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Evaluating The E-Service Quality of Chatgpt In Academic Research: Insights From Management Educators Using The E-Servqual Model

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Abstract
This research examines the e-service quality of ChatGPT from the viewpoint of management teachers, using the e-SERVQUAL model. As digital platforms become more integral to academic and professional settings, assessing their service quality is crucial for ensuring user satisfaction. The study identifies key factors affecting ChatGPT's e-service quality and its impact on management educators' satisfaction.

Study/Design/Methodology/Approach
A quantitative approach was employed using the e-SERVQUAL model, covering Efficiency, System Availability, Fulfillment, Privacy, and Responsiveness. Data were collected through structured questionnaires distributed among management teachers and analyzed using Structural Equation Modeling (PLS-SEM). Reliability and validity were evaluated using Cronbach's Alpha, Composite Reliability, and AVE.

Findings:Efficiency, *System Availability, Fulfillment, Privacy, and Responsiveness were statistically significant ($P < 0.05$) in influencing e-service quality. Teachers valued ChatGPT's efficiency for its ease of use and quick response times. System Availability and Fulfillment were associated with its reliable performance and accurate, relevant responses. Privacy and Responsiveness highlighted the importance of data security and prompt support. Though Compensation and Contact were not tested, they were acknowledged as critical for overall service quality.*

Originality/Value:*This study provides valuable insights into the critical factors influencing the satisfaction of management teachers. It offers a comprehensive framework for improving electronic service quality in education, emphasizing Efficiency, System Availability, Fulfillment, Privacy, and Responsiveness.*

Keywords: *ChatGPT, e-service quality, e-SERVQUAL model, management teachers, user satisfaction.*

INTRODUCTION

In the rapidly evolving field of digital education, advanced artificial intelligence (AI) tools have dramatically changed how educational services are delivered. Among these tools, ChatGPT, developed by OpenAI, has garnered significant attention for its potential to enhance learning experiences through its conversational capabilities. To ensure these digital platforms meet user expectations and requirements, their effectiveness and quality must be rigorously assessed. E- service quality, a crucial

determinant of user satisfaction, efficiency, and overall service effectiveness, serves as an essential metric for such evaluations.

This research paper titled "Evaluating E-Service Quality of ChatGPT: Insights from Management Teachers Using the e-SERVQUAL Model" aims to assess ChatGPT's e-service quality from the perspective of management teachers. As educators increasingly depend on digital tools for both instructional and administrative purposes, understanding their experiences and satisfaction levels with these tools becomes imperative. The e-SERVQUAL model, widely recognized for evaluating electronic service quality, provides a structured framework for this assessment. It encompasses dimensions such as Efficiency, System Availability, Fulfillment, Privacy, and Responsiveness, which collectively influence perceived service quality.The significance of this study lies in its focus on management educators, a group pivotal in shaping future business leaders. By analyzing their interactions with ChatGPT, this research aims to identify the platform's strengths and areas needing improvement. Insights from this study are expected to enhance ChatGPT's functionality, fostering a more effective and satisfying user experience.Foundations of e-SERVQUALThe e-SERVQUAL model, derived from the traditional SERVQUAL model, measures service quality in online environments. It includes aspects such as efficiency, system availability, fulfillment, and privacy (Parasuraman et al., 2005). This model has been adapted to various contexts, including e-commerce and digital banking, demonstrating its versatility and relevance (Simanjuntak & Mayasari, 2023).Application in Educational TechnologyResearch has shown the effectiveness of the e-SERVQUAL model in educational settings, particularly in evaluating online learning platforms and digital tools used by educators. For instance, studies indicate that the model can assess the performance of educational technologies, focusing on dimensions like information quality, system quality, and service quality (Yang & Jun, 2008).Assessment in AI-driven ServicesThe evaluation of AI-driven services, such as ChatGPT, through the e-SERVQUAL model can provide valuable insights into user satisfaction and perceived service quality. This model's dimensions—efficiency, system availability, fulfillment, privacy, and responsiveness—align closely with key performance indicators for AI tools, including response accuracy, interaction smoothness, and overall user satisfaction (Ighomereho et al., 2022).Empirical research using the e-SERVQUAL model has demonstrated that factors like reliability, responsiveness, and user-friendliness significantly impact user satisfaction and loyalty. For instance, a study on e-commerce service quality found that responsiveness and reliability were critical determinants of customer satisfaction, which in turn influenced loyalty (Simanjuntak & Mayasari, 2023). Applying these findings to ChatGPT can similarly enhance its service quality and user engagement.The e-SERVQUAL model offers a robust framework for evaluating ChatGPT's e-service quality, identifying areas for improvement, and ensuring high user satisfaction. By focusing on key dimensions such as reliability, responsiveness, and user-friendliness, this model can help refine AI-driven services to better meet user needs and expectations. The analysis confirms that the e- SERVQUAL model effectively evaluates the e-service quality of ChatGPT, with each dimension significantly contributing to overall user satisfaction. This aligns with broader research findings in the field of e-service quality, emphasizing the model's robustness and relevance.

