Effects of Job Crafting on Job Engagement of College Teachers in Hebei Province, China

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Abstract

Considering job resources of college teachers as a mediating variable, this study analyzed the relationship between job crafting and job engagement and established a model of the mechanism underlying the effects of job crafting on job engagement. This theoretical hypothesis model was empirically validated using 300 valid questionnaires completed by college teachers in Hebei Province, China, who were selected through convenience sampling. Job crafting directly affected job resources, and job resources exerted a direct effect on job engagement. However, job resources played a full mediating role in the relationship between job crafting and job engagement after it was added as a mediating variable.

Keywords: job crafting, job resources, job engagement

1. Introduction

The COVID-19 pandemic has transformed global approaches to education (Chang & Tsai, 2022; Oubibi et al., 2022; Obrad et al., 2021). Such transformation has forced individuals to actively change their working environment (Van Wingerden et al., 2017), and this behavior of active change is called job crafting (Van Wingerden et al., 2017). According to job crafting theory, individuals redesign and reinvent their jobs, further motivate themselves to cope with the changing work environment, help experience tasks, and more actively engaged in their work (Fute et al., 2022). Job crafting has been shown to have a positive effect on job engagement (Bakker et al., 2012; Van Wingerden et al., 2017; Fute et al., 2022). Van Wingerden et al. (2017) showed that primary school teachers' job crafting can positively affect their job engagement. Teachers learn to increase their fitness for the job by increasing structural and social job resources, thereby enhancing their job engagement. Therefore, job crafting is one of the factors influencing teachers' job engagement (Saragihet et al., 2020).

Job engagement refers to a fulfilling, positive, and work-related emotional and motivational state in one's work, characterized by vigor, dedication, and absorption (Bakker et al., 2007). Based on the theory of the Job Demands-Resources Model (JD-R model), Bakker et al. (2005) highlighted the core assumption of this model that each occupation has unique factors, which affect the physical and mental health of workers and working conditions, and categorized these factors as job demands and job resources. Job demand is the main dependent variable of health impairment that causes occupational burnout, primarily representing a health depletion process, namely fatigue. This can be explained as follows: Continuous work leads to exhaustion of employees, resulting in burnout and further harming their health. Job resources have the potential to motivate and promote job engagement and excellent work performance, which is primarily a process of motivation; this can be explained as follows: Available job resources stimulate employees' motivation to work, resulting in job engagement and eventually producing positive work outcomes (Bakker & Demerouti, 2007; Demerouti et al., 2001).

Job resources are a positive predictor of job engagement (Bakker et al., 2014), and individuals' absorption, dedication, and enthusiasm with job engagement in their work mainly account for their high work efficiency and positive outcomes (Karatepe & Aga, 2016). According to this theoretical model, job resources have the potential to increase job engagement levels and promote excellent work performance (Demerouti et al., 2001; Bakker & Demerouti, 2007). Job resources refer to work factors that can provide support and help to workers, such as

social support, autonomy, work remuneration, and performance feedback (Demerouti et al., 2001). Han et al. (2020) demonstrated that college teachers in China having access to job resources, such as support from organizations and colleagues, and sufficient teaching resources, are more energetic and committed to their work. Job resources encourage teachers' job engagement, and, therefore, are crucial for improving teachers' job engagement (Bakker et al., 2007).

According to the JD-R model theory, teachers improve job resources through job crafting and increase their job engagement. Job resources have a mediating effect between job crafting and job engagement (Tims et al., 2012). According to Bakker and Demerouti (2014), employees can optimize their job resources through job crafting, which may increase their job engagement level. Tims et al. (2012) opined that individuals need to reinvent their job resources for increasing job engagement. Some studies have shown that teachers' job crafting achieved by increasing structural and social job resources contributes to the improvement of their job engagement level. In other words, job crafting indirectly affects job engagement through job resources (Bakker & Demerouti, 2017; Demerouti, 2014). Colleges and universities in Hebei Province have good-quality faculty with high job engagement levels. Therefore, this study selected college teachers in Hebei Province as the subjects to explore the mediating role of college teachers' job resources in the relationship between job crafting and job engagement according to the JD-R model theory.

