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Abstract

This research study provides a comprehensive analysis of excessive use of ChatGPT in academia which started a debate that either the excessive use of ChatGPT in academia is a blessing or a curse. Recently, the advent of artificial intelligence (AI) like ChatGPT had dramatically enhanced the human and computer interaction by offering the unparalleled accessibility and convenience. The study has measured the potential factors of academia which caused the excessive use of ChatGPT. Instant gratification (IG), academia work overload (AW) and social isolation (SI) has been taken as the predictors of excessive use of ChatGPT in academia. By employing the Uses and Gratification theory, it has been observed that how university students seek the help of AI for gratification, to minimize their work load and to mitigate the impact of social isolation. To escape from hard work, to reduce the life stressor and to gain comfort, students constantly seek for positive reinforcement from their tutors. So, positive reinforcement (PR) has been taken as a mediator in the relationship between IG, AW, SI and excessive use of ChatGPT. Access and technical know-how will strengthen the relationship of IG, AW, SI and PR while lack of technological literacy will lessen the strength of such relationship. Hence, technological literacy (TL) has been taken a moderator for IG, AW, SI and PR. Data has been collected from a homogenous population of business and management students of public and private universities of southern Punjab, Pakistan. A survey has been by conducted by distributing a structured questionnaire to 1100 graduate and undergraduate students. Out of which 678 students responded. At the end 617 useable responses were recorded for analysis. It has been found that IG, AW and SI enhances the use of ChatGPT while PR partially moderates this relationship. Additionally, TL strengths the relationship of IG, AW, SI and PR. The study measured the possible reasons of excessive use of ChatGPT in the academia while the perils of AI is yet to be explored in academia.

Keywords: ChatGPT, Instant Gratification, Academia Work overload, Social Isolation, Positive Reinforcement, Technological Literacy, Uses and Gratification Theory

1. Introduction

ChatGPT is the magnum opus of this era by representing a significant advancement in artificial technologies (AI) by allowing users for interactive dialogue with computers and smart phones for various purposes in academia including instant information retrieval, problem solving, skill enhancement, personal tutoring and for content creation (Choudhury & Shamszare, 2023; Kalla, Smith, Samaah, & Kuraku, 2023). Apart from educational use, AI and ChatGPT has many uses including but not limited to health, law, marketing, manufacturing, customer service and in research & development. This study focusses on excessive use of ChatGPT for educational purpose only. In fact, the advent of AI especially ChatGPT in education sector has steered a new domain of learning categorized by custom-made, accessible, and interactive educational experiences. The incorporation of artificial intelligence (AI) in education has steered in a new era of knowledge, characterized by interactive, personalized, and reachable educational practices. ChatGPT is an AI-driven hassle-free representative developed by OpenAI which demonstrates this technological progression. This study focuses on the various dimensions and need of ChatGPT in the higher educational sector, by showing its potential to transmute the traditional higher educational paradigms (Sharma & Yadav, 2022).

ChatGPT is the significant advancement for use in higher educational sector allowing the students to engage and retrieve the bulk of information for academic purpose. ChatGPT provided the various interactive dialogues to access the knowledge. While ChatGPT offered very convenient and efficient way to offer the knowledge to the students at higher level, various concerns have been raised for its excessive use which started a debate that either the excessive use of ChatGPT in academia is a blessing or a curse (Rahman & Watanobe, 2023). On a positive side, ChatGPT provide a lot access to the students of higher education in academia which are the personalized learning, customized explanations, different learning paths and resources relevant to the interests of the students. In addition, 24/7 access to the information and wide range of topics is an added value for the students. This access to information helps the students to complete their home assignments, to prepare the test, to clarify the doubts, to improve the draft, to rephrase or summarize, to solve the problems and least but not last to enhance the learning and knowledge. These accessibility features not only help in seeking knowledge but also improve the multiple skills of students like language proficiency, improved grammar, interactive learning, writing assistance, problem solving and developing critical thinking (Baidoo-Anu & Ansah, 2023; Sok & Heng, 2023).

