

The Influence of Challenge-Hindrance Stressors and Job Crafting on Employee Innovation in Chinese High-Tech Enterprises

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Abstract

At present, innovation has become a key factor to promote the sustained economic growth of all countries. If enterprises want to survive, develop and grow, the key lies in continuous innovation to enhance competitiveness. Employees are the main force of enterprise innovation activities, and whether their creativity can be fully developed has a crucial impact on the development of enterprises. However, with the continuous improvement of the requirements of employees, the work pressure faced by employees is also gradually increasing. This study was searched on quantitative method based on the relevant theories of management and psychology, this paper discusses how challenging and hindering stress and job crafting jointly affect employees' hindrance stressor. The empirical results show that Challenge Stressor positively affects job crafting and employee hindrance stressor, and obstructive stress negatively affects job crafting and employee hindrance stressor. Job crafting positively influences employees' hindrance stressor, and mediates the relationship between Challenge Stressor, obstructive stress and employees' hindrance stressor.

Keywords: Challenge-Hindrance Stressor, Job Crafting, Innovative Behavior

Introduction

At present, the world is in a period of rapid development of knowledge economy, and innovation has become a key factor for the sustained economic growth of various countries. The competition between enterprises is no longer limited to product quality and enterprise strength, whether it has a strong innovation ability is more critical. Employees are the main participants in enterprise innovation activities, constantly produce new ideas and methods, and whether their creativity can be maximized is crucial to enterprise development. In order to enhance the core competitiveness, the requirements of enterprises on employees are also increasing, resulting in heavy work pressure on employees.

Early studies generally regard work stress as a risk factor, believing that it is beyond the scope of employees' abilities or resources, and will bring certain burdens

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to employees (LePine et al., 2016), which will have a negative impact on employees' emotions, behaviors, physical and other aspects. However, in 2000, Cavanaugh et al divided work stress into Challenge Stressor and obstructive stress (Cavanaugh et al., 2000), arguing that different degrees and types of stress would have different impacts on employee innovation (Wang et al., 2019). With the deepening of research, the positive effects of stress are gradually paid attention to by the academic community. As a brand-new management concept, job crafting breaks the past top-down passive management mode and brings more work resources and new working perspectives to employees (Liu et al., 2019). When employees face Challenge-hindrane stressor, they are likely to further influence the occurrence of innovative behavior through job crafting.

Research Objectives

This paper intends to introduce job crafting as an intermediate variable to discuss the influence mechanism of challenging and hindering stress on employees' hindrance stressor, hoping to further enrich the relevant research on the influence of work stress on hindrance stressor, and provide theoretical guidance and management enlightenment for enterprises to promote employees' hindrance stressor.

Research Hypothesis

A total of 7 hypotheses were proposed in this study.

Table 1 Research hypotheses

No	Hypotheses
H1a	Challenge stressor positively affects employee innovative behavior.
H1b	Hindrane stressor negatively affects employee innovative behavior.
H2a	Challenge stressor positively affects employee job crafting.
H2b	Hindrane stressor negatively affects employee job crafting.
H3	Job crafting positively affects employee innovative behavior.
H4a	Job crafting plays a mediating role between challenge stressor and employee innovative behavior.
H4b	Job crafting plays a mediating role between hindrance stressor and employee innovative behavior.

Literature Review

Stress is ubiquitous and inevitable in the workplace (Zhou et al., 2019). Previous studies generally believe that work pressure is beyond the scope of individual ability or resources and will bring a certain burden to individuals (LePine et al., 2016). However, Cavanaugh et al. (2000) proposed a binary work stress model through research, dividing stress into Challenge Stressor and obstructive stress. Challenge Stressor is mostly related to job requirements or working environment, such as work load, time pressure, work complexity and job responsibilities (Cavanaugh et al., 2000; Rodell et al., 2009). Challenge Stressor can cause stress, but it can also have a positive impact on individuals, such as promoting the growth of employees, improving earnings and achieving achievements (Li & Li, 2013). Obstructive stress is a kind of pressure that hinders the development of individual ability and realization of value. This kind of pressure is often unrelated to work content, such as organizational politics, ambiguous roles, and work autonomy (Cao, 2021). Obstructive pressure will cause negative emotions of employees, making them more inclined to maintain the status quo and avoid risks, unwilling to try new ways of working and reshaping work, weakening their innovation ability and motivation, and making it difficult for them to invest in innovation activities (Cao, 2021).

