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AI in Education: Examining ChatGPT Awareness and Usage among University of Science & Technology Students, Aden

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***Abstract* - The integration of artificial intelligence tools, specifically ChatGPT, in education poses both opportunities and challenges. However, there is a lack of comprehensive understanding regarding the effectiveness and impact of using ChatGPT in educational settings, particularly within the context of Yemen specifically the University of Science & Technology (UST) in Aden. To address this gap, there is a need to assess the current use of ChatGPT and explore the perceptions and experiences of academic staff and students regarding its implementation. By identifying potential issues, benefits, and concerns, this study aims to contribute valuable insights for the successful integration of ChatGPT and improve the overall educational experience at the UST University. Ultimately, the goal is to contribute to a more informed and effective use of AI tools, improving the overall educational experience of Yemeni universities and potentially serving as a model for similar institutions.**

Keywords: ChatGPT, Artificial Intelligence, Educational.

I. Introduction

In education, emerging technologies have also been transforming ways of teaching and learning. The AI market in US Education Sector is expected to grow by 48% in 2018–2022 [1]. The integration of artificial intelligence (AI) technologies in education has been an area of study for several decades [2]. In recent decades, artificial intelligence (AI) has grown rapidly, transforming various aspects of our society. AI now stands at the forefront of research in fields like medicine, robotics, education, and autonomous driving. In simple terms, AI involves computers learning to imitate human brain behavior by gathering external data and using that knowledge to achieve specific goals [3].The rapid advancement of artificial intelligence (AI) has generated significant interest in exploring its potential applications and impacts across various domains. A notable milestone in AI progress is ChatGPT, introduced by OpenAI in November 2022 [4].

The use of ChatGPT in education has generated considerable interest due to its potential to enrich the learning experience of students. By providing quick and personalized responses, this system has the ability to address individual student needs, offer immediate feedback and facilitate the understanding of complex concepts. In this way, it becomes a promising tool that promotes a student's active participation and cognitive advancement by adapting to their learning pace and offering continuous support in their knowledge acquisition process. In the field of education, these tools could support students to reflect on scientific practices, to optimize their texting, to have texts proofread or even to act as tutors for exam preparation [5, 6]. Academic perspectives on ChatGPT to date, however, have not unanimously declared AI tools as a monumental threat to higher education. Other responses have been more nuanced, pointing out that while ChatGPT can contain factual inaccuracies and biases, it can enhance student learning. Consequently, academics should adapt teaching and assessment practices to embrace the new reality of living, working, and studying in a world where AI is freely available [7, 8]. These tools, in short, provide an opportunity to rethink a focus on producing written tasks and instead focus on what students are doing to develop high-order critical thinking skills [9]. They also enable students to learn complicated concepts in plain language and improve inclusion for people with communication disabilities [10]. In this way, universities and their respective academics should focus on teaching students how to use ChatGPT and similar tools in ethical ways that foster critical thinking [11].

ChatGPT can be a valuable tool for academic staff, providing a starting point for creating course syllabi, teaching materials, and assessment tasks. However, concerns regarding the accuracy of its generated content must be addressed. One possible solution would be to use ChatGPT to generate raw materials to train course-specific chatbots.AI chatbots like ChatGPT also have the potential to enhance the accuracy of research by spotting and fixing mistakes in analysis or even data (Alshater, 2022). It is, therefore, plausible to leverage ChatGPT to confirm the veracity of study findings or to

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uncover errors or discrepancies in financial data. Thus, it is undeniable that ChatGPT could serve as a language assistant and linguistic accuracy verifier that plays a critical role in assisting both teachers and students in optimizing their academic writing and research [12].

Two issues regarding the ChatGPT: First, despite an increase in the number of users, the utilization of ChatGPT in higher education can be challenging, particularly in terms of the ethical implications, data privacy and security, because students and lecturers may share their personal or sensitive information while interacting with ChatGPT. This could entail the risks of using students' information for other activities beyond the realm of academia, illegal access to learners' data, and security breakdowns [13]. Second, although ChatGPT has significant potential in learning processes, educational innovations, and evaluation activities, its impact on education is still uncertain, and there is a need for more researches on how this AI application should be adapted to higher education [14].

Therefore, this study is our contribution to the educational society with the purpose of determining the university students' awareness and usage of ChatGPT and to identify potential issues, and benefits of it within the Yemeni universities. The main objective of this work is to explore the perspectives and opinions of students and lecturers in the Yemenis universities regarding the integration of ChatGPT in their educational experiences.

