ORIGINAL CONTRIBUTION
Elevating Careers through Technology and Creativity: A Middle-Level Manager's Odyssey

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Abstract— Purpose: This research investigates the influence of Middle-level managers' AI/GPT tools and technological proficiency on workplace diversity exposure, career calling, career advancement aspirations, and inclusivity perception in NBEAC-accredited universities in Pakistan. Additionally, the study explores the mediating role of workplace creativity in these relationships. The study adopts a quantitative research design and employs Partial Least Squares Structural Equation Modeling (PLS-SEM) to analyze data collected from 313 Middle-level managers, including Assistants, Program officers, Assistant Exam Controllers, and Assistant Registrars, through personal contacts and references. The data was collected in May and June for this research and the study utilizes established scales from previous research to measure the variables of interest. The results reveal that Middle-level managers' AI/GPT tools technological proficiency positively influences workplace diversity exposure, career calling, career advancement aspirations, and inclusivity perception. Workplace creativity significantly mediates the relationships between technological proficiency and workplace diversity exposure, career calling, and career advancement aspirations. Study contributes to the existing literature by examining the mediating role of workplace creativity and its influence on the relationships between technological proficiency and career-related perceptions among Middle-level managers in the educational context of NBEAC accredited universities in Pakistan. However, this study used data of Pakistani nationals only, while future studies can conduct this research on other nations too.

Index Terms— Artificial intelligence tools, Technological proficiency, Workplace diversity exposure, Career calling, Career advancement aspirations, Inclusivity perception
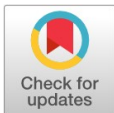
Introduction

The rapidly changing landscape of modern organizations has resulted in significant technological advancements, and their impact on employment relations has become a focus of research interest. Understanding the impact of Artificial Intelligence (AI) and Generative Pre-trained Transformer (GPT) tools on various aspects of employee experiences is critical as these tools continue to revolutionize workplaces (Haluza & Jungwirth, 2023; Trautman, Voss, & Shackelford, 2023). This study investigates the technological proficiency of AI/GPT tools among Middle-level managers in NBEAC-accredited universities in Pakistan, examining its relationships with workplace diversity exposure, career calling, career advancement aspirations, and inclusivity perception. The study aims to shed light on the complex dynam-

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ics that exist between technology, career-related perceptions, and creativity, providing valuable implications for organizations seeking to empower their workforce and foster inclusive and innovative work environments.

Previous research on employment relations and technology has found that technological proficiency has a positive impact on a variety of career-related outcomes (Bozkurt et al., 2023; Trautman et al., 2023). Individuals with higher technological proficiency are more likely to advance in their careers and be more adaptable to technological changes in the workplace Brougham and Haar (2018). Furthermore, research has highlighted the significance of technology in fostering inclusive work environments that value diversity and collaboration (Bozkurt et al., 2023). Employees who are skilled in AI/GPT tools are better able to collaborate with diverse colleagues Brougham and Haar (2018). Prior research has also looked into the role of creativity in shaping career aspirations and fostering an innovative culture in organizations (Haluza & Jungwirth, 2023). Individuals' sense of purpose and intrinsic motivation in their careers have been linked to their creative abilities and the pursuit of meaningful work (Jaiswal, Arun, & Varma, 2023). Furthermore, research has emphasized the importance of professional growth and development aspirations Trautman et al. (2023). Middle-level managers with higher technological proficiency are more likely to be proactive and seek career advancement opportunities, correlating with previous research on the relationship between technology and career aspirations Malik (2023). Furthermore, inclusivity perception, which reflects individuals' perceptions of a diverse and inclusive work environment, has been linked to organizations' use of technology to promote diversity and foster inclusive practices (Rathore, Mathur, & Solanki, 2022). Employees are more likely to perceive organizations that use AI/GPT tools to support diversity initiatives as inclusive.

Despite the existing body of knowledge, there are still some gaps in understanding the specific relationships between AI/GPT tools, technological proficiency, career-related perceptions, and workplace creativity among middle-level managers (Bozkurt et al., 2023; Jaiswal et al., 2023; Rathore et al., 2022; Trautman et al., 2023). There has been little research into the role of workplace creativity in mediating these relationships (Budhwar et al., 2023), particularly in the context of NBEAC-accredited universities in Pakistan. As a result, there is a need to close these gaps and advance understanding of how technological proficiency interacts with career-related outcomes, fostering a deeper understanding of the mechanisms at work. The purpose of this study is to fill the gaps mentioned above by investigating the relationships between Middle-level managers' technological proficiency with AI/GPT tools and their workplace diversity exposure, career calling, career advancement aspirations, and inclusivity perception. Furthermore, the study intends to investigate the role of workplace creativity in mediating these relationships. The research seeks to contribute valuable insights to the fields of employment relations, technology, and career development by delving into this uncharted territory, providing a comprehensive understanding of the factors influencing career-related perceptions among Middle-level managers.

