Research on the Nonlinear Influence of Artificial Intelligence on Employee Development in Manufacturing Enterprise

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Abstract. Artificial intelligence not only promotes the high-quality development of the manufacturing industry but also intensifies the job substitution effect. To explore the nonlinear impact of artificial intelligence on the job performance of manufacturing employees, a conceptual model of artificial intelligence on the job performance of manufacturing employees was constructed with perceived organizational support as the moderating variable. 311 employees were surveyed and SPSS22.0 was used for statistical analysis. The results show that: 1) artificial intelligence has an "inverted U-shaped" non-linear effect on both growth need strength and job performance; 2) growth need strength plays a partial mediating role between artificial intelligence and job performance; 3) perceived organizational support positively moderates the positive relationship between growth need strength and job performance. The research conclusion has practical guiding significance for manufacturing enterprises to reasonably improve employee performance.

Keywords: artificial intelligence · job performance · nonlinear influence

1 Introduction

Artificial intelligence and other new-generation information technologies promote the high-quality development of the manufacturing industry, but also accelerate the process of robot generation, and the total employment, employment structure, and employment quality will be impacted [22]. The application of artificial intelligence will change the boundary of work, occupation, and organization, and may affect the occupational pattern of employees [2], change the arrangement and distribution of resources within an organization, disrupt the relationship between individuals and organizations, and change the human-organization matching pattern [23]. Existing studies show that the impact of artificial intelligence technology on total employment mainly focuses on the employment substitution effect of artificial intelligence technology and the employment creation effect [8, 11]. The substitution effect emphasizes that artificial intelligence reduces the proportion of low-skilled employment in manufacturing enterprises through time effect and marginal output effect [22], while the creation effect emphasizes that artificial intelligence promotes the total employment in manufacturing by improving productivity and

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increasing the supply of high-skilled labour. And the productivity effect of creating new work tasks [9]. In the context that artificial intelligence replaces middle and low-end skilled positions [24] and creates high-end skilled positions [1], the application of artificial intelligence has a huge impact on the job performance of employees in middle and low-end skilled positions in manufacturing enterprises.

Through literature review, studies on the impact of artificial intelligence application mainly focus on the macro industry and enterprise-level, while the micro-level of the impact of artificial intelligence on the work performance of employees in manufacturing enterprises is rarely mentioned. Job performance is the employees within the enterprise's working behaviour and working results of the two comprehensive, investigate the influence mechanism of artificial intelligence of employees work performance is very important, high-performance employees can better adapt to the impact on jobs, artificial intelligence low-performance employees may face are replaced with artificial intelligence. This study from the perspective of the development of artificial intelligence to the manufacturing enterprise employee influence, the artificial intelligence, the strength of growing demand, job performance into a theory model, the thorough analysis of artificial intelligence, non-linear relation between the growth need strength and work performance, and perceived organizational support was studied between growth need strength and job performance. On this basis, the research hypothesis is proposed, and the questionnaire data is used to empirically test the relationship between artificial intelligence, growth need strength, perceived organizational support, and job performance, to provide theoretical reference and practical guidance for employees in manufacturing enterprises to improve job performance.

2 Theoretical Basis and Research Hypothesis

2.1 Artificial Intelligence and Job Performance

Brougham proposed the extent to which employees expect the new generation of artificial intelligence technologies such as intelligent technology, artificial intelligence, robots, and algorithms to change some workplaces and jobs in the future, namely artificial intelligence awareness. Artificial intelligence awareness refers to the awareness that artificial intelligence machines such as robots and algorithm-management may replace existing jobs in the future, which reflects the uncertain situation harmful to employees [4]. Artificial intelligence awareness is a measure that captures the extent to which employees believe that their job security and occupation or industry may be replaced by technologies such as artificial intelligence and automation [5]. Artificial intelligence awareness brings work pressure to employees and leads to job insecurity [13], which reduces their job-related self-efficacy and career-related self-management. However, there is a negative relationship between job insecurity and employee job performance [20]. According to the resource conservation theory, individuals on their resources to save, when employees perceive their rich resources are threatened, personal response to the pressure of environmental change will translate into job insecurity, actively take action to save resources, to achieve the value of the future resources. When employees perceive artificial intelligence application substitution effect may bring their jobs, possible losses on their resource insecurities will try to change to avoid their work was

replaced with the artificial intelligence, and improve their professional ability to adapt to the new job skill requirements [21].