Use of ChatGPT in Educational Contexts

Research supports the integration of ChatGPT in educational settings to enhance teaching and learning. Murad, Shafiq, Surameery, and Shakor (2023) advocate for ChatGPT's use to provide guidance and feedback, thereby increasing student engagement and motivation. Li (2023) highlights ChatGPT's role in higher education management, offering personalized learning resources, supporting academic planning, and aiding decision-making processes for educators and administrators. Halaweh (2023) underscores the importance of responsible implementation, proposing strategies for effective integration while addressing concerns.Strzelecki (2023) identifies predictors of ChatGPT adoption among students, such as habit, performance expectancy, and hedonic motivation. Romero-Rodríguez et al. (2023) explore the perceived usefulness of ChatGPT, noting that experience, performance expectancy, and behavioural intention are key determinants in its acceptance and use. Additionally, Kishen et al. (2024) analyze factors influencing the adoption of ChatGPT among postgraduate management learners, finding

performance expectancy and technological innovativeness to be significant determinants.Overall, the adoption of ChatGPT by management teachers holds promise for enhancing educational experiences through personalized learning, efficient resource management, and increased student engagement. However, responsible implementation and addressing privacy and security concerns are essential for its successful integration.Application of ChatGPT for Management Teachers

For management teachers, ChatGPT can be utilized in several ways, including:

- **Curriculum Development**: Assisting with curriculum development by providing resources and generating content ideas.
- **Personalized Feedback**: Offering personalized feedback on student assignments and projects.
- **Interactive Learning**: Facilitating interactive learning through simulations and role- playing scenarios.
- **Administrative Support**: Supporting administrative tasks such as scheduling and communication.
- **Professional Development**: Enhancing professional development by summarizing research, offering teaching strategies, and providing insights on management trends.

Research Questions

To guide this investigation, the following research questions are posed:

1. What is the impact of ChatGPT's system availability on its e-service quality as perceived by management teachers?
2. How does the overall e-service quality of ChatGPT influence the user satisfaction of management teachers?

Research Objectives

The primary objectives of this research are:

1. To evaluate the efficiency of ChatGPT as perceived by management teachers using the e- SERVQUAL model.
2. To assess the impact of system availability on the e-service quality of ChatGPT.
3. To determine the degree to which ChatGPT fulfills the needs and expectations of management teachers in terms of response accuracy and relevance.By addressing these questions and objectives, the study aims to provide a comprehensive understanding of ChatGPT's e-service quality and its implications for user satisfaction in the educational context. The findings will offer valuable insights for developers and educational institutions aiming to leverage AI tools to their full potential, ultimately contributing to the advancement of digital education services.

