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Work in Progress: Exploring the impact of Generative AI on Information Seeking Behavior of Engineering Students

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Work in Progress: Exploring the impact of ChatGPT's Generative AI on Information Seeking Behavior of Engineering Students

Abstract

The user and application base of generative AI tools has seen tremendous growth over the past year. In response, numerous papers have been published evaluating how capable such tools are within certain disciplines. This work in progress aims to shift from evaluating generative AI tools' capabilities to exploring how such tools impact the information-seeking behaviors of their users. The paper focuses on the impact of OpenAI's ChatGPT on the information-seeking behavior of engineering students. The paper presents data from a survey of engineering students. In addition, the paper provides the methodology and preliminary data from a structured interview where participants will use ChatGPT to address a multifaceted problem concerning the Grand Challenges for Engineering.

Introduction

Near the end of 2022, OpenAI released ChatGPT, a generative artificial intelligence (AI) tool. ChatGPT is a large language model (LLM) designed to take natural language inputs and produce natural language outputs. According to OpenAI, ChatGPT achieved 1 million users in the first week of its release. By the middle of 2023, ChatGPT had grown to 180 million users and was seeing over 1.4 billion visits a month [1]. Although there was evidence of declining usage trends at this time, the numbers demonstrate ChatGPT is a highly used tool.

A possible explanation for the popularity of ChatGPT is its ability to respond to seemingly any kind of prompt, regardless of subject, and to provide what appears to be an intelligent response. OpenAI encourages users to "Ask me anything" when it comes to using ChatGPT and provides academic suggestions such as Python coding and language translations as well as personal suggestions like Halloween costume design and vacation planning [2]. This combination of seemingly endless use cases with seemingly intelligent responses has led to interest from a myriad of communities including academics, professionals, and policy makers.

In March 2023, OpenAI released its own research results on how ChatGPT 3.5 and 4.0 performed on standardized exams from a variety of disciplines including: the LSAT, GRE writing and math sections, and AP exams covering science, math, social sciences, and humanities [3]. Independent researchers have also attempted to understand ChatGPT's capabilities since its release in 2022. Within STEM, studies have measured: ChatGPT's performance on the Fundamentals of Engineering Exam for Environmental Science [4] and on professional medical exams [5, 6], its capacity to understand and solve mathematical word problems [7], ChatGPT's performance as a "student" in college level computer engineering [8], physics [9], and digital design lab courses [10], and its performance on a college level computer science exam [11].

OpenAI's research does not specify how ChatGPT 3.5 and 4.0 performed on specific areas or questions within the exams tested, but shows that ChatGPT 4.0 tends to outperform its predecessor [3]. Due to the release of ChatGPT 4.0 in March 2023, independent studies vary on whether or not they assessed ChatGPT 3.5, ChatGPT 4.0, or both. Studies also vary in their methodologies with some employing prompt engineering and others using unmodified questions or problems from exams, course materials, or other sources. Overall, independent research studies show that while ChatGPT has an impressive overall knowledge of different subjects, it struggles with complex and context-dependent decision making and that, as a language model, it cannot actually calculate mathematical expressions [12-14]. These limitations are further exacerbated by the fact that ChatGPT is unable to communicate how reliable or confident it is in its answers, which may lead to novices or non-experts to trust ChatGPT's confidently delivered yet incorrect answers if they are not able to assess how accurate its responses are [15-17].

As information professionals, there is still an open question regarding the impact that generative AIs, such as ChatGPT, will have on information-seeking behavior and information literacy and how to approach teaching about it. At the time of writing this article, there have been few publications exploring this question as it relates to different disciplines. Hernandez et. al. [18] used a survey tool to explore factors that contribute to the information seeking behavior of computer programming students related to ChatGPT. By conducting a statistical analysis of their survey data, the group examined the correlation of perceived ease of use, perceived usefulness, social influence, herding, trustworthiness, convenience, and ethical considerations to the populations' information seeking behavior when using ChatGPT finding the strongest correlations existed in convenience and ethical consideration [18]. Karunaratne and Adesina [19] used a survey to examine the use of ChatGPT in the information retrieval process among students at higher education institutes. Through their survey they found "ChatGPT has reduced the anxiety of information search, and increased the confidence with which students seek information" [19]. Lo [20] proposes the "CLEAR framework" (Concise, Logical, Explicit, Adaptive, and Reflective) as a mechanism "to optimize interactions with generative AI language models. The focus of Lo's work is on improving prompt engineering skills of people using generative AI tools [20]. Jin et.al. [21] discussed potential use cases for generative AI in medical literature indicating potential benefits in using it as a tool to help summarize literature while also warning that it is still not ready for clinical use.

