside the classroom:

- When students produce strong work with GAI, how much can they do independently without resources?

Coding courses offer a clear test case, because unassisted skill can be measured directly with closed notes quizzes.

QUESTIONS EXPLORED:

- How does performance with GAI compare to performance without it, and does that gap differ by prior experience or cohort?
- How do students perceive GAI's role in their learning, including how it helped, how it hindered, and how they plan to use it professionally?
- Are students' perceptions related to the gap between their assisted and unassisted performance?

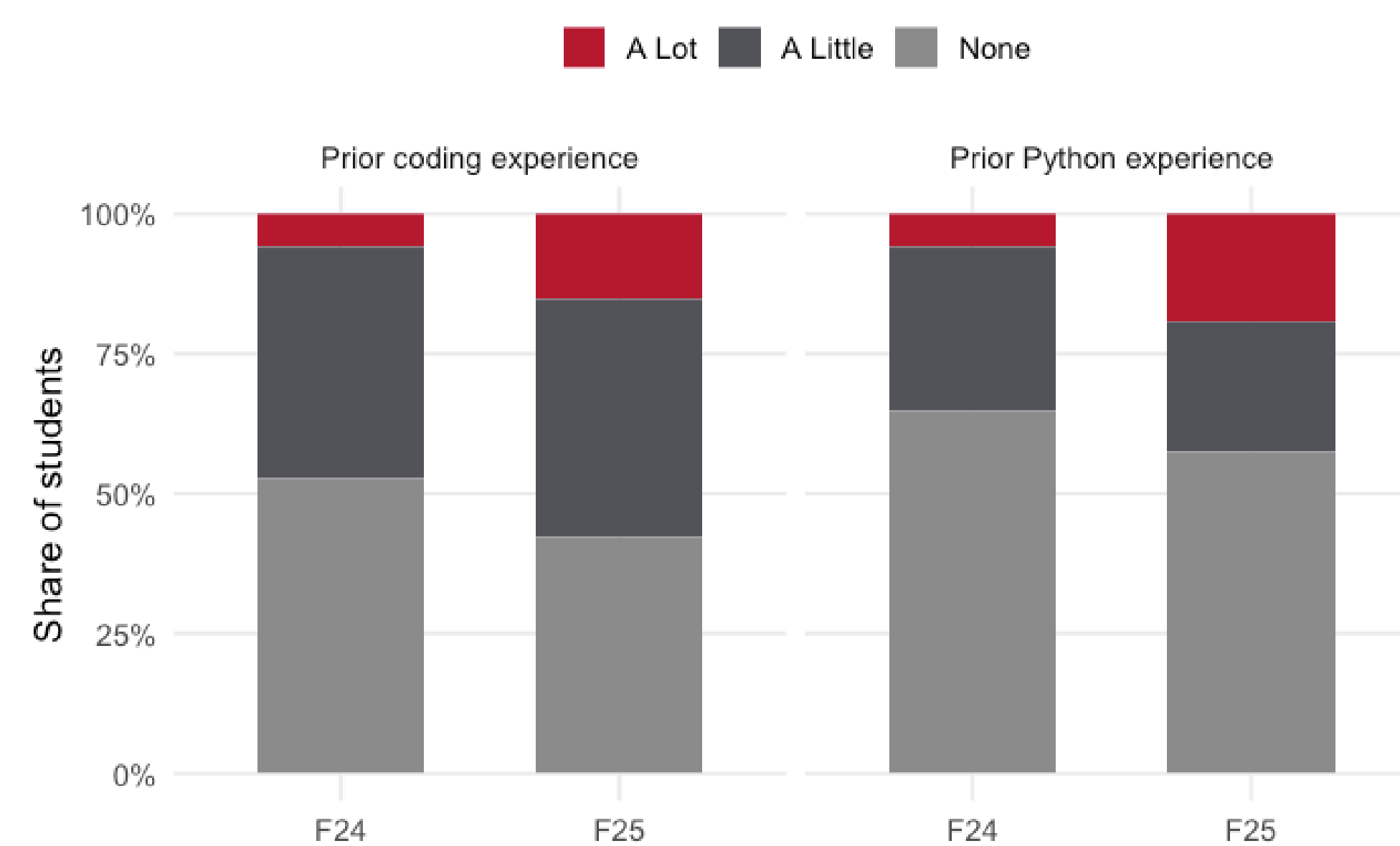
MATERIALS & METHODS

Participants: 43 undergraduate students in two sections of an introductory coding course (Fall 2024, n = 17; Fall 2025, n = 26) were studied. Most were business analytics minors (63%) or majors (26%), and most were juniors or seniors (49% seniors, 5% sophomores).

