

# ChatGPT, Finances, and Degree Attainment: Increasing Generative Artificial Intelligence (AI) Utilization and Implications for Students’ Decision-Making

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**Abstract**— Students’ decision-making related to attending college for science, technology, engineering, and mathematics (STEM) degrees and retaining them within those fields continue to be of focus, especially when considering the national goal of satisfying industry, private, and public sector workforce needs. This is particularly important when considering growing national security concerns and ongoing high cybersecurity and climate change workforce demands. However, despite concerted efforts, low enrollment and student attrition continue to be a challenge, even more so since the onset of the global pandemic. Simultaneously, the utilization of generative artificial intelligence (AI) has seen a sharp increase since 2022 by various stakeholders, most notably college students. Additionally, faculty are encouraged by their higher education institutions to incorporate these tools within classrooms for several reasons, including demands from industry for students to gain knowledge and experience with generative AI tools.

Given the importance of understanding the ongoing issue of STEM degree attrition and the increasing utilization of generative AI, this research study explored these two areas using ChatGPT, one of the world’s most utilized generative AI language models, within the process. The first research question (RQ#1) is: *What is the top reason why students do not finish college?* The response provided solely emphasized finances and/or financial constraints. Based on that answer, the second research question (RQ #2) was: *Is getting a college degree worth the cost?* RQ #2 was explored to allow a deeper understanding of the initial research question from a different angle. Both questions were analyzed through the lens of two theoretical frameworks, the human capital theory and the principal-agent theory, and results were compared to the literature as a form of research validation.

This research study is essential as there is an ongoing increase in the utilization of generative AI in homes, K-12 institutions, and higher education for everyday knowledge, formal and informal education. When considering that soon-to-be and current college students may be using these generative AI tools to make decisions related to pursuing and/or retaining their educational status, it is essential to explore how generative AI system outputs align with what has been researched and documented in the literature. Therefore, this research study explored the application of ChatGPT and the system’s responses to research questions as a form of document analysis and analyzed those results using triangulation as a form of validation. The analysis and results of this study contributed directly to the recommendations and

feedback to the owners of ChatGPT - OpenAI. Additionally, the results highlighted a need for increased focus on AI ethics related to data input, data output, access to the system, and who has a seat at the table as the company recommends, approves, and implements changes. Limitations of this study are provided along with an overarching concluding statement.

**Keywords**— *Attrition, STEM, Artificial Intelligence (AI), AI Ethics and Bias*

## I. INTRODUCTION AND BACKGROUND

Since the onset of the global pandemic, educational leaders have had to revisit priorities for themselves and their stakeholders [1]. Two areas that have consistently remained priorities are increasing and sustaining student engagement and persistence (i.e., retention, reducing attrition) and staying on track with technological advancements (i.e., software, hardware) [1][2].

Within U.S.-based science, technology, engineering, and mathematics (STEM) degree programs, there continues to be a strong emphasis on increasing the number of individuals graduating to satisfy workforce development needs across varying sectors [4]. However, despite concerted efforts, low and, in some cases, declining enrollments and student attrition continue to be a challenge. Many of the most recent statistics are attributed heavily to COVID-19, a global pandemic [1][2]. Simultaneously, the utilization of generative artificial intelligence (AI) has seen a sharp increase since 2022 by various stakeholders, most notably K-12 students, their parents, and college students [5][6][7]. The focus on AI in education has included teachers and faculty being encouraged by leadership to incorporate these tools within their curriculum for several reasons, including the industry push for students to gain knowledge and experience with generative AI tools [8][9].

Historically, research has highlighted the various reasons why students choose not to pursue STEM degrees, choose not to attend college altogether, or attend and then decide to leave [10][12]. The following section will provide an in-depth view of the literature and cover those areas.