Job reshaping means that employees take proactive actions to redefine and shape work content, work style and work relationship with others from their own perspective (Wrzesniewski, 2001). In the face of Challenge Stressor, employees tend to adopt positive coping strategies and carry out task crafting by improving work methods, changing work content and scope, etc., in order to complete such work and get rewards (Tims, 2010). At the same time, employees will strengthen communication with leaders and colleagues, actively seek feedback and support, take the initiative to improve interpersonal relationships at work, and rebuild relationships. Relational crafting helps employees collect work information and expand work resources to help them do their jobs better. When individuals actively face the Challenge Stressor and complete the challenging work, they will gain the sense of work value and achievement, which will promote the Cognitive crafting of individuals, change their understanding of work, and then more actively participate in work, and deal with the pressure with a more positive and healthier attitude. From their own perspective, employees actively take actions to redefine and shape the work content, work style and the relationship with others in the work, which helps to promote the production of creative ideas and innovative behaviors (Pearsall et al., 2009).

At present, scholars have a rich perspective on the study of Challenge-hindrance stressor and employees' hindrance stressor, but the research on how Challenge-hindrance stressor affects employees' hindrance stressor and its internal

mechanism is still insufficient, ignoring employees' spontaneous work adjustment behavior of reconstructing work content, mode and working relationship from the bottom up. Therefore, this study will build a theoretical framework for the impact of challenging and obstructive stress on employee hindrance stressor, explore the impact mechanism of job crafting, supplement existing research, and provide management decision support for enterprise managers.