This study is based on Social Cognitive Theory, which emphasizes the interaction of personal characteristics, contextual effects, and behavioral results (Budhwar, Malik, De Silva, & Thevisuthan, 2022). Social Cognitive Theory provides a theoretical framework for investigating how the technological proficiency of Middle-level managers' AI/GPT tools (personal factor) interacts with workplace diversity exposure, career calling, career advancement aspirations, and inclusivity perception (behavioral outcomes) within the university environment (environmental influences). The emphasis of the theory on self-efficacy, observational learning, and the influence of the environment in influencing individual views is consistent with the study focus on understanding the impact of technical proficiency on career-related perceptions and the mediating role of workplace creativity (Budhwar et al., 2022; Shaikh, Afshan, Anwar, Abbas, & Chana, 2023). This study investigates how middle-level managers' AI/GPT tools technological proficiency affects their exposure to workplace diversity, sense of career calling, and aspirations for career advancement, and whether workplace creativity mediates these relationships.

Literature Review

Role of AI/GPT tools technological proficiency refers to middle-level managers' ability to use AI (Artificial Intelligence) and GPT (Generative Pre-trained Transformer) tools effectively in their work tasks, which includes knowledge, skills, and confidence in using these advanced technologies (Haluza & Jungwirth, 2023). Moreover, workplace diversity exposure refers to middle-level managers' experiences with diverse perspectives, cultures, and backgrounds in the workplace, including interactions with colleagues from various racial, ethnic, gender, and cultural backgrounds (Bozkurt et al., 2023).

Previous study has recognized the importance of technical competency in organizational situations. Trautman et al. (2023), for example, discovered that managers with better technology skill displayed greater flexibility to technological changes and higher workplace efficiency. Furthermore, Bozkurt et al. (2023) discovered that technological proficiency was associated with higher job satisfaction and lower work-related stress among managers. Organizations that want to establish inclusive and varied work environments must have technical competency and workplace diversity exposure (Jaiswal et al., 2023).. Understanding how technical competency enables managers to communicate with people from different backgrounds can provide useful insights for developing effective training programs and initiatives to increase diversity awareness and promote inclusive behaviors inside organizations (Shaikh et al., 2023).

According to Social Cognitive Theory, social learning, self-efficacy beliefs, and contextual circumstances influence individuals' behaviors and beliefs (Budhwar et al., 2022). In this perspective, managers' technological proficiency with AI/GPT technologies can be

considered as a product of social learning, since they develop technological skills by seeing and learning from the experiences and training of others (Budhwar et al., 2023). This skill, in turn, may increase their self-efficacy in communicating with people of other perspectives Trautman et al. (2023), which is consistent with the concepts of Social Cognitive Theory.

H1: Middle-level managers' AI/GPT tools technological proficiency positively influences their workplace diversity exposure.

A middle-level manager's sense of being drawn to their profession as a greater purpose or mission rather than merely a means to an end is referred to as career calling (Ren, Cooke, Stahl, Fan, & Timming, 2023). It exemplifies intrinsic motivation, which drives managers to discover purpose and fulfillment in their job that is connected with their personal values and interests. Research has shown that professional calling is important for employee well-being and organizational commitment. According to Budhwar et al. (2023), managers who have a strong sense of professional calling report increased job satisfaction and engagement. Ren et al. (2023) discovered a link between career calling and work performance, implying that managers who are driven by a feeling of calling are more likely to excel in their professions.

Organizations wishing to retain and inspire skilled managers must first understand the relationship between their middle-level managers' AI/GPT tool technology proficiency and their career calling (Budhwar et al., 2023). Investigating how managers' intrinsic motivation and feeling of purpose in their jobs are influenced by technical competency might improve human resource practices and talent development strategies (Budhwar et al., 2023) According to Social Cognitive Theory, self-efficacy beliefs play an important role in molding people's behaviors and attitudes (Shaikh et al., 2023). In this context, managers' technological competency with AI/GPT tools may strengthen their self-efficacy in decision-making and problem-solving, generating a stronger sense of career calling through increased confidence in their abilities, coinciding with the concept of self-efficacy as defined by Social Cognitive Theory.

H2: Middle-level managers' AI/GPT tools technological proficiency positively affects their career calling.

Middle-level managers' desire and ambition to advance in their professions and take on higher-level roles within their businesses, reflecting the pursuit of professional growth and development, are referred to as career advancement aspiration (Budhwar et al., 2023). Previous research has investigated the effect of career development goals on employee behavior and organizational outcomes. Managers with high goals for professional promotion displayed greater dedication to their firms and higher work performance (Yu, Jiao, Wang, & Liu, 2022). Budhwar et al. (2023) discovered that managers' desire for professional advancement was positively related to their willingness to take on difficult jobs and contribute to organizational performance.

Understanding how AI adoption effects managers' career advancement goals requires investigating the relationship between middle-level managers' AI/GPT tool technological proficiency and their career advancement expectations (Yu et al., 2022). This research can help firms improve their people management processes and succession planning methods. According to Social Cognitive Theory, self-efficacy beliefs play a crucial influence in molding people's behavior and motivation (Budhwar et al., 2022). In this context, managers' AI/GPT tool technological proficiency may boost their self-efficacy in job tasks, leading to increased career advancement aspirations because they believe in their abilities to succeed in higher-level roles, aligning with the emphasis on self-efficacy in Social Cognitive Theory.

H3: Middle-level managers' AI/GPT tools technological proficiency positively influences their career advancement aspirations.

Inclusivity perception refers to middle-level managers' subjective impression of how well their workplace supports an inclusive and equitable atmosphere, which includes sentiments of belonging, fairness, and respect Brougham and Haar (2018). Previous study has demonstrated the significance of inclusion perception for employee well-being and organizational outcomes. Managers who saw their workplaces as more inclusive reported increased job satisfaction and organizational engagement (Jaiswal et al., 2023). According to (Rathore et al., 2022), inclusive corporate cultures are favorably associated to managers' creativity and innovative thinking.

