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## Investigating the Correlation between Different ChatGPT Versions and Task Initiation among Postgraduate Students: a Cross-Sectional Study

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### ABSTRACT

This study investigates the impact of ChatGPT usage on student task initiation, employing a cross-sectional design with 427 doctoral and master's students. The research examines correlations between the frequency of ChatGPT interaction and the promptness of initiating academic tasks, utilizing a standardized scale for task initiation alongside a newly developed scale for measuring ChatGPT usage. Through statistical analysis methods including bivariate correlation and one-way ANOVA, the study aims to identify patterns of task initiation among non-users and users of different ChatGPT versions. Results indicate a significant negative correlation ( $\rho = -0.511, p < .01$ ) between ChatGPT usage and task initiation, suggesting that increased use of ChatGPT may be associated with delayed task initiation. Notably, non-users demonstrated a higher tendency for prompt task initiation ( $M = 3.215$ ) than ChatGPT users. Furthermore, variations in task initiation behaviors were observed between users of the V3.5 and V4 versions of ChatGPT, with V4 users exhibiting more favorable task initiation outcomes. The findings highlight the nuanced impact of ChatGPT on student academic behavior, suggesting that while ChatGPT can serve as a valuable academic tool, its usage may also influence traditional task initiation habits. These insights emphasize the need for a balanced approach to incorporating AI tools in educational settings, considering their potential to alter student work habits and discipline.

### INTRODUCTION

Integrating artificial intelligence (AI) represents a significant shift in the evolving academic sphere, combining computational and psychological insights to redefine educational strategies and tools. AI has diverse roles in academia, from facilitating information access to enhancing interactive learning and streamlining task management (Mohapatra & Mishra, 2023; Zhang, 2023). This technological progression aims to surpass traditional human capabilities in problem-solving, creativity, and intelligence, with scholars like Saputra (2020) and Gelepithis (1999) emphasizing AI's potential to transform educational frameworks. Yet, alongside these advancements, AI's role in academia is double-edged, offering benefits in educational performance and workload management while promoting a dependency that could impede academic achievement (Cabrera, 2023). The introduction of AI tools, including ChatGPT, into educational environments extends their influence to psychological and cognitive dimensions, impacting not just academic performance but also critical thinking, memory, problem-solving skills, and social interactions (Bai *et al.*, 2023; Purwasih & Sahnan, 2023; Deepthi & Jameela, 2023). These effects emphasize AI's dual capacity to enrich and potentially challenge students' cognitive and psychological health.

Against this backdrop of technological integration, the academic dialogue gravitates towards understanding the nuanced dynamics between technology use and academic behaviors, particularly procrastination and

task initiation. Harper (2019) delineates procrastination as the deferral of tasks, highlighting its implications for stress and productivity. This behavior, affecting over 70% of students, presents a challenging barrier to academic success, exacerbated by the rise in digital media engagement (Schouwenburg, 2004; Türel & Dokumaci, 2022). While technology, including ICTs, harbors potential distractions, it also offers structured pathways to mitigate procrastination, promoting better task management (Hosseinaei, 2018; Guimarães & Lazaro, 2018).

Amidst discussions on procrastination, it's pivotal to introduce the concept of task initiation. Task initiation, distinct yet related to procrastination, encompasses the ability to commence tasks without delay. This construct shifts focus from the broad behavioral pattern of delaying tasks to the specific action of task commencement. Barkley (2012) has identified task initiation difficulties as prevalent among individuals with ADHD (Attention-deficit/hyperactivity disorder), further highlighting its significance as a broader academic hurdle. The differentiation between procrastination and task initiation is crucial, accentuating the need for targeted interventions to aid students in overcoming initial task-related inertia, a challenge potentially addressed through AI tools like ChatGPT.

Delving deeper into the intersection of AI tools and academic behaviors, ChatGPT emerges as a focal point of analysis. This AI's dual role in fostering procrastination on the one hand and aiding task initiation on the other exemplifies the complex relationship between technology

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use and student behavior. While specific studies attribute an increase in procrastination tendencies to ChatGPT use (Swargiary, 2023; Yilmaz & Yilmaz, 2023; Pereira & Diaz, 2022), others recognize the potential of AI, particularly task-oriented chatbots, to support task initiation and reduce procrastination (Gieselmann & Pietrowsky, 2016; Pereira, 2022).