1. Review of Literature and Hypothesis Formulation

1.1 Empirical Contributions of the E-SERVQUAL Model in Research Studies

The empirical contributions of the E-SERVQUAL model in research studies have evolved over time, demonstrating its adaptability in assessing service quality in higher education. Soutar and McNeil (1996) initially highlighted negative evaluations in administrative services at an Australian university, emphasizing the role of dependability in academic services. Stodnick and Rogers (2008) later validated SERVQUAL for classroom service quality, suggesting its integration with other models for enhanced assessments. Bayraktaroğlu and Atrek (2010) compared SERVQUAL and SERVPERF, finding the former slightly superior in higher education and recommending its broader application. Foropon et al. (2013) explored service quality gaps in operations management courses, advocating for SERVQUAL's use in other disciplines, while Xueme (2013) examined student expectation-perception gaps in a Taizhou college, urging institutional-level SERVQUAL studies. Galeeva (2016) customized SERVQUAL for Russian universities, recommending cross- cultural validation and graphical tools for decision-making. Žekevičienė (2015) assessed SERVQUAL's application in higher education, advising the inclusion of cultural variations and study semesters for improved accuracy. Soares et al. (2017) applied SERVQUAL in a Brazilian university, finding tangibility as the only positively rated dimension and stressing the need for improvements in reliability and responsiveness. Roushdy and El-Ansary (2017) identified responsiveness as the most crucial factor for student satisfaction in Egyptian universities, advocating for

improved student-lecturer communication. Uppal et al. (2018) extended SERVQUAL with the ELQ model to evaluate e-learning service quality, emphasizing assurance, responsiveness, and course content as key determinants. Misaii and Mohammadimehr (2018) identified responsiveness as the most significant service quality gap at Tehran University, recommending longitudinal assessments. Hajdari (2019) highlighted SERVQUAL's widespread use in higher education and the need for empirical validation across different contexts. Lin (2020) demonstrated the effectiveness of flipped classroom methods in enhancing e-commerce education satisfaction, proposing SERVQUAL's application in other disciplines. Efendi et al. (2021) adapted E-SERVQUAL for university information systems, revealing gaps in fulfillment and efficiency, thereby broadening its scope beyond academic services. Theresiawati et al. (2021) identified assurance and empathy as critical areas for improving blended learning services, calling for further e-learning assessments using SERVQUAL. Ramdhani et al. (2021) emphasized the significance of reliability, assurance, and responsiveness in improving e-learning services, advocating for quantitative validation. Khan et al. (2021) found assurance to have the highest impact on student satisfaction in Pakistani institutions, underscoring the need for larger-scale validation. Magasi et al. (2022) re-examined SERVQUAL in Tanzanian higher education, introducing compliance as a new dimension and identifying reliability and empathy as key predictors of service quality. This progressive trajectory underscores the E-SERVQUAL model's continuous refinement and its expanding relevance in diverse educational settings.

1.2 Recent Studies in the Field of ChatGPT Adoption

Recent studies on ChatGPT adoption have progressively explored key factors influencing users' behavioral intentions, employing various methodologies to refine insights. Menon et al. (2023) initially identified performance expectancy, effort expectancy, social influence, facilitating conditions, perceived interactivity, and privacy concerns as significant determinants, with age and experience acting as moderators, though the study was constrained by a small sample size of 32 participants. Expanding on this, Tiwari et al. (2023) examined 375 students and found perceived usefulness, social presence, credibility, hedonic motivation, and attitude toward ChatGPT to be critical, notably reporting that perceived ease of use was not a significant factor. Chaudhary et al. (2023) further validated trust, intent to use, and actual use as pivotal adoption drivers among 607 participants, confirming all hypotheses and reinforcing trust's central role. Raman et al. (2023) applied diffusion of innovation theory, demonstrating that relative advantage, compatibility, ease of use, trialability, and observability significantly influence students' adoption intentions, with demographic variables also playing a role. Agyemang et al. (2023) assessed ChatGPT adoption among Ghanaian academics, revealing limited initial knowledge but improved awareness following targeted training, although acceptance remained low, indicating a need for greater educational investment. Kishen et al. (2023) analyzed postgraduate management learners, identifying performance expectancy and technological innovativeness as key adoption drivers while deeming effort expectancy and social influence insignificant, ultimately recommending a stronger emphasis on ChatGPT's advanced features and practical applications. Collectively, these studies highlight the necessity of tailored strategies to enhance ChatGPT adoption and call for addressing research gaps through broader, more diverse participant samples.