Conceptual Framework

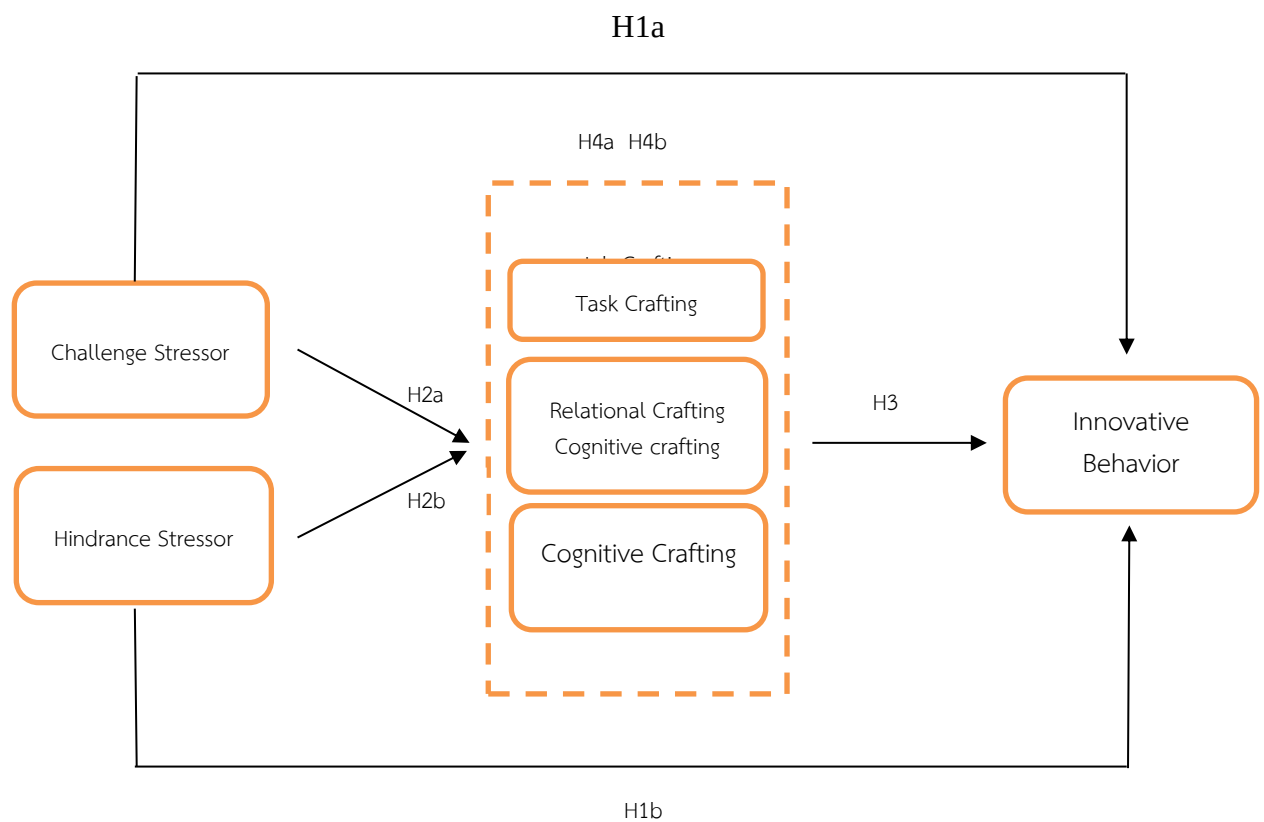


Figure 1 Conceptual framework

Note. Adapted from Xu et al..(2021).

Research methodology

1. Scope of Population

The research objects of this paper are employees of high-tech enterprises in eastern China (Beijing, Shanghai, Tianjin, Guangdong, Jiangsu, Zhejiang, Shandong, Fujian, Hebei, Hainan).

2. Data collection

Starting from August 2022 and ending in August 2023, this study mainly adopts multi-source and multi-time online electronic questionnaire survey to obtain data.

3. Data analysis

In this study, after sorting out the collected questionnaires, reliability analysis was carried out through SPSS26.0 to evaluate the reliability of the measurement tool. Conduct correlation analysis to evaluate the level of correlation between variables; Regression analysis was performed to determine the degree of influence between variables. Structural validity analysis was carried out through Amos24.0 to evaluate whether the measurement items really reflected the measurement objectives.

Hypothesis Testing

1. Reliability analysis

The reliability of the scales is good, as shown in Table 2.

Table 2 Reliability test

Scale	Cronbach α
Challenge stressor (CS)	0.928
Hindrance stressor (HS)	0.799
Job crafting (JC)	0.927
Employee innovative behavior (IB)	0.919

Confirmatory factor analysis

In this paper, a four-factor model including four variables such as challenge stressor and obstructive pressure is constructed, and other models are compared with the hypothetical four-factor model. Based on the four-factor model, the observed variables of challenge stressor and obstructive pressure are combined into one latent variable to form a three-factor model. On the basis of the three-factor model, the observed variables of work remodeling and innovative behavior are combined into one latent variable to form a two-factor model. All observed variables were equated with one latent variable, and a single-factor model was constructed. The statistical analysis results are shown in Table 3.

Table 3 Model fitting table (N=460)

Model	χ^2	df	χ^2/df	RMR	CFI	IFI	RMSEA	TLI
Four factor model	1013.451	375	2.563	.046	.925	.927	.053	.911
Three factor model	1566.743	393	3.769	.057	.866	.856	.088	.859
Two factor model	2576.835	410	6.677	.159	.765	.787	.113	.757
One factor model	3687.645	445	9.005	.175	.644	.657	.146	.624

As can be seen from Table 3, the fitting index of the four-factor model is better, and the index of the four-factor model is obviously better than that of other models, which proves that the four variables in this paper can be distinguished from each other and the discrimination validity is good.

Common method deviation test

In this study, questionnaires on challenge stressor, hindrance stressor, job crafting and innovative behavior were all filled out by employees, so they were affected by homologous variance to some extent. In order to reduce the influence of common method deviation, a common method factor test (CMV) is used to exclude the influence of homologous variance.

In this paper, a common method bias factor CMV was added to the four-factor model to conduct a common method bias test. If the changes of RMSEA and RMR in the four-factor +CMV model do not exceed 0.05, and the changes of CFI, IFI

and TLI do not exceed 0.1, it indicates that there is no significant common method bias. The results showed that RMR, RMSEA, CFI and IFI did not change and TLI decreased by 0.01 in the four-factor +CMV model compared with the four-factor model, which again verified that there was no common method bias in the data in this paper, as shown in Table 4.

Table 4 Table of common method deviation tests

Model	χ^2	df	χ^2/df	RMR	CFI	IFI	RMSEA	TLI
Four factor model	788.656	377	1.977	.041	.933	.934	.044	.942
Four factor +CMV model	788.452	373	1.979	.041	.933	.934	.044	.941

Note. Adapted from Amos. CMV is a common method factor.