2. Literature Review

2.1 Effect of Job Crafting on Job Engagement

According to the JD-R model, individuals can effectively increase their job engagement level through job crafting (Van Wingerden et al., 2017). Bakker et al. (2012) found that individuals are willing to actively make bottom-up adjustments and changes to the working environment, which can help them promote, stimulate, and maintain their positive job engagement. Individuals proactively optimize their job needs and resources in the working environment to promote and stimulate their own job engagement (Bakker et al., 2012; Nielsen et al., 2017; Tims et al., 2012).

Oprea et al. (2019) conducted a meta-analysis and effective analysis of job crafting interventions. They demonstrated that job crafting is a bottom-up job design with a high potential of increasing job engagement. Interventions wherein participants form plans including organizational and personal goals moderately increase job engagement, etc. The behavior of improving job crafting can enhance job engagement. Furthermore, Tims et al. (2013) found that job crafting at group and individual levels can predict individuals' job engagement. In addition, diary-based studies examining the relationship between job crafting and job engagement at a daily level have also yielded the same results (Bakker et al., 2014; Petrou et al., 2012; Tims et al., 2014).

Some scholars have also investigated a group of teachers. Saragihet et al. (2020) surveyed preschool and primary school teachers in Indonesia and suggested that job crafting is positively correlated with job engagement. They also suggested that teachers change their working environment to meet their needs, and thus find their work interesting and meaningful and further devote themselves to it. On investigating 146 teachers, Alonso et al. (2019) found that individual and collaborative job crafting are positively correlated with job engagement. Both individuals and teams can improve the meaning of work by modifying tasks or interactions and redefine job purposes and job experiences. Such changes lead to greater satisfaction and thus enhance job engagement. Therefore, the following hypothesis is put forward:

H1: Job crafting of college teachers significantly and positively affects their job engagement.

2.2 Effect of Job Crafting on Job Resources

Employees optimize and improve their job resources through job crafting (Demerouti, 2014). Facilitative job crafting is likely to result in positive work outcomes under the motivation of job resources, and strong facilitative job crafting enables employees to enhance the resources of working significance while actively shaping the working environment (Brenninkmeijer et al., 2010). The higher the motivation of employees with job crafting, the more the resources of working significance they tend to seek (Lichtenthaler & Fischbach, 2019). A study on the JD-R model showed that employees can optimize and improve job demands and resources through job crafting, and therefore, employees must mobilize their own job resources (Demerouti & Bakker, 2011). According to Tims et al. (2012), three dimensions of job crafting, namely increasing job resources (structural or social), increasing job demands or challenges, and reducing job demands, can optimize job resources, thereby enabling employees to show high work performance and produce positive results. Tims et al. (2012) stated that job crafting is an active job demand- and resource-related change made by employees through which they can actively increase their job resources. Moreover, they believed that employees can optimize their working

environment and stay motivated through job crafting. Tims et al. (2013) revealed that by enabling employees to seek challenges and resources, job crafting can help predict positive changes in job resources. In job crafting, employees proactively reinvent their own job and actively mobilize their job resources.

In a survey of college staff, Slemp et al. (2014) found that job crafting can predict job resources for employee autonomy. Both theoretical and empirical studies have confirmed the effect of job crafting on resources of working significance for college teachers (Steger et al., 2012). Job-motivated teachers are likely to exhibit job crafting behaviors, which leads to higher levels of job resources. Dedicated employees create their own job resources through job crafting (Bakker & Demerouti, 2016). Therefore, the following hypothesis is put forward:

H2: Job crafting of college teachers has a positive effect on their job resources.

2.3 Effect of Job Resources on Job Engagement

Job resources are considered as elements that can stimulate positive job engagement (Balducci et al., 2011). In the JD-R model, job resources have the potential to increase job engagement levels and improve performance of individuals (Bakker & Demerouti, 2007; Demerouti et al., 2001). Karasek (1979) defined jobs with resources as active work. These types of jobs can motivate individuals to acquire new knowledge and generate new behaviors in their work. Vera et al. (2012) demonstrated that job resources can motivate employees' potential, thereby improving their job engagement and performance and reducing negative attitudes. According to Balducci et al. (2011), job resources such as autonomy, career development, and social support positively affect job engagement. Schaufeli (2017) asserted that job resources can ignite workers' passion and immerse them in their work, thereby leading to higher job engagement levels and better work outcomes. In conclusion, more job resources may have a positive effect on teachers' job engagement.