This study focused on a Yemeni university within the Aden governorate. The choice for focusing on Aden governorate was based on the notion that it is the capital city of this country. And the study scope is a sample consist of 105 undergraduate students and lecturers from three different academic programs within the Faculty of Engineering and Computing at the University Science and Technology.

The significance of the research discoveries and conclusions from this study would be useful to the top management of Yemeni universities in as they would be in a better position to make the right decisions in allocating resources for the successful integration of ChatGPT as educational tool to improve the overall educational experience of the Yemeni universities.

In the next section, a brief definition of the ChatGPT tool. Section 3, describes our research methodology and illustrates the method of data collection and questionnaire design. The analysis and the results are described in section 4. Section 5 include the final conclusions.

II. ChatGPT Definition

In November 2022, OpenAI released ChatGPT, a versatile language model that can generate code, write stories, perform machine translation, conduct semantic analysis, and etc. By January 2023, nearly 13 million users were interacting with ChatGPT daily. ChatGPT is a variant of the generative pre-training transformer (GPT), a transformer-based large language model (LLM) that can understand human languages and create human-like text (e.g., stories and articles) [15, 16, 17]. ChatGPT is capable of generating precise responses to an array of prompts and inquiries instantaneously and producing nearly flawless texts that are challenging to distinguish from humans' writing. The potential benefits of AI in education as well as the challenges and barriers that may arise from its integration are discussed in the context of existing literature. Based on these findings, suggestions for future research include further exploration of the ethical implications of AI for education, the development of strategies to manage privacy concerns, and the investigation of how educational institutions can best prepare for the integration of AI technologies [18, 19, 20, 21].

The utilization of AI-based Chatbots in educational activities represents a significant domain for supporting student engagement and learning processes. Research has demonstrated that Chatbot technologies can enhance student interaction and learning processes, enrich learning experiences by impacting student success in higher education [22, 23, 24], and potentially improve student motivation, engagement, and learning outcomes. However, it is not yet possible to assert a consensus among educators, specifically concerning ChatGPT [25, 26, 27, 28].

III. Research Methodology

3.1 Research Population

This study utilized a cross-sectional research design to collect data on the ethical considerations of using Chat GPT in the university of Science and Technology, Aden. The main aim of this research is to explore the perspectives and opinions of university students regarding the integration of Chat GPT in their educational experiences, which combined both qualitative and quantitative approaches to obtaining data. Thus, the major participants in this study were undergraduate students enrolled in various disciplines and their faculty members. The study sent out a total of 107 questionnaires and 95 were answered therefore, this research used a sample size of 95participants, selected through random sampling. It included students from different academic levels and backgrounds to ensure a diverse representation.

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For the ethical considerations, permission was sought from the Head of the selected departments to access the participating departments to carry out the study.

Table 1: Research Population

Population	Distributed Questionnaire	Retrieved Questionnaire	Percent%	Cumulative Percent
Information Technology department	55	51	53.68	53.68
Information Systems department	20	18	18.95	72.63
Graphic Design department	20	14	14.74	87.37
Academic Staff	12	12	12.63	100
Total	**107**	**95**	**100**	

3.2 Data Sampling

First, purposive sampling was used to select teachers and students with prior experience using ChatGPT in education to participate in this study. The teachers selected were those who had been trained and were using the ChatGPT services in their lectures. However, there were also some teachers who, out of personal interest, were using these services with their students and these were also included. The student's participation will consist of students from three BSc. disciplines in the Engineering and Computing department, namely, students from the 3rd and 4th levels of the Information technology (IT), Information systems (IS), and Graphic Design Programs, with a total of 83 students and 12 academic staff across different days. Each participant's impact on AI Tools will be significant, and their feedback will be considered crucial for the study. Participants responded to a self-fill-in questionnaire, which contained both quantitative and qualitative questions. The questions required them to record their perceptions regarding the use of ChatGPT services on some aspects of their learning.

3.3 Questionnaire Design and Data Collection

The questionnaire consisted of a mix of closed-ended and open-ended questions to gather both quantitative and qualitative data. The questionnaire was designed to assess participants' opinions,

The questionnaire is composed of; besides the Personal Data, four dimensions as follows:

- First Part: Personal Data which consist of (7) items.
- Second Part: Type of the AI tools used for academic purposes which consist of (10) items.
- Third dimension: Frequency of use of AI tools for academic purposes which consist of (3) items.
- Fourth dimension: The benefits of using ChatGPT which consist of (10) items.

The section on opinions was particularly framed as a Likert Scale. The Likert items enabled respondents to agree or disagree with statements.