Job performance is a comprehensive standard to measure employees' work behaviour and results, including task performance, relationship performance, learning performance, and innovation performance [10]. When the employees of manufacturing enterprises realize that the substitution effect of artificial intelligence on employment brings about the reduction of middle and low labour positions [24], and the increase of high-end labour positions, the skill requirements of new positions brought by the productivity effect do not match their existing skills [1], employees' salary and job opportunities will decrease accordingly, and they may even lose their jobs. When employees realize this unfavourable working environment, they will eliminate the work pressure brought by artificial intelligence through learning to realize their long-term employability [6]. Learning will have a positive impact on learning performance, and relationship performance and innovation performance will be further improved with the improvement of learning performance. Therefore, the overall work performance of employees will have positive changes [12].

When the primary stage of artificial intelligence application in the manufacturing industry, use the density of artificial intelligence and intelligent degree is still relatively low, artificial intelligence application of adverse impact on employee job performance at this stage with the ascension of the artificial intelligence to use density increased, so the employee individual resources in learning can deal with to post the substitution effect of artificial intelligence, The effect of artificial intelligence on employee performance is mainly positive. On the contrary, when artificial intelligence has a high degree of intelligence and use density and artificial intelligence with high learning level is used as the main body, the learning ability of artificial intelligence is better than the learning ability of employees, and the resource investment of employees in learning cannot cope with the substitution effect brought by artificial intelligence. Therefore, the impact of artificial intelligence applications on employee performance will be mainly negative after that. Based on this, the following hypotheses are proposed in this paper:

H1: There is an inverted U-shaped relationship between artificial intelligence and employee performance.

2.2 Artificial Intelligence and Growth Need Strength

Growth needs strength refers to the importance individuals attach to personal growth and career development opportunities at work and their inner psychological needs for vocational ability development [17]. Facing the same job, the intensity of growth needs of employees will be different. Individuals with high growth need strength will seek to learn at work, tend to exercise autonomy, and actively seek challenging work to improve themselves [3]. Individuals with low growth need strength are content with the status quo, do not like challenges, and ignore career growth opportunities [19].

Artificial intelligence brings anxiety and work pressure to employees, and even leads to resignation intention and a sense of insecurity about their jobs [13], and the employee's job performance is negatively affected by job insecurity [20]. Growth learning can negatively affect the impact of artificial intelligence on job insecurity [14]. According to the resource conservation theory, employees will not give up saving their jobs due to the substitution effect brought by artificial intelligence, but will actively take action to update their knowledge and job skills to cope with the loss of work resources. In the context of artificial intelligence replacing middle and low-end skill posts [25] and creating high-end skill posts [1], employees update their knowledge and job skills through their growth and learning, which is a direct manifestation of growth need strength [21]. In the initial stage of artificial intelligence application, employees with high growth need strength can cope with the replacement effect of artificial intelligence on positions, and artificial intelligence plays a positive role in employee growth demand intensity. On the contrary, when the learning ability of artificial intelligence is superior to the learning ability of employees, artificial intelligence harms the growth need strength of employees. Based on this, the following hypotheses are proposed in this paper:

H2: There is an inverted U-shaped relationship between artificial intelligence and the growing need strength of employees.

