GMMC Journal of Interdisciplinary Studies
Vol. 13, December 2024, pp. 59-74
ISSN : 2392-4519 (Print), 3021-9086 (Online)
Journal homepage: http://gmmcjournal.edu.np

Use of ChatGPT and Its Impact on Students' Learning Experience Among the Students from Higher Education Institutions in Pokhara

Deepesh Ranabhat, PhD[1], Pradeep Sapkota, PhD[2], *Subash Malla[3], Kusum Shrestha[4], Mala Ranabhat[5]

[1,2,3]Assistant Professor, Pokhara University
ORCID ID: https://orcid.org/0000-0003-0503-1335
ORCID ID: https://orcid.org/0000-0002-9581-5047
ORCID ID: https://orcid.org/0000-0003-1305-5193
[4]Undergraduate Student, Pokhara University
[5]MPGD Graduate, Pokhara University
ORCID ID: https://orcid.org/0000-0003-3777-2509
**Corresponding Author's Email: subash.malla@pu.edu.com*

Received: June, 2024
Revised: July, 2024
Accepted: September, 2024
Available online: December, 2024
DOI: https://doi.org/10.3126/jis.v13i1.73338

ABSTRACT

The use of Artificial Intelligence (AI) tools like ChatGPT has seen rapid adoption among students for tasks such as writing, summarizing, and research in recent years. This study aims to investigate the factors influencing ChatGPT usage and its impact on students' learning outcomes, focusing on higher education institutions (HEIs) in Pokhara, Nepal. A quantitative research approach was employed, utilizing descriptive and analytical designs. Data were collected from 184 valid responses through a structured questionnaire and analyzed using statistical tools, including mean analysis and Partial Least Squares Structural Equation Modeling (PLS-SEM). The study explored constructs such as reliability, accuracy, security, privacy, usefulness, and convenience. The findings reveal that convenience and reliability significantly influence the use of ChatGPT, while accuracy, security, and privacy do not show a statistically significant effect. Moreover, the study found a strong positive relationship between the use of ChatGPT and its impact on learning, indicating that increased usage leads to enhanced learning experiences, access to educational resources,

and improved academic productivity. This study highlights that ease of use and reliability are key factors driving ChatGPT's adoption in educational settings, providing valuable insights for educators and policymakers to optimize AI tools for effective learning.

Keywords: ChatGPT, convenience, higher education institutions, Nepal, reliability

INTRODUCTION

In recent years, the use of Artificial Intelligence (AI) has been widespread in various fields round the globe. Incorporation and integration of AI in education and academia in various contexts such as intelligent tutoring systems, adaptive and personalized learning, dynamic assessments and automated grading systems, virtual reality simulations, teacher training, meaningful interactions, data analytics, curriculum development (Sallam et. al, 2024; Tiwari, 2024; Siregar et. al., 2023) have been observed. Furthermore, the adoption of Artificial Intelligence in Education (AIEd) technologies in teaching-learning activities in Higher Education Institutions (HEIs) is also expected to grow exponentially in the coming days due to innovation and increased attention of various businesses in this sector (Rodway and Schepman, 2023; Luckin et. al, 2016).

Chat Generative Pre-Trained Transformer (ChatGPT) is one of the fastest-growing and prominent AI chatbots developed by US-based company OpenAI and launched on November 30, 2022 (AcostaEnriquez, 2024). This record-breaking tool touched the first million users just in 5 days; 100 million users in the next 2 months; and as of March 2024, it has 180.5 million users and 1.6 billion per month visits around the globe (Mortensen, 2024). It has been widely used by students in writing assignments, revisions, summarizing texts, translations, coding, research activities, content development (Tiwari, 2024; Siregar et. al., 2023). However alarming issues regarding its use in academia have also been discussed in recent days that include the aspects such as academic dishonesty, incorrect information, over-dependency, decline in critical thinking, plagiarism, inaccurate referencing etc. (Sallam et al., 2024; Tiwari, 2024; Ngo, 2023). Due to this reason, some universities have banned its use in academia whereas others are updating their policies to prevent its misuse by students (Romero-Rodríguez, 2023).

In the context of Nepal, ChatGPT is gaining its popularity within the HEI students these days creating both positive and negative sides. Thus, this study aims to determine the various factors affecting the use of ChatGPT and its impact on student's learning experience regarding Pokhara, Nepal. The results will contribute the understanding on use/misuse as well as impact of ChatGPT on the academic life of students. Furthermore, it will be valuable for the

policymakers, educators and HEIs to go forward in the responsive and effective utilization of AIEd technologies in context of Nepal.