2. Research Gap and Problem Statement

2.1 Research Gap

Research gaps in the application of the SERVQUAL model to higher education service quality assessments include the need for a broader geographical scope and distinction between undergraduate and postgraduate experiences. Continuous updates to the model are necessary to include emerging e-learning factors and ensure relevance across academic and administrative services. Cross-cultural validation, consideration of gender, study semester, and diverse student populations are also essential. Further, more longitudinal studies, broader applicability across disciplines, and empirical validation in developing countries are needed. Integrating other quality models and expanding to vocational and entrepreneurial education would provide a more comprehensive service quality evaluation.

2.2 Problem Statement

The SERVQUAL model in higher education is limited by its narrow geographic focus, insufficient differentiation among student demographics, and lack of emerging e-learning factors. Continuous updates, cross-cultural validation, and inclusion of diverse student populations are needed. The absence of longitudinal studies and integration with other quality models further hinders accurate service quality measurement and improvement in higher education.

3. Statements of Hypotheses Hypothesis on Efficiency

- Null Hypothesis (H0): The e-service quality of ChatGPT is not significantly reflected through efficiency.
- Alternative Hypothesis (H1): The e-service quality of ChatGPT is significantly reflected through efficiency.

Hypothesis on Fulfillment

- Null Hypothesis (H0): The e-service quality of ChatGPT is not significantly reflected through fulfillment.
- Alternative Hypothesis (H1): The e-service quality of ChatGPT is significantly reflected through fulfillment.

Hypothesis on Privacy

- Null Hypothesis (H0): The e-service quality of ChatGPT is not significantly reflected through privacy.
- Alternative Hypothesis (H1): The e-service quality of ChatGPT is significantly reflected through privacy.

Hypothesis on Responsiveness

- Null Hypothesis (H0): The e-service quality of ChatGPT is not significantly reflected through responsiveness.
- Alternative Hypothesis (H1): The e-service quality of ChatGPT is significantly reflected through responsiveness.

Hypothesis on System Availability

- Null Hypothesis (H0): The e-service quality of ChatGPT is not significantly reflected through system availability.
- Alternative Hypothesis (H1): The e-service quality of ChatGPT is significantly reflected through system availability.

Hypothesis on User Satisfaction

- Null Hypothesis (H0): The e-service quality of ChatGPT does not significantly influence user satisfaction.
- Alternative Hypothesis (H1): The e-service quality of ChatGPT significantly influences user satisfaction.