The nuanced differences between ChatGPT versions further accentuate this relationship. Comparative analyses reveal that while ChatGPT 3.5 generated credible yet less precise data, GPT-4 has been lauded for its accuracy and professional utility (Currie *et al.*, 2023). However, even GPT-4, despite its advancements, still needs to fully replicate human-like understanding and creativity in interaction (Bahrini *et al.*, 2023). ChatGPT-3.5 provides broad insights into content generation, whereas GPT-4 is recognized for delivering detailed, academically relevant content, stressing its superiority in facilitating educational engagement (Livberber, 2023; Karakose *et al.*, 2023). Integrating the discussion on task initiation with the examination of ChatGPT versions illuminates the potential of AI to transcend its role as a facilitator of academic engagement to a possible source of distraction. This study navigates the intricate relationship between various ChatGPT versions and their influence on educational practices, spotlighting the unexploited potential of these technologies in enhancing task initiation among postgraduate students.

### Purpose of the Study

This study aims to scrutinize the complex dynamics between ChatGPT usage and Task Initiation among students in higher education. Central to this investigation are four pivotal research questions:

1. How does the use of ChatGPT correlate with the extent to which students initiate tasks?
2. What is the correlation between task initiation and using different versions of ChatGPT?
3. Are there differences in task initiation between individuals who use ChatGPT and those who don't, as well as between users of ChatGPT 3.5 and ChatGPT 4?
4. How do the specific constructs related to task initiation, such as immediate task initiation, confidence in starting tasks, distraction resistance, etc., differ between users and non-users of ChatGPT and between users of ChatGPT 3 and ChatGPT 4?

## MATERIALS AND METHODS

### Research Design

This cross-sectional study investigates the influence of ChatGPT usage on the extent to which students initiate tasks. This research design integrates the Procrastination Scale (Lay, 1986) to measure task initiation and a new scale to measure ChatGPT Usage to assess the frequency of ChatGPT with academic tasks. Various statistical analyses thoroughly address each research question, ranging from bivariate correlation to means comparison. This methodology was chosen to comprehensively explore

the potential impacts and correlations between ChatGPT usage and task initiation. Detailed descriptions of the participant recruitment, data collection procedures, and data analysis strategies will follow in the respective sub-sections.

### Participants

The study's demographic profile included 427 participants, 251 females and 176 males. Educational levels were categorized into 140 Doctoral Students and 287 Master's Students. Usage of ChatGPT varied among participants, with 108 using V4 (Premium Version), 187 using V3.5 (free version), and 132 non-users.

**Table 1: Demographic Data**

Variables	Category	Frequency
Gender	Female	251
	Male	176
Educational level/profession	Doctoral Student	140
	Master's Student	287
Version of ChatGPT	V4 (Premium Version)	108
	V3.5 (free version)	187
	ChatGPT non-users	132
	Total	427

### Sample Size Determination

Before conducting the main study, a pilot study was carried out with 82 respondents to estimate the appropriate sample size needed to achieve sufficient statistical power. The sample consisted of 24 non-users of ChatGPT, 39 users of ChatGPT 3.5, and 19 users of ChatGPT 4. Sample size calculations were performed based on the means and standard deviations observed in

Mean 1   
 Mean 2   
 Mean 3   
 Standard deviation   
 Alpha   
 Power   
 Allocation group 1   
 Allocation group 2   
 Allocation group 3   
  
 Required sample sizes for group 1 to 3 are  
 $n_1 = 49,$   
 $n_2 = 80,$   
 $n_3 = 39.$

this preliminary research, accounting for a desired power of 0.8 and an alpha level of 0.05. These calculations determined that a sample size of 49 non-users, 80 users of ChatGPT 3.5, and 39 users of ChatGPT 4 would be required to detect significant differences among the groups. These sample sizes ensure a robust comparison and valid generalization of the findings to the broader student population engaged in academic task initiation. Figure 1 presents the details of the sample size calculation process.