Investigating the association between middle-level managers' technological competency with AI/GPT tools and their inclusion perception is critical for firms trying to build inclusive work environments Brougham and Haar (2018). Understanding how managers' perceptions of inclusivity are influenced by technology skills can help identify areas for improvement and establish more inclusive policies and procedures (Rathore et al., 2022) Social Cognitive Theory provides a theoretical foundation for explaining how middle-level managers' technological skill with AI/GPT tools effects their inclusion perception (Shaikh et al., 2023). Individuals' thoughts and perceptions are shaped by social learning and contextual circumstances, according to Social Cognitive Theory (Chen, Liu, Zhang, & Tian, 2023). In this context, managers' AI/GPT tool technology expertise may boost their creative problem-solving skills, leading to a more inclusive image of the workplace, coinciding with the concept of environmental impacts on beliefs and attitudes proposed by Social Cognitive Theory.

H4: Middle-level managers' AI/GPT tools technological proficiency positively impacts their inclusivity perception.

Previous research has connected workplace creativity to improved problem-solving skills and inventive thinking (Jebali & Meschitti, 2021). Managers who are more creative in the workplace are more likely to connect with varied perspectives and contribute to inclusive team dynamics (Sujatha, Mukherjee, Singh, & Bamel, 2023). Investigating the mediating function of workplace creativity can provide useful insights into the mechanisms through which AI/GPT tool technological proficiency affects managers' exposure to workplace variety. Understanding how managers' competency with AI/GPT tools influences their creative problem-solving might help organizations improve their efforts to increase diversity awareness and develop inclusive teams (Haluza & Jungwirth, 2023). According to Social Cognitive Theory, self-efficacy beliefs and social learning influence individuals' behaviors and views (Budhwar et al., 2022). In this context, managers'

technological competency with AI/GPT tools may boost their self-efficacy in creative problem-solving, leading to increased workplace innovation. This is consistent with the emphasis on self-efficacy as a driver of behavior and attitudes in Social Cognitive Theory.

H5: Workplace creativity mediates the relationship between middle-level managers' AI/GPT tools technological proficiency and their workplace diversity exposure.

Previous research has found that workplace creativity is connected with intrinsic motivation and professional happiness (Budhwar et al., 2023). Managers who exhibit higher levels of workplace creativity are more likely to have a sense of calling and find meaning in their work (Sujatha et al., 2023). Exploring the mediating function of workplace creativity can provide insights into the ways by which AI/GPT tool technological proficiency influences managers' career calling (Jaiswal et al., 2023). Understanding how technical proficiency improves managers' creative problem-solving abilities can shed light on the relationship between AI/GPT tool proficiency and intrinsic drive for their careers (Budhwar et al., 2023). The emphasis on self-efficacy and social learning in Social Cognitive Theory can justify the link between AI/GPT tools and technological proficiency, workplace innovation, and career calling. As managers' technological competency with AI/GPT tools improves, they may gain more self-efficacy in creative work, leading to a stronger feeling of professional calling via improved intrinsic motivation, as highlighted by Social Cognitive Theory (Kanval, Ihsan, Irum, & Ambreen, 2024; Shaikh et al., 2023).

H6: Workplace creativity mediates the relationship between middle-level managers' AI/GPT tools technological proficiency and their career calling.

Previous research has demonstrated the importance of workplace creativity in organizational settings. Managers who are more creative in the workplace are more likely to generate innovation and adapt to changing market conditions (Malik, 2023). Furthermore, research has demonstrated that creativity is connected with job promotion and possibilities for professional development (Jam, Akhtar, Haq, Ahmad-U-Rehman, & Hijazi, 2010; Jebali & Meschitti, 2021). In order to understand how AI/GPT tools technological proficiency influences middle-level managers' career development objectives, it is necessary to investigate the mediating function of workplace creativity Malik (2023). Understanding the relationship between technical competency, workplace creativity, and career advancement goals can help organizations establish methods to encourage a creative work environment that promotes managers' professional growth and development (Yu et al., 2022). The emphasis on self-efficacy and social learning in Social Cognitive Theory can justify the link between AI/GPT tools technological competency, workplace innovation, and career development goals. As managers' technological competency with AI/GPT tools improves, they may gain greater self-efficacy in creative tasks, leading to enhanced workplace creativity (Budhwar et al., 2022). This is consistent with the Social Cognitive Theory concept of self-efficacy as a driving force of behavior and attitudes, impacting managers' career aspirations.

H7: Workplace creativity mediates the relationship between middle-level managers' AI/GPT tools technological proficiency and their career advancement aspirations.