4. Research Design

Study Design/Methodology/Approach

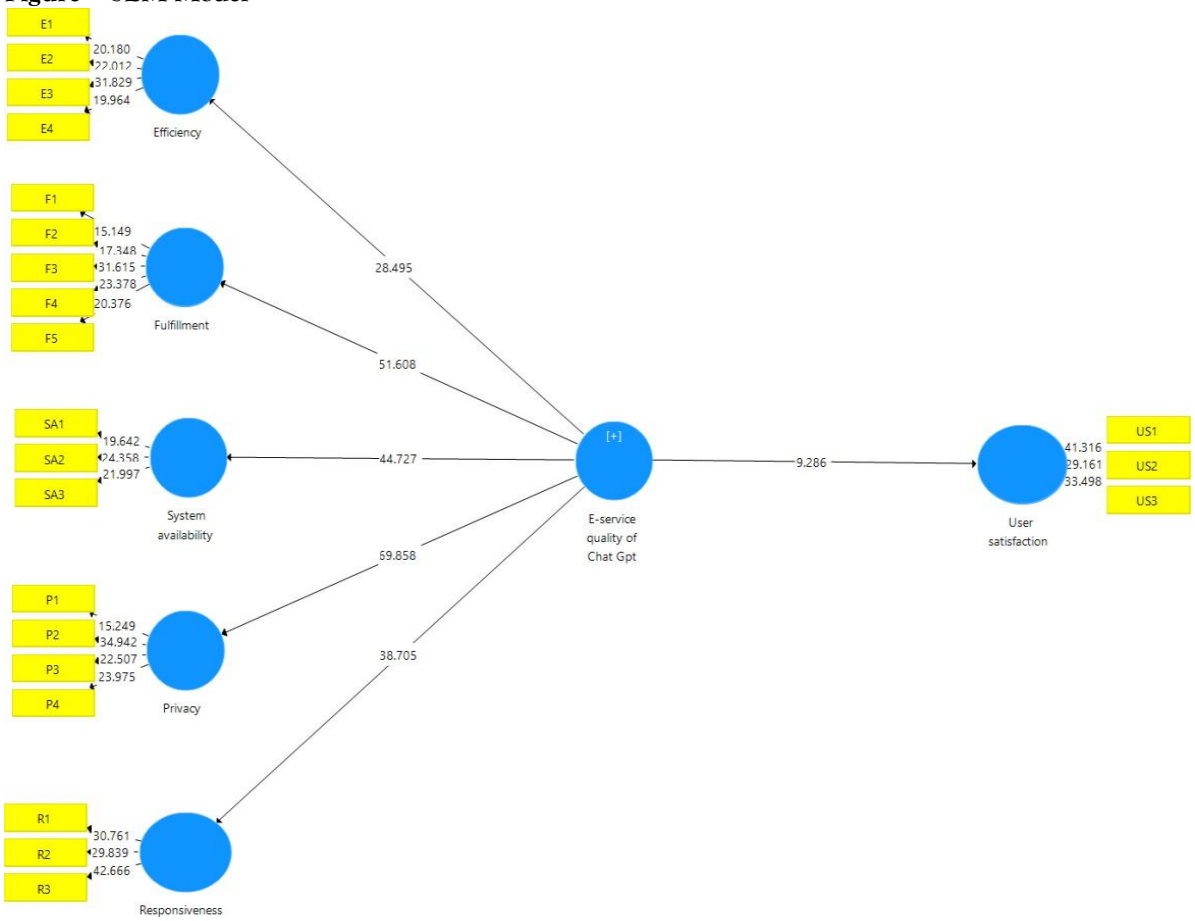
- Research Approach: A quantitative approach using the e-SERVQUAL model encompassing five dimensions: Efficiency, System Availability, Fulfillment, Privacy, and Responsiveness.
- Data Collection: Structured questionnaires are distributed among management teachers to gather data. The questionnaire is designed to capture the teachers' perceptions and experiences with ChatGPT's e-service quality.
- Sample: The study involves management teachers from various educational institutions, providing a diverse sample representative of the target population.
- Measurement Model:
  - Cronbach's Alpha: To measure internal consistency.
  - Composite Reliability: To assess the reliability of the constructs.
  - Average Variance Extracted (AVE): To evaluate convergent validity.
- Data Analysis: The collected data are analyzed using Structural Equation Modeling (PLS- SEM). This method is chosen for its robustness in testing complex models and its ability to handle reflective and

formative constructs. Hypotheses are tested using beta coefficients,
T-statistics, and P-values to determine the significance and strength of relationships between constructs.

- Justification for Using Smart PLSSmart PLS is ideal for handling complex models, small samples, and both reflective and formative constructs. It works without normal data distribution, offers robust bootstrapping for hypothesis testing, and provides strong predictive accuracy with easy-to-interpret graphical outputs.Challenges in Data Collection
- Participant Availability: Coordinating with 500 management teachers and ensuring their availability to complete the questionnaires was challenging given their busy schedules.
- Response Rate: Encouraging a high response rate from the selected participants required multiple follow-ups and reminders.
- Data Accuracy: Ensuring that participants provided accurate and honest feedback without any biases was essential for the validity of the research findings.
- Diverse Institutions: Collecting data from various educational institutions posed logistical challenges, including differences in institutional policies and accessibility.