1.1. Background of ChatGPT

ChatGPT was developed by a US based company named OpenAI in 2015. It uses the cutting-edge technology of AI with deep learning techniques and by using the online data on the web. It is claimed to be a mimic of human brain but still at nascent stages (Wu et al., 2023). The word GPT in ChatGPT is the abbreviation of generative pre trained transformer which means it is capable of getting inputs from humans and can give an immediate response like humans by making it difficult to distinguish between humans and machines. Due to its wide area of utility, it is being extensively used in academia as well as in other disciplines (Rajaraman, 2023).

1.2. Possible Reasons for Excessive Use of ChatGPT

Various reasons compel the students for excessive use AI tools in academia. Some of these possible reasons are excessive work load, instant gratification and social isolation. In case of excessive workload, students seek the information from AI or from ChatGPT as it is convenient, easy to use and available at 24/7 (Ngo, 2023). As the ChatGPT is enriched with abundance of information from the globe and also yields new ideas in the relevant disciplines of academia hence, students go for excessive use of ChatGPT for seeking appreciation or instant gratification. Another major reason for excessive use of ChatGPT is the social isolation where students unable to seek guidance physically from any mentor, they connect themselves with the virtual mentor and go for excessive use of ChatGPT (AlAfnan, Dishari, Jovic, & Lomidze, 2023). This excessive use prevails for long time, if there is appreciation from the tutor by ignoring the use and contribution of AI tools in the given assignments. Such carelessness from the supervisor's side encourages students for excessive use of ChatGPT in every academic task and ultimately

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leads towards the positive reinforcement for using ChatGPT for prolonged use. This usage is enhanced if the user is technological literate which strengthens the relationship of excessive use of ChatGPT (Choudhury & Shamszare, 2023; Sharma & Yadav, 2022).

1.3. Definitions

1.3.1. Excessive Use of Technology

Excessive use of technology is considered as the extended and obsessive usage of technology that disturbs the routine activities, personal relations, and overall welfare of the individual. While refer to excessive use of ChatGPT, it's the prolonged and repetitive use of ChatGPT beyond its functional usefulness, it is driven by instant gratification, work overload and social isolation with positive reinforcement and technological literacy (Turel & Ferguson, 2020).

1.3.2. Instant gratification

Instant gratification (IG) is the instantaneous satisfaction or pleasure in fulfilling the required task without any delay. IG is termed with short run appreciation which may leads to long term advantage. It is only limited to gaining immediate satisfaction on the cost of future gains (Ribeiro & Peeters, 2021).

1.3.3. Academic Work Overload

This is the situation where students are overburdened with excessive tasks. These tasks may be in the form of quantitative and qualitative from, lengthy or tedious assignments or routine but monotonous work which ultimately leads towards boring. Such over load may be the cause of over stress and reduced academic well being. To tackle with such type of stress, students seek the immediate remedy in the form of ChatGPT (Bin-Nashwan, Sadallah, & Bouteraa, 2023).

1.3.4. Social Isolation

Social Isolation (SI) is the state of feeling when an individual is dissatisfied from his/her social relationship. This dissatisfaction is the cause of perceived meaningfulness in the life and as a result that individual felt isolated from the society (Alzyoudi & Al Mazroui, 2024).

1.3.5. Positive Reinforcement

Positive reinforcement (PR) is the process where individual is encouraged and appreciated by showing a specific behavior. Such appreciation or reward compels that individual to repeat such behavior in future. PR act as stimulus for repeated behavior and increases the likelihood same action (Jahan, Azam, Ahmad, & Sadia, 2023).

1.3.6. Technological Literacy

Technological literacy (TL) is the skill or ability to understand and use of technology in ad effective way. TL is the engagement of individual with the technology which comprehend the technological skills and knowledge which ultimately leads towards the effective and efficient use of technological tools (Ciampa, Wolfe, & Bronstein, 2023).

1.3.7. Problem Statement

Previous studies suggested that AI driven tools like ChatGPT can provoke the individual for compulsive use of these latest tools over the traditional technologies. Excessive and continuous engagement with AI tools like ChatGPT is the result of many factors and a serious dilemma of academia (Karthikeyan, 2023). The factors of this excessive use may be the optional obligations to the compulsive tasks where users think that ChatGPT is the only solution (Oranga, 2023). This study highlights the such compulsive factors which may be the cause of compulsive or excessive use of ChatGPT in academic life. The exceptional abilities of ChatGPT by performing the complex tasks in academia caused mixed schools of thoughts in the literature. So the researchers emphasized to measure this newly developed relationship of human and AI (Baidoo-Anu & Ansah, 2023; Sok & Heng, 2023).