Previous research has highlighted the significance of inclusion perception in affecting employee happiness and organizational success (Rathore et al., 2022). Managers who believe their workplace is more inclusive report better levels of job satisfaction and organizational commitment (Budhwar et al., 2023). Furthermore, research has demonstrated that an inclusive company culture interacts positively with managers' creativity and innovative thinking Malik (2023). Investigating the mediating function of workplace creativity is critical for understanding the mechanisms through which AI/GPT tool technological proficiency influences middle-level managers' perceptions of inclusion (Yu et al., 2022). Understanding this link might provide useful insights into how managers' technology skill influences their creative problem-solving abilities, ultimately impacting their perceptions of workplace inclusivity. Social Cognitive Theory provides a theoretical foundation for explaining the relationship between AI/GPT tools' technological proficiency, workplace innovation, and inclusion perception (Jaiswal et al., 2023). Individuals' thoughts and perceptions are shaped by social learning and contextual circumstances, according to Social Cognitive Theory (Shaikh et al., 2023). In this context, when managers' technological expertise with AI/GPT technologies improves, they may improve their creative problem-solving skills, leading to a more inclusive workplace view, coinciding with Social Cognitive Theory's concept of environmental impacts on beliefs and attitudes.

H8: Workplace creativity mediates the relationship between middle-level managers' AI/GPT tools technological proficiency and their inclusivity perception.
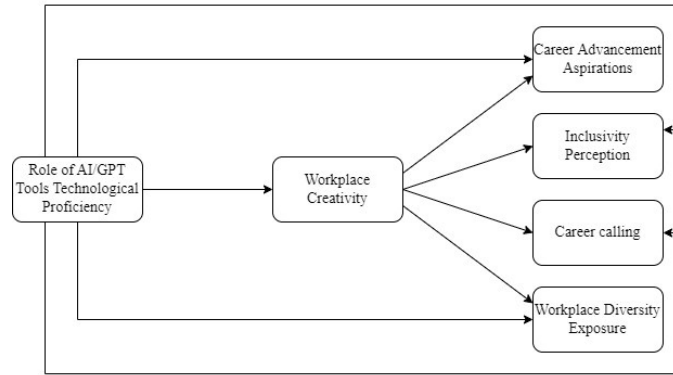
Fig. 1 *Conceptual model*

Methodology

To investigate the associations between variables, this study used a cross-sectional research approach. The analytical tool used to analyze the hypothesized correlations was partial least squares structural equation modeling (PLS-SEM). 313 middle-level administration managers from NBEAC (National Business Education Accreditation Council) recognized universities in Pakistan participated in this study. The participants were chosen because they occupied roles such as Assistants, Program Officers, Assistant Exam Controllers, and Assistant Registrars. A mixed-method approach was used to collect data. The individuals' personal contacts and references were used to recruit the sample. In addition, an online poll was conducted to collect quantitative data. The poll includes questions about technological skill with AI/GPT tools, workplace diversity exposure, career calling, career advancement aspirations, inclusivity perception, and workplace creativity. The data collection phase lasted two and a half months, and participants were encouraged to take an online survey during that time. The study sought to provide a sufficient and diversified representation of middle-level administration managers from Pakistan's NBEAC-accredited colleges.

The measurement scales used in this investigation were adapted from previous studies. The seven items scale of Swed et al. (2022) was used to measure AI/GPT tools technological competency. The scale of (Novak, Whitehead, Close, & Kaplan, 2004) with five items was used to assess workplace diversity exposure. Four items scale of career calling was employed from the study of Wen, Liu, Pang, and Chen (2022). The four-item scale of Beauregard, Basile, and Canonico (2013) was employed to measure career advancement ambitions. A twelve-item scale for inclusivity perception was adopted from the study of Şahin, Van der Toorn, Jansen, Boezeman, and Ellemers (2019). Workplace creativity was measure on five items scale of Li, Yan, Yang, and Gu (2022). In particular scales were derived from well-established and validated measures used in previous research.

Following data collection, quantitative data from survey responses were subjected to Partial Least Squares Structural Equation Modeling (PLS-SEM) using appropriate software (e.g., SmartPLS or equivalent tools). PLS-SEM is an appropriate tool for assessing complicated models and investigating correlations between latent components, making it well-suited to the research design and aims of this study. Prior to data collection, the relevant institutional review board granted ethical permission to conduct the study. This study obtained informed consent from all participants, who could withdraw at any time without penalty. This study kept participants' identities private by assigning unique identifiers and securing data. Risk evaluations and mitigation measures protected participants' well-being in this research.

Results

Table 1 shows the Cronbach's Alpha results, which assess the internal consistency reliability of the measurement scales. Cronbach's Alpha values are as follows for each variable: Workplace Creativity (0.872), Workplace Diversity Exposure (0.774), Career Advancement Aspirations (0.737), Career Calling (0.848), Inclusivity Perception (0.873), Role of AI/GPT Tools Technological Proficiency (0.879), Workplace Creativity (0.872), and Workplace Diversity Exposure (0.774). Cronbach's Alpha values indicate that most of the variables in the study have satisfactory levels of internal consistency. Cronbach's Alpha values greater than 0.7 are generally considered acceptable for research purposes, and all variables in this study meet this criterion except for Career Advancement Aspirations, which is slightly below the threshold. Nonetheless, the reliability coefficients for all variables are within an acceptable range, indicating that the measurement scales can be used to assess the respective constructs.