Bakker (2005) validated the positive effect of job resources on job engagement in music teachers, and Bakker et al. (2007) further validated this finding in primary, secondary, and vocational schools. Some studies have suggested that job resources such as organizational justice and professional groups positively affect teachers' job engagement to some extent (Aboramadan et al., 2020; Cai et al., 2022). The support from superiors, colleagues, families and friends, a type of job resources, could significantly and positively predict the job engagement level in kindergarten teachers (Wu et al., 2020). Based on an empirical analysis, Zahed-Babelan et al. (2019) reported that the type of job resources of leaders also positively affects job engagement of teachers. In addition, salary satisfaction at the material level is a critical resource that affects job engagement. If the demands of teachers are guaranteed, their work efforts are recognized, and teaching positions are established, teachers obtain relatively sufficient job and social resources and exhibit a relatively higher degree of job engagement. The income level has a positive effect on job engagement of teachers. Therefore, the following hypothesis is put forward:

H3: College teachers' job resources significantly and positively affect their job engagement.

2.4 Mediating Effect of Job Resources on the Relationship between Job Crafting and Job Engagement

According to the JD-R model, in the face of job resource scarcity, individuals' behaviors of increasing structural resources, such as self-directed learning, enhancing professionalism, and seeking challenging demands in the job crafting process, contribute to higher job engagement levels (Demerouti, 2014). The three dimensions of job crafting, namely increasing job resources (structural and social), increasing job demands or challenges, and reducing job demands, can improve and optimize job resources and allow employees to have higher job engagement levels (Tims et al., 2012). Individuals' crafting behaviors of autonomously increasing diverse resources, challenging demands, and reducing obstructive demands stimulate their intrinsic potential and promote job engagement (Irfan & Qadeer, 2020). According to a study, pediatric nurses improved job resources to conduct job crafting, thus promoting job engagement (Kang & Cho, 2020). Facilitative job crafting improves the job engagement level through the incentivizing effect of job resources, and strong facilitative job crafting enables employees to elevate the resources of working significance while actively shaping the working environment, eventually resulting in higher job engagement (Brenninkmeijer et al., 2010). The higher the motivation of the employees with job crafting, the more resources of working significance they tend to seek (Lichtenthaler & Fischbach, 2019). Employees can adjust current job resources through job crafting, thereby increasing their job engagement (Dubbelt et al., 2019).

Tims et al. (2012) opined that individuals must reinvent their job resources to improve job engagement. An increase in structural and social job resources can contribute to increasing the job engagement level of teachers (Demerouti, 2014). Job-motivated teachers are likely to have job crafting behaviors, thus having higher job resources levels and higher degrees of job engagement. Therefore, the following hypothesis is put forward:

H4: College teachers' job resources can indirectly affect their job engagement through the mediating effect of

their competencies.