LITERATURE REVIEW

The Technology Acceptance Model (TAM) is a widely recognized framework for understanding how individuals adopt new technologies. It identifies two key factors—Perceived Usefulness (PU), or the belief that using technology will enhance performance, and Perceived Ease of Use (PEOU), or the belief that technology is user-friendly—as the primary determinants of user acceptance. These factors influence a user's attitude toward the technology and their behavioral intention to use it, which ultimately predicts actual system use. TAM provides a robust and parsimonious explanation for predicting technology adoption behaviors in both individual and organizational contexts. The Unified Theory of Acceptance and Use of Technology (UTAUT) framework, developed by (Venkatesh et al., 2003), offers a comprehensive model for understanding the factors that drive technology adoption and use. UTAUT consolidates elements from eight prominent models, including the Technology Acceptance Model (TAM), to create a unified explanation of user behavior. It identifies four primary constructs: Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions, which predict an individual's behavioral intention to adopt and actual use of technology. By offering a holistic view of the various determinants of technology adoption, UTAUT has become a widely accepted framework for studying technology use across different environments and populations.

When considering the adoption and use of AI-driven tools like ChatGPT, various factors significantly influence users' trust and engagement. Among these, reliability, accuracy, privacy, usefulness, and convenience are key determinants that shape user experience and acceptance. Reliability is a fundamental factor in determining how users perceive the trustworthiness of AI systems (Choung et al., 2023). Reliable systems consistently provide stable and dependable outputs. In the context of ChatGPT, reliability refers to its ability to deliver coherent, consistent, and contextually relevant responses across different sessions. Daronnat et al. (2021) suggest that reliability directly affects user trust, with users more likely to engage with systems that demonstrate consistent performance. Any form of erratic behavior, such as producing irrelevant or misleading information, can significantly erode trust and diminish overall user satisfaction (Patrick et al., 2005). Haze et al. (2023) consistent checking helps to identify incorrect answers and increases the accuracy of information provided by AI systems.

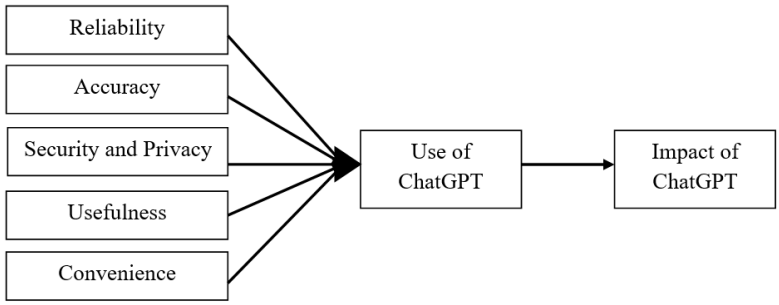
Kuşcu et al. (2023) suggested that despite of some limitations, tools like ChatGPT work as a useful source of information for making crucial decisions. Delivering accurate information is crucial, especially in contexts where users rely on it for factual knowledge or decision-making. Studies have shown that inaccuracies in AI outputs lead to reduced confidence and increased skepticism among users (Karran et al., 2022). Privacy concerns play a crucial role in determining user adoption (Dai & Chen, 2015). As AI systems like ChatGPT engage in conversations and handle personal or sensitive information, users may fear data breaches or misuse. Privacy concerns are magnified when AI systems store or process personal information without explicit consent (Levy & Schneier, 2021). Ensuring robust privacy measures, such as data encryption and anonymization, is vital to maintaining user trust while using AI tools (He et al., 2015). However if not used properly use of AI sometimes creates big issues on users privacy (Ahmed et al., 2023). Gregory et al. (2020) suggested that degree to which an AI system meets user needs and provides value determines its importance. Marquis et al. (2024) study demonstrates a strong positive correlation between using AI tools and enhancing experiencing substantial gains in efficiency, accuracy, and overall productivity. In the context of ChatGPT, usefulness can be gauged by how well it helps users draft texts, retrieve information, or offer assistance in specific domains (Albayati, 2024). AI systems like ChatGPT must be convenience across various platforms to cater to a broad audience and has a direct relationship with user satisfaction (Harjamäki et al., 2024).