The remainder of this proceeding will be split into two major sections followed by concluding remarks. The first section will provide details on a survey conducted in the summer and fall of 2023 that explored current trends and opinions among an engineering student body with regards to generative AI and ChatGPT. The second section proposes a methodology for a rigorous study that explores the impact of ChatGPT on the information-seeking behavior of engineering students based on a "think out loud" observational approach. In this section, there will be a focus on how the proposed research instrument was designed, the purpose of each element of the instrument, and how the authors plan to use this instrument in future work. Finally, the paper will conclude with a brief discussion on future research perspectives in this area.

Survey - Overview

We developed and launched a quantitative survey to get a baseline understanding of how faculty and students at a large private university use ChatGPT. Before conducting the study we sought and received IRB approval (IRB_FY2023-7542). 86 participants started the survey, with 48 unique participants completing it. Two of the participants that completed the survey indicated they were not ChatGPT users. Of the remaining 46 responses, 4 were faculty members, 3 were graduate students, and 39 were undergraduate students. The most represented departments among these participants were: computer science and engineering (n = 19); technology, culture, and society (n = 7); and technology, management, and innovation (n = 7).

The survey asked participants to quantify their usage of ChatGPT and to describe specific interactions they had with the tool. Due to the length of the survey, the exact questions used are not included in this proceeding, but can be directly shared with any interested reader. Figure 1 offers a look at how student survey respondents perceived the accuracy and usefulness of ChatGPT's responses based on a Likert scale where 0 indicates lack of consideration for usefulness or accuracy, 1 indicates not at all useful or accurate, and 5 indicates extremely useful or accurate. Students who indicated they use ChatGPT for academic or research purposes viewed the tool as more useful and more accurate than those who do not use ChatGPT in that context.
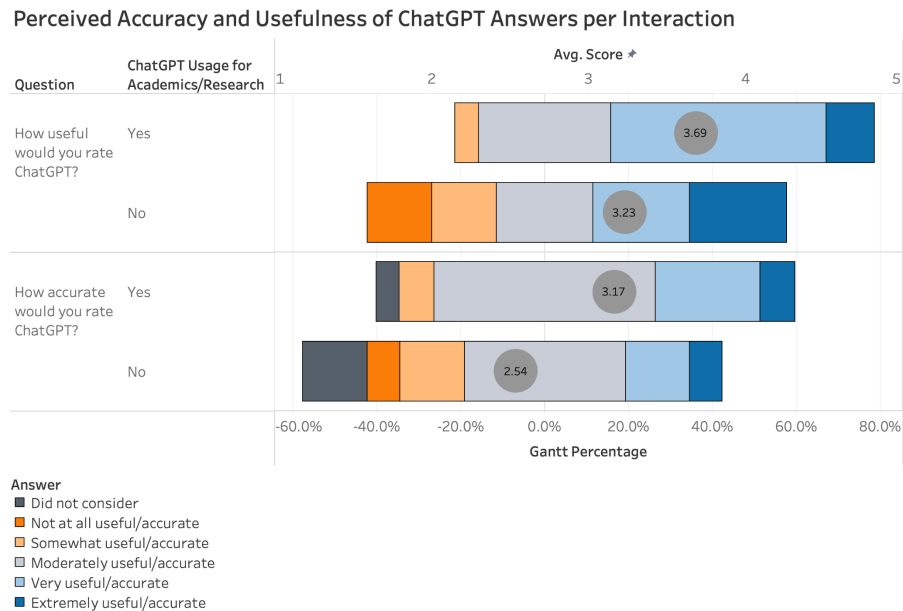
FIGURE 1: Likert scale chart of student ChatGPT users and their perceived accuracy and usefulness of ChatGPT. n = 42.
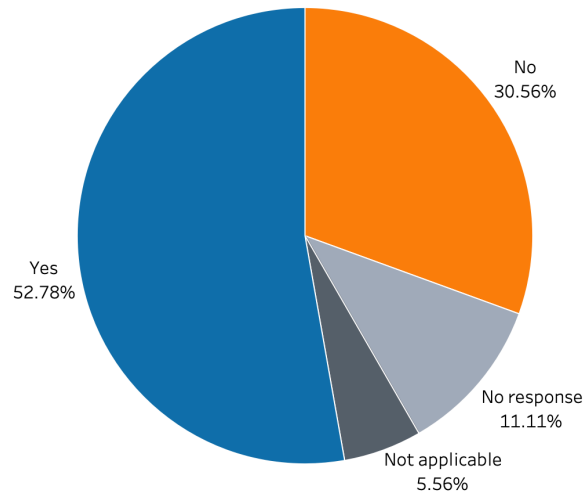
Survey -Student Responses