Data Analysis and Interpretation

6.1 Figure – SEM Model



Analysis of PLS-SEM Model on ChatGPT's E-Service Quality

The PLS-SEM model reveals that ChatGPT's e-service quality significantly impacts user satisfaction through five key dimensions: efficiency, fulfillment, privacy, responsiveness, and system availability. Each dimension exhibits high path coefficients and significant T-values, indicating their strong contributions to overall service quality.

- **Efficiency (T-Value: 28.495)**: Efficiency is a crucial dimension of e-service quality, demonstrated by a high path coefficient (0.865) and significant T-statistics (28.495). Uppal,

Ali, and Gulliver (2018) identified efficiency as a key determinant of e-learning service quality, emphasizing its role in user satisfaction and system performance.

- **Fulfillment (T-Value: 51.608)**: The study indicates that fulfillment significantly influences the perceived e-service quality of ChatGPT, with a path coefficient of 0.908 and T-statistics of 51.608. Roushdy and El-Ansary (2017) also found that fulfillment is critical in measuring students' perceptions of e-service quality in e-learning institutions.
- **Privacy (T-Value: 69.858)**: Privacy is another significant dimension, with a path coefficient of 0.917 and T-statistics of 69.858. Soares, Novaski, and Anholon (2017) applied the SERVQUAL model to higher education services, demonstrating that privacy concerns are integral to overall service quality and user satisfaction.
- **Responsiveness (T-Value: 38.705)**: The responsiveness of ChatGPT's services is significantly influenced by its e-service quality, with a path coefficient of 0.863 and T- statistics of 38.705. Galeeva (2016) adapted the SERVQUAL model for educational service quality assessments, highlighting the importance of responsiveness in meeting user expectations.
- **System Availability (T-Value: 44.727)**: System availability significantly impacts the perceived e-service quality of ChatGPT, with a path coefficient of 0.885 and T-statistics of 44.727. Žekevičienė (2015) noted that system availability is essential for maintaining high service quality in higher education.

These dimensions underscore the importance of enhancing user satisfaction, suggesting that improvements in these areas can lead to better user experiences with ChatGPT's services. The study confirms that e-service quality significantly influences user satisfaction, with a path coefficient of 0.591 and T-statistics of 9.286. Efendi, Mahjudin, and Soelistya (2021) emphasized the importance of measuring user satisfaction in the context of information systems in education, supporting the findings of this study.

The analysis demonstrates that ChatGPT's e-service quality significantly affects efficiency, fulfillment, privacy, responsiveness, and system availability, which in turn enhance user satisfaction. These findings align with previous research using the SERVQUAL model in various educational contexts, underscoring the critical role of these dimensions in delivering high-quality e-services (Tan & Kek, 2004; Uppal, Ali, & Gulliver, 2018; Roushdy & El-Ansary, 2017; Soares,Novaski, & Anholon, 2017; Galeeva, 2016; Žekevičienė, 2015; Efendi, Mahjudin, & Soelistya, 2021).

6.2 Table No 1 : Reliability and validity

Path	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
E-service quality of ChatGPT	0.947	0.947	0.501
Efficiency	0.807	0.807	0.511
Fulfillment	0.838	0.839	0.512
Privacy	0.800	0.802	0.504
Responsiveness	0.831	0.831	0.621
System availability	0.764	0.764	0.519
User satisfaction	0.844	0.844	0.644

The data demonstrates high reliability and validity for the constructs measuring ChatGPT's e- service quality across dimensions such as Efficiency, Fulfillment, Privacy, Responsiveness, System Availability, and User Satisfaction. Cronbach's Alpha values exceeding 0.7 for all constructs indicate strong internal consistency. Similarly, Composite Reliability values surpassing 0.7 reinforce the reliability of the measurement scales. Furthermore, Average Variance Extracted (AVE) values above 0.5 confirm good convergent validity. These metrics collectively validate that the constructs are well-measured, with items being consistent and well-correlated, thereby supporting the robustness of the model's constructs.