## II. LITERATURE REVIEW

### A. STEM Degree Attrition

Research has found that various factors negatively impact broadening participation efforts within STEM education, including financial constraints, pre-college academic preparation, and demands of these majors, to name a few [10][13]. Additionally, research specifically linked to attrition within STEM education has found that individual identifying factors such as gender, race, first-generation college status, and socioeconomic status (SES) have all been indicated as factors that can lead to students a role in starting their programs but then choosing to change majors or leave college altogether [10][12]. Regarding STEM degrees, access to a high-quality pre-college education is vital for academic persistence in college [13][14]. This often relies heavily on access to quality teachers, software, and technology linked to or relevant to what is required within a college degree program [14][15]. For example, access to and proper understanding of software from more universal tools used by companies in most industries, Microsoft Office to Python, a software required for almost every engineering or computing major. In many cases, proficiency with those tools is required for internship or permanent job placement [16][17]. When considering access to these tools, many students from low-socioeconomic status (LSES) neighborhoods and schools may not have access to these software tools. Another challenge may be accessing the hardware (i.e., laptop, desktop computer) compatible with the system [18][19][20].

### B. ChatGPT: Increasing Demand and Utilization

According to Reuters, only 2 months after being launched, ChatGPT became the fastest-growing app used by consumers in history, with approximately 100 million active users per month. This data marked only 2 months total since it had been launched. The article went on to say that around 13 million unique users were using the application per day, which was a figure that doubled the amount the company saw during December when the app was released [6]. Within a study produced by the Pew Research Center in 2023 [7], the utilization of ChatGPT is growing for every age group between 18 and 65+, with the fastest group being those between the ages of 18-29 (see Figure 1). While the image does not include those under 18, the figure highlights that the younger the population group, the more application usage there is.

#### ChatGPT use has ticked up since July, particularly among younger adults

% of U.S. adults who say they have ever used ChatGPT

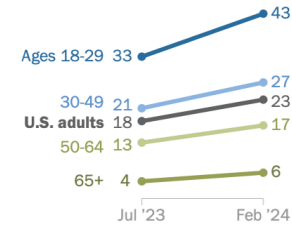
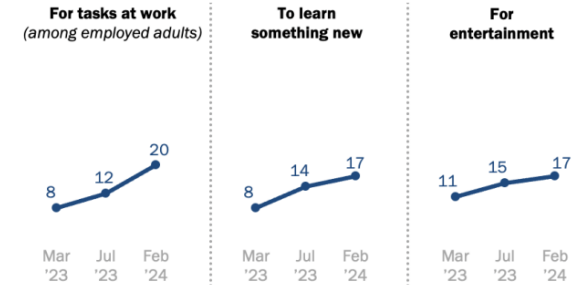


Fig. 1 ChatGPT Utilization by Age Group [7]

#### Share of employed Americans who have used ChatGPT for work has risen by double digits in the past year

% of U.S. adults who say they have ever used ChatGPT ...



Note: "Employed" refers to those working full or part time for pay at the time of the survey. Those who did not give an answer are not shown.  
Source: Survey of U.S. adults conducted Feb. 7-11, 2024.

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Fig. 2 ChatGPT Utilization Explained

Figure 2 highlights how an increasing number of people use the application for various tasks ranging from work assignments to entertainment or learning something new.

## III. THEORETICAL FRAMING

Young adults between the ages of approximately 16 and 18 are traditionally finishing up some form of high school (secondary school) and preparing to go to college. This population traditionally seeks out advice from adults, including school counselors, parents, and guardians, to assist with their decision-making related to life after secondary school [21][22][23]. Before the internet and information search sites such as google.com, this population primarily relied on individuals such as their parents, older siblings, family members, friends, mentors, or academic advisors within their high schools [22]. Internet-based search engines allow humans to obtain personal and non-personal information online rather than going to another person. Considering generative artificial intelligence (AI), as highlighted in the previous section, an increasing number of individuals within this age group are using these platforms to seek everyday

advice [7] and the social impact and implications of this is being studied [24].

#### A. Human Capital Theory

Human capital theory highlights how education, training, other skills development techniques, and other knowledge-gathering avenues serve as a form of capital that contributes to economic productivity and growth. The theory suggests that people can improve their economic productivity and earnings potential by investing in themselves through education, training, and acquiring new skills [25][26]. Historically, this theory was primarily focused on economics. Still, since its inception in 1958, the theory has grown to include more aspects of education, education policy, and the direct individual impact on human beings [27].