We surveyed 43 students in total and 42 reported having experience using ChatGPT. Students who used ChatGPT were invited to share up to four of their interactions with ChatGPT. We collected 49 unique ChatGPT interactions, which were organized into three categories: career/professional, class/research, and personal interest (Figure 2). Career/professional entailed questions where students asked ChatGPT potential interview preparation questions and had ChatGPT edit their resumes. Class/research entailed questions where students asked ChatGPT to solve a class assigned problem set, to explain a concept from class, or to write code to complete a task. Personal interest entailed questions where students were curious about ChatGPT's response and capabilities. Students asked ChatGPT to generate a workout regimen, to solve morality scenarios, or to translate phrases.
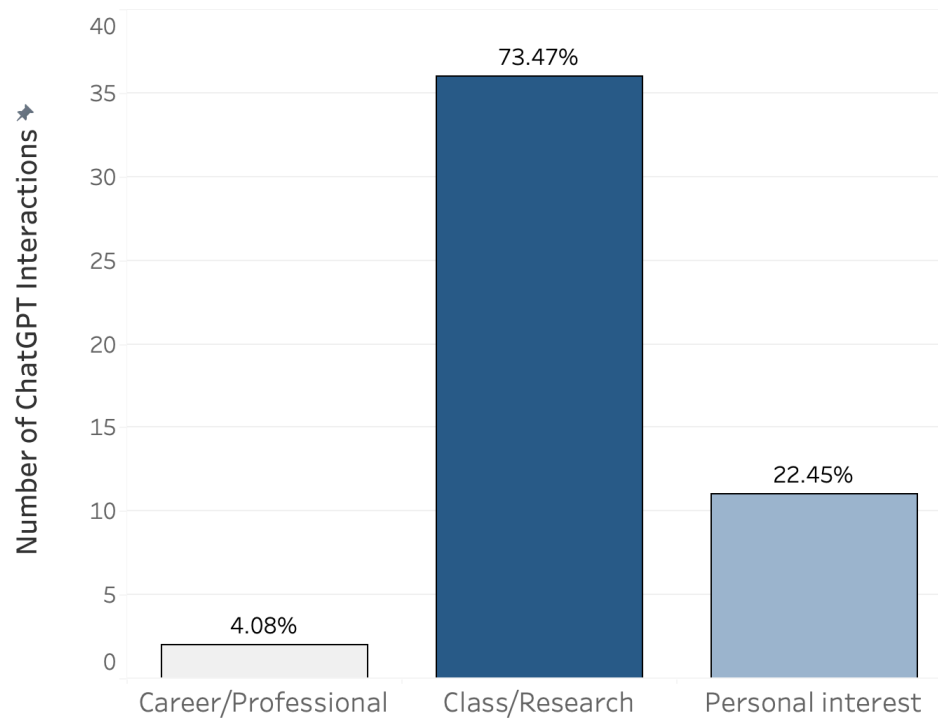
FIGURE 2: Categories of reported ChatGPT interactions student users reported. n = 49.

Amongst the student ChatGPT responses, 73.47% of interactions were related to the student's academic or research interests, while 22.45% and 4.08% were related to personal interest and career or professional development interests respectively (Figure 2). For academic or research related interactions, only 52.78% of ChatGPT's responses were verified by students for accuracy (Figure 3). Less than half of students (n = 13) reported they did not check ChatGPT's responses for accuracy.