2.3 The Mediating Effect of Growth Need Strength

According to the theory of resource conservation, when employees perceive the loss of their work resources, growth and learning is the intuitive performance of resource conservation. Growth need strength is an important means for employees to learn new knowledge and improve job skills to cope with the impact of artificial intelligence on the employment environment [19]. Artificial intelligence replaces middle and low-end skill positions [24], causing employment skill polarization and exacerbating the income gap [2], and employees will show different degrees of growth need strength [25]. Employees with high growth need strength actively find opportunities at work, relationship performance, learning performance, and innovation performance will improve with the increase of growth need strength [16], which has a positive effect on the overall work performance of employees [12]. According to self-determination theory, individual autonomous motivation guides employees to engage in the trend beneficial to their career development, and growth needs strength can cope with the job insecurity caused by the application of artificial intelligence [21]. Moreover, the intensity of growth need has a positive effect on employee relationship performance and task performance. Therefore, when employees perceive the job insecurity brought by artificial intelligence, individual autonomy motivation will enhance their growth needs, that is, to cope with the pressure brought by the job insecurity through growth and learning [14], to cope with the change of the impact of artificial intelligence on employees' job performance. Based on this, the following hypotheses are proposed in this paper:

H3: Growth need strength plays a mediating role in the inverted U-shaped relationship between artificial intelligence and job performance.

Growth needs strength refers to the importance individuals attach to personal growth and career development opportunities at work and their inner psychological needs for career development [17]. According to self-determination theory, individuals with high growth need strength will seek learning at work and tend to exercise autonomy, preferring more stimulating and challenging jobs, thus showing a learning tendency [3]. It emphasizes the development and improvement of knowledge, skills, and abilities [19]. Innovation performance will be improved with the emergence of learning behaviour [16]. In addition, employee relationship performance and task performance also increase with the increase of growth need strength. Based on this, the following hypotheses are proposed in this paper:

H4: There is a positive relationship between growth need strength and job performance.

2.4 The Moderating Role of Perceived Organizational Support

The sense of organizational support means that the support provided by the organization to the employees can be perceived by the employees. Employees' beliefs depend on how much their organization trusts them, recognizes their contributions, and cares about their welfare in assessing their perceived organizational support [18]. Perceived organizational support ensures that when employees face job insecurity caused by the application of artificial intelligence, the organization provides support and the resources needed. Therefore, by providing employees with a supportive work environment, manageable workload, and increased autonomy, Perceived organizational support can help anticipate and mitigate the negative consequences of the application of artificial intelligence and robots in the workplace by improving the overall well-being and overall job satisfaction of employees [11]. Perceived organizational support has become a help employees significantly reduce stress levels and regain control of one of the first strategies of work-life balance, a high level of perceived organizational support includes fairness, training, independent and good working conditions, such as reward, which can reduce the employee's job insecurity [7], and help them get higher strength on the growth of need, To improve employee performance [25]. Based on this, the following hypotheses are proposed in this paper:

H5: Perceived organizational support positively moderates the relationship between growth need strength and job performance.

To sum up, the research conceptual model of artificial intelligence influencing work performance constructed in this paper is shown in Fig. 1.

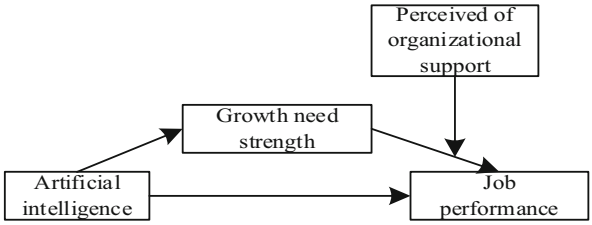

Fig. 1. Research conceptual model.

3 Study Design

3.1 The Sample

This study collects data through questionnaires, mainly selects intelligent manufacturing enterprises, and the research objects are mainly from the middle and low-end skilled talents in intelligent manufacturing in Hebei, Heilongjiang, Guangdong, Shandong, Shaanxi, and other regions, involving mainly machinery, chemical, electronics, instruments, textiles, and other subsectors. For the neighbouring provinces of Shaanxi, field research was used, while for the distant provinces of Hebei and Guangdong, data were collected through WeChat, mail, and other network methods. A total of 420 questionnaires were sent out and 370 were collected, of which 311 were effective, with an effective rate of 84.1%.