The use of ChatGPT in learning is very important nowadays as it helps to enhance the learning experience by providing immediate, interactive, and personalized assistance to the learners (Dhananjaya et al., 2024). According to Karakose and Tülübas (2023), immediate feedback is a key factor in enhancing learning outcomes, as it helps students understand their mistakes and correct them quickly. Similarly, Aryal (2024); Gill (2024) highlighted the importance of ChatGPT on personalized learning. ChatGPT allows the learners to ask questions repeatedly and can create learning environments that are suited to their individual needs.

Since the adoption and use of AI-driven tools like ChatGPT are influenced by several key factors, including perceived usefulness, ease of use, reliability, accuracy, privacy, and convenience and the use of ChatGPT plays crucial role in learning. The following conceptual framework (See Figure1) has been adopted in this study.

Figure 1

Conceptual Framework of the Study



METHODS AND MATERIALS

This study adopted a positivist research philosophy, emphasizing objectivity and the use of quantitative data to understand the relationships between variables. A quantitative research approach was employed, utilizing both descriptive and analytical research designs to investigate the opinions of students regarding the use of ChatGPT and its impact on learning outcomes. The research focused on students from higher education institutions within the Pokhara Valley. A sample size of 225 respondents was initially targeted, but after data validation, 184 responses were deemed valid and used for further analysis. The primary tool for data collection was a structured survey questionnaire, which consisted of two parts. The first section gathered socio-demographic information, while the second section included a series of statements rated on a 5-point Likert scale with 5 representing "Strongly Agree" and 1 representing "Strongly Disagree", aimed at measuring students' perceptions regarding the use of ChatGPT and its effects on their learning experiences. To analyze the collected data, various statistical tools were employed. Mean analysis was conducted to summarize general trends in responses, while Partial Least Squares Structural Equation Modeling (PLS-SEM) was utilized to explore deeper relationships between variables. The analysis was performed using Excel for basic statistical functions, and SmartPLS software for structural equation modeling.

Reliability and validity of the survey instrument were rigorously assessed. Cronbach's alpha and composite reliability were used to assess the reliability of the scale, while average variance extracted (AVE) was used to measure the consctruct validity, and Fornell-Larcker's Criterion and the Heterotrait-Monotrait Ratio (HTMT) were used to assess the discriminant validity of the scale.

RESULTS

Demographic Deatils and Usage of ChatGPT

This section includes descriptive statistics of the respondents based on demographic variables such as gender, age group, and monthly income and their usage of ChatGPT including the duration and frequency of usage.

Table 1

Demographic Details and Usage of ChatGPT

Variables	Freq.	Percent	Variables	Freq.	Percent
Gender			Use of ChatGPT		
Male	92	50.0	Yes	182	98.9
Female	92	50.0	No	2	1.1
Age Group			Duration of ChatGPT Usage		
Upt to 20	48	26.1	Less than 1 year	93	51.1
21 to 30 Years	130	70.7	1-2 years	84	46.2
More than 30	6	3.3	3-4 years	4	2.2
Monthly income of the family			More than 4 years	1	0.5
Up to Rs. 50,000	42	22.8	Frequency of ChatGPT Usage		
Rs. 50,001 to Rs. 1,00,000	62	33.7	Daily	64	35.2
Rs. 1,00,001 to Rs. 1,50,000	54	29.3	Weekly	78	42.9
Above Rs. 1,50,000	26	14.1	Monthly	18	9.9
			Very rarely	22	12.1
Total	184	100.0	Total	184	100.0

Table 1 summarizes the demographic details of the respondents and their usage of ChatGPT. It shows that out of total 184 respondents, there is an equal gender distribution: 50% male (92 respondents) and 50% female (92 respondents). The majority of respondents fall within the 21 to 30 years age group (70.7%), followed by those up to 20 years (26.1%), and only 3.3% were over 30 years. In terms of family income, 33.7% of respondents reported a monthly family income between Rs. 50,001 and Rs. 1,00,000, while 29.3% had a family income between Rs. 1,00,001 and Rs. 1,50,000. About 22.8% reported an income of up to Rs. 50,000, and 14.1% had an income above Rs. 1,50,000.

Regarding the use of ChatGPT, a significant 98.9% of respondents indicated they use ChatGPT, with only 1.1% not using it. Most respondents (51.1%) reported having used ChatGPT for less than one year, while 46.2% had been using it for 1-2 years, and a small

percentage had used it for 3-4 years (2.2%) or more than 4 years (0.5%). The frequency of ChatGPT usage varied, with 35.2% using it daily and 42.9% using it weekly. Some respondents used ChatGPT on a monthly basis (9.9%), and 12.1% reported very rare usage.