**Data Collection**

In this study, we employed a multi-faceted approach to data collection tailored to engage a diverse array of participants across various academic fields. Data collection was conducted using a combination of convenience sampling, snowball sampling, and purposive sampling methods. The primary distribution method for our questionnaires was through digital platforms, specifically WhatsApp and Facebook. The WhatsApp groups consisted of English studies Ph.D. students, a demographic readily accessible due to existing academic networks. Simultaneously, Facebook groups were utilized to reach a broader audience, encompassing various academic disciplines. A snowball sampling technique supplemented this digital distribution. Initially, respondents and colleagues from different universities and countries were encouraged to share the questionnaire within their personal and academic circles, thus potentially amplifying the reach beyond the initial groups.

**Data Analysis**

**Task Initiation**

The study utilized the Procrastination Scale developed by Lay (1986), which included six items. The scale included statements like “When I have a task to complete, I typically start immediately” and “I feel confident in my ability to initiate tasks when they are challenging.” Responses were recorded on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree).

**ChatGPT Usage**

A six-item scale was developed to measure ChatGPT usage among university students. The scale employs a branching technique to direct respondents to items relevant to their academic level. For example, Ph.D. students respond to statements such as ‘I use ChatGPT to guide me through my research methodology’ and ‘I use ChatGPT to conduct the literature review.’ In contrast, Master’s students answer items like ‘I rely on ChatGPT to prepare my presentations’ and ‘I use ChatGPT to write reviews/reports.’ Responses to these statements are rated using a consistent 5-point Likert scale.

Following data collection, a thorough statistical analysis was performed using SPSS software to address the research questions. The analytical procedures were as follows:

**Composite Score Calculation**

Initially, composite scores for Task Initiation and ChatGPT usage were calculated by summing the scores of each respective item.

**Correlation Analysis (RQ1 and RQ2)**

Spearman’s correlation analysis was conducted to determine the relationship between ChatGPT usage and Task Initiation.

**Means Comparison (RQ3)**

To compare their mean scores, a one-way ANOVA was conducted separately for each category (non-users, users of ChatGPT 3.5, and users of ChatGPT 4).

**Means Comparison (RQ4)**

Separate ANOVAs were conducted to compare the mean scores of each item among the three categories (non-users, users of ChatGPT 3.5, and users of ChatGPT 4).

**The Scale**

The consistency of the scales was evaluated, revealing high reliability, as evidenced by Cronbach’s alpha coefficients of 0.883 and 0.898 for the Task Initiation scale and ChatGPT usage scale, respectively.

**Table 2:** Reliability Statistics

	Cronbach's $\alpha$	N of Items
Task Initiation	0.883	6
ChatGPT Usage	0.898	6

**RESULT**

**Research Question 1**

How does the use of ChatGPT correlate with the extent to which students initiate tasks?

**Table 3:** Correlation Analysis of Task Initiation with ChatGPT Usage

	Spearman's rho	p
Task Initiation - ChatGPT Usage	-0.511**	.000

\* $p < .05$ , \*\* $p < .01$

The Spearman’s rank correlation (Table 3) indicates a strong negative correlation ( $\rho = -0.511$ ,  $p = .000$ ) between task initiation and ChatGPT usage.

**Research Question 2**

What is the correlation between task initiation and the usage of different versions of ChatGPT?

Spearman’s rho for task initiation and ChatGPT usage was -0.916 for V3.5 and -0.875 for V4, respectively, with p-values less than 0.01.

**Table 4:** Correlation Between Task Initiation and ChatGPT Usage for Versions 3.5 and 4

	V3.5		V4	
	Spearman's rho	p	Spearman's rho	p
Task Initiation -Chatgptusage	-0.916**	0.000	-0.875**	0.000

*Correlation is significant at the 0.01 level (2-tailed). \*\**

**Research question 3**

Are there differences in task initiation between individuals who use ChatGPT and those who don't, as well as between users of ChatGPT 3.5 and ChatGPT 4?

According to the mean scores presented, non-users of ChatGPT have the highest average score in task initiation (3.21), followed by users of the V4 (Premium Version) at 3.000, and finally users of V3.5 (free version) at 2.67.

