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THE CATALYTIC ROLE OF ARTIFICIAL INTELLIGENCE IN THE RELATIONSHIP OF SOCIAL MEDIA USAGE AND SATISFYING CUSTOMER EXPERIENCE AMONG POTENTIAL BUYERS

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Abstract

The increasing influence of social media on customer behavior has prompted a need to explore its implications in various sectors, including higher education. This study examines the dynamic relationship between social media usage and satisfying customer experience in the context of public sector universities in Southern Region of Khyber Pakhtunkhwa (KP), Pakistan. A mediation model is proposed and empirically validated to investigate the mediating roles of artificial intelligence.Grounded in theoretical perspectives

from digital marketing and consumer psychology, this quantitative study utilized survey data collected from university graduates, Structural equation modeling was conducted using Smart-PLS (Partial Least Squares) to assess both direct and indirect relationships among the constructs.The results revealed that Artificial Intelligence significantly mediate the relationship between social media usage and satisfying customer experience among potential buyers. This research makes a theoretical contribution by integrating artificial intelligence into model of social media usage influence on satisfying customer experience in the educational context. It also provides practical recommendations for university administrators and policymakers to strategically utilize AI-driven technologies engaging social media content to optimize student recruitment and engagement.

Keywords: *Social Media Usage, Artificial Intelligence, Satisfying Customer Experience, University Graduates.*

INTRODUCTION

Information and communication technologies ICT have evolved tremendously and revolutionized the commercial world by incorporating AI systems in intelligent systems that support the business world (Lari, Vaishnava & Manu, 2022). These developments have featured conventional business performance measurement tools and evolved them into self-identical systems with the capacity to perform tasks that were hitherto only deemed doable by a human. The current advanced AI technologies allow the machines to have usually standalone tasks of cognitive processing, self-writing of codes, & self-learning. It has changed the functionality of these systems to be more sensitive, productive, and autonomous to perform tasks without much interference from the user (Wang, Wan, Zhang, Gong, Luo & Tian, 2023).

In its simplest and most common form, artificial intelligence is the ability of a machine to mimic the human mind and perform tasks that would otherwise be associated with the human brain including identification, learning and decision-making (Dong, Hou, Zhang & Zhang, 2020). Due to the simulation of human thought processes, AI has become a formidable tool in the various field. For instance, in marketing, hospitality and tourism industries have experienced a drastic reallocation of uses of artificial intelligence in various business activities including marketing, customer

service, and communication among others (Chintalapati, & Pandey, 2022). These sectors have adopted the use of AI in their operations to help them in the design of customized marketing strategies, improving service provision through the use of analytics and also improved customer relations through the use of chatbots among others (Verma, Sharma, Deb & Maitra, 2021).

It has been observed that those sectors which have embraced artificial intelligence not only made their operations efficient but also received a notable boost in the level of their customers' satisfaction (Vera, Maurice, Moore & Rohrbeck, 2023). Through artificial intelligence, organizations can predict the needs of consumers, manage and design services delivery and have constant interaction with consumers. This change has ensured that AI is a vital tool used in updating business demands and making sure that organizations are expanding to be relevant in today's market. The continuous evolution of AI in business practice leads to the expansion of the limits of such systems, which in turn reforms the possibilities of business performance and services in general. However, it is crucial to recognize that the frequency of social media usage by customers has paved the way for multinational companies to tailor their promotional strategies using appropriate AI techniques on these platforms.

At the same time, the increased use of technologies based on artificial intelligence, including recommendations, chat-bots, and prediction systems is helping online companies to deliver better and more satisfying consumer experiences (Huang & Rust, 2021). These improvements with the help of AI possibly can affect the purchase decision making process (Stone, Aravopoulou, Ekinci, Evans, Hobbs, Labib & Machtynger, 2020). The use of artificial intelligence in the online marketing of products and services and e-commerce has helped organizations change the way they attend to their consumers including university students (Wang et al., 2023). These advancements can boost consumer experiences through recommendation, analytics and interfaces through 'AI' as noted by Huang and Rust (2021).