Mean Score Analysis of Constructs

In this study, several constructs related to the use and impact of ChatGPT in learning experience were evaluated based on a Likert scale, where respondents rated their agreement with statements using values from 1 to 5, with 5 representing "Strongly Agree" and 1 representing "Strongly Disagree." The mean values given in Table 2 represent the average level of agreement expressed by the 184 respondents, with each construct measured using five indicators, except for the "Use of ChatGPT" construct, which was assessed with four indicators.

Table 2

Mean Score

Constructs	Mean
Reliability	3.99
Accuracy	3.98
Security and Privacy	3.73
Usefulness	4.11
Convenience	4.33
Use of ChatGPT	4.14
Impact of ChatGPT	4.10
Overall Mean	4.05

The construct of Reliability (Mean = 3.99) reflects that respondents generally agree that ChatGPT is reliable, though opinions are close to neutral. Accuracy (Mean = 3.98) shows that respondents tend to agree ChatGPT provides correct and precise responses, though with mixed opinions. Security and Privacy (Mean = 3.73) received the lowest score, indicating that while respondents lean toward agreement, concerns exist around the protection of personal information. In terms of Usefulness (Mean = 4.11), respondents expressed a high level of agreement that ChatGPT is beneficial in supporting their learning, while Convenience (Mean = 4.33) stood out as the highest-rated construct, indicating strong favorability toward the ease of using ChatGPT. The Use of ChatGPT (Mean = 4.14) demonstrates frequent utilization by respondents, while the Impact of ChatGPT (Mean = 4.10) reflects strong agreement regarding its positive influence on learning outcomes. Overall, the mean score of 4.05 across all constructs suggests that respondents generally have a positive perception of ChatGPT.

Structural Equation Modeling

In this study, partial Least Squares Structural Equation Modeling (PLS-SEM) has been used to examine the impact of independent variables on dependent variables. It includes measurement model and structural model.

Measurement Model

The measurement model is used to assess the reliability and validity of the constructs. In this study, seven different constructs are used, and various indicators are employed to measure these constructs. The measurement model, presented in Figure 2, illustrates the relationship between the constructs and their respective indicators. The factor loadings, results of reliability and validity tests are presented below.