Information Accuracy Check for ChatGPT Class/Research Questions

No
30.56%

Yes
52.78%

No response
11.11%

Not applicable
5.56%

FIGURE 3: Student reported verification of ChatGPT responses for class/research-related questions. n = 36.

Our survey questions asked respondents to rate ChatGPT's capacity to answer three types of engineering questions: basic, open-ended, and complex. We defined a basic engineering question as a simple retrieval such as the density of a specific material; an open-ended engineering question as one in which named equations, values, or data sets are not defined; and a complex engineering question as one that would involve the synthesis of different pieces of information from different sources, and require assessment of the gathered information. 71.43% of student ChatGPT users believed ChatGPT was capable of answering basic engineering questions, while 21.43% were uncertain and 7.14% did not believe ChatGPT was capable (Figure 4). Students' certainty in ChatGPT dropped significantly for open-ended and complex engineering questions. 35.71% of student ChatGPT users believed ChatGPT could answer open-ended engineering questions and 50% selected maybe (Figure 4). Only 7.14% of students believed ChatGPT was capable of answering complex engineering questions and 52.38% selected maybe (Figure 4).

Student Perceptions of ChatGPT's Ability to Answer Engineering Questions
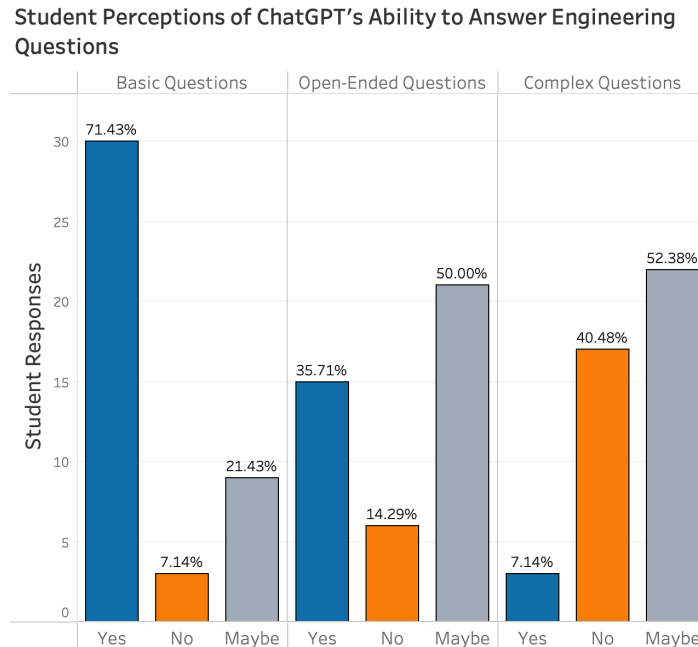
FIGURE 4: Student ChatGPT users and their perception of ChatGPT's ability to answer engineering questions. n=42.

The survey also provided opportunities for participants to address how helpful they felt ChatGPT was and if it did anything unexpected through open ended questions in the survey. One student that rated ChatGPT as being extremely helpful, said with regard to writing, "I was quite confident and pleased with its response considering that it did not tweak the meaning of the paragraph I had provided but it modified the words and restructured it into a beautiful paragraph." On the other hand, a student that rated ChatGPT as only slightly useful when asking a technical question from a homework assignment stated, "It's not working that well, the answers are wrong, but the way it solve[s] the problem is correct".

Survey - Faculty Responses

We had five faculty respondents that were all affiliated with Technology, Culture, and Society. The faculty sample size was much smaller than the student sample size and does not present statistically significant information, but can offer some insight on faculty perspectives. Of these five faculty, one indicated that they had never used ChatGPT.

The four faculty ChatGPT users each shared one ChatGPT interaction. Three interactions were research related and one interaction was career related. Two faculty indicated that they found ChatGPT's response to be moderately useful, while the other two found its response to be extremely useful. One faculty participant verified ChatGPT's response externally for accuracy, while another faculty participant did not verify ChatGPT's response and the remaining two had asked questions where verification was not applicable. One faculty participant usedChatGPT to

help develop work-related reasons to attend a conference and wrote, "I knew the info already, so I guess I just parsed it for what I needed. There were likely some pieces of misinformation that I automatically skimmed over and didn't consider". A faculty member with limited coding experience asking a more technical coding question stated, "The process of creating code (much like writing) involves trial and error. I did not expect the code it produced to work correctly [on the] first try. I expected a lot of back and forth was necessary, and the [session] was long and complex but productive." This faculty member also indicated they spent more than 30 minutes interacting with ChatGPT during this session.