3. Method

3.1 Architecture

Based on the JD-R model, this study explored whether job crafting of college teachers in Hebei Province, China, can affect their job engagement through job resources. Structural equation modeling (SEM) was used to validate the theoretical model. The research architecture is as follows:
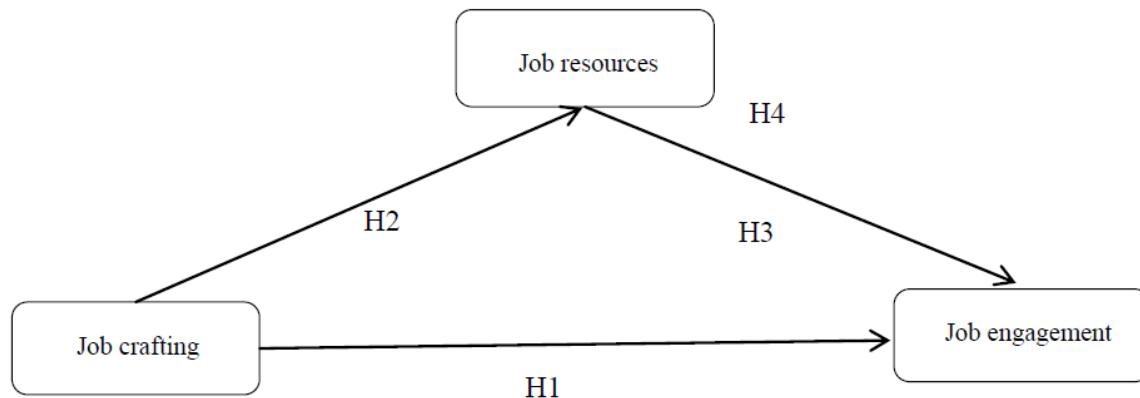

Figure 1. Research Architecture

3.2 Study Subjects and Procedures

Hebei Province is adjacent to Beijing and Tianjin and has abundant higher education resources and humanistic resources. Colleges and universities in this province have good quality faculty with high levels of job engagement and competency. Therefore, this study included college teachers from this province as the subjects. First, 160 teachers from 5 colleges and universities were sampled for a pre-test. Then, convenience sampling was adopted for the formal test. Of the 5 universities selected, two were in Baoding, one in Shijiazhuang, one in Qinhuangdao, and one in Tianjin. In total, 340 online questionnaires were collected. After eliminating invalid questionnaires, 300 valid questionnaires remained. Of them, 149 were from male teachers and 151 were from female teachers.

3.3 Research Tools

3.3.1 Job Crafting Scale

The present study adopted the "job crafting scale" developed by Bakker et al.(2012). This scale includes three dimensions: "increasing social job resources," "increasing structural job resources," and "increasing challenging job demands." The scale included 16 questions in total. First, the questionnaire items were pre-analyzed. Question 4 of the second dimension was deleted as it did not meet the reliability standard. The subsequent reliability analysis of the pre-test scale revealed that Cronbach's α was .889, which indicated the good reliability of the scale. In the confirmatory factor analysis (CFA) of the formally recovered questionnaire, the factor loading of each item was 0.711–0.836; the construct reliability (CR) was 0.817, which exceeded the assessment criterion of 0.60; and the average variance extracted (AVE) was 0.599, which exceeded the assessment criterion of 0.50 (Fornell & Larcker, 1981). This highlighted that the scale had good construct validity and discriminatory validity. Regarding the scale's overall fit indicators, SRMR = 0.0386, χ^2/df = 1.586, GFI = .979, AGFI = .928, PGFI = .687, NFI = .946, IFI = .979, CFI = .979, PNFI = .784, and RMSEA = .044; most of these indicators met the criteria, indicating that the scale had a good fit.

3.3.2 Job Resources Scale

This study employed the "Job Resource Scale" developed by Bakker et al. (2004). This scale comprises a total of 9 questions and three dimensions, namely autonomy, possibilities for professional development, and social support. Examples of "autonomy" are: "I can make my autonomous decisions about how to do the work" and "I'm free to decide how to do my job"; examples of "possibilities for professional development" are "My job gives me the opportunity to learn new things" and "I have enough possibilities to develop myself in my work"; and examples of "social support" are "I can ask my colleagues for help if necessary" and "I can count on my colleagues when I encounter difficulties at work." The reliability analysis of the pretest scale revealed that

Cronbach's α was .893, which indicated the good reliability of the scale. In the CFA of the formally recovered questionnaire, the factor loading of each item was 0.630–0.909; the CR was 0.826, which exceeded the assessment criterion of 0.60; and AVE was 0.614, which exceeded the assessment criterion of 0.50 (Fornell & Larcker, 1981). This suggested the good construct validity and discriminatory validity of the scale. Regarding the scale's overall fit indicators, SRMR = .0415, χ2/df = 3.174, GFI = .951, AGFI = .909, PGFI = .507, NFI = .942, IFI = .960, CFI = .959, PNFI = .628, and RMSEA = .085; most of these indicators met the criteria, suggesting that the scale had a good fit.