3.2 Variable Measurement

In this study, the scale was developed based on papers published in core journals at home and abroad and was translated and revised based on the background of Intelligent manufacturing enterprises in China. All variables were evaluated by Likert 5-level scales, ranging from strongly disagree to strongly agree. Artificial intelligence: The artificial intelligence consciousness scale developed by Brougham and Haar was used for measurement, including 4 items, and the scale α coefficient was 0.885. Growth needs strength: The growth need strength scale prepared by Hackman was used for measurement, including 6 items, and the α coefficient of the scale was 0.895. Work performance: The work performance scale prepared by Han Yi was adopted, including 9 items, and the scale α coefficient was 0.928. Perceived organizational support: The perceived organizational support scale developed by Eisenberger was used to measure the perceived organizational support scale, including 6 items, and the scale α coefficient was 0.899.

4 The Empirical Analysis

4.1 Common Method Deviation Test

In this study, the Harman single-factor test was used for the common method deviation test. The results showed that there were 4 factors with eigenvalues greater than 1, and the variance explained by the first principal factor was 37.04%, which was less than the recommended value of 50%. Therefore, this study does not have a serious impact on common method bias.

Table 1. Correlation analysis

	Average	Standard deviation	Artificial intelligence	Growth need strength	Job performance	Perceived organizational support
Artificial intelligence	2.624	1.111	1			
Growth need strength	4.006	0.779	0.426**	1		
Job performance	4.008	0.755	0.361**	0.524**	1	
Perceived organizational support	4.017	0.824	0.122*	0.257**	0.427**	1

Note: *, $p < 0.05$; **, $p < 0.01$; ***, $p < 0.001$

4.2 Reliability and Validity Analysis

In this study, SPSS22.0 was used to test the reliability and validity of each variable. In terms of reliability, Cronbach's Alpha of each variable is greater than the standard of 0.7, indicating that each variable has good internal consistency. In terms of validity, factor loads of each measurement item were all greater than 0.6, and items of each variable fell on different factors, indicating that the scale had good structural validity.

4.3 Correlation Analysis

The mean value, standard deviation, and Pearson correlation coefficient of all variables in this study are shown in Table 1. Artificial intelligence is significantly positively correlated with growth demand intensity ($r = 0.426$, $P < 0.01$), artificial intelligence was positively correlated with job performance ($r = 0.361$, $P < 0.01$), there was a significant positive correlation between growth need strength and job performance ($r = 0.524$, $P < 0.01$), which provides a preliminary basis for studying the hypothetical relationship between variables.

4.4 Regression Analysis

4.4.1 Regression Analysis of Artificial Intelligence on Growth Demand Intensity

This study takes artificial intelligence and the square term of artificial intelligence as independent variables and growth need strength as dependent variables. SPSS22.0 is used for analysis and Table 2 is obtained.

According to Model 2 in Table 2, the growth need strength of artificial intelligence ($\beta = 0.598$, $P < 0.001$), the square term of artificial intelligence has a significant positive effect on the growth need strength ($\beta = -0.288$, $P < 0.001$) has a significant negative effect, indicating that the relationship between artificial intelligence and growth need strength is inverted U-shaped, which increases first and then decreases.

Table 2. Regression analysis of artificial intelligence on growth need strength

Variable	Growth need strength	
	Model 1	Model 2
Control variables		
Gender	−0.037	−0.059
Age	−0.139*	−0.085
Record of formal schooling	0.134*	0.180**
Working a fixed number of year	0.182*	0.103
The independent variables		
Artificial intelligence		0.598***
Artificial intelligence squared term		−0.288***
R^2	0.067	0.291
R^2 change	0.067	0.225
F	3.102**	13.752***

Note: *, $p < 0.05$; **, $p < 0.01$; ***, $p < 0.001$

Table 3. Regression analysis of artificial intelligence on job performance

Variable	Job performance	
	Model 3	Model 4
Control variables		
Gender	−0.055	−0.074
Age	−0.251***	−0.205**
Record of formal schooling	0.108	0.146**
Working a fixed number of year	0.286***	0.220**
The independent variables		
Artificial intelligence		0.511***
Artificial intelligence squared term		−0.269***
R^2	0.093	0.255
R^2 change	0.093	0.162
F	4.465***	11.468***

Note: *, $p < 0.05$; **, $p < 0.01$; ***, $p < 0.001$

4.4.2 Regression Analysis of Artificial Intelligence on Job Performance

This study takes artificial intelligence and the square term of artificial intelligence as independent variables and job performance as dependent variables and uses SPSS22.0 for analysis, which is shown in Table 3.