When faculty ranked ChatGPT's capability to answer basic, open-ended, and complex engineering questions, faculty ChatGPT users responded slightly more positively than students. 50% (n = 2) faculty ChatGPT users believed ChatGPT can answer basic engineering questions and 75% (n = 3) believed ChatGPT can answer open-ended questions. 0% of faculty ChatGPT users believed ChatGPT can answer complex questions, but 75% (n = 3) selected maybe. An interesting finding was that the one faculty member that did not use ChatGPT selected yes when asked to consider ChatGPT's capability to answer basic, open-ended, and complex engineering questions.

Survey - Conclusions Based on Survey Data

Overall, the data show that, regardless of status (i.e., student or faculty), respondents who use ChatGPT for academic or research purposes viewed it as more accurate and more useful than those who use ChatGPT for personal or career related purposes. The data also show that both students and faculty are critical of ChatGPT's ability to answer engineering questions, particularly as questions were more complex or open-ended.

Designing Observation Sessions

While a survey provides useful insights regarding preferences and behaviors, the authors of this proceeding recognize that it is also important to make direct observations and measurements with regards to information-seeking behavior and information literacy and not to assume all self-reported information will be accurate. Based on the previous experience of one of our authors, Samuel R. Putnam, it was decided to model our work on a "think out loud" exercise [22]. This section of this proceeding will detail how our research team worked over the course of the 2023 fall semester to develop a viable observation session which will be used to collect data starting in the Spring of 2024.

Designing Observation Sessions - Scoping

A critical step at the beginning of this process was establishing a clear scope for this research project. As information professionals, we felt it was important to explore the impact generative

AI tools such as ChatGPT could have on the information-seeking behavior and to explore how critical users were of the kinds of information they received from these tools. Since our research team works closest with a population of engineering students, we decided to limit our scope to exploring the behaviors of that population. We also determined that we should keep the scope focused around information within an engineering context, even though engineering students may be using these tools outside of that context. We thought this was of particular interest based on previous research we had done [23]. This lead us to write a purpose statement for our study as follows:

> How does ChatGPT impact the information-seeking behavior of engineering students who use ChatGPT and what implications might that have for lifelong learning and engineering education?

With this statement, our next step was to develop a research instrument that would allow us to explore this question. We decided our research instrument should take the form of an observation session based on a "think out loud" approach.

Designing Observation Sessions - Observation Session Development

The most challenging part of this process was crafting the research instrument that we could use to explore our research question. Following the model of [22], we set out to devise an observation session where participants would engage in a "think out loud" exercise, while answering engineering questions using ChatGPT. Our intention is to record these sessions through screen capture and audio recording, so they can later be coded and analyzed. In addition to this exercise, participants would also fill out a pre- and post-survey to provide additional information for the study.

Many conversations were conducted during the fall of 2023, which focused on creating the pre-observation and post-observation survey and developing appropriate questions for the observational sessions. We started this process by establishing goals for each part of the research instrument. These goals can be seen in Table 2.

Table 2. The goals associated with the various question sets used for designing the research instrument.

Question Set	Goals
Pre-Survey	- Understand participants current usage of AI - Understand participants current engagement with research - Understand, deceptively, participants familiarity with information literacy

Post-Survey	• Understand participants impressions of ChatGPT as a research tool and if/how they have changed • Discuss how they feel about information literacy, the accuracy of AI, and its ability as an engineering tool • Discuss how they thought about some of this before the session took place

Observation Session	• Provide an opportunity for participant to interact with ChatGPT in several different capacities:
	  ○ Finding background information
	  ○ Solving engineering problems
	  ○ Sourcing Information/Data
	  ○ Ideation
	  ○ Coding
	  ○ As a tool (write a cover letter, an email, etc…)

Developing appropriate questions was an iterative process that required roughly a dozen meetings over the course of the fall 2023 semester. Having clearly stated goals for each element of the research instrument helped keep us on track during those meetings.