Table I
Cronbach's alpha

	Cronbach's Alpha
Career Advancement Aspirations	0.737
Career Calling	0.848
Inclusivity Perception	0.873
Role of AI/GPT Tools Technological Proficiency	0.879
Workplace Creativity	0.872
Workplace Diversity Exposure	0.774

These findings bolster confidence in the measurement instruments' ability to consistently capture the study's intended concepts and constructs of interest. Cronbach's Alpha values are high for Career Calling, Inclusivity Perception, and the Role of AI/GPT Tools (see figure 2). Technological Proficiency, Workplace Creativity, and Workplace Diversity Exposure all indicate that the items within each scale are highly related and consistently measure the underlying constructs. It is important to note that Cronbach's Alpha is only one measure of internal consistency; future research may look into other reliability and validity tests to strengthen the measurement instruments. Overall, the satisfactory Cronbach's Alpha values support the reliability of the data collected and provide a solid foundation for the subsequent analyses that will investigate the relationships between the variables in this study.
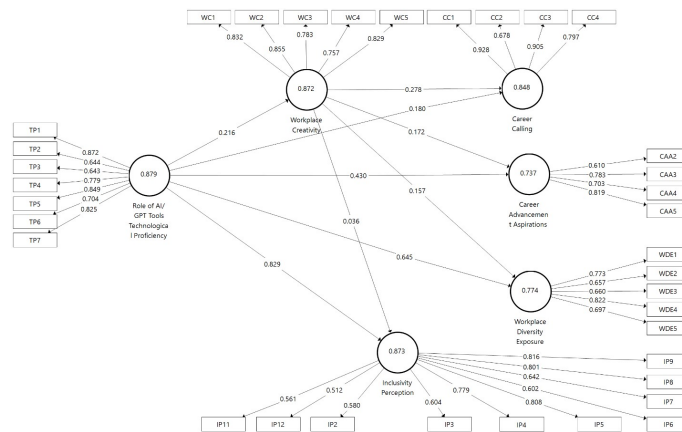

Fig. 2 *Measurement model*

The reliability and validity statistics for the measurement scales used in this study are presented in Table 2. The reliability of each factor is evaluated using Composite Reliability (CR), while the validity is evaluated using Average Variance Extracted (AVE). The Composite Reliability (CR) for the Career Advancement Aspirations factor is 0.821, indicating high internal consistency reliability. The average variance extracted (AVE) for Career Advancement Aspirations is 0.538, indicating that the underlying construct accounts for 53.8% of the variance in the observed variables. Similarly, with a Composite Reliability (CR) of 0.899, the Career Calling factor has excellent internal consistency. The Average Variance Extracted (AVE) for Career Calling is 0.694, indicating that the latent construct accounts for 69.4% of the variance in the measured items.

The Composite Reliability (CR) for the Inclusivity Perception factor is 0.893, indicating high internal consistency reliability. The average variance extracted (AVE) for Inclusivity Perception is 0.562, indicating that the latent construct accounts for 56.2% of the variance in the observed variables. The Composite Reliability (CR) for the Role of AI/GPT Tools Technological Proficiency factor is 0.907, indicating strong internal consistency. The Average Variance Extracted (AVE) for Technological Proficiency is 0.585, implying that the underlying construct accounts for 58.5% of the variance in the measured items. With a Composite Reliability (CR) of 0.906, the Workplace Creativity factor has good internal consistency. The Average Variance Extracted (AVE) for Workplace Creativity is 0.660, indicating that the latent construct accounts for 66.0% of the variance in the observed variables. Finally, with a Composite Reliability (CR) of 0.846, the Workplace Diversity Exposure factor has acceptable internal consistency. The Average Variance Extracted (AVE) for Workplace Diversity Exposure is 0.525, indicating that the underlying construct accounts for 52.5% of the variance in the measured items.

Table II
Variables reliability and validity stats

	Factor	Original Sample	Composite Reliability	Average Variance Extracted (AVE)
Career Advancement Aspirations	CAA2	0.610	0.821	0.538
	CAA3	0.783		
	CAA4	0.703		
	CAA5	0.819		
Career Calling	CC1	0.928	0.899	0.694
	CC2	0.678		
	CC3	0.905		
	CC4	0.797		
Inclusivity Perception	IP11	0.561	0.893	0.562
	IP12	0.512		
	IP2	0.580		
	IP3	0.604		
	IP4	0.779		
	IP5	0.808		
	IP6	0.602		
	IP7	0.642		
	IP8	0.801		
	IP9	0.816		
Role of AI/GPT Tools Technological Proficiency	TP1	0.872	0.907	0.585
	TP2	0.644		
	TP3	0.643		
	TP4	0.779		
	TP5	0.849		
	TP6	0.704		
	TP7	0.825		
Workplace Creativity	WC1	0.832	0.906	0.660
	WC2	0.855		
	WC3	0.783		
	WC4	0.757		
	WC5	0.829		
Workplace Diversity Exposure	WDE1	0.773	0.846	0.525
	WDE2	0.657		
	WDE3	0.660		
	WDE4	0.822		
	WDE5	0.697		