1.3.8. Research Objectives

The research aimed to fulfill the following objectives

- To measure the direct impact of instant gratification (IG) on positive reinforcement (PR)
- To measure the direct impact of academic workload (AW) on positive reinforcement (PR)
- To measure the direct impact of social isolation (SI) on positive reinforcement (PR)
- To measure the direct impact of positive reinforcement (PR) on excessive use of ChatGPT
- To measure the indirect impact of IG, AW, and SI on excessive use of ChatGPT
- To measure the moderating impact of technological literacy (TL) in the relationship between IG, AW and SI on PR

1.3.9. Research Questions

Aligned with research objectives, the research questions are

1. What is the impact of instant gratification (IG) on positive reinforcement (PR)
2. What is the impact of academic workload (AW) on positive reinforcement (PR)
3. What is the impact of social isolation (SI) on positive reinforcement (PR)
4. What is the impact of positive reinforcement (PR) on excessive use of ChatGPT (EUGPT)
5. What is the indirect impact of IG, AW, and SI on excessive use of ChatGPT
6. What is the moderating impact of technological literacy (TL) in the relationship between IG, AW and SI on PR

2. Literature Review

Excessive use of ChatGPT is prevailing in academia and its use is increasing day by day. This study focuses on the factors which are the cause of this excessive usage of ChatGPT in academia. The presence of ChatGPT has added valuable insights for the academic community (Karthikeyan, 2023). As ChatGPT is the new innovation in the area of technology, still there is a lot of gaps to be identified in the arena of literature and research (Elbanna & Armstrong, 2024).

2.1. Theoretical Support

To understand the excessive use of ChatGPT from theoretical point of view can be framed within numerous relevant points that help to explain why students in academia may engage with AI-driven technologies in compulsive or awkward ways. Usually, theories deliver insights into the social, psychological, and behavioral instruments underlying excessive use of technology. Such theoretical frameworks highlight the valuable insights for knowing the complex dynamic forces which are the cause of excessive use of ChatGPT in academia (Rasul et al., 2023).

2.2. Uses and Gratifications Theory

Katz, Blumler, and Gurevitch (1973) observed that how individual continuously and actively seek the use of media for the satisfaction of their specific needs or to seek the gratification. As per uses and gratification theory there are two major reasons for excessive usage and these are gratification seeking and escapism (Ruggiero, 2000).

2.2.1. Gratification Seeking

Here the individual may engage with excessive use of ChatGPT to fulfill different requirements like information seeking, for clarity, for completing assignment or to gain psychological or emotional support. This excessive usage enhanced when it is also equipped with instant gratification (Lin, 1993).

2.2.2. Escapism

The other major reasons for excessive use of any media as per the theory of Uses and Gratification is the stressors or the social interactions. These stressors and problematic social interactions are known escapism. In academia, the escapisms are the academic work overload and social isolation (Konzack, 2017).

2.3. Instant Gratification and Excessive Use of ChatGPT

Instant gratification (IG) is the situation when students are seeking for immediate reward while compromising for the long-term benefits. Such behaviors occurred when a user is seeking pleasure or satisfaction as quickly as possible. Such phenomenon is observed commonly in real life which ultimately become the personal habits. Such urge for immediate appreciation is common in academia and one of the major reasons for the excessive use of ChatGPT in academia. In the long run such urge of IG became the part of personal habits, reflected in behavior and visible in decision making process. Moreover, IG is also influenced by many factors which might be psychological, environmental or social but all leads towards the excessive use of ChatGPT in academia (Jishnu, Srinivasan, Dhanunjay, & Shamala, 2023). So, IG is the major factor of excessive use of ChatGPT in academia and can be hypothesized as

H1: Instant Gratification (IG) enhances the excessive use of ChatGPT in academia

2.4. Academic Workoverload and Excessive Use of ChatGPT

Academic workoverload (AW) is a state of academic demand when students are unable to manage it in a reasonable way. There are many reasons for AW which might be the higher volume of syllabus, complicated assignments, tight or short deadlines or other curricular compulsions. Such compulsions enforce students to go for extensive use of ChatGPT. If the AW prevails continuously, there are chances that students will become habitual for using the ChatGPT in an excessive way (Bin-Nashwan et al., 2023).

