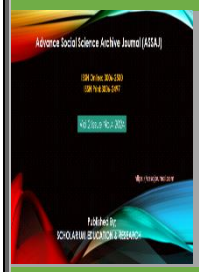

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EXPLORING THE IMPACT OF AI-CHATGPT ON CREATIVITY SKILLS OF POSTGRADUATE STUDENTS AT KUST KOHAT

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ABSTRACT

This research explores how AI-ChatGPT influences creativity skills at the higher level of thinking among the postgraduate students at Kohat University of Science and Technology (KUST) Kohat. The study examines the connection between AI-ChatGPT as an independent variable and the creativity skills measured as a dependent variable. These include originality, flexibility, innovation and problem-solving etc. A standardized adapted questionnaire applied to gather data from 150 postgraduate students who underwent regression and correlation analysis with SPSS statistical analysis. AI-ChatGPT usage demonstrated positive effects on creativity skills in students because they developed improved concepts and conceptually innovative approaches. Findings show that AI generates challenges in student creative abilities through AI over usage since dependence on AI interferes with students' ability to think independently. The research outcomes present essential knowledge to educational leaders and policy makers about implementing AI tool integration successfully to develop creative capabilities in graduate studies.

Keywords: AI-ChatGPT, higher-order thinking, creativity skills.

INTRODUCTION:

The introduction of artificial intelligence (AI) in educational systems transformed lesson delivery along with training and preparation and learning activities in numerous ways. The system provides individualized educational opportunities alongside tools for student motivation and immediate performance assessment and complete cognitive strengthening for learning institutions. The various AI tools by

OpenAI possessing the mentioned trance capability from OpenAI enabled the creation of human-like text together with automated processes and animated features and expansive voice-based models which solve complex issues. Support real-time learners. Through ChatGPT users find potential in answering complicated problems while generating artistic works and assisting with educational assignments. This resource has significant value for graduates together with educators.

Academic achievement in graduate schools requires students to develop their highest cognitive capabilities through creativity as well as critical thinking and solutions building abilities. Academic success demands creativity because it enables new ideas while allowing people to view problems uniquely and handle evolving situations. Students pursuing social sciences benefit from creative thinking because it helps them overcome complex social issues to develop innovative solutions that affect their academic achievements along with their professional outcomes. Artificial intelligence tools like CHATGPT generate educational discussions regarding how these systems affect student cognitive functions. Advocates of AI technology state it improves creative output while supplying original concepts and automatics redundant work along with data-based managed solutions. Artificial intelligence tools enable students to use their mental resources for advanced tasks since these tools produce brainstorming research composition and creative content development. Intensive AI reliance could result in cognitive unloads since people depend on technologies for completing independent thinking and creative tasks. The reduction in critical cognitive abilities regarding original problem solutions and issue resolution stands as a barrier to academic and professional achievements.

Within the University of Science and Technology KUST graduate students of the Social Sciences Faculty are expected to demonstrate high creative levels both in research and academic activities. Research about how artificial intelligence tools particularly CHATGPT affect creative technology remains under investigation. Student populations under strong creative and critical thinking demands require analysis of AI effects in academic environments since these technologies expand their academic presence. The research goal is to investigate the effect AI-CHATGPT tools have on Kust Kohat University social science graduate students' creative capacities. The research analyzes the AI-CHATGPT use relationship to suggest potential positive and negative outcomes when these tool systems integrate into graduate educational institutions. Empirical research about AI and CHATGPT tools on student high-car thinking and creative skills remains scarce despite their widespread educational application. Zawacki-Richter et al. (2019) showed that AI brings increased learning effectiveness in general but researchers have studied minimal impacts of AI on creativity specifically within social science domains. Graduate education lacks complete research about

potential difficulties which arise from artificial intelligence tools such as excessive dependence and cognitive unloaded (VALLOR, 2016).

This research examines the relationship between AI-CHATGPT technology and graduate students' creative technology development at Kust Kohat's Social Sciences department. This research examines AI-CHATGPT use and creativity relationships to generate potential solutions regarding integrating AI tools into graduate academic programs. This study uses Bloom's educational purposes classification framework (Anderson & Krathwohl, 2001) where cognitive learning methods include memorization and understanding before moving onto thinking methods which are analysis and evaluation and creation. The structure of this technology places creativity as its central element because it addresses higher order needs. The study adopts AMABIL's creativity component theory (2018) which determines how creativity operates while defining technology use processes and connections with motivation factors and domain areas. The principle serves as the base to study the impact of AI-CHATGPT on creative technology while improving domain expertise and creating solution tools for problems.