Materials: The original course materials were used with the topics Introduction to Programming and the Python and Excel VBA languages. The focus was on Data Exploration, Summarization, and Analysis. Starting in week 4, they also were asked to compare solutions generated with and without AI for small in class or homework questions.

Assessments: SELF-ASSESSMENT

- Prior Knowledge of Programming and Python



- End-Of-Course GAI Reflection (submitted with Final)
 - How do you think it helped you?
 - How do you think it hindered you?
 - How might you use Generative AI as part of your profession or career?

GAI ASSISTANCE ALLOWED

- Individual Project

NO GAI ASSISTANCE OR NOTES

- PreTest (Day 1 - Participation Points - 14 questions)
- Mid Course Quiz (14 questions)

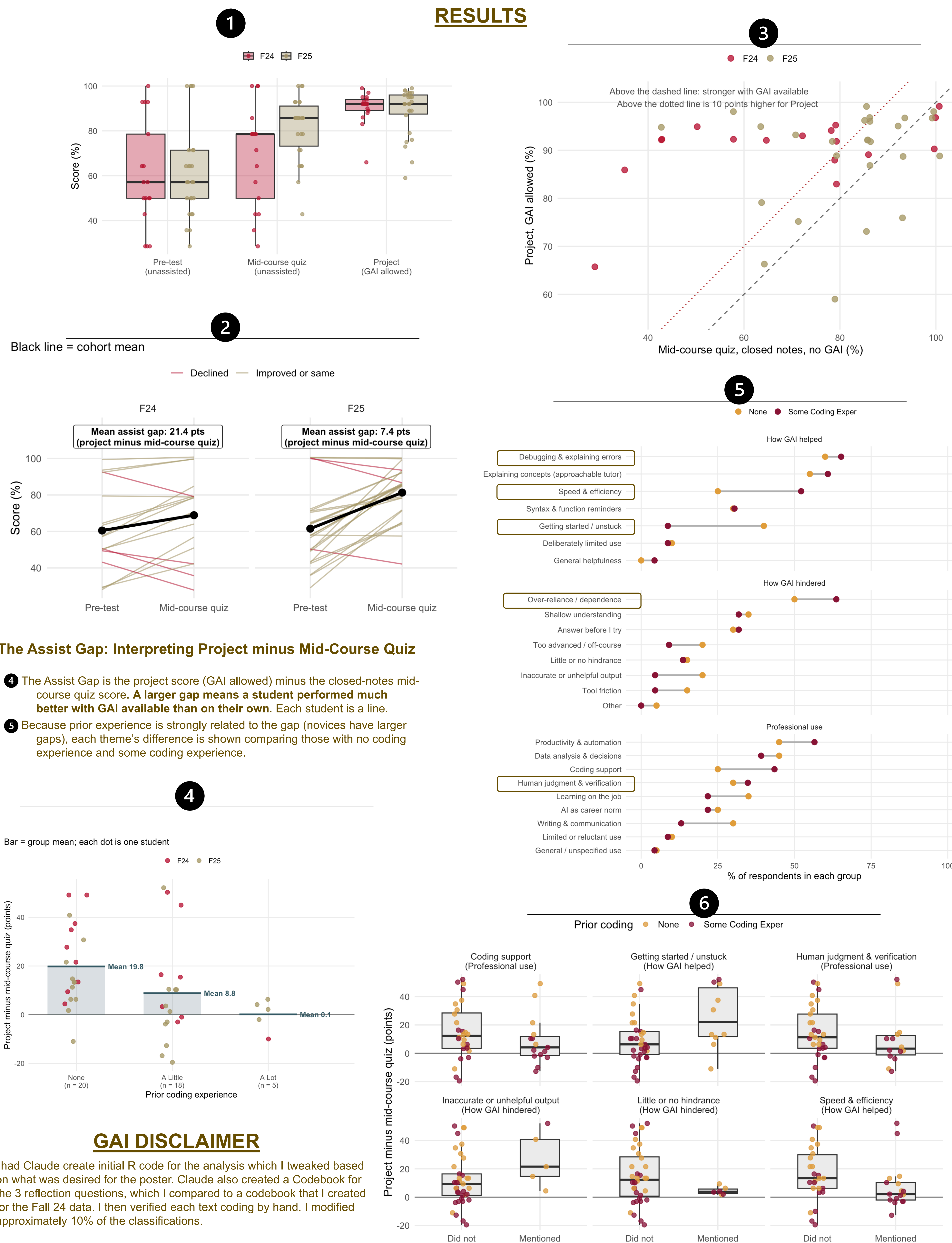
A sample question is shown below:

```
x=1
while x <= 4:
    print(x)
    x = x + 1
```

What is the output for this code?