Figure 2

Mesurement Model

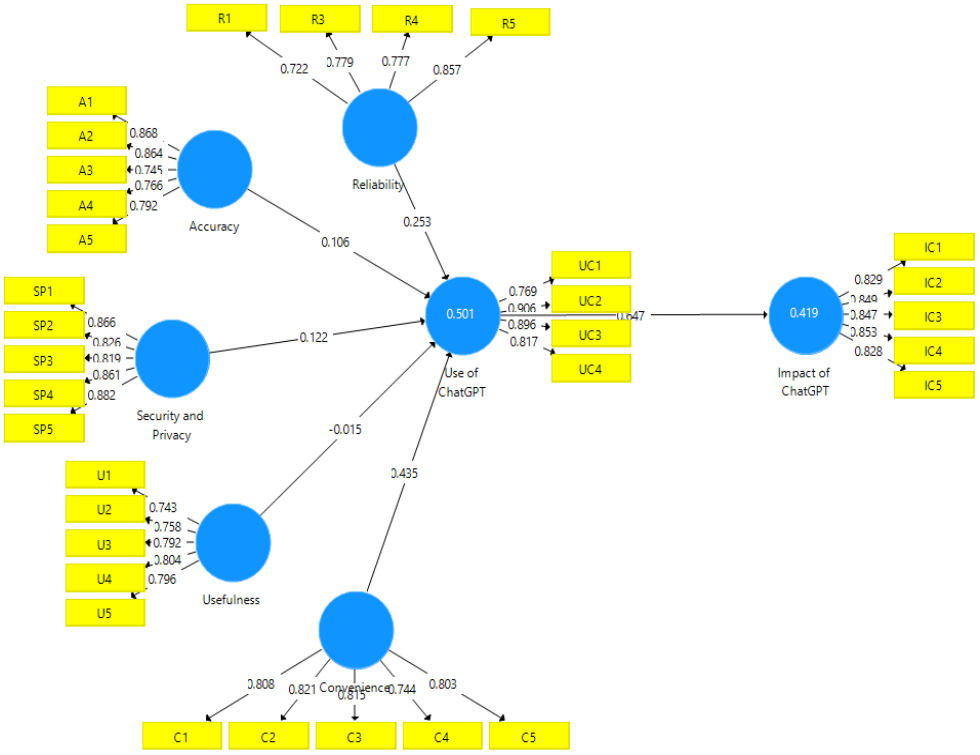


Table 3

Construct Reliability and Convergent Validity

Constructs	Items	Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Reliability	R1	0.722	0.793	0.865	0.617
	R3	0.779			
	R4	0.777			
	R5	0.857			
Accuracy	A1	0.868	0.868	0.904	0.653
	A2	0.864			
	A3	0.745			
	A4	0.766			
	A5	0.792			
Security and Privacy	SP1	0.866	0.905	0.929	0.724
	SP2	0.826			
	SP3	0.819			
	SP4	0.861			
	SP5	0.882			
Usefulness	U1	0.743	0.838	0.885	0.606
	U2	0.758			
	U3	0.792			
	U4	0.804			
	U5	0.796			
Convenience	C1	0.808	0.859	0.898	0.638
	C2	0.821			
	C3	0.815			
	C4	0.744			
	C5	0.803			
Use of ChatGPT	UC1	0.769	0.869	0.911	0.721
	UC2	0.906			
	UC3	0.896			
	UC4	0.817			

Constructs	Items	Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Impact of ChatGPT	IC1	0.829	0.897	0.924	0.707
	IC2	0.849			
	IC3	0.847			
	IC4	0.853			
	IC5	0.828			

Table 3 shows the result of factor loading, Cronbach's alpha, composite reliability, and average variance extracted (AVE). The factor loadings for reliability range from 0.722 to 0.857, for accuracy from 0.745 to 0.868, for security and privacy from 0.819 to 0.882, for usefulness from 0.743 to 0.804, for convenience from 0.744 to 0.821, for the use of ChatGPT from 0.769 to 0.906, and for the impact of ChatGPT from 0.828 to 0.853. All the factor loadings exceed 0.70, indicating that the items are strongly correlated with their respective constructs.

Likewise, this study found that all of the constructs have high levels of reliability and consistency, as evidenced by Cronbach's alpha values ranging from 0.793 to 0.905 and composite reliability values ranging from 0.865 to 0.929. Additionally, the convergent validity of the constructs was confirmed by AVE values ranging from 0.606 to 0.724.

Table 4

Results of Fornell Lacker's Criteria and HTMT Ratio

	Accuracy	Convenience	Impact of ChatGPT	Reliability	Security and Privacy	Use of ChatGPT	Usefulness
Accuracy	0.808	0.466	0.591	0.833	0.668	0.591	0.746
Convenience	0.409	**0.799**	0.601	0.409	0.331	0.675	0.561
Impact of ChatGPT	0.53	0.543	**0.841**	0.634	0.574	0.732	0.629
Reliability	0.695	0.348	0.549	**0.785**	0.702	0.64	0.782
Security and Privacy	0.6	0.304	0.518	0.594	**0.851**	0.515	0.701
Use of ChatGPT	0.524	0.597	0.647	0.542	0.46	**0.849**	0.579
Usefulness	0.64	0.481	0.551	0.638	0.61	0.499	**0.779**

Table 4 presents the results of two key tests for assessing discriminant validity in the study: Fornell-Larcker's Criterion and the Heterotrait-Monotrait Ratio (HTMT). The

diagonal values in the table (0.808 for Accuracy, 0.799 for Convenience, 0.841 for Impact of ChatGPT, 0.785 for Reliability, 0.851 for Security and Privacy, 0.849 for Use of ChatGPT, and 0.779 for Usefulness) represent the square root of the Average Variance Extracted (AVE) for each construct. According to the Fornell-Larcker criterion, for discriminant validity to be established, the diagonal values should be higher than the correlations (below the diagonal values) between that construct and all others. In this table, all diagonal values are larger than the correlation values, indicating that each construct shares more variance with its own indicators than with other constructs. This confirms that the constructs exhibit discriminant validity. Similarly, all the values above the diagonal values (e.g., 0.466 between Accuracy and Convenience, 0.591 between Accuracy and Impact of ChatGPT) represent the Heterotrait-Monotrait (HTMT) ratios. In this table, all HTMT values are below 0.85, confirming that the constructs are adequately distinct from one another. Both the Fornell-Larcker criterion and HTMT ratio confirm that the constructs in this study are distinct from one another, establishing strong discriminant validity across the measurement model.

Structural Model

The study then analyzed the relationships between independent and dependent variables using a structural model. The results of this analysis are presented in Figure 3 and Table 5.