For instance, in the university space, an AI-based chatbot can be deployed to assist learners in their common questions and issues freeing

them up to make the right purchasing decisions hence increasing their overall satisfaction out of the purchasing process (Følstad & Brandtzæg, 2017). Furthermore, operational approach and real-time promotion techniques such as predictive analytics and machine learning algorithms can determine consumer data to predict their preferences in a product to enhance the chances of making successful buys (Davenport, Guha, Grewal, & Bressgott, 2020).

Incorporation of the examined AI technologies can also enhance the decision making of university students given the time constraints and the large amounts of information regarding the online marketplaces. When they make shopping easier and offer tailored solutions, AI allows to decrease the information load that comes with the purchasing choices and result in higher levels of satisfaction for customers (Huang & Rust, 2021).

Still, these advances in AI-consumer experiences are only possible if these AI-technologies are correctly integrated and implemented and if the users accept and trust in those systems (Følstad & Brandtzæg, 2017). It is therefore important that future implementation of AI solutions takes time to analyze the shortcomings that may be associates with it, for instance privacy issues and algorithmic injustices, with an aim at targeting the university student grouping. The integration of social media and the advancement of AI technologies has significantly transformed online marketing and consumer behavior, creating new opportunities for businesses to engage with their audiences more effectively (Mariani, Perez-Vega, & Wirtz, 2022).

Social networks are essential in modern society, with people spending more time engaging with content, communicating, and consuming various goods and services (Raza, Qazi Umer, & Khan., 2020; Kaplan & Haenlein, 2010). This has resulted in social media dependency in which users are obsessed with using social media platforms in an uncontrolled and excessive manner that is was impaired their academic, social and personal performance (Turel & Serenko, 2012). Social media dependency is defined as the excessive and uncontrolled utilization of the social media sites, and it has been identified that university students are part of the many who have become involved in the same (Kircaburun, Alhabash, Tosuntaş, & Griffithse, 2018). This kind of addiction may result in a wide range of negative effects,

including deterioration academic achievement, social relationships, and stimulate the occurrence of mental health disorders, depression and anxiety included (Andreassen, Pallesen, Griffiths, Torsheim, & Sinha, 2016).

LITERATURE REVIEW

Social Media Usage and Satisfying Customer Experience

The rise of social media platforms has had a significant impact on consumer behavior and the customer experience. One emerging area of research focuses on the relationship between Social Media Usage and satisfied consumer experiences. The emergence of social media has basically reshaped the customers' behavior regarding their perception about the discovering, evaluating and experiencing any product or service. Social media usage ranges from causal browsing to intense engagement with brands effecting both, positive and negative, aspects of customers' satisfaction (Kircaburun, et al., 2018). Active interaction on social media platforms can build trust, loyalty and emotional connection on positive side (Alawan, 2018). Additionally, when customers see others approving and recommending a product, they perceive it as more trustworthy and hence leads to more satisfaction (Sheldon, Antony & Sykes, 2021).

On negative side, mostly, idealized content on social media creates unrealistic expectations in the customers' minds, which according to Expectation-Confirmation theory (Oliver, 1980), leads to high disappointments when reality doesn't meet the created hype (Buglass, Binder, Betts, & Underwood, 2017). Furthermore, excessive social media usage fosters impulsive purchasing because of fear of missing out, which may lead to post purchase regret (Gong, Li, & Stump, 2020).