#### B. Principal-Agent Theory

The principal-agent theory explains the relationship between the individuals who lead decisions (principal) and those who work for or on behalf of the principal (agents) [29]. When considering young adults and the utilization of generative AI systems, the principal-agent theory highlights how the owners of ChatGPT, OpenAI, are the principal and users of the system are agents. The theory emphasizes that challenges can exist due to misalignment of interests, one group having more information than the other, and between the two groups, such as information asymmetry and conflicting goals [30][31].

While both theories offer insights into human behavior and organizational accountability, their theoretical foundations, focus, and emphasis differ. Human capital theory emphasizes that individuals can make choices related to their lives and the prospective implications of those decisions. In contrast, the principal-agent theory focuses on the challenges of aligning the interests of principals and agents in hierarchical relationships. Collectively, they drive home a very important idea that humans can utilize this generative AI platform and get answers to almost any question they desire. They have the power to choose whether they use the system, and the owners of the system entirely control the information that they receive. Generative AI software continues to grow and, in some cases, is being required or strongly encouraged to be utilized within educational settings, including formal education, informal education, and private tutoring, to name a few.

### IV. RESEARCH JUSTIFICATION AND SIGNIFICANCE

When combining information provided within the introduction, literature review, and the theoretical framing considered, the key areas to note as a transition into the research methodology are the following:

- There is an increasing use of ChatGPT by young adults (preconference proceedings, to validate the findings and post-college age) at a faster rate than any other group (18-29) [7]
- The application is used for all aspects of life (work, school, When asking the first research question (RQ#1), *What is the top general learning, etc.*), which can include decision-making around attending and continuing their higher education. [7] the following statement:

- There is great concern around OpenAI, the owner of ChatGPT, is managing the inflow of information/data that comes out of the ChatGPT system (AI technology access, ethics, and bias) [38][41]

Based on all previous sections and information within this paper thus far, the next section will provide an overview of the methodological approach used to answer the following research questions: RQ #1: *What is the top reason why students do not finish college?* and RQ #2: *Is getting a college degree worth the cost?* An explanation and justification for RQ #2 will be provided in the following sections.

### V. RESEARCH OVERVIEW AND METHODOLOGY

#### A. Document Analysis

Document analysis systematically analyzes and examines one or more sources to address research questions and other research goals. In most cases, the documents used include textbooks, trade books, new articles, websites, journal papers, and even more art-centered sources such as videos, photos, and audio recordings [32]. Given its unique and versatile approach, this methodology has been utilized across almost every discipline [32]. For this study, a single source was used: ChatGPT responses to the research questions:

RQ #1: *What is the top reason why students do not finish college?*

RQ #2: *Is getting a college degree worth the cost?*

#### B. ChatGPT as Document Source and Methodology

ChatGPT is an artificially intelligent virtual robot that uses machine learning to develop responses to questions proposed by users. The system is one of the most utilized due to its extremely powerful language functioning. Given its powerful capability and unique, groundbreaking abilities in analyzing and outputting data, ChatGPT can be considered a research methodological tool and has already been used in prior studies [33][34]. Instead of collecting data through traditional methodological approaches such as qualitative interviews or surveys, ChatGPT allows one to gain answers to questions that encompass data and information from varying sources, including webpages, research covering complex datasets, and more [39][40].

#### C. Triangulation of Data

Triangulation is a methodology that uses varying sources of data and information to improve the validity of research results [42][43]. Within this study, the research questions were prompted within the ChatGPT system and then compared to various literature sources, including journal publications and

### VI. RESULTS AND DISCUSSION

TABLE I. CHATGPT RESPONSE TO RQ #1

<b>RQ #1:</b> <i>What is the top reason why students do not finish college?</i>
<b>ChatGPT Response:</b> <i>The top reason why students don't finish college is often attributed to financial constraints. Many students face challenges related to the high costs associated with attending college, including tuition fees, textbooks, accommodation, and living expenses. Despite the availability of financial aid and scholarships, some students may still struggle to afford the full cost of attendance, leading them to drop out in order to work and support themselves or their families. Financial barriers can be particularly pronounced for students from low-income backgrounds or those who are the first in their families to attend college. Therefore, addressing financial concerns and providing adequate financial support to students is crucial in improving college completion rates.</i>