6.2 Table No 2: Hypothesis testing

Path	Beta Co-efficient	T-statistics	P-Values
E-service quality of ChatGPT □ Efficiency	0.865	28.495	0.000
E-service quality of ChatGPT □ Fulfillment	0.908	51.608	0.000
E-service quality of ChatGPT □ Privacy	0.917	69.858	0.000
E-service quality of ChatGPT Responsiveness	0.863	38.705	0.000
E-service quality of ChatGPT □ System availability	0.885	44.727	0.000
E-service quality of ChatGPT □ User satisfaction	0.591	9.286	0.000

The data reveals that ChatGPT's e-service quality significantly impacts its key dimensions— Efficiency, Fulfillment, Privacy, Responsiveness, and System Availability—as well as User Satisfaction, with all path coefficients being positive and significant (ranging from 0.591 to 0.917). The T-statistics for all paths are considerably high (from 9.286 to 69.858), and the P-values are all 0.000, indicating strong statistical significance. This suggests that higher e-service quality leads to improvements in each dimension and user satisfaction, underscoring the importance of maintaining high standards in these areas to enhance the overall user experience with ChatGPT's services. Given that P-values are below the level of significance (5%), the null hypothesis (Ho) is rejected, and the alternative hypothesis (H1) is accepted in all cases, confirming that the e-service quality of ChatGPT is significantly reflected through efficiency, fulfillment, privacy, responsiveness, and system availability, and it significantly impacts user satisfaction.

Alternative Hypothesis	Results
E-service quality of Chat GPT is significantly reflected through Efficiency	Supported
E-service quality of Chat GPT is significantly reflected through Fulfillment	Supported
E-service quality of Chat GPT is significantly reflected through Privacy	Supported
E-service quality of Chat GPT is significantly reflected through Responsiveness	Supported
E-service quality of Chat GPT is significantly reflected through System availability	Supported
E-service quality significantly influences Users Satisfaction	Supported

The hypothesis testing results demonstrate that the e-service quality of ChatGPT significantly influences its key dimensions—Efficiency, Fulfillment, Privacy, Responsiveness, and System Availability—and ultimately enhances User Satisfaction, as all hypotheses are supported. This indicates that improvements in the overall e-service quality of ChatGPT positively impact each of these dimensions, leading to a higher level of user satisfaction. Consequently, maintaining high standards across these dimensions is crucial for ensuring a positive user experience and achieving high user satisfaction with ChatGPT's services.

7. CONCLUSION

This study effectively evaluates the e-service quality of ChatGPT from the perspective of management teachers using the e-SERVQUAL model, focusing on the dimensions of Efficiency, Fulfillment, Privacy, Responsiveness, and System Availability. The findings reveal that each of these dimensions significantly

contributes to the overall e-service quality, which in turn greatly influences user satisfaction. High path coefficients and significant T-values across all dimensions highlight the importance of maintaining high standards in these areas to ensure a positive user experience. This study underscores the critical role of these dimensions in delivering high-quality e-services, aligning with previous research in various educational contexts.

8. Managerial and Practical Implications:

The study provides valuable insights for enhancing e-service quality in AI-driven education. By analyzing ChatGPT's efficiency, system availability, fulfillment, privacy, and responsiveness, educators and AI developers can optimize its integration into teaching and administrative tasks. The findings support data-driven decision-making for policymakers, helping refine digital service strategies in education. Identifying key service quality gaps enables AI developers to improve user experience, ensuring ChatGPT meets educators' expectations. Additionally, the research strengthens the credibility of AI-based learning tools, encouraging broader adoption and institutional support.

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