In short, the constant use of social media platforms, on one side, enrich the customers' experience, the overuse can distort expectations resulting to dissatisfaction on other side (Gupta & Bashir, 2018). This undecided and complex associations highlight the need for further research. Hence, researcher hypothesized that

H1; There is significant relationship exists between Social Media Usage and Satisfying Customer Experience among university graduates

SOCIAL MEDIA USAGE AND ARTIFICIAL INTELLIGENCE

The rapid advancement and emergence of artificial intelligence have changed the dynamics of social media usage by reshaping communication patterns, users' experiences and broader digital landscape. Social media platforms like WhatsApp, Facebook, Instagram, Tik Tok and other use artificial intelligence to analyze users' behavior and hence provide highly personalized content (Baig, Altaf & Azam, 2023). Social media usage is proven significantly positively associated with artificial intelligence by various studies previously. Although this personalization foster greater user satisfaction and loyalty however it also leads to having concerns about algorithm biasness, digital dependency and data privacy (Kashif et al., 2024).

Additionally, artificial intelligence integration into social media enhance the automation of communication through Chatbots and content generation tools. Though these features improve responsiveness and interaction efficiency however, also blur the border between genuine interactions and artificial ones and hence leads to effect trust and authenticity online (Sundar, 2020). Moreover, the regular exposure to idealized artificial intelligence curated content may cause a damage to mental health particularly among young users, contributing to develop low self-esteem, anxiety and social comparison (Kashif et al., 2024). All these above findings underline the intertwined association of social media and artificial intelligence as where social media serves both as a data source for artificial intelligence training and as a medium through which artificial intelligence capabilities and perceptions are shaped and disseminated (Shahzad, Xu, Lim, Yang & Khan, 2024). Based on the above discussion, it is hypothesized that

H2; There is significant relationship exists between Social Media Usage and Artificial Intelligence Technology among university graduates.

ARTIFICIAL INTELLIGENCE AND SATISFYING CUSTOMERS' EXPERIENCE

Artificial intelligence integration into customers' services operations have considerably enhanced the capability of businesses to deliver satisfying customer experiences through various digital platforms. Artificial

intelligence powered chatbots recommendation systems help companies to offer more personalized, faster and efficient support (Clark, 2024). Artificial intelligence have the ability to analyze customers data in real-time to predict their needs, suggest products and offer help even before the problems arise, which may boost their loyalty and satisfaction (Huang & Rust, 2021). For example, artificial intelligence powered chatbots are available around the clock to resolve the customers queries immediately without wasting any time and keeping services consistent (Grewal, Roggeyeen & Nordfalt, 2017).

In the context of e-commerce and digital banking, artificial intelligence contributes smoother experiences through features like smart pricing, voice assistants, fraud detection, smart pricing and self-services options. These innovative features not only enhance operational efficiency but also make customers feel more understood, empowered and valued (Chatterjee et al., 2020). Although, artificial intelligence enhances convenience and personalization, some concerns still exist. Issues like algorithm transparency, data privacy and overreliance on automation may lead to dissatisfaction particularly when human judgement is needed in complex situations (Paschen, Pitt & Kietzmann, 2020).

Nonetheless, when appropriately designed and ethically implemented, AI serves as a powerful tool for elevating the overall quality of customer experience by combining speed, precision, personalization, and emotional intelligence. Hence, researcher hypothesized that

H3; There is significant relationship exists between Artificial Intelligence Technology and Satisfying Customer Experience among university graduates

ARTIFICIAL INTELLIGENCE AS MEDIATOR

Artificial Intelligence (AI) technology significantly mediates the relationship between social media usage and satisfying customer experience by enabling businesses to transform social media data into actionable customer insights. Social media platforms like Facebook and Instagram have become key spaces for customer interaction, but the large amount of unstructured data they generate requires AI to make sense of it. AI tools like