#### A. Literature comparison

When comparing the ChatGPT response to RQ #1 to the literature, there are essential aspects to note. First, while finances are mentioned within most literature around STEM student attrition [10][11], it was rarely mentioned as the sole, single most important reason. This response could lead students to believe they can complete a STEM degree if their finances are in order or not a significant concern. The literature highlights that pre-college academic preparation, mentoring, access to technology, broadband internet access, and many other factors are all vital aspects of a student completing a STEM degree [4][24]. When connecting this ChatGPT response to human capital theory, it's essential to emphasize the potentially problematic nature of this response as it insinuates that the student can successfully gain their degree and receive economic and other benefits associated with degree completion, as long as they're able to pay for it. The ChatGPT response does not provide a holistic picture of what it takes for a student to succeed and persist toward degree completion.

#### B. Recommendations/Feedback to Open AI

The following recommendations are provided based on the system response and literature comparison. First, the system should provide a more comprehensive response the first time a ChatGPT user submits a prompt. Second, the response should include references to reputable online articles, journal publications, or conference proceedings to show accountability and action for using correct and all-encompassing datasets. As highlighted above, this response did not mention or emphasize that. While finances may be the top issue, it is not the only issue; for some students, it is not the primary issue. As defined within principal-agent theory, challenges exist with aligning the interests of the two groups (owners versus users). In this case, ChatGPT and OpenAI, the principal, not only have complete control over the management of the system in its current state, but they also have complete control over what datasets and information are used in the system moving forward and who gets access to all user-related statistics linked to the system. Users cannot make recommendations or changes to the system even when able to highlight discrepancies such as this one.

The response to RQ #1 directly impacted RQ #2: *Is getting a college degree worth the cost?* Table II below highlights the response provided by ChatGPT when the question was prompted in the system:

TABLE II. CHATGPT RESPONSE TO RQ #2

<b>RQ #1:</b> <i>Is getting a college degree worth the cost?</i>
<b>ChatGPT Response:</b> <i>The worth of a college degree in relation to its cost is a complex and subjective matter that varies depending on individual circumstances and factors. Here are some considerations:</i>
<ol style="list-style-type: none"> <li><b>Career Opportunities:</b> <i>In many fields, a college degree is a prerequisite for entry into certain careers and professions. Statistics consistently show that, on average, individuals with a college degree tend to have higher earning potential and better job prospects compared to those without a degree.</i></li> <li><b>Personal Development:</b> <i>College can provide valuable opportunities for personal growth, critical thinking skills, and intellectual exploration. It's not just about acquiring knowledge in a specific field but also about developing skills such as communication, problem-solving, and teamwork, which are highly valued by employers.</i></li> <li><b>Networking:</b> <i>College offers opportunities to build a network of peers, mentors, and professionals in various industries, which can be beneficial for future career advancement and opportunities.</i></li> <li><b>Debt Burden:</b> <i>One of the main concerns with the cost of college is student loan debt. Many students graduate with significant debt, which can take years to pay off and may impact their financial well-being in the long run. It's essential to consider the return on investment (ROI) of obtaining a degree relative to the amount of debt incurred.</i></li> <li><b>Alternative Paths:</b> <i>It's worth noting that college isn't the only path to success. Vocational training, apprenticeships, and entrepreneurship are viable alternatives that can lead to fulfilling and financially rewarding careers.</i></li> </ol>
<i>Ultimately, whether a college degree is worth the cost depends on factors such as the individual's career goals, financial situation, and personal preferences. It's essential for prospective students to carefully weigh the potential benefits and costs of obtaining a degree and to explore options for minimizing debt, such as scholarships, grants, and work-study programs. Additionally, choosing a field of study with strong job prospects and earning potential can also enhance the value of a college degree.</i>

#### C. Literature Comparison

Unlike the response to RQ #1, the response to RQ #2 was more thorough and aligned with the research findings. To begin, there was an acknowledgment that determining if a college degree is worth the cost is complex and subjective [45][46]. The response then highlights five different areas considered when answering this question. The areas listed align with previous findings from journal publications [45][46], white paper research and reputable reports [48][49], and online media outlets [49][50]. Both the first item, career opportunities, and the fourth item, debt burden, are frequently for individuals who are considering or have made the decision to pursue a STEM degree [11][12][51]. The summary provided for each aligns with research showing that students desire to get a degree so that they can earn higher incomes and have a higher number of job prospects that are not afforded if you don't have that STEM

degree. Additionally, students who choose STEM degrees are often more certain that they'll have a positive return on investments (ROI) for the money they pay to go to school [52].