Table 4. Regression analysis of growth demand intensity to work performance

Variable	Job performance	
	Model 5	Model 6
Control variables		
Gender	−0.055	−0.037
Age	−0.251***	−0.183**
Record of formal schooling	0.108	0.043
Working a fixed number of year	0.286***	0.197**
Intervening variable		
Growth need strength		0.486***
R^2	0.093	0.314
R^2 change	0.093	0.22
F	4.465***	17.254***

Note: *, $p < 0.05$; **, $p < 0.01$; ***, $p < 0.001$

It can be seen from Model 4 in Table 3 that artificial intelligence influences job performance ($\beta = 0.511$, $P < 0.001$), the square term of artificial intelligence had a significant positive effect on job performance ($\beta = -0.269$, $P < 0.001$) has a significant negative effect, indicating that the relationship between artificial intelligence and employee job performance is inverted U-shaped, which increases first and then decreases.

4.4.3 Regression Analysis of Growth Demand Intensity to Work Performance

As for the impact of growth need strength on job performance, this study takes growth need strength as an independent variable and job performance as the dependent variable, and uses SPSS22.0 to analyze and obtain in Table 4.

According to Model 6 in Table 4, the relationship between growth needs strength and job performance ($\beta = 0.486$, $P < 0.001$) had a significant positive effect. So let's assume that H4 is true.

4.5 Mediation Effect Test

This study mainly adopts the mediation effect test method proposed by Wen Zhonglin et al. (2004). Artificial intelligence and the square term of artificial intelligence are taken as independent variables, growth need strength as an intermediary variable, and job performance as the dependent variable. SPSS22.0 is used for analysis and Table 5 is obtained.

According to Model 7 in Table 5, artificial intelligence has a significant positive effect on growth need strength ($\beta = 0.598$, $P < 0.001$), and the square term of artificial intelligence has a significant negative effect on growth need strength ($\beta = -0.288$, $P < 0.001$), indicating that there is an inverted U-shaped relationship between artificial

Table 5. Test of mediating effect of growth demand intensity

Variable	Growth need strength	Job performance	Job performance
	Model 7	Model 8	Model 9
Control variables			
Gender	−0.059	−0.074	−0.052
Age	−0.085	−0.205**	−0.173**
Record of formal schooling	0.180**	0.146**	0.079
Working a fixed number of year	0.103	0.22**	0.181**
The independent variables			
Artificial intelligence	0.598***	0.511***	0.289***
Artificial intelligence squared term	−0.288***	0.269***	−0.162**
Intervening variable			
Growth need strength			0.371***
R^2	0.291	0.255	0.353
R^2 change	0.270	0.233	0.331
F	13.752***	11.468***	16.362***

Note: *, $p < 0.05$; **, $p < 0.01$; ***, $p < 0.001$

intelligence and growth need strength. According to model 8, artificial intelligence has a significant positive effect on job performance ($\beta = 0.511$, $P < 0.001$), and the square term of artificial intelligence has a significant negative effect on job performance ($\beta = -0.269$, $P < 0.001$), indicating that there is an inverted U-shaped relationship between artificial intelligence and job performance. In model 9, after the addition of the mediating variable growth needs strength, the influence of the square term of artificial intelligence on job performance is significantly reduced but still significant ($\beta = -0.162$, $P < 0.01$), while the influence of growth needs strength on job performance is significant ($\beta = 0.371$, $P < 0.001$). Therefore, growth need strength plays a partially mediating role in the relationship between artificial intelligence and job performance, and H3 is assumed to be true.