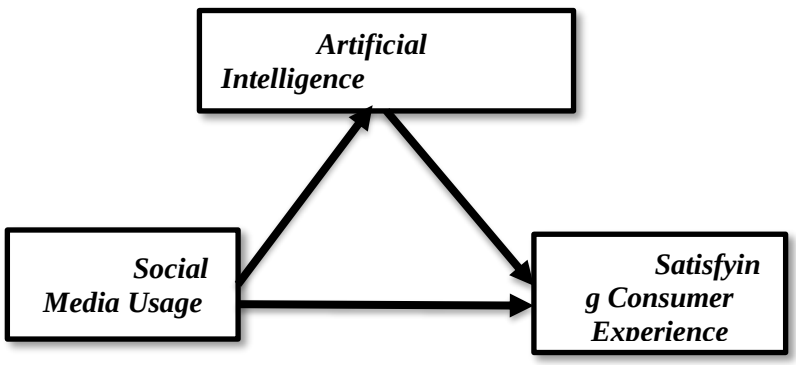
machine learning and sentiment analysis help businesses understand customer emotions, predict needs, and personalize experiences (Chatterjee et al., 2020). Chatbots and virtual assistants offer instant, around-the-clock support, boosting satisfaction by reducing effort (Huang & Rust, 2021). By analyzing behavior and preferences in real-time, AI delivers tailored content and offers that make customers feel seen and valued. This leads to stronger connections, increased engagement, and long-term loyalty which is crucial in developing a satisfying and memorable customer experience (Kaplan & Haenlein, 2019).

Additionally, artificial intelligence supports predictive analytics, through which customers' preferences are anticipated and hence products, contents and offers aligned with these preferences are delivered automatically. This not only enrich the social media interaction but also drives involvement and satisfaction by making customers interactions more seamless and relevant (Davenport et al., 2020).

In this way, AI does not merely facilitate the process but acts as a transformative force, shaping the quality and impact of customer experiences derived from social media engagement.

H4; Artificial Intelligence technology mediates the relationship between Social Media Usage and Satisfying Customer Experience among university graduates

Figure 1 Theoretical Framework



METHODS AND PROCEDURES

Quantitative research approach is followed by the researcher in current study. This approach is generally used for collecting and analyzing numerical data. In this method, averages, trends, and predictions are made. With the help of a sample, casual connections are evaluated with the possibility of population-wide generalization (Malebana & Swanepoel, 2015). Students enrolled in various public sector universities of Southern region, KP, Pakistan comprised the target population for current study. This population is relevant due to its active engagement with social media and the increasing influence of digital platforms on consumer behavior within the academic environment. Given the focus on understanding the relationship between Social Media Usage and satisfying customer experience through artificial intelligence, targeting this demographic provides valuable insights into the behavioral patterns of a technologically savvy and academically inclined group. To determine the appropriate sample size for the study, the research follows the item-to-response ratio formula suggested by Hair et al. (2012), which recommends obtaining 10 to 20 responses for each survey question when analyzing data using structural equation modeling (SEM) techniques, such as those offered by Smart-PLS. Given that the survey for this study consists of 29 questions, the required sample size would range between 290 to 580 respondents to ensure robust and reliable data analysis. For this study, total 385 students were surveyed, aiming for approximate responses. This ensures adequate statistical power and precision in the SEM analysis, providing reliable results for validating the moderated mediation model. 315 responses, completed in all respect, were considered for data analyses. The sampling technique employed is stratified random sampling. In the first stage, the population is divided into strata based on the universities, ensuring that each institution is proportionately represented in the final sample. Within each stratum, students are randomly selected to participate in the survey, ensuring that every student within the target population has an equal chance of being included (Creswell & Clark, 2017). This method enhances the

generalizability of the findings across the southern zone of KP while minimizing selection bias. Questionnaire having Likert type items is used as data collection instrument. Scales are adopted from previous studies. Social media usage is measured through scale developed by Naranjo-Zoloty et al., (2021) having 4 items. Artificial intelligence and satisfying customer experience, both, are measured through scales developed by Capatina et al., (2020) having 8 and 5 items respectively. Various statistical tools such as scale reliability & validity through measurement model, correlation and simple mediation are employed for testing hypotheses developed for current study. Smart-PLS, a variance-based structural equation modeling (SEM) tool, well-suited for analyzing complex models having latent variables, is employed for testing hypotheses developed for current study.

