Virtual Tutor: learning and having fun with a friend

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SURE EXP+ Undergraduate Research

How Can GenAI Improve Student Learning?

INTRODUCTION

This research project explores

- How GenAI-based virtual tutors help students learn more effectively.
- How virtual tutors impact students' flow experience and behavioral intention.

PURPOSE STATEMENT

- Improve the design of educational tools that not only teach but also engage and motivate students effectively.
- Provide insights for other organizational settings for human in the loop AI augmented decision making.

METHODS

This project examines the impact of GenAI tutors on student learning through two pilot studies:

- Pilot Study 1 - AI Programming Tutor for undergraduate students (UM MAIZEY AI in Canvas)
- Pilot Study 2 - AI Business Partner for graduate students (ChatGPT)

The studies assess the AI tutor's explanation quality in terms of volume and clarity, fun, human-likeness, helpfulness, and trustworthiness. Additionally, the research seeks to determine whether response quality and anthropomorphism are related to perceived usefulness, flow experience, sense of empowerment, and behavioral intentions. (Fig 2)

RESULTS

- (Study 1) Students working with system default prompt had rated the AI tutor higher than more elaborated system prompt. (Fig 1)
- (Study 2) Response quality is significantly associated with perceived usefulness. Perceived usefulness impacts user behavioral intentions. (Fig 3)

CONCLUSIONS

- GenAI Chatbots are a valuable addition to education
  - AI powered chatbot is well-regarded for both response quality and usefulness.
  - Most users plan to use it again.
- To maximize benefits and minimize risks, educators should integrate prompt-based scaffolding and encourage reflective and critical use of AI tools.
- More research is needed.

NEXT STUDY

In the next stage, we plan to test the effect of anthropomorphism by comparing two versions of a Python tutor created with ChatGPT Plus.

- Python Pal: Acts as a learning partner. (Fig 4)
- PyLearn Pro: Functions as a teaching tool. (Fig 4)

Please participate in our next study. See flyer in the middle.

Try Our AI Python Tutors!

Do you want to learn Python?
Python Pal and **PyLearn Pro are here to help!**

You can interact with one or both tutors—if you try both, please complete the survey twice (one per tutor).

PyLearn Pro:

Start here

Python Pal:

Start here

Image courtesy of Microsoft 365 Stock Images.

```
import random

play_again = 'yes'

while play_again.lower() == 'yes':
    secret_number = random.randint(1, 100)
    guess = None
    tries = 0
    max_tries = 7

    print("\nI'm thinking of a number between 1 and 100.")
    print(f"You have {max_tries} tries to guess it!")

    while guess != secret_number and tries < max_tries:
        guess = int(input("Take a guess: "))
        tries += 1

        if guess < secret_number:
            print("Too low!")
        elif guess > secret_number:
            print("Too high!")
        else:
            print(f"You got it in {tries} tries!")

    if guess != secret_number:
        print(f"Sorry, you're out of tries. The number was {secret_number}.")

    play_again = input("Do you want to play again? (yes/no): ").strip()
```

What to do:

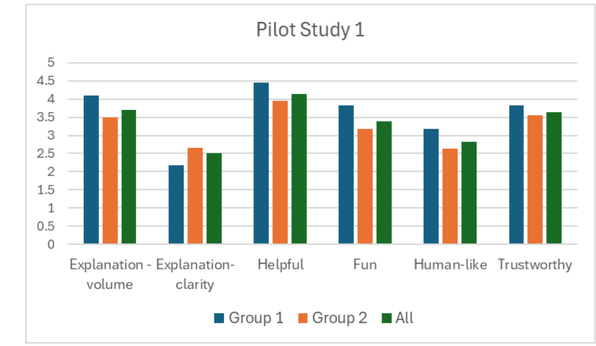
- Ask Python questions (loops, polymorphism, lambdas, tuples).
- Request help with tasks (create a temperature converter, currency converter, build web crawlers, conduct data analysis, etc.).
- Use conversation starters or come up with your own!

After you are done, **Share your experience with us:**

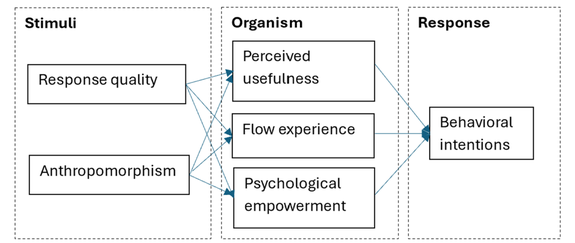
- Click **Share** (top-right corner) → copy the link → paste it into the survey.
- Take the survey: **Survey link or QR code**

Thank you very much for your assistance–we truly appreciate it !

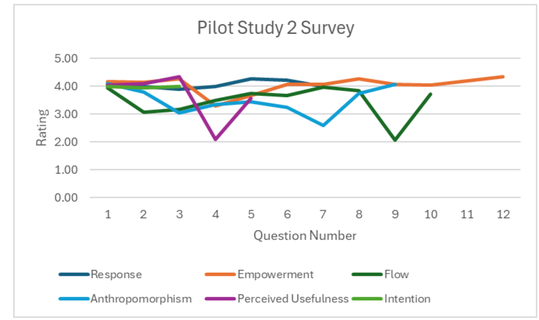
FIGURES



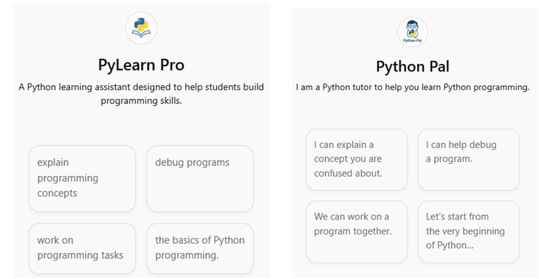
(Fig 1) Pilot Study 1- AI Programming Tutor Group Comparisons



(Fig 2) Pilot Study 2- Research Model



(Fig 3) Pilot Study 2 - AI Assistant for Business Tasks Measures



(Fig 4) Next Study – AI Programming tutor Interface

NACE SKILL:

Critical Thinking: While reviewing literature and analyzing data, I strengthened my critical thinking by identifying useful information and understanding its value.
Technology: Experienced in customize chatbots and leveraging AI tools to enhance effectiveness. Skilled in data analysis using Excel. Strengthened programming skills through hands-on testing of Python GPT models.