Figure 3

Structural Model

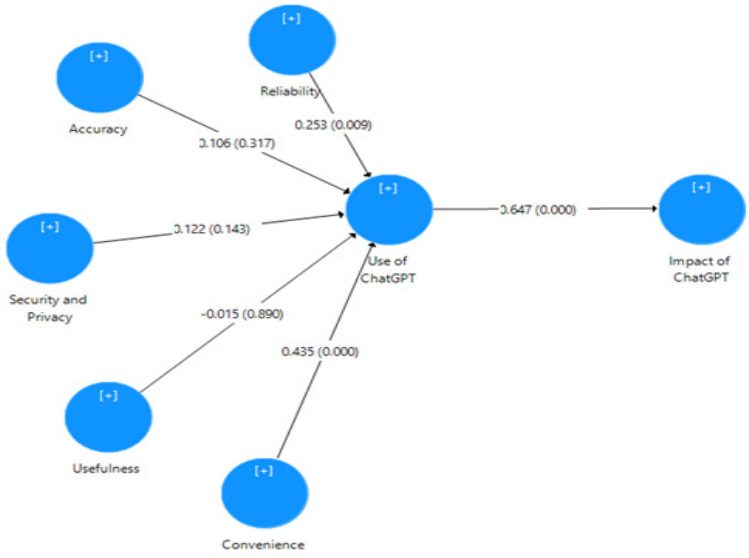


Table 5

Results of Path Analysis

Relationship	Beta Coefficient	T Statistics	P Values
Accuracy -> Use of ChatGPT	0.106	1.001	0.317
Convenience -> Use of ChatGPT	0.435	4.862	0.000
Reliability -> Use of ChatGPT	0.253	2.627	0.009
Security and Privacy -> Use of ChatGPT	0.122	1.464	0.143
Usefulness -> Use of ChatGPT	-0.015	0.138	0.890
Use of ChatGPT -> Impact of ChatGPT	0.647	12.023	0.000

Table 5 presents the results of the structural model. Out of five different independent variables, convenience had a significant positive effect on the use of ChatGPT ($\beta = 0.435$, $t = 4.862$, $p < .001$), indicating that higher convenience is associated with increased use. Likewise, reliability also showed a significant positive effect on the use of ChatGPT ($\beta = 0.253$, $t = 2.627$, $p = .009$). Further, the use of ChatGPT has a strong positive and statistically significant effect on the impact of ChatGPT ($\beta = 0.647$, $t = 12.023$, $p < .001$), suggesting that increased usage of ChatGPT is strongly linked to its perceived impact on students' learning. However, the impact of accuracy on the use of ChatGPT ($\beta = 0.106$, $t = 1.001$, $p = .317$), security and privacy on the use of ChatGPT ($\beta = 0.122$, $t = 1.464$, $p = .143$), and usefulness on the use of ChatGPT ($\beta = -0.015$, $t = 0.138$, $p = .890$) are not statistically significant.

DISCUSSION

This study found that convenience and reliability significantly affect the use of ChaGPT. This results aligns with findings from Harjamäki et al. (2024), who emphasized that the convenience of AI systems across multiple platforms enhances user satisfaction. Users value the flexibility and ease of access that ChatGPT offers, enabling them to engage with the tool. This convenience is crucial in fostering regular use. The strong association between convenience and use of ChatGPT confirms previous studies that identified ease of use and accessibility as critical factors in technology adoption (Venkatesh et al., 2003; Albayati, 2024). Likewise, Reliability was another significant factor supporting the idea that users prefer ChatGPT. This result is consistent with Daronnat et al. (2021) and Choung et al. (2023), who found that reliability plays a key role in building trust with AI systems. Users are more likely to engage with ChatGPT when they can rely on it to deliver accurate and logical responses consistently. The strong and statistically significant relationship between the use of ChatGPT and its perceived

impact on learning supports the notion that increased usage of AI tools leads to enhanced educational experiences. This finding aligns with Dhananjaya et al. (2024) and Karakose & Tülübas (2023), who found that the immediate, personalized assistance provided by ChatGPT significantly enhances learning by offering real-time feedback and interactive engagement.

Interestingly, this study found accuracy, and security and privacy did not have a statistically significant impact on the use of ChatGPT. This is somewhat unexpected, given that previous literature Karran et al. (2022) and Haze et al. (2023) have emphasized the importance of delivering accurate information for user trust and engagement and Levy & Schneier (2021) highlight that privacy concerns AI adoption. However, the results of this study indicate that while accuracy is important, it may not be the primary concern for users of ChatGPT, especially in educational contexts where immediate feedback and functionality of the ChatGPT are prioritized.