1. Measurement Model

Measurement model covering internal consistency, convergent validity and discriminant validity of the model presented by Hair, Hult, Ringle and Sradtedt (2019) are examined.

2. Convergent Validity and Reliability

Below table 4.7 shows the values for reliability and convergent validity of the adopted constructs for current study. Reliability is calculated using composite reliability whereas convergent validity is checked using factor loading (FL) of items on each construct and average variance (AVE) of the constructs.

Table 1 ***Convergent Validity and Reliability Coefficients***

Construct	*Items*	*FL*	*CA (α)*	*CR*	*AVE*
Artificial Intelligence Technologies (AIT)	*AITQ1*	*0.588*	*0.861*	*0.865*	*0.510*
	AITQ2	*0.726*			
	AITQ3	*0.744*			
	AITQ4	*0.749*			
	AITQ5	*0.765*			
	AITQ6	*0.775*			
	AITQ7	*0.655*			
	AITQ8	*0.689*			
Satisfying Customer	*SCEQ1*	*0.819*	*0.805*	*0.815*	*0.566*

Experience (SCE)	*SCEQ2*	*0.768*			
	SCEQ3	*0.841*			
	SCEQ4	*0.648*			
	SCEQ5	*0.667*			
Social Media Usage	*SMUQ6*	*0.788*	*0.87*	*0.844*	*0.542*
(SMU)	*SMUQ2*	*0.536*			
	SMUQ3	*0.791*			
	SMUQ4	*0.731*			
	SMUQ5	*0.811*			
	SMUQ1	*0.728*			

The above table 1 presents the composite reliability, representing the scale internal consistency as well as the reliability coefficients ranging between 0.805 and 0.861 for all the three constructs of model 1 crossing the minimum acceptable value of 0.60 (Nawaz et al., 2024). Moreover, the factor loading (FL) and average variance extracted (AVE) values must be more than 0.70 and 0.50 respectively for evaluating convergent validity of scales employed. In present case, although, there are some items on each scale, scoring below the minimum acceptable value of factor loading i.e. AITQ1 (0.588), AITQ7 (0.655), AITQ8 (0.689), SCEQ4 (0648), SCEQ5 (0.667) and SMUQ2 (0.536) and hence indicating weak convergent validity of scales employed however as the overall scales reliability scores range in very good therefore researcher kept all the items for further analyses. The item and factor loading on each latent construct may be observed in figure 2.

3. DISCRIMINANT VALIDITY

For the confirming of discriminant validity of scales employed, generally cross loading by Hsu and Lin (2016) and the Heterotrait-Monotrait (HTMT) by Henseler, Ringle and Sartedt (2015) approaches are employed. Results obtained are presented are as below

Table 2 ***Cross Loading***

Items	*AIT*	*SCE*	*SMU*
AIQ1	***0.588***	*0.433*	*0.523*

AIQ2	***0.726***	*0.595*	*0.608*
AIQ3	***0.744***	*0.576*	*0.58*
AIQ4	***0.749***	*0.589*	*0.588*
AIQ5	***0.765***	*0.506*	*0.692*
AIQ6	***0.775***	*0.566*	*0.606*
AIQ7	***0.655***	*0.538*	*0.479*
AIQ8	***0.689***	*0.559*	*0.514*
SCEQ1	*0.638*	***0.819***	*0.52*
SCEQ2	*0.583*	***0.768***	*0.509*
SCEQ3	*0.631*	***0.841***	*0.581*
SCEQ4	*0.464*	***0.648***	*0.435*
SCEQ5	*0.541*	***0.667***	*0.59*
SMUQ2	*0.579*	*0.588*	***0.788***
SMUQ3	*0.435*	*0.316*	***0.536***
SMUQ4	*0.694*	*0.593*	***0.791***
SMUQ5	*0.596*	*0.463*	***0.731***
SMUQ6	*0.673*	*0.549*	***0.811***
SMUQ1	*0.555*	*0.551*	***0.728***

Table 2 showing the factor loading values on each scale. Here it can be observed that all the items have attained greater values on each respective own scale than on any other which indicate a good discriminant validity of all scales employed in present study.