4.6 Test of Moderating Effect

In this study, SPSS22.0 was used for hierarchical regression analysis, with growth need strength as the mediating variable and perceived organizational support as the moderating variable, to explore the impact of the interaction term between growth need strength and perceived organizational support on job performance, which was obtained in Table 6.

It can be seen from Table 6 that the adjusted R^2 value of Model 13 (0.425) is greater than that of Model 12 (0.400), indicating that the regression results are good and the overall explanatory degree of the model is improved. R^2 was 0.025, indicating

Table 6. Test of the moderating effect of organizational support

Variable	Job performance			
	Model 10	Model 11	Model 12	Model 13
Control variables				
Gender	−0.055	−0.037	−0.03	−0.034
Age	−0.251***	−0.183**	−0.162**	−0.145**
Record of formal schooling	0.108	0.043	0.015	0.005
Working a fixed number of year	0.286***	0.197**	0.203***	0.183**
Intervening variable				
Growth need strength		0.486***	0.412***	0.466***
Adjust the variable				
Perceived organizational support			0.307***	0.349***
Interactive variables				
GNS*POS				0.175***
R^2	0.093	0.314	0.400	0.425
R^2 change	0.093	0.220	0.086	0.025
F	4.465***	17.254***	22.305***	22.144***

Note: *, $p < 0.05$; **, $p < 0.01$; ***, $p < 0.001$

that the interaction term between growth needs strength and perceived organizational support was significantly correlated with job performance ($\beta = 0.175$, $P < 0.001$), indicating that perceived organizational support had a significant moderating effect on the relationship between growth need strength and job performance. Meanwhile, it can be seen from Model 13 that when the interaction term of growth need strength and perceived organizational support is added, the β value of growth demand intensity is significant at $P < 0.001$, and the β value of 0.466 is significantly higher than the β value of Model 12, indicating that perceived organizational support positively moderates the relationship between growth need strength and job performance, assuming that H5 is true.

5 Conclusion

5.1 Research Conclusions

From the perspective of resource conservation theory and self-determination theory, this study constructs a conceptual model among artificial intelligence, growth need strength, and job performance. The following conclusions are drawn: (1) There is an inverted u-shaped relationship between artificial intelligence and employee growth need strength and job performance in manufacturing enterprises; (2) Growth need strength partially

mediates the relationship between artificial intelligence and job performance; (3) Perceived organizational support plays a positive moderating role in the impact of employee growth need strength.

5.2 Practical Enlightenment

(1) The government needs to attach great importance to artificial intelligence application effect on the employment market, the application of artificial intelligence will replace more mid-range skill labor, so the government to give financial support, on the one hand to the intelligent manufacturing enterprises strengthen the education and training, low-end Labour realize human-machine collaborative, at the same time also can improve the work performance guarantee employment. On the other hand, we should vigorously develop the tertiary industry and actively guide labor to flow into the tertiary industry to effectively deal with the employment impact of artificial intelligence on the traditional manufacturing industry and realize the stable development of the employment market.

(2) Enterprises should realize that the penetration of artificial intelligence and other new generation of information technology is inevitable in the future. They should design an effective organizational structure or management system to take advantage of the advantages of artificial intelligence, provide training and learning support for employees, and maximize employees' investment in learning resources. On the other hand, enterprises should guide their employees to cooperate with artificial intelligence to improve their professional ability development. Through human-machine cooperation, employees can be transferred from procedural work to work requiring subjective judgment and emotional connection, to enhance their adaptability to changing environment and lifelong learning ability.

(3) When employees are aware of the substitution effect of artificial intelligence on their positions, they should take the initiative to improve their skills. Growth and learning is effective ways to improve their skills and knowledge. Therefore, employees can improve their skills at work through learning behaviors with various support provided by the organization, to obtain more employment opportunities and maintain their usefulness and irreplaceability in the realistic environment of artificial intelligence application.