H2: Academic Workoverload (AW) enhances the excessive use of ChatGPT in academia

2.5. Social Isolation and Excessive Use of ChatGPT

Social loneliness (SI) is considered as a situation of isolation or a feeling when someone's social needs are not being fulfilled. Contrary to physical isolation, SI is the depth of social interactions which is based on quality as compared to quantity. It's a pure subjective phenomenon that can occur when an individual perceived that his/her surrounding social interactions are not meaningful (Alzyoudi & Al Mazroui, 2024; Kalam, Rahman, Islam, & Dewan, 2024). So, to fulfill his/her academic requirements, these socially isolated individuals prefer to seek technological help rather than from their social circle. Such social loneliness is one of the major reasons for the excessive use of ChatGPT and hypothesized as under

H3: Social Loneliness (SI) enhances the excessive use of ChatGPT in academia

2.6. Positive Reinforcement and Excessive Use of ChatGPT

Positive reinforcement (PR) is the basic concept of psychology and often associated with in the environments of academia, workplace and parenting. It usually provides the positive result and appreciation, if the desired behavior is displayed, that's why the desired behavior is the reinforcement power which compels the user to repeat that behavior again and again. In academia, positive reinforcement by the mentor or tutor persuades the students for excessive use of ChatGPT. In fact, PR act as a facilitator and remedy for the students when they are seeking immediate appreciation, when they have feelings of loneliness and when they have excessive academic workload (Kushwah, Goyal, & Jain, 2024). In such scenarios, students automatically compelled for the excessive use of ChatGPT and PR act as the mediator in this relationship by facilitating it. So, the hypotheses are

H4: Positive Reinforcement (PR) mediates the relationship of Instant Gratification (IG) and the excessive use of ChatGPT in academia

H5: Positive Reinforcement (PR) mediates the relationship of Academic Workoverload (AW) and the excessive use of ChatGPT in academia

H6: Positive Reinforcement (PR) mediates the relationship of Social Isolation (SI) and the excessive use of ChatGPT in academia

2.7. Technological Literacy and Excessive Use of ChatGPT

Technological Literacy (TL) is the competency or skill to use the technology for a meaningful way. Effective use of technology is essential not only in routine life but also mandatory in academia and work place (Dawa, Dhendup, Tashi, & Rosso, 2023). In fact, TL strengthens or weakens the relationship of excessive use of technology with other predictors. If an individual is tech oriented, he or she is likely to enhance the use of technology and vice versa. In the relationship of excessive use of ChatGPT PR explained the relationship of predictors whereas TL strengthens the relationship of IG, AW and SI with PR. The moderating hypotheses with TL are

H7: Technological Literacy (TL) moderates the relationship of Instant Gratification (IG) and Positive Reinforcement (PR) in academia

H8: Technological Literacy (TL) moderates the relationship of Academic Workoverload (AW) and Positive Reinforcement (PR) in academia

H9: Technological Literacy (TL) moderates the relationship of Social Loneliness (SI) and Positive Reinforcement (PR) in academia

Based on the literature and relationships defined above, study has developed the following research model