3.4 Reliability of Questionnaire

The validity of the questionnaire (tool) was ensured through two types or methods of validity: the Face validity and the Construct validity.

3.4.1 Face Validity:

Face validity refers to the extent to which the questionnaire appears to measure what it intends to measure. It involves assessing the questionnaire's clarity, relevance, and comprehensibility. Face validity was established by obtaining feedback and opinions from experts or judges.

3.4.2 Construct Validity:

Also known as the internal consistency refers to the extent to which each item in a questionnaire aligns with the dimension it belongs to. The internal consistency of the questionnaire was calculated to assess the internal homogeneity of the measurement

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tool. This was done by calculating the Cronbach's Alpha coefficient between the score of each item within its dimension and the total score of the dimension to which it belongs. After calculating the Cronbach's Alpha coefficient using the SPSS software, it was found that all Alpha coefficients between the paragraphs and the dimension to which they contribute are statistically significant at a significance level of p <0.5 This is because their values (rp) are greater than the critical table value of 0.844 at a degree of freedom (N-2=28) and a two-tailed test.

The Likert items, in particular, where30 questionnaire sheets are subjected to statistical verification using Cronbach's Alpha of reliability to ensure that each item in the section on opinion appropriately measured the respective underlying constructs. The reliability for questionnaire used in this study is shown in Table 3.

Cronbach's Alpha equals 0.844 for a part of the questionnaire which indicates an excellent reliability of the entire questionnaire. Thereby, it can be said that the researcher proved that the questionnaire was valid, reliable, and ready for distribution for the population.

Table 2: List wise deletion based on all variables in the procedure

		N	%
Cases	Valid	30	100
	Excluded	0	0
	Total	30	100

Table 3: Reliability of questionnaire

Cronbach's **α**	N of Items
0.844	30

3.5 Statistical Analysis Tools

The Statistical Package for Social Sciences (SPSS 19) was used to analyze quantitative data. Data were subjected to mapping through frequencies on the descriptive statistics. Students' demographic data were provided; this included: gender, age, year/level of study. Descriptive statistics were used in the form of frequency tables to present categories of variables and percentages of the sample. In this process of mapping out the data through frequencies, one critical problem which emerged was that of missing data. Missing data were also detected by means of visual scanning. Bivariate correlations between imperative independent and dependent variables were also conducted to determine the associations. Qualitative data from open ended questions were coded and various themes were generated from the data. Answers were then all read through to find those responses which fitted each of the themes.

The questionnaire consisted of a mix of closed-ended and open-ended questions to gather both quantitative and qualitative data. The questionnaire was designed to assess participants' opinions, attitudes, and concerns regarding the ethical considerations of using Chat GPT in university education. The collected data were analyzed using both quantitative methods. Descriptive statistics, such as frequencies and percentages, were used to analyze the closed-ended questions, providing an overview of participants' opinions on various ethical considerations.

To achieve the research goal, we used quantitative data analysis. We utilized the following statistical tools:

1. Cronbach's Alpha for reliability statistics.
2. Frequency and Descriptive analysis.
3. Parametric Tests (Analysis of Variance- ANOVA). It is used to examine if there is a statistically significant difference between several means among the respondents the use of ChatGPT in faculty of engineering and computing due to (Department and level).

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IV. Results and Analysis

According to general information which is collected from the respondents of the questionnaire, the population characteristics was determined in order to identify the characteristics of the respondents. The repeatability distributions of some of these variables are presented to the following arrangement: Department and Level.

Part 1: Personal Data

Here, in this section the personal data are characterized as the following:

- **Level**

Table 4 shows the student distribution according to department and the level. Table 5 shows the level distribution among the population. The statistics show that the majority of responders at the third level with 60.24% of the population, and for the fourth level is (39.76%) of the population.

Table 4: Department and Level distribution

Department	Level		Total
	3rd	4th	
Information technology	35	16	51
Information systems	8	10	18
Graphic design	7	7	14
Total	50	33	83

Table 5: Population Distribution According to students' Level

Level	Frequency	Percent	Valid Percent	Cumulative Percent
3rd	50	60.24	60.24	60.24
4th	33	39.76	39.76	100
Total	83	100.0	100.0	

- **The Gender**

The results show that out of the 95 participants, 59 (62.1%) identified as male, while 36 (37.9%) identified as female (see Table 6).

This indicates a slight gender imbalance, with a higher representation of male participants. Researchers should consider this gender distribution when interpreting the research findings, as the results may be more representative of the male population. Efforts to increase gender diversity in future studies could enhance the generalizability of the findings.