The Fornell-Larcker Criterion, which assesses the discriminant validity of the measurement scales used in the study, is shown in Table 3. The diagonal values represent the square root of the Average Variance Extracted (AVE) for each construct, whereas the off-diagonal values represent correlations between constructs. All constructs meet the discriminant validity criteria, according to the Fornell-Larcker Criterion results. Each construct's square root of the AVE (diagonal values) is greater than the correlations between that construct and other constructs (off-diagonal values). Career Advancement Aspirations, for example, has a square root of 0.733, and its correlations with other constructs (Career Calling: 0.324, Inclusivity Perception: 0.660, Role of AI/GPT Tools Technological Proficiency: 0.467, Workplace Creativity: 0.265, and Workplace Diversity Exposure: 0.576) are lower than its AVE value. This implies that Career Advancement Aspirations is distinct from the other constructs, lending credence to its discriminant validity. Similarly, Career Calling has discriminant validity because its square root of AVE (0.833) is greater than its correlations with the other constructs (Inclusivity Perception: 0.323, Role of AI/GPT Tools Technological Proficiency: 0.240, Workplace Creativity: 0.317, and Workplace Diversity Exposure: 0.382). Perception of Inclusivity, and the Role of AI/GPT Tools Technological Proficiency, Workplace Creativity, and Workplace Diversity Exposure also meet the discriminant validity criteria, as their AVE values (diagonal values) exceed their correlations with other constructs (off-diagonal values). The confirmation of discriminant validity indicates that the measurement scales measure distinct constructs and are not highly correlated with one another, lowering the possibility of multicollinearity. These findings support the validity of the measurement instruments used in this study by providing confidence in the distinctness of the variables.

Table III
Fornell-Larcker Criterion

	1	2	3	4	5	6
Career Advancement Aspirations	0.733					
Career Calling	0.324	0.833				
Inclusivity Perception	0.660	0.323	0.680			
Role of AI/GPT Tools Technological Proficiency	0.467	0.240	0.837	0.765		
Workplace Creativity	0.265	0.317	0.214	0.216	0.812	
Workplace Diversity Exposure	0.576	0.382	0.656	0.678	0.296	0.725

Table 4 shows the results of the Heterotrait-Monotrait (HTMT) criterion, which compares the correlations between different constructs to assess the discriminant validity of measurement scales. To establish discriminant validity, the HTMT values represent the correlations between constructs, and the criterion recommends that these values be less than 0.85. When the HTMT values are examined, all constructs meet the recommended discriminant validity criterion, as all values are less than 0.85. The HTMT value between Career Calling and Inclusivity Perception, for example, is 0.387, which is lower than the recommended threshold. Likewise, the HTMT value between Inclusivity Perception and Role of AI/GPT Tools Technological Proficiency is 0.279, which also meets the discriminant validity criterion.

Furthermore, all other construct pairs, such as Career Advancement Aspirations and Career Calling, Role of AI/GPT Tools Technological Proficiency and Workplace Creativity, and Workplace Diversity Exposure and Career Advancement Aspirations, have HTMT values that are significantly lower than the recommended threshold of 0.85, confirming the discriminant validity of these measurement scales. The HTMT criterion results provide additional support for the study's construct distinctiveness, indicating that the measurement scales effectively capture different aspects of the intended constructs. The establishment of discriminant validity improves the robustness of the study's measurement model and the credibility of the results obtained from subsequent analyses exploring the relationships between the variables.

Table IV
HTMT Criterion

	1	2	3	4	5	6
Career Advancement Aspirations						
Career Calling	0.444					
Inclusivity Perception	0.848	0.387				
Role of AI/GPT Tools Technological Proficiency	0.491	0.279	0.885			
Workplace Creativity	0.309	0.344	0.234	0.241		
Workplace Diversity Exposure	0.691	0.473	0.740	0.805	0.357	

Table 5 displays the R-squared values, indicating the variance explained by independent variables in the study. For Career Advancement Aspirations, the R-Square value is 0.246, signifying 24.6% variance. Career Calling has an R-Square value of 0.131, explaining 13.1% variance. Inclusivity Perception has an R-Square value of 0.701, accounting for 70.1% variance. Workplace Creativity has an R-Square value of 0.046, representing 4.6% variance. Workplace Diversity Exposure has an R-Square value of 0.484, explaining 48.4% variance. The findings highlight the significance of AI/GPT Tools Technological Proficiency and other relevant factors in influencing Career Advancement Aspirations, Career Calling, Inclusivity Perception, Workplace Creativity, and Workplace Diversity Exposure among middle-level administration managers in Pakistani NBEAC-accredited universities.

Table V
R-square values

	R Square
Career Advancement Aspirations	0.246
Career Calling	0.131
Inclusivity Perception	0.701
Workplace Creativity	0.046
Workplace Diversity Exposure	0.484

Table 6 presents the F-Square values, indicating the strength of correlations between independent factors and dependent variables in the study. For Career Advancement Aspirations, the Role of AI/GPT Tools Technological Proficiency and Workplace Creativity have statistically significant relationships with F-Square values of 0.234 and 0.037, respectively. Similarly, for Career Calling, the Role of AI/GPT Tools Technological Proficiency and Workplace Creativity are significant predictors with F-Square values of 0.035 and 0.085. Inclusivity

Perception shows significant relationships with both Role of AI/GPT Tools Technological Proficiency (F-Square value of 2.194) and Workplace Creativity (F-Square value of 0.004). Workplace Creativity significantly predicts itself with an F-Square value of 0.046. Additionally, both Role of AI/GPT Tools Technological Proficiency and Workplace Creativity significantly predict Workplace Diversity Exposure, with F-Square values of 0.768 and 0.046, respectively. These significant findings highlight the importance of Technological Proficiency of AI/GPT Tools and Workplace Creativity as predictors of Career Advancement Aspirations, Career Calling, Inclusivity Perception, and Workplace Diversity Exposure among middle-level administration managers in Pakistani NBEAC-accredited universities. This study contributes valuable insights into the impact of AI/GPT tools, technological proficiency, and workplace creativity on career-related and inclusive perceptions.