3.3.3 Job Engagement Scale

This study applied the "Job Engagement Scale" (UWES) developed by Schaufeli et al. (2002). This scale included three dimensions: vigor, dedication, and absorption, with a total of 17 questions. The reliability analysis of the pre-test scale revealed that Cronbach's α was .958, implying the good reliability of the scale. In the CFA of the formally recovered questionnaire, the factor load of each item was 0.673–0.800; the CR was 0.820, which exceeded the assessment criterion of 0.60; and the AVE was 0.603, which exceeded the assessment criterion of 0.50 (Fornell & Larcker, 1981). This implied that the scale had good construct validity and discriminatory validity. Regarding the scale's overall fit indicators, SRMR = .0390, χ2/df = 1.524, GFI = .939, AGFI = .919, PGFI = .712, NFI = .925, IFI = .973, CFI = .973, PNFI = .789, and RMSEA = .042. Most of these indicators met the criteria, implying that the scale had a good fit.

4. Results

4.1 Correlation Analysis

The mean values of job crafting, job resources, and job engagement were 3.443, 3.511, 3.744, and 4.835, respectively, and the standard deviation of these three variables ranged from 0.625 to 0.765 (Table 1). Moreover, the correlation between each variable was positive and significant (p< 0.001), which indicated a positive correlation among all variables. The correlation coefficient ranged from 0.245 to 0.528, thereby suggesting a low to medium degree of correlation among them and lack of collinearity. Furthermore, as suggested by Hair et al. (1998), the correlation coefficient between two concepts should be less than the AVE square root of each concept. In this study, the AVE square root of each dimension was met, which suggested good discriminatory validity. Therefore, the overall model validation was conducted subsequently in this study.

Table 1. Mean, Standard Deviation, and Correlation and Discrimination Validity of Each Variable (n = 300)

Variables	Mean	Standard deviation	Job crafting	Job resources	Job engagement
Job crafting	3.443	0.625	0.774a		
Job resources	3.511	0.700	0.452***	0.800a	
Job engagement	4.835	0.765	0.365***	0.528***	0.777a

Note: ***p < 0.001

4.2 Overall Path Model Analysis

This study analyzed the overall model path of job crafting, job resources, and job engagement of college teachers. First, the overall fit test of the model was conducted, as proposed by Hair et al. (1998). Three standards were referred to: measures of absolute fit, incremental fit measures, and parsimonious fit measures. Regarding "measures of absolute fit," χ2 = 73.932, df = 24, and χ2/df = 3.080, with χ2/df being <5 (Schumacher & Lomax, 2004), indicating that χ2/df was in the acceptable range. In addition, RMR = .037, SRMR = .054, RMSEA = .083, GFI = .952, and AGFI = .909. Regarding "incremental fit measures," NFI = .924, IFI = .947, CFI = .947, and TLI = .920, all greater than 0.90, thus meeting the criterion. Regarding "parsimonious fit measures," PNFI, PGFI, and PCFI were .661, .508, and .631, respectively, all greater than .50, thus meeting the criterion (Ullman, 2001). These values indicated that the overall model had a good fit and can be analyzed.

Regarding the direct effect of the overall model (Table 2 and Figure 1), job crafting of college teachers had no significant positive effect on job engagement, with a path coefficient of 0.136 (p > 0.5). Job resources significantly and positively affected job engagement, with a path coefficient of 0.702 (p < 0.001); and job crafting significantly and positively affected job resources, with a path coefficient of 0.578 (p < 0.001). This result implied that teachers' job crafting and job resources increase their job engagement level. Thus, the higher the teacher's job crafting level, the higher will be their job resources level. Therefore, H2 and H3 were verified, whereas H1 was not.

The bootstrapping method proposed by Shrout and Bolger (2002) was applied to test the mediating effect.