**Table 6:** ANOVA Results for Task Initiation by ChatGPT Version

		t	df	Sig. (2-tailed)	Mean Difference
Non-Users	Task Initiation	38.022	95	.000	3.21528
V3.5 (free version)	Task Initiation	29.880	151	.000	2.67434
V4 (Premium Version)	Task Initiation	30.267	75	.000	3.00000

**Research Question 4**

How do the specific constructs related to task initiation, such as immediate task initiation, confidence in starting tasks, distraction resistance, etc., differ between users and non-users of ChatGPT, as well as between users of ChatGPT 3 and ChatGPT 4?

The table summarizes the results of multiple ANOVAs, revealing distinct behavioral outcomes across task initiation variables for non-users and users of two different versions of an intervention, V3.5 and V4. Non-users are most likely to start tasks immediately,

with the highest mean of 3.833, yet V4 users exhibit substantial gains in this area over V3.5 users. Similarly, the confidence in initiating tasks is considerably higher for V4 users (3.444) than for non-users and V3.5 users. V4 users also surpass other groups in finishing tasks ahead of deadlines and initiating tasks regardless of their complexities, with the highest mean scores of 3.444 and 2.667, respectively. However, while non-users are better at resisting distractions and avoiding procrastination, V4 users significantly advance over V3.5 users with a mean score of 2.444.

**Table 7:** Comparative Analysis of Task Initiation Constructs Among Non-Users and Users of ChatGPT Versions 3.5 and 4

Dependent Variable/Usage	Non-Users	V3.5 Users	V4 Users	p
Starting Tasks Immediately	3.833	2.723	2.947	.000
Confidence in Initiating Tasks	3.364	3.128	3.444	.000
Starting tasks without Complexity	2.818	2.684	3.444	.000
Distraction Resistance	2.727	2.561	2.667	.000
Finish Ahead of Deadline	2.455	2.427	2.667	.000
Avoiding Procrastination	3.0	2.112	2.444	.000

**DISCUSSIONS**

The correlation analysis demonstrated a substantial negative relationship between ChatGPT usage and task initiation. This suggests that as ChatGPT usage increases, the immediacy with initiating tasks decreases. This could indicate reliance on the tool supplanting students' intrinsic motivation or traditional study methods.

The comparison between ChatGPT V4 and V3.5 users reveals a nuanced advantage for those using the premium version. V4 users reported greater confidence in starting tasks, quicker ability to begin tasks, and more readily tackled straightforward tasks. This suggests that the enhanced features of ChatGPT V4 provide substantial support in planning and executing academic work. The performance boost among V4 users could be attributed

to the advanced functionalities streamlining academic workflows and the psychological motivation to maximize the value of their financial investment in the premium service, fostering a more efficient approach to task management.

In contrast, non-users exhibited a significant tendency to initiate tasks, possibly as a proactive measure to compensate for the lack of AI assistance, reflecting a strategic approach to time management. Additionally, non-users scored higher in resisting distractions and avoiding procrastination, indicating that they may develop and rely on a more rigorous self-regulation regime without relying on technological tools. This suggests that while technological tools like ChatGPT can be beneficial, traditional task management practices that

foster discipline and focus also have inherent strengths. Collectively, these findings illuminate the complex interplay between technology usage and academic behavior. They suggest that while technological tools like ChatGPT can offer substantial support, their impact on behavior is flexible and varies based on the version and the psychological responses induced by different modes of access (free vs. premium). This discourse contributes a critical perspective on integrating AI tools in academic settings, advocating for a balanced approach that considers individual differences in technology adoption and the diverse strategies students employ in task management.

## CONCLUSION

The adoption of ChatGPT by students has introduced a shift in academic effort and confidence, with the technology's capabilities leading to a perception that tasks can be accomplished with minimal personal input. This ease of use, contrasting sharply with the traditional, more labor-intensive approach to academics, might inadvertently foster a propensity towards procrastination, as students might postpone tasks, relying on the efficiency of ChatGPT to compensate for the delay. However, an interesting behavioral nuance is observed among premium ChatGPT users, who exhibit a lower tendency towards procrastination. This could be attributed to the psychological effect of their financial investment in the tool, where the desire to maximize the value of the purchased service encourages more timely task initiation. This dynamic underscores the complex interplay between technological tools and student work habits, highlighting the need for mindful engagement with AI to balance its benefits against potential impacts on academic discipline.

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