Table VI
F-Square Values

	Career Advancement Aspirations	Career Calling	Inclusivity Perception	Workplace Creativity	Workplace Diversity Exposure
Role of AI/GPT Tools Technological Proficiency	0.234	0.035	2.194	0.049	0.768
Workplace Creativity	0.037	0.085	0.004		0.046

The research model has a moderate level of predictive relevance (Q2 predict = 0.540), indicating that it can reasonably predict the dependent variables, according to Table 7. The model is also accurate, with low RMSE (0.069) and MAE (0.092) values indicating small average prediction errors. Overall, the model represents the relationships between the variables reasonably well and predicts the outcomes of the dependent variables with acceptable precision.

Table VII
Model fitness

Q^2 predict	RMSE	MAE
0.540	0.069	0.092

Table 8 displays the path analysis results, which show the relationships between the independent variable, Middle-level managers' AI/GPT tool technological proficiency, and the dependent variables, which are Workplace Diversity Exposure, Career Calling, Career Advancement Aspirations, and Inclusivity Perception. The hypotheses H1, H2, H3, and H4, which investigate the direct influence of AI/GPT tools technological proficiency on Workplace Diversity Exposure, Career Calling, Career Advancement Aspirations, and Inclusivity Perception, yielded statistically significant results (p 0.05). These hypotheses' T statistics were 9.653, 2.172, 5.264, and 16.641, indicating strong and significant relationships. Hypothesis H5, which proposes that Workplace Creativity mediates the relationship between AI/GPT tools technological proficiency and Workplace Diversity Exposure, also produced a significant result (p 0.05) with a T statistic of 2.149, indicating that Workplace Creativity plays a mediating role. Similarly, Hypothesis H6, which looked at the role of Workplace Creativity in mediating the relationship between AI/GPT tool technological proficiency and Career Calling, produced a statistically significant result (p 0.05) with a T statistic of 2.440.

Table VIII
Path Analysis

	Original Sample	Standard Deviation	T Statistics	P Values
H1	0.645	0.067	9.653	0.000
H2	0.180	0.083	2.172	0.015
H3	0.430	0.082	5.264	0.000
H4	0.829	0.050	16.641	0.000
H5	0.034	0.016	2.149	0.016
H6	0.060	0.025	2.440	0.008
H7	0.037	0.021	1.727	0.042
H8	0.008	0.012	0.670	0.252

With a T statistic of 1.727, the result of Hypothesis H7, which examines the mediating role of Workplace Creativity between AI/GPT tools technological proficiency and Career Advancement Aspirations, was statistically significant (p 0.05). However, with a T statistic of 0.670, Hypothesis H8, which proposes the mediating effect of Workplace Creativity on the relationship between AI/GPT tools technological proficiency and Inclusivity Perception, did not produce a statistically significant result (p > 0.05). In summary, the path analysis shows that

Middle-level managers' technological proficiency with AI/GPT tools has a significant influence on Workplace Diversity Exposure, Career Calling, Career Advancement Aspirations, and Inclusivity Perception (see figure 3). Furthermore, Workplace Creativity is an important mediator between AI/GPT tool technological proficiency and Workplace Diversity Exposure, Career Calling, and Career Advancement Aspirations, but not for Inclusivity Perception. These findings shed light on the complex relationships that exist between AI/GPT tools, technological proficiency, workplace creativity, and various career-related perceptions among middle-level administration managers at NBEAC-accredited universities in Pakistan.
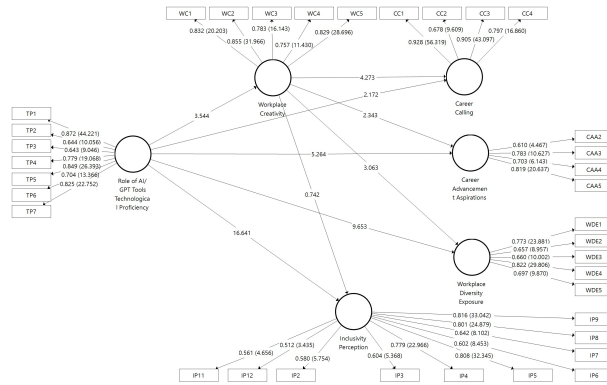

Fig. 3 *Structural model*

Discussion

The purpose of this study was to look into the relationships between Middle-level managers' technological proficiency with AI/GPT tools and their workplace diversity exposure, career calling, career advancement aspirations, and inclusivity perception. The study also looked into the role of workplace creativity in mediating these relationships. The path analysis findings shed light on the complex dynamics between the variables, providing valuable insights into the implications for middle-level administration managers in NBEAC-accredited universities in Pakistan.

The path analysis revealed that the technological proficiency of Middle-level managers in AI/GPT tools has significant and positive influences on workplace diversity exposure, career calling, career advancement aspirations, and inclusivity perception. These results are in line with earlier studies that have demonstrated the positive effects of technology competence on a variety of employment situations for employees. According to earlier studies Shaikh et al. (2023), individuals with better technological skill are more likely to adopt and apply modern technological tools, increasing workplace diversity exposure. The current study supports these findings by demonstrating that middle-level managers with greater technological proficiency in AI/GPT tools have more exposure to diverse workplace settings, fostering an inclusive and diverse work environment. Furthermore, the positive impact of AI/GPT tools technological proficiency on career calling and career advancement aspirations aligns with research highlighting the importance of digital skills and adaptability in enhancing individuals' career aspirations and growth prospects (Budhwar et al., 2023; Setyowati, Adi, Suryawati, Parwiyanto, & Prakoso, 2024). Middle-level managers with higher technological proficiency are more likely to envision promising career paths and seek opportunities for advancement, owing to their ability to effectively navigate the technological landscape. The relationship between AI/GPT tool technological proficiency and inclusivity perception is consistent with studies that investigate the relationship between technology and workplace inclusivity (Trautman et al., 2023). Because of their improved ability to collaborate and communicate effectively with diverse teams, middle-level managers with greater technological proficiency may perceive the workplace as more inclusive.