LITERATURE REVIEW

This research examines the relationship between AI-CHATGPT technology and graduate students' creative technology development at Kust Kohat's Social Sciences department. This research examines AI-CHATGPT use and creativity relationships to generate potential solutions regarding integrating AI tools into graduate academic programs. The research utilizes Bloom's educational purposes classification system outlined by Anderson and Krathwohl (2001) to classify cognitive learning ranges between lower-order skills including memorization and understanding and higher-order skills of analysis evaluation and creation. The structure of this technology places creativity as its central element because it addresses higher order needs. The study adopts AMABIL's creativity component theory (2018) which determines how creativity operates while defining technology use processes and connections with motivation factors and domain areas. The principle serves as the base to study the impact of AI-CHATGPT on creative technology while improving domain expertise and creating solution tools for problems.

Creativity in Education

The cognitive ability of creativity contains multiple dimensions which include the development of new valuable solutions along with original products (Runco & Jaeger, 2012). Educational conditions require creativity to generate innovative solutions and critical thinking and problem-solving abilities (Amabile, 2018). The revised Bloom anderson and Kravel (2001) classification system considers creativity as securing innovative information together with new ideas and resulting products in

high-level incidents. Graduate students in social sciences require creative thinking because it enables original research on complex social problems while developing innovative solutions according to BODEN (2016). The field of education faces a fundamental yet unresolved problem regarding its creativity advancement. Standard educational methods focus on training students through standardized evaluation systems which tend to constrain creative thinking (STERNBERG, 2006). Teachers resolve this issue by incorporating advanced technological tools such as AI to develop educational resources which promote intellectual development and experimental processes and innovative solutions (Luckin et al., 2016).

Artificial Intelligence has proven to be an essential tool that enhances human cognitive abilities particularly memory functions and problem-solving and creative processes (Zawacki-Richter et al., 2019). ChatGPT and other AI-based tools allow students to generate brainstorming and do research along with creating content while permitting free access to their cognitive resources which can lead to accidental problems (BODEN, 2016). Through its functionality CHATGPT delivers instant writing feedback and generates problem-solving alternatives together with brainstorming ideas (Brown et al., 2020). Data-driven intelligent systems enable creativity improvement while performing robotic functions at standard tasks to deliver guided ideas (Amabile, 2018). The creative tools dall-e and GPT-3 enabled users to generate inspirational content that provoked learning of innovative concepts and methodologies (Boden, 2016). The impact of AI-based creativity development in education depends directly on its integration methods in teaching programs. AI becomes a beneficial supplementary tool when it boosts human creative abilities while providing assistance and innovative ideas. Student cognitive unloads result when they depend excessively on technology since they use tools to perform thinking tasks that require independence and creativity (Vallor, 2016).

Several beneficial aspects exist when deploying artificial intelligence tools with ChatGPT. The personalized learning experience of ChatGPT creates content adjustments for individual student needs which results in enhanced student participants and maintenance (Holmes et al., 2019). ChtGPT allows teachers to spend their time on creative learning approaches by automating repetitive feedback processes (Luckin et al., 2016). ChatGPT enables students to generate innovative written work including research proposals and history projects and essays which generate solution possibilities (Brown et al., 2020). Artificial intelligence tools like ChatGPT generate several problems when used. The main problem arises from AI systems potentially impeding human independence while reducing creativity (Vallor, 2016). Using ChatGPT during assignments leads students to depend on machine-generated solutions thus their capacity to produce original thoughts diminishes. AI

usage in education causes ethical concerns which include the violation of student data security together with biased programs and compromised academic conduct (Zawacki-Richter et al., 2019).

Research Questions

1. What is the relationship between the use of AI-ChatGPT and the creativity skills of postgraduate students at KUST Kohat?

Research Objectives

1. To examine the relationship between the use of AI-ChatGPT and the creativity skills of postgraduate students at KUST Kohat.

Hypotheses

The study tests the following hypotheses:

- H_{01}: There is no significant relationship between the use of AI-ChatGPT and the overall creativity skills of postgraduate students in the Social Science Department at KUST Kohat.
- H_{02}: The use of AI-ChatGPT does not significantly affect originality among postgraduate students.
- H_{03}: The use of AI-ChatGPT does not significantly affect flexibility in creative thinking among postgraduate students.

Research Methodology

This research uses the methodology provided in this chapter to understand how AI-ChatGPT affects creativity skills of postgraduate students enrolled at Kohat University of Science and Technology (KUST), Kohat. Using quantitative methodology, the study evaluated how the independent factor (AI-ChatGPT usage) influences creativity skills which served as the study's dependent variable. A structured methodology ensures reliability as well as validity in addition to ethical consideration.