Mackinnon et al. (2004) simulated and compared the performance of the traditional method, product distribution method, and five nonparametric Bootstrap methods in the mediating effect analysis. They found that the bias-corrected nonparametric percentile bootstrap method offered the most accurate confidence interval (CI) for mediating effects with the highest statistical power. The sampling was repeated for 5,000 times, and the mediating effect results were tested. The total effect of job crafting on job engagement was 0.542, and the 95% CI was [0.409, 0.655] (Table 2), which does not include 0. This indicated a significant total effect. The mediating effect of job crafting on job engagement through job resources was 0.136, and the 95% CI was [0.287, 0.560], which does not include 0, indicating a significant indirect effect.

However, the direct effect of job crafting on job engagement was 0.136, with a 95% CI of [−0.055, 0.312] (including 0), whereas the total effect was 0.542, with a CI of [0.409, 0.655] (excluding 0). In conclusion, job resources fully mediated the relationship between job crafting and job engagement, thereby verifying hypothesis H4.

Table 2. Analysis of Bootstrap Mediating Effect

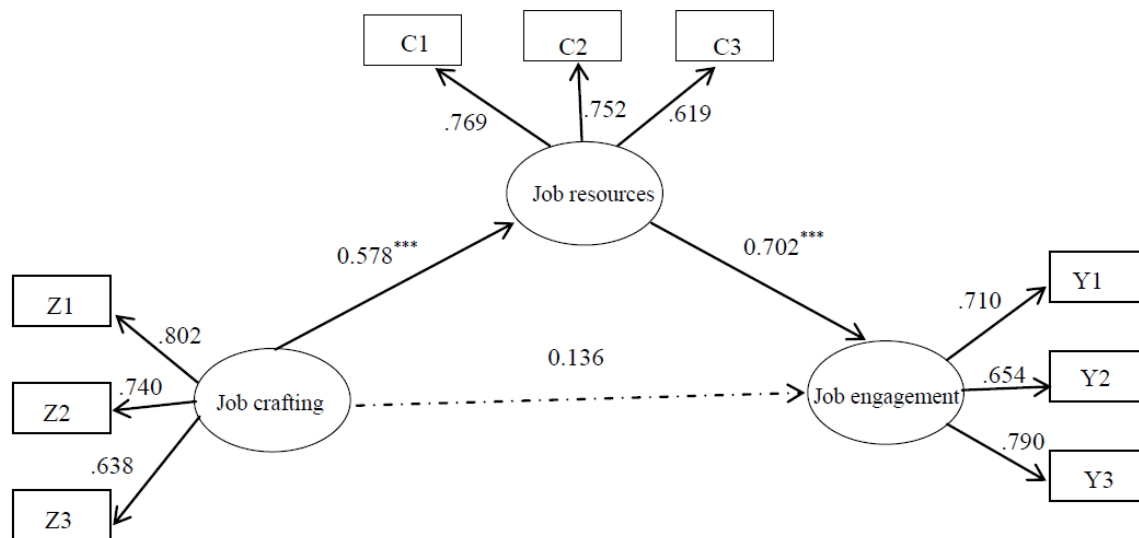| Path	Effect	P value	Confidence interval (95%)
Direct effect Job crafting → job engagement	0.136	0.155	[−0.055, 0.312]
Job crafting → job resources	0.578	0.000	[0.452, 0.683]
Job resources → job engagement	0.702	0.000	[0.539, 0.859]
Indirect effect Job crafting → job engagement	0.136	0.000	[0.287, 0.560]
Total effect Job crafting → job engagement	0.542	0.000	[0.409, 0.655]

Figure 2. Mediating Model Effect Roadmap

5. Discussion

The findings of this study show that job crafting of college teachers positively affects their job resources, which coincides with the results of previous studies (Bakker & Demerouti, 2016; Lichtenthaler & Fischbach, 2019). Job crafting promotes teachers to have more job resources (Slemp & Vella-Brodrick, 2014). In other words, in the job crafting process, college teachers can obtain more opportunities to identify and explore their potentials, interests, and advantages, which in turn allow them to enhance their working motivation, generate a more desirable working environment, and further strengthen their working enthusiasm, thereby providing more favorable conditions and guarantee for their job resources (Steger et al., 2012).