	A. 1	B. 1	C. 2	D. 2
1	2	2	3	3
2	3	3	4	4
3	4		5	

RESULTS



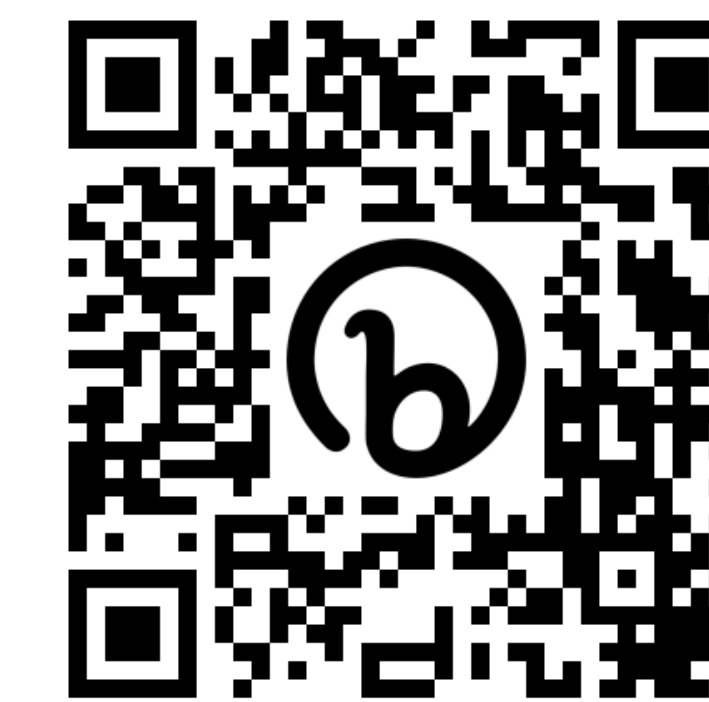
The Assist Gap: Interpreting Project minus Mid-Course Quiz

- The Assist Gap is the project score (GAI allowed) minus the closed-notes mid-course quiz score. A larger gap means a student performed much better with GAI available than on their own. Each student is a line.
- Because prior experience is strongly related to the gap (novices have larger gaps), each theme's difference is shown comparing those with no coding experience and some coding experience.

GAI DISCLAIMER

I had Claude create initial R code for the analysis which I tweaked based on what was desired for the poster. Claude also created a Codebook for the 3 reflection questions, which I compared to a codebook that I created for the Fall 24 data. I then verified each text coding by hand. I modified approximately 10% of the classifications.

JOIN THE CONVERSATION



<https://bit.ly/KKPresentationFiles>

- Digital copy of this poster
- Padlet to answer the Question below:

What's one assignment, activity, or policy you use to keep students thinking when GAI can just produce an answer for them?

What should students be able to do WITHOUT GAI in your field?

CONCLUSIONS

- Students performed well on GAI-supported projects in both years. What changed was how much of that performance they could reproduce on their own.
- The mean Assist Gap fell from 21 points in F24 to 7 points in F25.
- In Fall 24, 59% of students had a gap larger than 15 points; in Fall 2025, 15% did.
- The mean Assist Gap was 20 for students with no coding experience and 9 for those with a little prior coding experience.
- Assisted work alone can hide large differences in skill, especially for beginners, who were most likely to use GAI to get started rather than to check or speed up work they could already do.
- Students were not naive about this tradeoff. Most named over-reliance as a real cost, many described strategies to protect their learning, and the Fall 2025 cohort more often said humans must stay responsible for AI-assisted work.
- This chart focuses on mentioned themes with the largest differences between novice and experienced coders. Getting started/unstuck appeared in 40% of novices' answers vs 9% of students with coding experience. Speed and efficiency appeared in 52% of experienced students' answers vs 25% of novices' answers.

Takeaways for any discipline:

Pair GAI-permitted assignments with periodic unassisted checkpoints, so both students and instructors can see what has been learned.

Watch beginners most closely. Using GAI to start work carries more risk than using it to check or speed up work.

Ask students to reflect on their GAI use. Their self-assessments were candid and often aligned with the performance data.

Limitations: It is noted that this study included a small sample size with only 17 students in Fall 24 and 26 in Fall 25. In addition, the PreTest was given on Day 1 for participation points. The MidTest score weight was increased in Fall 25. Finally, the students were skewed more towards BA minors.