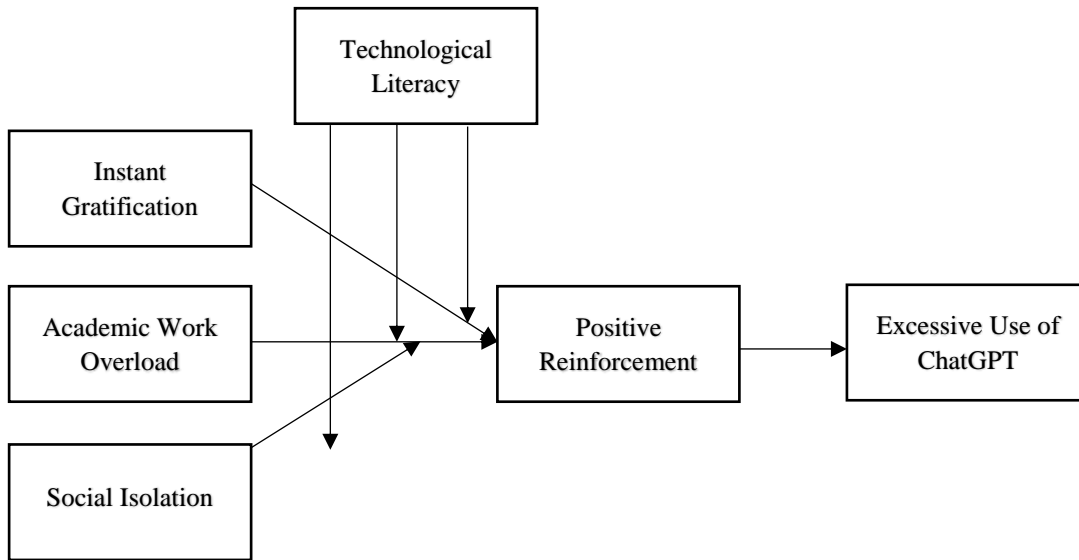


Figure 1: Research Model

3. Methods

The current study employed a quantitative research technique using a survey methodology for data collection at university level students. The instrument of data collection was a structured questionnaire. The purpose of data collection was to measure the relationship of excessive use of ChatGPT with predictors in the presence of moderated and mediated relationships. The target population consisted of all university enrolled students in southern Punjab, Pakistan. A total of 1100 structured questionnaires were distributed to collect the response. A stratified sampling technique was used across various faculties and departments for equal representation. The bases this stratification was demographic variables of gender, age and qualification.

The questionnaire comprised of three main sections. First section was the introductory note describing the purpose of the study. This section also includes the author's information and described the rights of the respondents about their consent to fill this questionnaire form and right to withdraw at any stage without mentioning any reason. 2nd part of the questionnaire consisted of demographic variables where respondents were asked about their gender, age and education. To ensure anonymity of the respondents, no personal information have been collected like email or phone numbers. Since the nature of study is cross sectional, so there is also no need of such personal information of the respondents which might be used for further study. In the 3rd part of questionnaire, questions were asked about instant gratification, academic workoverload, social loneliness, positive reinforcement, technological literacy and excessive use of ChatGPT. All questions in the 3rd section were close ended and used the liker scale ranging from strongly disagree to strongly agree.

Initially, 678 filled questionnaires were returned yielding a response rate of 61 percent. It takes 8 weeks to distribute and collect back the filled questionnaires from university students. These 678 returned questionnaires were further scanned for completeness and accuracy. The questionnaires where demographic information was missing or a large section was unanswered were excluded from the survey. At the end 617 questionnaires were found to be suitable for analysis and included in the study with a response rate of 56 percent.

4. Results and Findings

The results were segregated into two major parts. First part was related to demographic variables including the number of valid responses, gender, age and qualification of the respondents whereas the second part was related to inferential statistics measuring the overall summary of the model, model fit, coefficient of the variables, total direct effects and total indirect effects. Before preceding to inferential statistics, reliability and validity of the constructs were also measured and found to be in the acceptable range. The detail of descriptive and other analysis is given below.

4.1. Descriptive analysis

Table 1 below describes the valid responses included in the study for analysis. Form data, it is clearly observed that valid responses for all demographic variables of gender, age, qualification and institution were 517. There is no single missing response as all the incomplete questionnaires were discarded before the analysis.

Table 1: Statistics of the Respondents

		Gender	Age	Qualification	Institution
N	Valid	617	617	617	617
	Missing	0	0	0	0

Table 2: Gender of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	323	52	52	52
	Female	294	48	48	100.0
	Total	617	100.0	100.0	

Table 2 shows the gender distribution of the respondents. Out of 617 valid responses 323 males and 294 females participated in the survey regarding excessive use of ChatGPT in their academic life. The valid percentage of male and female students are 52 and 48 percent respectively.

Table 3 below showed the age range of the respondents who used the ChatGPT excessively. 119 students are in the age range of 18 to 21, 409 students have the age ranges from 22 to 25 years while 89 students have the age above 50 years. These are the students who showed their informed consent to participate in the survey. The big chunk in the age group ranges from 22 to 25 years of age constituting the total 66 percent of the total population. While the least portion is of the range above of 25 years.