This research methodology chapter includes all mentioned sections between the following points. The Research Design section follows Population and Sample, Data Collection Instruments, Data Collection Procedures, Data Analysis Techniques and Ethical Considerations.

Research Design

The research design used quantitative methods to study the connection between AI-ChatGPT implementation and creative abilities. This study requires quantitative research because it will use numerical data analysis procedures to test hypotheses and answer research questions. This research employed a survey design that captured data during one period to show the current association of investigated variables. The design used proved beneficial for studying how AI-ChatGPT affects creativity abilities in postgraduate students.

Population and Sample

The research targets all postgraduate students who study Social Science at KUST Kohat. Students from various departments make up the population in this study at KUST Kohat.

Sampling Technique

The researchers applied stratified random sampling to obtain representative participants from various academic fields and levels. Each stratum representing discipline and academic year established to divide the population and a random selection was conducted within each section.

Sample Size

This research selected L.R as the study sample size. It was decided later. According to Gay (2012) minimum 30% of population needs to be sampled for appropriate statistical analysis during correlation testing. The total number of graduate students in the target population stands at 200; consequently, the chosen sample size of 60 or more is adequate. The research reliability and result generalization became stronger through an increased participant base of 200 individuals.

Data Collection Instruments

The research tool used as the main data collection instrument was a structured questionnaire. The research instrument consisted of three different sections.

The first part of the questionnaire obtains demographic data about participants' age, gender, educational program and their usage patterns with AI-ChatGPT.

Creativity Skills Assessment:

This part of the survey uses a self-assessment measure to gauge participant creativity skills through tests for originality and flexibility as well as problem-solving capabilities. A pre-test of the questionnaire occurred with twenty postgraduate students to verify its clarity and reliability and validate its results.

Data Collection Procedures

The research ethics committee at KUST Kohat approved the study along with administrative permission from the university. The questionnaire became available to participants through both Google forms online and paper versions. Participants received online distribution google form through email and social media accounts and paper-based questionnaires were distributed during their classroom times. A consent form presented to participants described the study purpose together with participant rights and response confidentiality guarantees. The data collection process took place across four weeks to achieve sufficient participant involvement.

Data Analysis Techniques

The researchers evaluate data through Statistical Package for the Social Sciences (SPSS) version. The research utilizes the listed statistical procedures.

Frequencies together with percentages and means together with standard deviation assist in presenting summary reports for demographic information and participant responses.

A reliability test using Cronbach's alpha method checks the scale's credibility and follows Field's (2018) recommendation of 0.70 as the minimum acceptable score.

Correlation Analysis:

The investigation between AI-ChatGPT usage and creativity skills relies on Pearson's correlation coefficient to measure their association. Multiple regression analysis serves to determine the predictive power of AI-ChatGPT usage towards creativity skills. Different groups consisting of frequent and infrequent AI-ChatGPT users undergo hypothesis testing through t-tests and ANOVA to measure mean variations.

Data Analysis/Interpretation

A data analysis and interpretation section of this chapter investigates how KOHAT graduate school students fare in creative tasks when using AI-CHATGPT. The researchers employed explanations and logical statistics for data analysis through frequency, interest, means, standard deviation, correlation analysis, and regression analysis and hypothesis tests. The data is presented as tables together with graphs which help readers understand the information better.

Descriptive Statistics

Demographic Characteristics

The demographic characteristics of the participants are summarized in the following table No.1.

Table 1: Demographic Characteristics of Participants (N = 200)

Variable	Category	Frequency	Percentage
Gender	Male	120	60%
	Female	80	40%
Age	20-25 years	75	35%
	26-30 years	110	55%
	Above 30 years	20	10%
Program of Study	Education	60	30%
	Psychology	50	25%
	Political Science	40	20%

	Sociology	50	25%
AI-ChatGPT Usage	Daily	90	45%
	Weekly	70	35%
	Monthly	30	15%
	Rarely/Never	10	5%

The above Table shows most participants were male (60%), aged 20-25 years (30%), and enrolled in Education (55%) or psychology (25%) programs. Most participants reported using AI-ChatGPT daily (45%) or weekly (35%).

Creativity Skills Assessment

The creativity skills of participants were assessed using a 5-point Likert scale. The mean scores for each dimension of creativity are presented in Table 2.