Table 3 ***Heterotrait-Metrotrait (HTMT)***

	SCE	***SMU***	***AI***
SCE			
SMU	*0.817*		
AIT	*0.851*	*0.853*	

The HTMT values of all the three constructs shown in above table 3 are within the range of cutoff value of 0.85 (Henseler et al., 2015) also verifying a good discriminant validity of scales employed in present study.

4. CORRELATION ANALYSIS

Relationships related hypotheses developed for present study covering by Model # 1 are tested through Pearson Correlation analysis. Pearson correlation test is employed to find out the strength and direction of relationships exist between study constructs (Nawaz, Goh, Ong, Yasri, Ali & Waluyo, 2024). Empirical results obtained from correlation analysis covered are presented as under

Table 4 ***Summary of Correlation Coefficients***

Constructs	*SMU*	*AI*	*SCE*
Social Media Usage (SMU)	*1*		
Artificial Intelligence (AI)	*.807***		
Satisfying Customer Experience (SCE)	*.704***	*.765***	*1*

***Correlation is significant at level 0.01*

In the above table 4, correlation analysis results revealed a significant positive association of social media usage with satisfying customer experience (β=.0704, p=.000) as well as with artificial intelligence (β=0.807 p=.000) in the present study context. Results also revealed that artificial intelligence is significantly positively associated with satisfying customer experience (β=0.765, p=.000) among university graduates. In the light of these findings, hypothesis 1 to hypothesis 3, all are accepted.

5. MEDIATION PATH ANALYSIS

In model, related to mediation analysis, artificial intelligence is under consideration as mediating variable in the relationship of social media usage and satisfying customer experience among university graduates. As stated earlier, Smart-PLS is employed to estimate the expected direct and indirect proposed paths. The obtained empirical results are summarized in

table 5 and the structured model (figure 2).

Figure 1 Structured Model

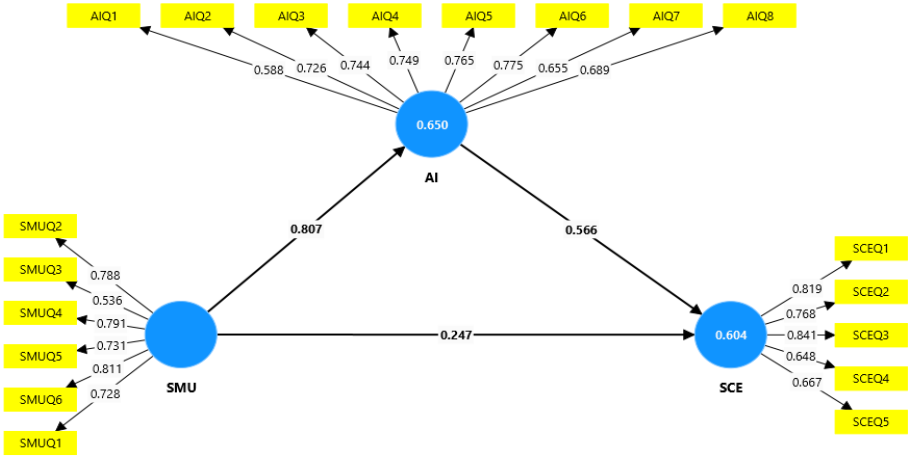


Table 5 Summary of Mediation Path Analysis

	Beta Coefficient	*Sample mean (M)*	*Standard deviation(STDEV)*	*T statistics (|O/STDEV|)*	*values*
SMU -> AI	*0.807*	*0.806*	*0.037*	*21.828*	*.000*
AI -> SCE	*0.566*	*0.563*	*0.076*	*7.443*	*.000*
SMU -> SCE	*0.247*	*0.249*	*0.081*	*3.039*	*002*
SMU -> AI -> SCE	*0.457*	*0.454*	*0.068*	*6.721*	*.000*