The pre- and post-survey questions can be found in Appendix 1. The pre-survey questions are largely quantitative or multiple choice with a few short answer questions to allow for participants to elaborate. When initially discussing what questions should be included in the pre-survey, we came to the conclusion that we wanted to assess how critical a participant was of information sources. But we also recognized that asking a direct question on this topic could influence their behavior during the observational session. As a workaround to this issue, we decided to ask the student about their previous engagement with research projects and their previous exposure to library instruction. We feel that these questions will help us parse out students that have more formal experience with information literacy and source evaluation in the final dataset. The post-survey questions are designed to provide both quantitative and qualitative data to better understand how participants view generative AI as a tool. These questions ask students to both evaluate how ChatGPT was as a tool during the observational session and how they feel ChatGPT fits in their future information-seeking process.

Crafting the observational session questions proved to be the most challenging part of designing the research instrument. Despite having clearly stated goals to help guide us, over the course of our team meetings, these questions underwent several complete revisions.

In our first attempt to craft the questions, we focused on the distinct elements outlined within our goals: finding background information, solving engineering problems, ideation, coding, and

using ChatGPT as a tool for writing. The first iteration had separate questions for each of these goals. These questions did not have a connecting thread other than the using ChatGPT. Though crafting the questions this way allowed us to address each goal we had set out, it made the observational session feel disjointed. We also found that the questions that might make more sense to engineering students in some disciplines can be confusing to students in others. As an example, a need to find material properties might feel commonplace to a mechanical or civil engineer, but is something less common for someone working in computer/software or financial engineering. This pushed us to look for a unifying thread within our questions and something that would resonate with as many engineering students as possible.

To unify our questions, we looked for inspiration from the National Academy of Engineering Grand Challenges [24]. While exploring these challenges, we decided that we would attempt to unify our questions by crafting them to resemble an assignment for a course exploring renewable energy. The following prompt was developed to provide before the questions were given:

> You are tasked with developing suggestions for how renewable energy can be integrated in New York City. To achieve this goal, we will ask you to complete a series of tasks which include research, coding, and writing. You should use ChatGPT as a tool, as well as your own expertise, to answer the questions. When you are done, we'll ask you some questions about your thought process.

Six questions were written supported by this prompt to satisfy our original goals as seen in Table 3:

Table 3. First questions designed around the Engineering Grand Challenges.

1.) Using ChatGPT and your own expertise, define the following terms:
   a.) Power
   b.) Renewable energy
   c.) Heat island
   d.) Photovoltaic array
   e.) Albedo
   f.) Angle of attack

2.) Using ChatGPT and your own expertise, provide some background information about renewable energy projects which have been started in New York City the last 5 years.

3.) Using ChatGPT and your own expertise, examine the following facets of the scholarly conversation occurring around renewable energy and New York City.
   a.) Are there debates in this conversation or is there general consensus?

> b.) Which disciplines are represented in this conversation? Or, are there related disciplines which are not represented?
>
> c.) Which audiences or demographics are represented in this conversation? Are there perspectives which are not represented?
>
> 4.) Using ChatGPT and your own expertise, explain how a photovoltaic array works.
>
> 5.) Using ChatGPT, your own expertise, and data available through NYC Open Data, use the coding language of your choice to show the average energy usage (kWh) by borough using this data set: https://data.cityofnewyork.us/Environment/Energy-Usage-From-DOE-Buildings/mq6n-s45c
>
> 6.) Using ChatGPT and all of the information you gathered above about energy usage and renewable energy programs in NYC, write a letter to your city councilperson which supports a specific renewable energy solution and uses some background information to support your stance.

These questions meet all of our requirements, but it was uncertain if students would interpret them in the manner we intended. To address this concern, we asked students to sit down with us and work their way through a slightly revised version of the questions contained in Table 3. These sessions were only used to better understand how the students were interpreting the questions and how much time was needed to work through the question set. We did not retain any data from these sessions as they are not part of the larger study, but the feedback we received from students was helpful in refining our instrument.

Following these sessions, we made two major determinations. First, we found that presenting a question that required writing and implementing code, with all of our other questions, was too challenging for our limited session time. Second, we found that we should better ground our questions within an engineering framework. Using an engineering framework allows us to better mimic the feel of a real classroom assignment, enabling our research instrument to accurately simulate a student's experience and still achieve our question goals. We decided to use the design thinking framework to guide us.