Table 3: Age of the Respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-21	119	19.3	19.3
	22-25	409	66.3	85.6
	Above 25	89	14.4	100.0
	Total	617	100.0	100.0

All students were categorized into two main categories of undergraduate and undergraduate students. All responses were taken only from university enrolled students in the region of southern Punjab. The students enrolled in undergraduate programs studying in affiliated colleges were not included in the study because of less technological resources at college level. Out of 617 students, 78.6 percent participated from undergraduate programs while 21.4 percent participated from graduate programs of MPhil and PhD.

Table 4: Qualification of the Respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Undergraduate	485	78.6	78.6
	Graduate	132	21.4	100.0
	Total	617	100.0	100.0

Following table shows the statistics of Cronbach's alpha, composite reliability and average variance extracted (AVE) of the observed constructs. The threshold value for Cronbach's alpha is 0.7 however for newly developed constructs it should be greater than 0.50. Here in table 5 the Cronbach's alpha value for IG is 0.715, for AW its 0.852, for SI its 0.763, for TL its 0.838 for PR its 0.711 while for EUGPT its 0.828. All values of Cronbach's alpha is above the threshold value of 0.7 so it can be safely said that the scale adopted to measure the excessive use of ChatGPT (EUGPT) is reliable. The threshold value for composite reliability value is also 0.7. Here all the values of composite reliability are greater than 0.7, For example, the composite reliability value of IG is 0.84s, for AW its 0.838, for SI its 0.909, for TL its 0.824, for PR its 0.823 and for EUGPT its 0.917. So, the scale is reliable. Similarly, the threshold value of average variance extracted (AVE) should be above 0.5. Here the AVE for IG is 0.689, for AW its 0.628, for SI its 0.759, for TL its 0.651, for PR its 0.655 and for EUGPT its 0.639. It is evident from table 5 that all constructs are in the range of accepted benchmarks.

Table 5: Reliability of the Constructs

Variables	Cronbach's Alpha	Composite Reliability	AVE
IG	0.715	0.843	0.689
AW	0.852	0.838	0.628
SI	0.763	0.909	0.759
TL	0.838	0.824	0.651
PR	0.711	0.823	0.655
EUGPT	0.828	0.917	0.639

Despite the fact that all constructs utilized in this study were adapted from well-established and validated scales from the existing literature, a further validation process was deemed necessary. However, to enhance the authenticity of these constructs within the local context of students of higher education of southern Punjab, the reliability and validity of all constructs was recalculated. As demonstrated in Table 5, the values of Cronbach's alpha, composite reliability, and average variance extracted all meet the minimum required thresholds, thus allowing for further analysis.

Table 6: Model Summary

Variables	R Square	Adjusted R Square
EUGPT	0.851	0.922
PR	0.663	0.814

Table 6 summarizes the overall summary of the research model. There are two dependent variables in the research model one is EUGPT which is also the main variable of the study while the other is PR which act as the mediator in between the relationship

of IG, AW and SI for EUGPT while PR itself acted as a dependent variable for IG, AW and SI. The overall variation explained by the suggested model for excessive use of ChatGPT in academia is 85 and 66 percent respectively. Whereas the threshold value of 0.5 is considered a good criterion for prediction of any model.

Table 7: Total Direct Effects

Variables Relationship	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
IG -> PR	0.331	0.091	4.192	0.000
AW -> PR	0.312	0.074	3.107	0.000
SI -> PR	0.395	0.083	4.759	0.000
TL -> PR	0.310	0.034	3.487	0.000
TL -> EUGPT	0.334	0.571	3.618	0.000
PR -> EUGPT	0.357	0.092	5.221	0.000

Hair (2019) approach was used to measure the direct and indirect effects of the model. From table 7, it is evident that all direct hypotheses of the research model are supported with p values less than 0.005. There are four direct relationships of IG, AW, SI and TL with PR while TL and PR also have direct relationship with excessive use of ChatGPT. It is evident from the table that all direct relationships have positive and significant impact on EUGPT. In other words, it can be said that for academia IG, AW and SI are the good predictors for EUGPT.