Hypothesis testing

1. Challenging - hindering stress and employee innovative behavior

Firstly, the effect of independent variable on dependent variable is verified, that is, the effect of challenging and hindering pressure on employee innovative behavior is verified. In this paper, the hierarchical regression method is adopted to construct three models: Model 1 only adds gender, age and other control variables to test their impact on employee innovative behavior; In Model 2, based on model 1, challenge stressor is added as an independent variable to verify its impact on innovative behavior. In Model 3, based on model 1, hindrance stressor is added as an independent variable to verify its impact on employee innovative behavior. According to model 1, the type of work unit and position level among the control variables have a significant effect on employee innovative behavior; in model 2 and model 3, challenge stressor has a significant positive impact on employee innovative behavior ($\beta=0.502$, $p < 0.001$). hindrance stressor had a significant negative effect on employee innovative behavior ($\beta=-0.546$, $p < 0.001$). Therefore, H1a and H1b are assumed to be true.

Table 5: The regression results of challenging - hindering stress on employee innovative behavior

		M1		M2		M3	
		Beta	t	Beta	t	Beta	t
Control variable	Gender	0.018	0.400	0.006	0.151	0.053	1.771
	Age	-0.097	-1.166	-0.069	-0.972	-0.102	-1.866
	Degree of education	0.000	0.001	-0.044	-1.084	-0.014	-0.451

Table 5: Cons.

		M1		M2		M3	
		Beta	t	Beta	t	Beta	t
	Years of working	-0.039	-0.470	-0.009	-0.125	0.034	0.625
	Unit category	-0.139***	-3.068	-0.062	-1.582	-0.055	-1.836
	Position level	0.302***	5.227	0.201***	3.993	0.107***	2.755
Independent variable	CS			0.502***	12.518		
	HS					-0.546***	-18.005
Model	F	6.619***		30.009***		85.553***	
goodness-	R-sq	0.081		0.317		0.603	
of-FIT	Adjusted R-sq	0.068		0.307		0.596	

Note. Adapted from SPSS. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

2. Challenging - hindrance stressor and job crafting

In order to study the effect of challenge-hindrance stressor on job crafting, the first model, Model 4, was constructed to test the influence of the control variable on job crafting. Then Model 5 adds challenge stressor on the basis of model 4 to verify its impact on job crafting. Finally, hindrance stressor is added to model 6 to verify its influence on job crafting. The results are shown in Table 6. In model 4, job level has a significant influence on job crafting. Model 5 and Model 6 show that challenge stressor has a significant positive influence on job crafting ($\beta=0.238$, $p < 0.001$), and hindrance stressor has a significant negative influence on job crafting ($\beta=-0.183$, $p < 0.001$). Therefore, H2a and H2b are assumed to be true.

Table 6 The regression results of challenging - hindering stress on job crafting

		M4		M5		M6	
		Beta	t	Beta	t	Beta	t
Control variable	Gender	-0.095	-2.023	-0.100	-2.206	-0.085	-1.880
	Age	-0.007	-0.080	0.006	0.073	-0.005	-0.059
	Degree of education	-0.029	-0.600	-0.049	-1.059	-0.039	-0.858
	Years of working	-0.049	-0.570	-0.035	-0.414	-0.020	-0.243

Table 6: Cons.

		M4		M5		M6	
		Beta	t	Beta	t	Beta	t
	Unit category	-0.043	-0.933	-0.007	-0.156	-0.005	-0.106
	Position level	0.176***	2.969	0.128*	2.197	0.097	1.668
Independent variable	CS			0.238***	5.127		
	HS					-0.183***	-4.052
Model	F	2.386*		5.914***		7.404***	
goodness-of-FIT	R-sq	0.031		0.084		0.116	
	Adjusted R-sq	0.018		0.070		0.100	

Note. Adapted from SPSS. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

3. Job crafting affects employee innovative behavior

In order to study the effect of job crafting on employee innovative behavior, this paper constructs two models: Model 1 only adds control variables such as gender and age to test their impact on employee innovative behavior. On this basis, job crafting variables are added to model 7, and the test results show that job crafting has a significant positive impact on employee innovative behavior ($\beta=0.331$, $p < 0.001$), as shown in Model 7 in Table 7. Therefore, H3 is assumed to be true.