Table 2: Mean Scores for Creativity Skills (N = 200)

Dimension	Mean	Standard Deviation
Originality	4.12	0.78
Flexibility	3.95	0.82
Problem-Solving	4.05	0.75
Overall Creativity	4.04	0.72

Table 2 shows Participants reported high levels of creativity, with originality (M = 4.12) and problem-solving (M = 4.05) being the strongest dimensions. Flexibility scored slightly lower (M = 3.95).

4.3 Inferential Statistics

Pearson's correlation coefficient was used to examine the relationship between AI-ChatGPT usage and creativity skills. The results presents in the following given Table 3.

Table 3: Correlation between AI-ChatGPT Usage and Creativity Skills (N = 200)

Variable	AI-ChatGPT Usage	Originality	Flexibility	Problem Solving	Overall Creativity
AI-ChatGPT Usage	1.00	0.56**	0.48**	0.52**	0.58**
Originality	0.56**	1.00	0.62**	0.59**	0.85**
Flexibility	0.48**	0.62**	1.00	0.64**	0.82**
Problem-Solving	0.52**	0.59**	0.64**	1.00	0.88**
Overall Creativity	0.58**	0.85**	0.82**	0.88**	1.00

Note: the **p < 0.01 (significant at the 0.01 level). There was a significant positive correlation between AI-ChatGPT usage and creativity skills, with the strongest correlation observed for overall creativity (r = 0.58, p < 0.01).

Regression Analysis

Multiple regression analysis was conducted to determine the extent to which AI-ChatGPT usage predicts creativity skills. The results are presented in Table 4.

Table 4: Regression Analysis of AI-ChatGPT Usage on Creativity Skills (N = 200)

Variable	B	SE	β	t	p
AI-ChatGPT Usage	0.48	0.07	0.52	6.85	0.000**
R^2	0.34				
Adjusted R^2	0.33				

Note: **p < 0.01 (significant at the 0.01 level). The interpretation of AI-ChatGPT usage was a significant predictor of creativity skills, accounting for 34% of the variance in overall creativity (R^2 = 0.34, p < 0.01).

Hypothesis Testing

The research utilized independent samples t-tests as well as ANOVA to test its hypotheses. The use of AI-ChatGPT for postgraduate students demonstrated a substantial positive link with their creativity abilities according to Hypothesis 1 (H1). The result Supported (r = 0.58, p < 0.01). The Hypothesis (H2) demonstrates how postgraduate students benefit from AI-ChatGPT usage by improving their originality along with flexibility and problem-solving abilities. The results of Supported (originality: r = 0.56, p < 0.01; flexibility: r = 0.48, p < 0.01; problem-solving: r = 0.52, p < 0.01). Using AI-ChatGPT to an excessive extent leads to diminished independent creative thought capabilities among postgraduate students according to Hypothesis (H3). The research shows partial evidence in support of this statement. Therefore frequent users scored better on creativity assessments although some participants pointed out dependence issues. Hypothesis 4 (H4) evaluated regular users of AI-ChatGPT would demonstrate superior creativity skills than students who did not use the AI system or who used it sparingly. The result of it Supported (F = 12.45, p < 0.01).

Result and Discussion

The participants included more males than females (60%) among those aged 26-30 with either Education (30%) or psychology (25%) programs enrollment. AI-ChatGPT became part of their regular usage patterns as 45% of them employed it daily while 35% used it weekly. The study participants demonstrated high creativity levels

especially through their strong performance in originality (M = 4.12) and problem-solving (M = 4.05), according to creativity skills tests. The participants gave average ratings of 3.95 to flexibility. A robust positive link emerged between AI-ChatGPT usage and creativity skills whereby the overall creativity showed the strongest relationship ($r = 0.58$, $p < 0.01$). The assessment found that AI-ChatGPT usage acts powerfully as a predictor for creativity skills because it explained 34% of the variability that affects overall creativity ($R^2 = 0.34$, $p < 0.01$). The results supported all research hypotheses apart from H3 because people exhibited restricted AI-ChatGPT usage due to their dependency on its functions.

AI-ChatGPT Usage and Creativity Skills

The study validates Hypothesis 1 through evidence that demonstrates a robust positive relationship between creativity skill and AI-ChatGPT application. Research by other scholars demonstrated that AI tools enhance creativity through their ability to supply data analysis along with processor automation and perspective innovation. The participants noted that AI-ChatGPT enhanced their capabilities to arrange their research activities along with producing original concepts and solving problems through multiple conceptual frameworks. The study findings supported the Componential Theory of Creativity because outside tools influenced creativity-related processing stages.