Regarding age distribution, the majority of participants fell within the age range of 18-24 years, with 75 participants (78.9%). The next most represented age group was 25-34 years, with 12 participants (12.6%), followed by 35-44 years with 5 participants (5.3%). The age groups of 45 years and above accounted for 3 (3.2%) participants.

Table 6: Gender distribution

	Frequency	Percent	Valid Percent	Cumulative Percent
Male	59	62.1	62.1	62.1
Female	36	37.9	37.9	100.0
Total	95	100.0	100.0	

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- **The Current Position (Instructor)**

Table 7 shows the level distribution among the population. Table 8 presents the distribution of current positions among instructor participants. A total of 12 participants were included in the analysis. Various positions within the academic hierarchy, including Teaching Assistant (25%), Lecturer (16.7%), Associate Professor (16.7%), Assistant Professor (33.3%), and Assistant Lecturer (8%). These findings provide insights into the distribution of current positions among the instructor participants and highlight the diverse roles and responsibilities they hold within the educational institution. These results will contribute to the understanding of the participant demographics and may be relevant for exploring potential relationships between current position and other variables of interest in the study.

Table 7: Illustrates Population Distribution According to Role

	Frequency	Percent	Valid Percent	Cumulative Percent
Students	83	87.37	87.37	87.37
Academic Staff	12	12.63	12.63	100
Total	95	100.0	100.0	

Table 8: Illustrates population distribution according to the current position

	Frequency	Percent	Valid Percent	Cumulative Percent
Teaching Assistant	3	25.0	25.0	25.0
Lecturer	2	16.67	16.67	41.67
Associate professor	2	16.67	16.67	58.34
Assistant professor	4	33.33	33.33	91.67
Assistant lecturer	1	8.33	8.33	100
Total	12	100.0	100.0	

Part 2: Types of AI Tools Used

Tables 9 and 10 provide a breakdown of the respondents based on their usage of educational AI tools, along with corresponding frequencies and percentages. According to the results, out of the total 95 respondents, the majority (95.8%) reported using educational AI tools, with ChatGPT being a prominent example with (78.9%). This high adoption rate indicates a strong presence of AI tools in the educational experiences of UST university students and faculty members. Conversely, a small proportion of respondents (4.2%) indicated that they had not utilized any educational AI tools, including ChatGPT.

The results suggest a positive reception of AI technology in educational settings, emphasizing its potential benefits for student learning and engagement.

Table 9: Using any Educational AI Tools

Level	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	91	95.8	95.8	95.8
NO	4	4.2	4.2	100.0
Total	95	100.0	100.0	

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Table 10: Types of AI Tools used

	Frequency	Percent	Valid Percent	Cumulative Percent
ChatGPT	75	78.9	78.9	78.9
Bard(Gemini)	8	8.4	8.4	87.4
Claude	1	1.1	1.1	88.4
Other	11	11.6	11.6	100.0
Total	95	100.0	100.0	

Part 3: The Frequency of Usage of AI Tools

The results in Table11 and Table 12, indicate that the frequency of AI tools usage for academic purposes varied among the respondents. The majority of the participants reported using AI tools on a regular basis. Specifically, 21.1% of respondents mentioned using AI tools daily, while 30.5% reported using them a few times a week. Additionally, 28.4% stated that they used AI tools once a week, and 20.0% reported using them rarely. These findings suggest that AI tools are utilized with varying degrees of frequency for academic purposes. Some individuals rely on AI tools more extensively, incorporating them into their daily or weekly academic routines, while others use them more sporadically.

Table 11: Frequency of Usage

	Frequency	Percent	Valid Percent	Cumulative Percent
Daily	20	21.1	21.1	21.1
A few times a week	29	30.5	30.5	51.6
Once a week	27	28.4	28.4	80.0
Rarely	19	20.0	20.0	100.0
Total	95	100.0	100.0	

As shown in Table 12, more than 52% of respondents spent less than 1 hour per day using AI tools, indicating widespread but shorter engagement. Additionally, 32.6% spent 1-2 hours, demonstrating a notable level of involvement. 11.6% dedicated 2-4 hours, suggesting a subset of actively engaged students. A small proportion (3.2%) spent over 4 hours, representing highly involved users. These findings highlight diverse usage patterns among UST University students in integrating AI tools into their academic routines. Understanding these patterns aids in assessing educational impact and informing strategies for effective implementation.

Table 12: Duration of Usage of AI Tools for academic purposes?