The above table 5 shows the direct and indirect path estimates of predictors towards criterion constructs in model # 1. Results revealed a highly strong and significant impact of social media usage on artificial intelligence (β=0.807, t=21.828, p=0.000) among university graduates. Artificial intelligence is also revealed as significantly impacting satisfying costumer experience (β=0.566, t=7.443, p=0.000) in the present study context. Results also showed a significant positive direct impact of social media usage on satisfying costumer experience (β=0.247, t=3.039,

p=0.002). Furthermore, results also revealed a strong indirect effect of social media usage on satisfying customer experience through artificial intelligence (β=0.457, t=6.721, p=0.000).

On the bases of above findings, it is contended that artificial intelligence partially mediates the link of social media usage and satisfying customer experience among university graduates. Social media usage has a significant direct impact on Satisfying customer experience (β=0.807, p=0.000) and a strong indirect through artificial intelligence (β=0.247, p=0.002). These findings suggest that although social media usage directly enhance satisfying customer experience, a substantial portion of its effect is transmitted through the adoption of artificial intelligence. Hence, organizations leveraging social media can significantly enhance satisfying customer experience effectiveness specially when such use facilitates great integration of artificial intelligence. In the light of above findings hypothesis 4 is partially accepted.

DISCUSSION

The aim of present study was to investigate the direct association of social media usage influence on satisfying customer experience as well as indirect through artificial intelligence as mediator among university graduates enrolled in various public sector universities of southern region, KP, Pakistan. For this purpose, 315 students were surveyed. Empirical results revealed a significant positive association of social media usage with satisfying customer experience. These findings are consistent with previous research highlighting the impact of social media on enhancing customer experiences. For instance, Bilgin (2018) found that social media marketing activities significantly influence brand awareness and customer satisfaction. Similarly, Harrigan et al. (2021) demonstrated that active engagement with brands on social media contributes positively to customer relationship quality and satisfaction. Results also revealed that social media usage is significantly positively associated with artificial intelligence in the present study context. These findings are in line with previous studies like Rehan et al. (2024) who conducted a study involving 203 university students in South

Punjab, Pakistan, to examine the impact of AI acquisition on social media campaigns. The study revealed significant positive relationships between AI acquisition and user behavior on platforms like Instagram and Facebook, with regression coefficients of $\beta = 0.65$ and $\beta = 0.58$ respectively ($p < 0.001$). These results suggest that AI tools enhance personalization and engagement in social media usage among students. Similarly, Ali et al. (2022) explored the impact of social media marketing on youth buying behavior in Pakistan. The study revealed that social media marketing advantages, including convenience and time-saving features, increase the intention to purchase by 42.9%, while website design and features enhance Purchase Decision by 55.2%. This indicates that effective social media marketing, often powered by AI, significantly influences youth purchasing decisions. A significant positive relationship between artificial intelligence and satisfying customer experience is also revealed by empirical results. These findings are in line with previous studies. For instance, a study by Singh and Singh (2024) investigated the impact of AI-powered customer service on customer satisfaction and loyalty. The findings revealed that AI significantly enhances customer satisfaction (path coefficient = 0.91) and perceived efficiency (path coefficient = 0.95), leading to increased customer loyalty. This underscores the role of AI in improving customer experiences through efficient and personalized services. Similarly, Park et al. (2024) analyzed the characteristics of AI chatbots in the banking industry and their effect on customer satisfaction. The study found that anthropomorphism and personalization in chatbots significantly influence customer satisfaction by enhancing perceived ease of use and usefulness. These results suggest that well-designed AI chatbots can positively impact customer experiences. Artificial intelligence is also revealed significantly mediating the association of social media usage and satisfying customer experience in the present study context. It is because as artificial intelligence-driven tools like chabots, recommendation systems and sentiment analysis algorithms play a significant role in transforming raw social media engagement into meaningful and satisfying customer experiences.

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