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References

1. Acemoglu D, Restrepo P (2019) Automation and new tasks: how technology displaces and reinstates labor. J Econ Perspect 33(2):3–30
2. Acemoglu D, Restrepo P (2020) The wrong kind of AI? Artificial intelligence and the future of labour demand. Camb J Reg Econ Soc 13(1):25–35
3. Zhenwu A, Quan M (2020) Employee growth demand intensity and employee creativity: an Interactive study based on leadership member exchange. J Technol Econ Manag 08:67–71
4. Brougham D, Haar J (2018) Smart technology, artificial intelligence, robotics, and algorithms (STARA): employees' perceptions of our future workplace. J Manag Organ 24(2):239–257

5. Brougham D, Haar J (2020) Technological disruption and employment: the influence on job insecurity and turnover intentions: a multi-country study. Technol Forecast Soc Chang 161:120276
6. Mingshu C, Zixuan Z (2020) The impact of job insecurity on employee creativity: a perspective based on the stress learning effect. China Human Resour Dev 37(05):33–45
7. Duke AB, Goodman JM, Treadway DC et al (2009) Perceived organizational support as a moderator of emotional labor/outcomes relationships. J Appl Soc Psychol 39(5):1013–1034
8. Frey CB, Osborne MA (2017) The future of employment: how susceptible are jobs to computerisation? Technol Forecast Soc Chang 114:254–280
9. Graetz G, Michaels G (2018) Robots at work. Rev Econ Stat 100(5):753–768
10. Han Y, Liao J, Long L (2007) Model of development and empirical study on employee job performance construct. J Manag Sci 5:62–77
11. Li L, Wang X, Bao Q The employment effect of robots: mechanism and China's experience. Manag World 201,37(09):104–119
12. Lejeune C, Beausaert S, Raemdonck I (2021) The impact on employees' job performance of exercising self-directed learning within personal development plan practice. Int J Human Resour Manag 32(5):1086–1112
13. Lingmont DNJ, Alexiou A (2020) The contingent effect of job automating technology awareness on perceived job insecurity: exploring the moderating role of organizational culture. Technol Forecast Soc Chang 161:120302
14. Liu R, Zhan Y (2020) The impact of artificial intelligence on job insecurity: a moderating role based on vocational learning capabilities. J Phys Conf Ser 1629(1):012034
15. Li JJ, Bonn MA, Ye BH (2019) Hotel employee's artificial intelligence and robotics awareness and its impact on turnover intention: the moderating roles of perceived organizational support and competitive psychological climate. Tour Manage 73:172–181
16. Mumtaz S, Parahoo SK (2019) Promoting employee innovation performance: examining the role of self-efficacy and growth need strength. Int J Prod Perform Manag
17. Oldham GR, Hackman JR (2010) Not what it was and not what it will be: the future of job design research. J Organ Behav 31(2–3):463–479
18. Rhoades L, Eisenberger R (2002) Perceived organizational support: a review of the literature. J Appl Psychol 87(4):698
19. Shalley CE, Gilson LL, Blum TC (2009) Interactive effects of growth need strength, work context, and job complexity on self-reported creative performance. Acad Manag J 52(3):489–505
20. Shin Y, Hur WM (2021) When do job-insecure employees keep performing well? The buffering roles of help and prosocial motivation in the relationship between job insecurity, work engagement, and job performance. J Bus Psychol 36(4):659–678
21. Wang C, Zhou W, Zhao S (2019) Robot scale application and job insecurity: based on the adjustment of employees' occupational competence. Econ Manag 41(04):111–126
22. Xie M, Xia Y, Pan J, Guo J (2020) Artificial intelligence, technological progress and low-skilled employment: an empirical study of Chinese manufacturing firms. Manag Sci China 28(12):54–66
23. Xu S, Stienmetz J, Ashton M (2020) How will service robots redefine leadership in hotel management? A Delphi approach. Int J Contempora Hospitality Manag
24. Zhang Y (2019) The employment effect of artificial intelligence and robot and its countermeasures. Sci Manag Res 37(01):43–45+109
25. Zhao W, Wang C (2021) The effect of robot use on job performance and its mechanism: a case study of middle and low-end skilled workers. China Soft Sci 04:106–119