Job resources positively affect the job engagement of college teachers. This is consistent with the results of previous studies (Schaufeli, 2017). According to Hackman and Oldham's (1971) job characteristics theory,

teachers can complete their work in the way they choose because of the autonomy in their work. In a relaxed and supportive organizational climate (social support from colleagues), teachers can feel recognized and trusted by their schools, which invisibly nurtures their commitment to the organization and enhances their dedication, vigor, and enthusiasm for work (Han et al., 2020). Furthermore, when good learning and development opportunities are available, teachers establish their development goals, rather than feeling confused or even losing interest in work because of the lack of clear goals, which can severely affect their job engagement (Bakker et al., 2004).

According to the present study, job crafting of college teachers in Hebei Province indirectly affects their job engagement through job resources. This coincides with the results of previous studies (Demerouti, 2014; Bakker & Demerouti, 2016). According to the JD-R model theory, individuals can optimize their job resources through job crafting, which possibly leads to high job engagement levels (Bakker & Demerouti, 2014). Tims et al. (2012) believed that job engagement can be improved when individuals reinvent their job resources. Job crafting achieved by increasing structural and social job resources contributes to the improvement in job engagement of teachers. In other words, job crafting indirectly affects job engagement through job resources (Demerouti, 2014; Bakker & Demerouti, 2016). This effect seems to be more relevant when teachers change their cognitive levels, choose their social relationships, and practically apply their skills to change their work- and job role-related perceptions, which lead to higher job engagement levels. The same is true when the changes made are related to interactions and social relationships occurring in their work environment (Letona-Ibañez, 2021). Therefore, to achieve a high job engagement level, college teachers should attempt to change their working environment by adjusting their work.

6. Conclusions

The results indicate that work crafting of college teachers have a positive effect on work resources, which in turn positively influences their work engagement. Moreover, it was observed that in Hebei Province, China, the work resources of college teachers acted as a complete mediator between job crafting and work engagement.

7. Implications

Based on the aforementioned findings and conclusions, this study shares the following suggestions:

The level of teachers' job crafting must be increased. Teachers' job crafting is a crucial factor for promoting their job engagement. On the one hand, in school management, some degree of autonomy should be given to teachers for job crafting. Teachers should be allowed to adjust work arrangements and implement the educational and teaching reforms based on the actual situation. They should be invigorated to provide full play to their own subjective initiative and creatively solve work-related problems. On the other hand, for the personal development of college teachers, growth in both teaching and professional fields, and further enhancement of job engagement and efficiency, school leaders must give these teachers moderate flexibility and autonomy, empower them to enhance their professional autonomy, and offer timely professional suggestions.

Job resources of teachers must be enriched. First, we should offer support to teachers. Support among colleagues is a great catalyst for job engagement among teachers. Based on emotion and the principle of mutual respect and help, teachers must be guided to collaborate and assist each other, so that they can realize how mutual support is beneficial for personal growth and team development in collaboration and assistance. Second, school leaders' support for teachers must be enhanced. Leaders should support teachers in various ways, thereby increasing the likelihood that the teachers successfully meet challenges. Teachers should also be offered challenging work tasks and development opportunities. To this end, schools and higher authorities must actively create and maintain a favorable working environment conducive to the cultivation of job resources of teachers, reassure and support them to participate in the required professional training, and provide learning opportunities. Finally, teachers' autonomy in their work must be expanded. Some degree of autonomy for job crafting should be given to teachers in school management. They should be allowed to adjust work arrangements and adhere to the educational and teaching reforms based on the actual situation. They must be encouraged to give full play to their own subjective initiative and creatively solve work-related problems.

8. Limitation and Future Research

This study has several limitations that should be considered: (1) The sample only includes teachers from five universities in Hebei Province, China, who volunteered for the survey, to enhance the generalizability of the findings, it would be beneficial to expand the geographic scope of the sample. (2) Due to the cross-sectional nature of our data, caution must be exercised in making causal inferences. To gain a more comprehensive understanding of the dynamic relationships between variables, future research could employ a longitudinal study or a quasi-experimental design.

Conflict of Interest

The authors declare no potential conflict of interest.

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