	Frequency	Percent	Valid Percent	Cumulative Percent
Less than 1 hour	50	52.6	52.6	52.6
1-2 hours	31	32.6	32.6	85.3
2-4 hours	11	11.6	11.6	96.8
More than 4 hours	3	3.2	3.2	100.0
Total	95	100.0	100.0	

Part 4: Benefits of Using ChatGPT

After studied the results of this part (The perception of benefits of using ChatGPT) we got that the Weighted Average is 4.04 (Agree) based on five Likert Scale.

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Table 13: The mean perception of benefits of using ChatGPT

Item	SA_5 (%)	A_4 (%)	N_3 (%)	D_2 (%)	SD_1 (%)	Mean	SD	Decision
ChatGPT is easy to use	41 (43.2%)	39 (41.1%)	14 (14.7%)	0 (0%)	1 (1.1%)	4.25	.79	**High Perception** 4.25 > 4.04
ChatGPT improve my problem-solving and critical thinking skills	17 (17.9%)	47 (49.5%)	22 (23.2%)	7 (7.4%)	2 (2.1%)	3.74	.91	**Low Perception**
ChatGPT can be used with various input languages	28 (29.5%)	41 (43.2%)	21 (22.1%)	4 (4.2%)	1 (1.1%)	3.96	.89	**Low Perception**
ChatGPT is a useful tool for study	41 (43.2%)	38 (40.0%)	10 (10.5%)	5 (5.3%)	1 (1.1%)	4.19	.89	**High Perception**
ChatGPT can give answers quickly	48 (50.5%)	34 (35.8%)	13 (13.7%)	0 (0%)	0 (0%)	4.37	.72	**High Perception**
ChatGPT can help save time	46 (48.4%)	38 (40.0%)	8 (8.4%)	3 (3.2%)	0 (0%)	4.34	.77	**High Perception**
ChatGPT can provide information in diverse fields	37 (38.9%)	46 (48.4%)	10 (10.5%)	2 (2.1%)	0 (0%)	4.24	.73	**High perception**
ChatGPT can facilitate personalized learning experiences	25 (26.3%)	36 (37.9%)	25 (26.3%)	6 (6.3%)	3 (3.2%)	3.78	1.01	**Low perception**
ChatGPT helps understand a hard topic easily using explanations and examples	21 (22.1%)	41 (43.2%)	27 (28.4%)	6 (6.3%)	0 (0%)	3.81	.85	**Low Perception**
ChatGPT can illuminate ideas in writing thus improving efficiency and productivity	16 (16.8%)	46 (48.4%)	27 (28.4%)	4 (4.2%)	2 (2.1%)	3.74	.87	**Low Perception**
TOTAL	320	406	177	37	10	4.04		
					Weighted Average =	4.04		

Testing the Hypothesis

Before performing ANOVA test to evaluate the difference between the means of the variables under study, we performed Levene test for homogeneity of the variances in our sample and Kolmogorov-Smirnova test to verify the normality of distribution. Now, let first we put the null hypothesis as that means of all the different groups are equal.

Null Hypothesis:

There is no significant difference in the perceived educational impact of ChatGPT among students with different academic programs, and academic levels at the University of Science and Technology, UST.

Alternate Hypothesis:

There is no significant difference in the perceived educational impact of ChatGPT among students with different academic programs, and academic levels at the UST University.

Table 14: ANOVA Test for AI Tools Usage Patterns with different academic programs

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.36	2	1.181	.767	.468
Within Groups	123.2	80	1.540		
Total	125.5	82			

Table 14 shows the comparison between the means by test the value of F. There is no significant effect or difference between students in terms of AI tools usage patterns with different academic programs, where the p-value (0.468) of the independent variable (academic programs) is greater than the significance level ($\alpha = 0.05$) so we accept the null hypothesis.

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V. Conclusion

The purpose of this research work is to assess the current use of ChatGPT and explore the perceptions and experiences of academic staff and students regarding its implementation to improve the overall educational experience at the UST University in Aden. For this purpose, a survey was conducted through questionnaires to evaluate the objectives from students of faculty members in three departments within the faculty of Engineering and Computing of the UST. Findings are showing that most of the students are familiar with ChatGPT (80%) We also find that most students use AI tools daily (21%) for around 2 hours. An increase in the awareness and familiarity with ChatGPT amongst students will serves as the perfect recipe for increased adoption. There is therefore the need to focus and raise awareness on its benefits and importance in teaching system to extend the lack in computing resources. The main recommendation is that, the Yemenis universities and their respective academics should focus on teaching students how to use ChatGPT and similar tools in ethical safe ways that foster critical thinking and avoiding the risks of using students' information for other activities beyond the realm of academia, illegal access to learners' data, and security breakdowns.

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