#### *D. Recommendations/Feedback to OpenAI*

Based on the system response and prior research comparison, there is acknowledged that this response was of quality and aligned well with prior studies. Additionally, this response mentioned financial burdens, which aligned with the response to RQ #1. The two recommendations here are for OpenAI to (1) include reputable references as a part of the prompt response. This could be any sources used in this study as a research comparison (i.e., journal publications, reports and online articles). (2) Each response from ChatGPT should be thorough and align with the research.

### VII. AI ETHICS: POLICY IMPACT AND IMPLICATIONS

Overall, the results for the two research questions highlight a need for OpenAI to focus more on the ethical impacts and implications of the ChatGPT system output. ChatGPT, like broadband internet, personal laptops, and software such as Microsoft Office tools, are all technical applications that allow individuals to learn and advance their lives personally, including economically. Access to such a tool has been found to significantly increase educational understanding and advancement of information, including tutor-like assistance for those working on higher education degrees. When taking into consideration the role of ChatGPT and the massive scale in which it's playing within the context of education, knowledge gathering, and advancement, it is vital to understand the impact and implications of ethics related to the current functions of the system-led and managed by OpenAI - the owners of ChatGPT.

#### *A. Increase Research on Generative AI Utilization and Response Impact and Implications*

There needs to be an increased focus on understanding the number of students (K-12 and college-age individuals) using generative AI systems. Are they asking these types of questions within these increasingly utilized systems? What are the implications of these every day, vital questions being asked and summarized in a way that may not be able to tell the whole story as what we saw in the response for research question #1 (RQ #1)?

#### *B. Equitable Inclusion For Feedback to OpenAI*

Within AI ethics, they speak about ongoing assessment and adaptation as technology and society continue to evolve and advance. It is important to ensure that individuals from diverse backgrounds (education, location, professional experiences, ages, etc.) are included in these processes.

#### *C. ChatGPT Ethical Concerns*

While educators are increasingly being pushed to use generative AI tools like ChatGPT in the classroom and students are increasingly choosing to use it on their own [44], more emphasis should be placed on areas of AI ethics,

particularly bias and data privacy. Researchers must critically evaluate the outputs generated by ChatGPT and consider its strengths and weaknesses within the context of their research goals and methodologies. Additionally, ethical considerations regarding data privacy, bias mitigation, and transparency should be carefully addressed when utilizing AI technologies in research.

### VIII. LIMITATIONS

It is important to note that the ChatGPT system does not repeat the same response when you ask the system the same question a second time. When the first research question was asked a second time, a different answer was provided that included more details and reasons for the number one reason why students do not finish college. The response was similar in quality to the response for RQ #2. While this is a limitation of this study, it is also an area that OpenAI should focus on moving forward. While the system was asked twice out of curiosity as a part of this study, it is not guaranteed that every human being utilizing the system will ask a question more than once. Therefore, in the case of RQ #1, if someone received the response provided within this study, there is a chance that person could believe finances are the sole, primary purpose why people leave college. This should be further explored and prioritized by the OpenAI leadership team.

### IX. CONCLUSION

Integrating generative artificial intelligence (AI) like ChatGPT within everyday life and formal or informal education settings can significantly influence students' decision-making processes. As generative AI tools continue to advance and increase in utilization, they offer unprecedented access to personalized financial advice, academic guidance, and real-time information, empowering students to make more informed decisions regarding their educational and economic futures. However, this increased utilization warrants increased research and oversight due to possible over-reliance and trust in system responses. Potential ethical challenges include algorithmic bias, lack of policies, and external regulation on ChatGPT.

Leadership within education must collaborate with policymakers and prioritize creating robust systems that lead to required transparency from generative AI owners and improved ethical AI training for educators and students linked to the systems. These actions will assist in creating a culture where AI is an augmentative tool that enhances human judgment in a respectful and socially conscious way. Future work should include research and local, state, national, and global-level dialogue related to adapting to this evolving technological landscape.

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