CONCLUSION

This study highlighted the factors influencing the use of ChatGPT in educational settings and its impact on students' learning experiences among the students from higher education institutions in Pokhara. The findings indicate that convenience and reliability are the most significant factors contributing to the use of ChatGPT. The ease of use, simple to input data, less time to generate the response, as well as the consistent, reliable responses from ChatGPT highlight these factors as critical for its use. Additionally, the study found a strong positive relationship between the use of ChatGPT and its perceived impact on learning, suggesting that increased usage leads to positive learning experiences, including the development of essential skills, access to a wide range of educational resources and information, and enhanced efficiency and productivity in students' academic tasks.

However, accuracy, security, and privacy were found to have no statistically significant effect on the use of ChatGPT. The results suggest that in educational contexts, where immediate feedback and functionality are prioritized, users may be more willing to overlook occasional inaccuracies and potential privacy concerns. These insights have several implications in the education sector. The findings highlight the potential of integrating AI tools like ChatGPT into the academic process to enhance educational outcomes. Institutions can encourage the adoption of such tools to support students in developing essential skills, accessing diverse learning materials, and improving productivity.

REFERENCES

Acosta-Enriquez, B.G., Arbulú Ballesteros, M.A., Huamaní Jordan, O. *et al.* (2024). Analysis of college students' attitudes toward the use of ChatGPT in their academic activities: effect of intent to use, verification of information and responsible use. *BMC Psychol,* 12, 255. https://doi.org/10.1186/s40359-024-01764-z

Ahmed, H., Youssef, H., Tamer, A., & Hossam, A. (2023). Privacy issues in AI and cloud computing in e-commerce setting: A review. *International Journal of Responsible Artificial Intelligence*, *13*(7), 37–46. https://neuralslate.com/index.php/Journal-of-Responsible-AI/article/view/44

Albayati, H. (2024). Investigating undergraduate students' perceptions and awareness of using ChatGPT as a regular assistance tool: A user acceptance perspective study. *Computers and Education: Artificial Intelligence*, *6*. https://doi.org/10.1016/j.caeai.2024.100203

Aryal, M. (2024). Exploring the impact of ChatGPT in English language teaching-learning pedagogy. *Journal of NELTA Gandaki*, *7*(1-2), 137-150.

Choung, H., David, P., & Ross, A. (2023). Trust in AI and its role in the acceptance of AI technologies. *International Journal of Human-Computer Interaction*, *39*(9), 1727–1739. https://doi.org/10.1080/10447318.2022.2050543

Dai, H., & Chen, Y. (2015). Effects of exchange benefits, security concerns and situational privacy concerns on mobile commerce adoption. *Journal of International Technology and Information Management*, *24*(3). https://doi.org/10.58729/1941-6679.1046

Daronnat, S., Azzopardi, L., Halvey, M., & Dubiel, M. (2021). Inferring trust from users' behaviours; agents' predictability positively affects trust, task performance and cognitive load in human-agent real-time collaboration. *Frontiers in Robotics and AI*, *8*. https://doi.org/10.3389/frobt.2021.642201

Dhananjaya, G. M., Goudar, R. H., Govindaraja, K., Kaliwal, R. B., Rathod, V. K., Deshpande, S. L., ... & Hukkeri, G. S. (2024). Enhancing education with ChatGPT: Revolutionizing personalized learning and teacher support. *EAI Endorsed Transactions on Internet of Things*, *10*.

Gill, S. S., Xu, M., Patros, P., Wu, H., Kaur, R., Kaur, K., ... & Buyya, R. (2024). Transformative effects of ChatGPT on modern education: Emerging era of AI chatbots. *Internet of Things and Cyber-Physical Systems*, *4*, 19-23.