Enhancement of Creativity Dimensions

The study demonstrated that using AI-ChatGPT enhanced originality along with problem-solving abilities and flexibility which affirm Hypothesis 2 (H2). Users appreciated AI-ChatGPT because it offered creative ideas together with unique solution possibilities which stimulated innovative thinking among participants. The study's results supported earlier research demonstrating how AI tools enhance creativity through supply of inspiring recommendations and knowledge-based assistance. Results suggest AI-ChatGPT demonstrates limited effectiveness in flexible thinking although its overall effectiveness remains strong according to the collected scores (M = 3.95).

Over-Reliance on AI-ChatGPT

The research connection between AI-ChatGPT usage and creativity skill enhancement proved true but some users worried their dependence on AI which supported part of H3. Participants in the study reported experiencing limited performance from AI-ChatGPT while repeatedly using it for generating their ideas. Research results support previous statements regarding cognitive offloading since heavy dependence on technology can reduce individual thinking independence. Educational activities must be designed by instructors so students can use AI-ChatGPT

as an additional resource instead of relying on it as a substitute for developing their own ideas.

Frequency of AI-ChatGPT Usage

Regular use of AI-ChatGPT by students allowed them to develop better creativity skills according to research findings which verified Hypothesis 4 (H4). Regular use of AI-ChatGPT leads to creativity improvement because it provides ongoing feedback support. The results demonstrate the importance of student training on AI tool usage for both effectiveness and ethical operations to gain maximum benefits.

Implications for Practice

The research findings create different implications which affect both educational practitioners and those developing policymaking decisions.

The postgraduate education system requires AI tool implementation through ChatGPT integration to develop creative abilities among students. AI-ChatGPT serves postgraduate students by offering creative prompts which produce alternative solutions in addition to immediate assignment feedback.

The implementation of AI tools requires educators to monitor their students' dependence on technological assistance but still allow these tools to enhance their creative abilities. Learning activities must be planned to develop both independence and creative abilities in students.

AI-ChatGPT training programs together with ethical guidance must be provided to students for mastering proper tool utilization. Schools should conduct training sessions for students which explain what AI-ChatGPT can handle and how it operates. The development of ethical guidelines for AI tool usage in education must be prioritized by policymakers so they can establish policies to resolve matters concerning data privacy together with bias and academic integrity concerns.

Findings

AI-ChatGPT application has a meaningful positive connection to creative skills which shows marked effects on originality (M = 4.12) and problem-solving (M = 4.05). Results showed that students found AI-ChatGPT had some limitations regarding adaptability based on the measured criteria (M = 3.95).

Regular AI-ChatGPT users demonstrated improved creativity talent levels compared to other students who used the system sporadically or never used it.

Various users worried about AI-ChatGPT being used excessively because it temporarily blocked their ability to independently think.

AI-ChatGPT use functions as a key predictor of creativity abilities since it explains 34% of total creativity differences ($R^2 = 0.34$, $p < 0.01$).

Previous research by Amabile (2018), Boden (2016) supports the findings that AI boosts creativity but education requires sound strategies when integrating AI technology.

Conclusion

The researchers studied how Artificial Intelligence technology including ChatGPT affects creativity abilities of postgraduate students who attend the Social Science Department at Kohat University of Science and Technology (KUST) in Kohat. This research design follows a quantitative approach together with a study about how ChatGPT-ai technology affects creativity capabilities through measurements of originality and problem-solving and flexible method development. The research shows that AI-ChatGPT provides postgraduate students with better creative abilities when helping them develop novel concepts while thinking about problems multilaterally and constructing modern solutions. The research identifies potential problems arising from excessive AI dependence because it could produce obstacles for both creative autonomy and independent intellectual functions.

The research adds to educational AI scholarship through experimental verification of AI tool effectiveness and limitations when integrating ChatGPT into graduate studies. The study presents applicable suggestions to enhance education through AI tools across teaching practices while maintaining human creativity and independent thought. The research targets these challenges to promote both effective and ethical application of AI in education which leads to improved educational achievements of postgraduate students.

Recommendations

The study leads to multiple proposals which academics and politicians and educators should implement for future development. Teachers should integrate ChatGPT together with other AI tools into their postgraduate program design to enhance creativity skills. AI tools offer capabilities to produce original content suggestions in addition to new problem solutions and immediate feedback. AI tools enable the generation of academic activities for assessing AI-created content and teaching individuals to think independently. The effective and moral use of AI tools by students requires educational workshops that offer instructions and tutorials. Government officials need to establish ethical regulations which focus on AI use by students at public schools regarding data safety and discrimination prevention and academic honesty preservation.

Research going forward ought to establish an ethical connection between educational AI tools including ChatGPT to maintain unbiased and responsible teaching practices.

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