Table 7: The regression results of job crafting on employee innovative behavior

		M1		M7	
		Beta	t	Beta	t
Control variable	Gender	0.018	0.400	0.050	1.149

	Age	-0.097	-1.166	-0.094	-1.210
	Degree of education	0.000	0.001	0.010	0.218
	Years of working	-0.039	-0.470	-0.023	-0.294
	Unit category	-0.139***	-3.068	-0.124***	-2.919
	Position level	0.302***	5.227	0.244***	4.437
Independent variable	JC			0.331***	7.674
	F		6.619***		14.811***
Model goodness-of-FIT	R-sq		0.081		0.187
	Adjusted R-sq		0.068		0.174

Note. Adapted from SPSS. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

4. Mediating role of job crafting

Based on the existing studies of scholars, this paper adopts the currently common hierarchical regression analysis (Baron and Kenny, 1986) and Bootstrap sampling method proposed by Efron in 1977 to test the mediation effect. Hierarchical regression analysis is mainly to observe the change of regression coefficient before and after the addition of mediating variables to judge whether there is mediating effect. The Bootstrap sampling method is to judge whether the intermediary effect exists by looking at whether the non-parametric percentile contains 0 in the 95% confidence interval.

Firstly, hierarchical regression analysis was used to test the mediating effect. According to model 2, challenge stressor has a significant positive effect on employee innovative behavior ($\beta=0.502$, $p < 0.01$). According to model 5, challenge stressor had a significant positive effect on job crafting ($\beta=0.238$, $p < 0.01$). On the basis of model 2, job crafting variables were added to build model 8. Job crafting had a significant positive impact on employee innovative behavior ($\beta=0.227$, $p < 0.001$), so the mediating effect was significant, and H4a was assumed to be valid. According to Table 8, it can be seen that in Model 8, after adding the mediating variable job crafting, the influence coefficient of challenge stressor on employee innovative behavior decreases, indicating that job crafting plays a partially mediating role. Similarly, according to model 3, hindrance stressor has a significant negative relationship with employee innovative behavior ($\beta=-0.546$, $p < 0.001$). According to model 6, hindrance stressor had a significant negative relationship with job crafting ($\beta=-0.183$, $p < 0.001$).

Table 8 Regression results of mediating effects of job crafting

Dependent variable

		Job crafting		Employee innovative behavior			
		M5	M6	M2	M3	M8	M9
Control variable	Gender	-0.100	-0.085	0.006	0.053	0.029	0.085
	Age	0.006	-0.005	-0.069	-0.102	-0.071	-0.125
	Degree of education	-0.049	-0.039	-0.044	-0.014	-0.032	0.032
	Years of working	-0.035	-0.020	-0.009	0.034	-0.001	0.017
	Unit category	-0.007	-0.005	-0.062	-0.055	-0.061	-0.115***

Table 8: Cons.

		Dependent variable					
		Job crafting		Employee innovative behavior			
		M5	M6	M2	M3	M8	M9
	Position level	0.128*	0.097	0.201***	0.107**	0.172***	0.161***
Independent variable	CS	0.238***		0.502***		0.447***	
	HS		-0.183***		-0.546***		-0.538***
Mediating variable	JC					0.227***	0.223***
Model goodness-of-FIT	F	5.914***	7.404***	30.009***	85.553***	32.350***	47.001***
	R-sq	0.084	0.116	0.317	0.603	0.365	0.455
	Adjusted R-sq	0.070	0.100	0.307	0.596	0.353	0.445

Note. Adapted from SPSS. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

On the basis of model 3, job crafting variables were added to construct model 9, and job crafting had a significant positive impact on employee innovative behavior ($\beta = 0.223$, $p < 0.001$), so the mediating effect was significant, and hypothesis H4b was established. The influence coefficient of hindering stress on employee innovative behavior decreased, indicating that job crafting played a partial mediating role.

The mediation effect was further examined by Bootstrap sampling method. The total effect of challenge stressor on employee innovative behavior was significant, and the confidence interval was [0.4133, 0.5673]. The direct effect of challenge stressor on

employee innovative behavior is significant, and the confidence interval is [0.3610, 0.5139]. The indirect effect of job crafting on challenge stressor and employee innovative behavior is significant, with confidence interval [0.0247, 0.0897], indicating that job crafting plays a partial mediating role between challenge stressor and employee innovative behavior, and the mediating effect accounts for 10.79%. Similarly, the total effect of hindrance stressor on employee innovative behavior is significant, and the confidence interval is [-0.7777, -0.6059]. The direct effect of hindrance stressor on employee innovative behavior is significant, and the confidence interval is [-0.7228, -0.5543]. Job crafting has a significant indirect effect on hindrance stressor and employee innovative behavior, with confidence interval [-0.0920, -0.0230], indicating that job crafting plays a partial mediating role in the relationship between hindrance stressor and employee innovative behavior, and the mediating effect accounts for 7.69%. Therefore, the hypothesis that H4a and H4b are established has been verified again, as shown in Table 9.