Design thinking is commonly broken down into stages. The names of these stages may vary depending on source, but the core idea is always the same. The Interaction Design Foundations breaks down design thinking into five steps [25]:
1. Empathize
2. Define
3. Ideate

4. Prototype
5. Test

Since our instrument was focused on information seeking behavior, we felt we could revise our questions using the first four steps of the design thinking framework. Given the limited timeframe of an observational session, we did not feel we could accurately engage the participant with the testing step of the design thinking process. Using this framework, we revised our question. Table 4 provides the most current question revisions as well as how each question relates to design thinking and our goals for the research instrument.

Table 4. Observation session questions and relationships to both Design Thinking and Observation sessions goals.

Question	Design Thinking Step	Research Instrument Goal

Define the following terms in the context of this assignment:
  A. Renewable Energy
  B. Power
  C. Damage Function
  D. Heat Island
	Define	Background Information

How has climate change directly impacted NYC since 2010? List specific incidents of damage related to the examples you mention.	Empathize	Background Information
Determine the amount of energy that could be generated if solar panels were installed on the roof of every building in New York City.	Define, Ideate	Background information, Problem Solving
Find 3 academic papers that explore the effectiveness of solar panels in urban environments. Provide citations for these papers in IEEE format.	Define	Background Information, Sourcing Information
The energy usage of a city is directly tied to its population. Find population data for the population of NYC in 1930, 1970, 2020, and a forecast for the population in 2070.	Define	Sourcing Data
Explore non-solar renewable energy sources. Propose one non-solar renewable energy source that is most viable for NYC.	Ideate	Ideate

Generate a letter to your city councilperson that advocates for two renewable energy projects, one of which must be solar, in New York City. Use any of the information from your previous answers to help support your arguments	Prototype	As a tool

Question 1 is intended to be a direct definition question. The question relates to design thinking through defining the task and allows us to explore how participants engage with generative AI to seek background information. Question 2 creates a space to develop empathy around the problem in line with design thinking, while also having the participant seek a different kind of background information than direct definitions. Question 3 mimics the kind of calculation an engineer might be tasked with and relates to defining the problem and to ideation. Question 4 is intended to probe how the participant searches for academic sources. Question 5 focuses on finding and predicting data. The years were intentionally chosen to match with census data. Question 6 is an ideation question, and lastly, in question 7 the participants will have to create a prototype in the form of a letter. Before any of these questions are given to the participant, they will be presented with a slight variation on the original prompt:

> Imagine you are taking an elective course on engineering and climate change. Your professor has given an assignment for you to write a letter to your local city council member advocating for increasing renewable energy projects in NYC. The professor requires that this letter must discuss at least TWO sources of renewable energy, one of which must be solar. The letter must also incorporate answers to the set of questions provided. The professor is allowing students to use ChatGPT for this assignment.
>
> As you work through this assignment, please start each question in ChatGPT. After starting the question in ChatGPT you are welcome to use any other resources on the internet as your work on this assignment.

A lot of conversations were had by the group about asking participants to start in ChatGPT and how to incorporate the open internet. We recognize that though we will screen participants so that they must have experience with ChatGPT, that does not mean they would default to using it first, or at all, for the questions proposed in the observation session. We debated the idea of having a control group that was not given any instruction to use ChatGPT, but decided the sample size would be too small. Ultimately, we decided that since our proposed research is aimed at understanding how generative AIs, such as ChatGPT, influence the information seeking behavior of our student population, and how critical that population is of the responses received from ChatGPT, we should require its use at the start of all parts of the observational session. Only requiring it at the start still allows for students to answer questions using the open web if they find responses from ChatGPT unhelpful or incomplete. We also have included questions in

the post-survey that allow for participants to explain how their information seeking behavior outside of the observational session may have differed from what they did during it.

Future Work and Concluding Remarks

During the spring and summer of 2024, we will begin collecting data through our observational sessions. We are targeting 10-15 sessions to constitute our first set of data. We hope to include both undergraduate and graduate students from a variety of engineering departments, but do not plan to force a specific distribution of majors or academic standing among participants. Following the collection of the first set, we will begin a process of coding and analyzing the results to be shared in future publications. As we analyze the collected data, a grounded theory approach will be applied to determine themes from the data. We intend to continue collecting data after the first set. Depending on our initial findings, we will consider changes to our questions or research scope.