Table 8: Total Indirect Effects

Variables Relationship	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
IG -> PR -> EUGPT	0.331	0.053	5.327	0.000
AW-> PR -> EUGPT	0.339	0.032	4.258	0.000
SI -> PR -> EUGPT	0.341	0.051	4.458	0.000
TL*IG->PR	0.392	0.044	4.257	0.000
TL*AW->PR	0.327	0.062	3.925	0.000
TL*SI->PR	0.308	0.064	3.584	0.000

Table 8 is the most crucial and important table as it depicts the indirect relation of the research model. In research model there are 3 mediation hypotheses and 3 moderation hypotheses. The mediation hypotheses are in between the IG & EUGPT, AW & EUGPT and SI & EUGPT where PR performed the role of mediator. From table 8, it is confirmed that mediation of positive reinforcement worked well for excessive use of ChatGPT. For constructive use of ChatGPT in academia is a good thing and such behaviors must be appreciated by the faculty or by the mentors. Technological literacy performed as a mediator in between the relationship of IG, AW, SI and PR. From table 8, it is evident that technological awareness and skills strengthens the use of ChatGPT. Table 9 below gives the complete summary of all they hypotheses of the study.

Table 9: Hypotheses Summary

Hypothesis	Statement	Status
H1	Instant Gratification (IG) enhances the excessive use of ChatGPT in academia	Supported
H2	Academic Workoverload (AW) enhances the excessive use of ChatGPT in academia	Supported
H3	Social Loneliness (SI) enhances the excessive use of ChatGPT in academia	Supported
H4	Positive Reinforcement (PR) mediates the relationship of Instant Gratification (IG) and the excessive use of ChatGPT in academia	Supported
H5	Positive Reinforcement (PR) mediates the relationship of Academic Workoverload (AW) and the excessive use of ChatGPT in academia	Supported
H6	Positive Reinforcement (PR) mediates the relationship of Social Isolation (SI) and the excessive use of ChatGPT in academia	Supported
H7	Technological Literacy (TL) moderates the relationship of Instant Gratification (IG) and Positive Reinforcement (PR) in academia	Supported
H8	Technological Literacy (TL) moderates the relationship of Academic Workoverload (AW) and Positive Reinforcement (PR) in academia	Supported
H9	Technological Literacy (TL) moderates the relationship of Social Loneliness (SI) and Positive Reinforcement (PR) in academia	Supported

5. Discussion

The study was initiated to measure the contributing factors which persuade the higher education students for excessive use of ChatGPT. Bases on empirical analysis, the study measured the direct relationships of IG, AW and SI for PR and EUGPT. It was found that IG, AW and SI significantly contributed to enhanced the use of ChatGPT in academia. This usage is enhanced more if this relationship is explained with positive reinforcement by the faculty. Students go for excessive use of ChatGPT to gain instant appreciation, to mitigate their excessive workload and to reduce the negative effects of their social isolation. This excessive use become repetitive and frequent if there is positive gesture from the immediate supervisor or faculty. It was also found that technologic literacy strengths the use of ChatGPT in academia as all three moderating relationships found to be significant. The study has developed 09 hypotheses by using the Uses and Gratification theory where 3 hypotheses measured the direct impact while 06 hypotheses measured the indirect impact. All 09 hypotheses found to have positive and significant impact on excessive use of ChatGPT.

6. Conclusion

The notion of excessive use of ChatGPT in academia poses the significant challenges to individuals, societies, communities and academicians to understand the social, psychological and ethical implications of excessive use of ChatGPT. At the moment, there is no harm for excessive use of ChatGPT in academia as it enhances the knowledge of students, help in reducing their stress, mitigate their social loneliness and give a good grasp on the effective use of technology. From a positive side, it also helps for interdisciplinary research and help students to improve their well-being. Apparently, the effective use of ChatGPT in academia is a blessing due to its usefulness and instant availability. The main aim of this study was also to measure the strength of predictors who contributed directly or indirectly in the excessive use of ChatGPT but the perils of ChatGPT in academia is still unresolved and have not been addressed in this study. The study provided a comprehensive view of excessive use of ChatGPT in academia with mediation effect of positive reinforcement and moderation effect of technological literacy with the predictors of instant gratification, academic workload and social isolation.

7. Future Research Directions

The study has provided a very comprehensive view by mentioning the factors which are the cause of excessive use of ChatGPT in academia. But the mystery is still unresolved either the excessive use of ChatGPT is a blessing or a curse in academia which should be addressed in future studies.

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