Table 9: The results of Bootstrap test on the mediation effect of job crafting

Path		Effect	BootSE	Bootstrap 95% confidence interval		Effect ratio
				BootLLCI	BootULCI	
CS-JC-IB	JC	0.0529	0.0169	0.0247	0.0897	10.79%
	Direct effect	0.4374	0.0389	0.3610	0.5139	89.21%
	Total effect	0.4903	0.0392	0.4133	0.5673	
HS-JC-IB	JC	-0.0532	0.0178	-0.0920	-0.0230	7.69%
	Direct effect	-0.6385	0.0429	-0.7228	-0.5543	92.31%
	Total effect	-0.6917	0.0437	-0.7777	-0.6059	

Note. According to the Process macro analysis results.

Research contribution

1. Theoretical research contributions

From the perspective of interpersonal interaction process, this paper puts forward the positive effect of constructive controversy on the relationship between

challenge stressor and job crafting, enriches the research on the moderating variables of job crafting, contributes to the relevant theories in the field of organizational behavior and innovation management, and expands the research ideas in the field of job stress and employee innovation.

2. Contribution of empirical experience

Based on empirical investigation and data analysis, this study selects employees of high-tech enterprises as the research objects, and reveals the influence of challenge-hindrance stressor on employee innovative behavior through job crafting, and explores the moderating role of constructive controversy through large-sample empirical research. Through the data support of the research results, it provides practical basis and guidance for the innovation management and talent training of enterprises.

Conclusion and discussion

A total of 7 hypotheses were set up in this study, all of which were verified. According to the establishment of H1a, H1b, H2a and H2b, challenge stressor has a positive impact on job crafting and employee innovative behavior, while obstructive pressure has a negative impact on job crafting and employee innovative behavior, that is, two different kinds of pressure have opposite effects on job crafting and employee innovative behavior. Based on the establishment of H3, it can be seen that job crafting positively affects employee innovative behavior, that is, more job crafting will prompt employees to produce more innovative behavior. The establishment of H4a and H4b indicates that job crafting has an intermediary effect between challenge-hindrance stressor and employee innovative behavior, that is, challenge stressor and hindering stress will not only directly affect job crafting, but also have an impact on employee innovative behavior through job crafting.

Recommendations

Based on the above research findings and contributions, the following are strategic recommendations for high-tech enterprises:

1. Manage challenge-hindrance stressor properly

The different nature of work pressure has different effects on employee innovative behavior. Therefore, when stimulating employee innovation ability, enterprises should pay attention to the difference in the nature of pressure, rather than just the size of pressure, identify the type of pressure, and find a suitable entry point.

The organization should encourage employees to face challenges and pressures, set specific and challenging goals, and ensure that employees understand the organization's expectations and goals for them; And actively create challenge stressor for employees, such as increasing the complexity of work, increasing the urgency of time, expanding the scope of work responsibilities and so on, improve employee work passion and motivation, stimulate employee self-transcendence and growth; Pay attention to follow the law of individual career growth and development, reasonably control the difficulty of tasks, and gradually increase the work intensity.

2. Assist employees in job crafting

Managers should provide employees with sufficient autonomy and decision-making opportunities, create a relaxed working atmosphere, and increase fault tolerance space. Allow employees to explore and try new ways to solve problems while ensuring the completion of work objectives, encourage employees to generate new ideas to improve work processes and efficiency, and actively adopt ideas and opinions that are valuable to the organization; Provide employees with learning and development opportunities, make them understand the important role of job crafting through training, systematically master the ways and ways of job crafting, know how to do job crafting in combination with their own positions, help employees adapt to the new technology and environment, and encourage employees to actively participate in innovation. Within a certain range, employees can choose ways to complete work tasks according to their own abilities, preferences and needs, increase challenging work tasks, and find more work resources.

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