The study also looked into the role of workplace creativity as a mediator in the relationships between AI/GPT tools technological proficiency and the dependent variables. The findings show that workplace creativity mediates the relationships between AI/GPT tool technological proficiency and workplace diversity exposure, career calling, and career advancement aspirations. However, it does not serve as a bridge between the technological proficiency of AI/GPT tools and the perception of inclusivity. The role of workplace creativity as a moderator in the relationship between AI/GPT tool technological proficiency and workplace diversity exposure is consistent with previous research that emphasizes the role of creativity in promoting a diverse and innovative work environment (Haluza & Jungwirth, 2023). Middle-level managers with advanced technological skills may be more creative in their work, contributing to a more inclusive and diverse organizational culture.

Similarly, studies that highlight the importance of creativity in shaping individuals' career aspirations and sense of purpose (Sujatha et al., 2023) support the mediating effect of workplace creativity on the relationship between AI/GPT tools technological proficiency and career calling. Middle-level managers who use their technological expertise to investigate creative solutions are more likely to align their

career paths with their passions and interests, resulting in a stronger sense of career calling. Previous research emphasizing creativity as a driver of career growth and advancement (Haluza & Jungwirth, 2023) is supported by the mediation of workplace creativity in the relationship between AI/GPT tools technological proficiency and career advancement aspirations. Middle-level managers who use their technological expertise to generate novel ideas and solutions may demonstrate a proactive approach to career development, leading to higher aspirations for advancement. The findings of this study are consistent with previous research on the positive relationships between AI/GPT tool technological proficiency and a variety of career-related outcomes. Furthermore, the mediating role of workplace creativity sheds new light on the underlying mechanisms that link technological proficiency to exposure to workplace diversity, career calling, and career advancement aspirations. While the current study adds to the body of knowledge on the subject, it also provides new perspectives by focusing on the specific role of workplace creativity as a mediator.

Finally, this study emphasizes the importance of AI/GPT tools' technological proficiency in shaping the workplace experiences and perceptions of middle-level managers. The positive direct influences on workplace diversity exposure, career calling, career advancement aspirations, and inclusivity perception highlight the importance of improving organizational technological proficiency. Furthermore, the role of workplace creativity as a moderator reveals potential pathways through which technological proficiency can influence career-related perceptions. These findings have important implications for organizations that want to foster inclusive and creative workplaces while leveraging technology and empowering middle-level administration managers.

Conclusion

In conclusion, this study revealed the critical role of Middle-level managers' technological proficiency with AI/GPT tools in shaping their workplace experiences and career-related perceptions at NBEAC-accredited universities in Pakistan. The study found that among middle-level managers, technological proficiency has a significant and positive influence on workplace diversity exposure, career calling, career advancement aspirations, and inclusivity perception. Furthermore, workplace creativity emerged as a significant mediator in the relationships between technological proficiency and exposure to workplace diversity, career calling, and career advancement aspirations. These findings highlight the importance of fostering technological proficiency and encouraging workplace creativity in order to improve career outcomes and foster inclusive and innovative work environments. The findings of this study add to the body of knowledge and have important implications for organizations looking to empower their middle-level managers and create thriving and diverse workplaces.

Implications of the study

By investigating the impact of Middle-level managers' AI/GPT tools technological proficiency, this study adds to the existing literature on employment relations, technology, and career-related perceptions. The study adds to the theoretical understanding of the relationship between technological proficiency and career outcomes by looking at how it affects workplace diversity exposure, career calling, career advancement aspirations, and inclusivity perception. Furthermore, by investigating the mediating role of workplace creativity, this study adds to our understanding of the mechanisms that influence career-related perceptions. The findings contribute to the advancement of social cognitive theory and organizational behavior literature by providing valuable insights into the complex interplay between technology, creativity, and career experiences.

This research has two practical implications. To begin, organizations and educational institutions can recognize the importance of improving Middle-level managers' technological proficiency with AI/GPT tools. To capitalize on the benefits of technology and its positive impact on workplace diversity exposure, career calling, career advancement aspirations, and inclusivity perception, training and development programs aimed at equipping middle-level managers with advanced technological skills can be implemented. Second, encouraging a creative work environment can be prioritized in order to take advantage of the mediating effect of workplace creativity on the relationship between technological proficiency and career-related perceptions. Organizations can cultivate a culture that promotes innovation, idea generation, and creative problem-solving, resulting in better career outcomes and a more inclusive workplace for middle-level managers. Organizations can optimize their human resources and drive long-term success in the changing landscape of modern workplaces by incorporating these practical implications.

Conflicts of Interest

The authors declare that they have no conflicts of interest, financial or otherwise, related to the research presented in this manuscript. No relevant financial or non-financial interests are disclosed.

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