Gregory, R. W., Henfridsson, O., & Kyriakou, H. (2020). The role of artificial intelligence and data network effects for creating user value. *Academy of Management Review*. https://

www.researchgate.net/publication/339726791

Harjamäki, J., Rantanen, P., Lahtinen, D., Sillberg, P., Saari, M., Grönman, J., Rasheed, Z., Sami, A. M., & Abrahamsson, P. (2024). *The Report of 85 AI Tools GenAI Content Production: Enhancing Repeatability and Automation with ChatGPT*. https://orcid.org/0000-0001-5136-2587

Haze, T., Kawano, R., Takase, H., Suzuki, S., Hirawa, N., & Tamura, K. (2023). Influence on the accuracy in ChatGPT: Differences in the amount of information per medical field. *International Journal of Medical Informatics*, *180*. https://doi.org/10.1016/j.ijmedinf.2023.105283

He, D., Chan, S., & Guizani, M. (2015). User privacy and data trustworthiness in mobile crowd sensing. *IEEE Wireless Communications*, *22*(1), 28–34. https://doi.org/10.1109/MWC.2015.7054716

Karakose, T., & Tülübas, T. (2023). How can ChatGPT facilitate teaching and learning: implications for contemporary education. *Educational Process: International Journal*, *12*(4), 7-16.

Karran, A. J., Demazure, T., Hudon, A., Senecal, S., & Léger, P. M. (2022). Designing for confidence: The impact of visualizing artificial intelligence decisions. *Frontiers in Neuroscience*, *16*. https://doi.org/10.3389/fnins.2022.883385

Kuşcu, O., Pamuk, A. E., Sütay Süslü, N., & Hosal, S. (2023). Is ChatGPT accurate and reliable in answering questions regarding head and neck cancer? *Frontiers in Oncology*, *13*. https://doi.org/10.3389/fonc.2023.1256459

Levy, K., & Schneier, B. (2021). Privacy threats in intimate relationships. *Journal of Cybersecurity*, *6*(1), 1–13. https://doi.org/10.1093/CYBSEC/TYAA006

Luckin, R., Holmes, W., Griffiths, M. &Forcier, L. B. (2016). *Intelligence Unleashed: An argument for AI in Education.* London: Pearson.

Marquis, Y. A., Oladoyinbo, T. O., Olabanji, S. O., Olaniyi, O. O., & Ajayi, S. A. (2024). Proliferation of AI tools: A multifaceted evaluation of user perceptions and emerging trend. *Asian Journal of Advanced Research and Reports*, *18*(1), 30–35. https://doi.org/10.9734/ajarr/2024/v18i1596

Mortensen, O. (2024 April 24). How many users does ChatGPT have? Ststistics& Facts (2024) *SEO Score Audit*, https://seo.ai/blog/how-many-users-does-chatgpt-have

Ngo, T.T.A. (2023). The Perception by university students of the use of ChatGPT in education. *International Journal of Emerging Technologies in Learning (iJET)*, 18(17), pp. 4–19.

https://doi.org/10.3991/ijet.v18i17.39019

Patrick, A., Marsh, S., & Briggs, P. (2005). Designing systems that people will trust. *Security and Usability: Designing Secure Systems That People Can Use*, 75–100. http://nparc.cisti-icist.nrc-cnrc.gc.ca/npsi/ctrl?action=shwart&index=an&req=8913238&lang=en

Rodway, P. &Schepman, A. (2023). The impact of adopting AI educational technologies on projected course satisfaction in university students,*Computers and Education: Artificial Intelligence*, 5,100150,https://doi.org/10.1016/j.caeai.2023.100150.

Romero-Rodríguez, J., Ramírez-Montoya, M., Buenestado-Fernández, M., & Lara-Lara, F. (2023). Use of ChatGPT at university as a tool for complex thinking: Students' perceived usefulness. *Journal of New Approaches in Educational Research*, 12(2), 323-339. https://doi.org/10.7821/naer.2023.7.1458 323

Sallam, M., Elsayed, W., Al-Shorbagy, M., et. al. (2024). ChatGPT usage and attitudes are driven by perceptions of usefulness, ease of use, risks, and psycho-social impact: a study among university students in the UAE. *Front. Educ*, 9:1414758.https://doi.org/10.3389/feduc.2024.1414758

Siregar, F. H., Hasmayni, B. &Lubis, A.H. (2023). The analysis of chat GPT usage impact on learning motivation among scout students. *International Journal of Research and Review,* 10(7): 632-638. https://doi.org/10.52403/ijrr.20230774

Tiwari, C.K., Bhat, M.A., Khan, S.T., Subramaniam, R. and Khan, M.A.I. (2024), "What drives students toward ChatGPT? An investigation of the factors influencing adoption and usage of ChatGPT", *Interactive Technology and Smart Education*, Vol. 21 No. 3, pp. 333-355. https://doi.org/10.1108/ITSE-04-2023-0061

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly: Management Information Systems*, *27*(3), 425–478. https://doi.org/10.2307/30036540