Generative AI is a growing and rapidly evolving technology. Our survey results showed that students use generative AI tools like ChatGPT for course work and research, but 30% of our respondents also indicated that they are not checking the accuracy of ChatGPT's responses. In addition, more than 50% believe ChatGPT can be capable of answering a wide variety of engineering questions. At this point in time, there is no reason to believe that use cases of generative AI tools won't continue to grow. As these tools become more commonplace in both educational and professional settings, it is important to understand the trust people place in them and the impact they have on the information seeking behavior of people. The research outlined and proposed in this paper is focused on engineering students, but there are many other disciplines worth investigating. We hope to see librarians with varied subject expertise build off the instrument presented in this paper and explore how generative AI impacts their communities.

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Appendix 1

Pre- Questions*:*

1. Demographic information (survey)
   - **What year the student is in (undergrad/masters/PhD)?**
   - **What program and department are they in?**
2. **Is English your second language?**
3. **Are you currently engaged in any research projects?** We are defining research projects as projects which require a methodical search for information in support of a research question or hypothesis. These projects may be course assignments, part of other academic programs (VIP, grants, etc.), or independent research.
   a. If yes:
      i. Have you engaged with additional research projects within the last two years?
      ii. Which of the following best describes research projects you've engaged with in the last two years? [Check all that apply]

1. Course Assignment
                    2. Thesis/Dissertation Project
                    3. Work in a Faculty Research Lab (not part of a
                       Thesis/Dissertation)
                    4. Independent Research Project
                    5. Other
            iii. How do you typically gather information at the start of your research
                 project?
        b. If no:
            i. How would you typically gather information about a new topic? For
               example, you need to complete a research paper on the ethics of cloud
               seeding. How do you gather information?
4. **Have you ever talked with a librarian for help on a research project? (Yes/No)**
5. **Have you ever attended a lecture or workshop taught by a librarian?** [If needed:
   "For example, your professor recommended you attend a LaTeX workshop offered at
   the library or a librarian came to your classroom."]
        a. How many sessions have you attended?
        b. Which of the reasons describe why you attended the workshop(s). [Check all
           that apply]
            i. It was part of my course
            ii. It was recommended to me to a course instructor or departmental
                advisor
            iii. I discovered it on my own
            iv. Other
        c. What was the topic of the workshop?
6. **Including ChatGPT, which generative AI tools have you used before?** We are
   defining generative AI tools as any software that pulls information from a data set to
   quickly generate new/original text, images, sounds, or data for the user.
        a. What did you create or accomplish using generative AI tools?
        b. After using generative AI tools, what takeaways did you gain from the
           experience?
        c. Approximately how much time did you spend using the generative AI tool over
           the course of the past two weeks (in minutes)?
        d. Has your usage of generative AI tools been increasing, decreasing, or about the
           same over the past month?

Post- Questions*:*

1. On a scale of 1-5, with 1 being very inaccurate and 5 being very accurate, how accurate would you rate the information provided by ChatGPT?
    a. Please elaborate on how you came to this conclusion.
2. On a scale of 1-5, with 1 being not helpful at all and 5 being very helpful, how would you rate how helpful was ChatGPT in helping you answer the question(s) provided.
    a. Please elaborate on your response.
3. If you were to submit the letter from the final question to your professor for this assignment, what grade do you think you would receive? Remember ChatGPT was allowed by the assignment.
4. Were there any questions that you would not normally use ChatGPT to answer, but did so because we prompted you to do so? If so, what would your process have been without ChatGPT?
    a. Based on this experience, are there new ways you would use ChatGPT in the future?
5. How long do you approximate it would have taken you to complete this assignment without ChatGPT?
6. Based on your usage of AI tools and your experience using ChatGPT just now, how do you feel about the trustworthiness of ChatGPT as a resource for accomplishing the tasks you typically use AI tools for?
7. Do you find ChatGPT more/less/as trustworthy/or no opinion as the following resources
    i. Google
    ii. Google Scholar
    iii. Wikipedia
    iv. Library Database
    v. Textbook
    vi. TV/Print/Electronic News Sources
    vii. Professor
8. Where do you think ChatGPT's answer came from, or how was it generated?
9. Where do you think ChatGPT fits into your information-seeking process? Please elaborate on your response.