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Understanding employee training satisfaction in China's coal industry from the perspective of Baldwin and Ford's transfer of training model

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Abstract: In the fast-paced modern society, enhancing employees' professional qualities through training has become crucial for enterprise development. However, training satisfaction remains under-studied, particularly in specialized sectors such as the coal industry. **Purpose:** This study aims to investigate the impact of personal characteristics, organizational characteristics, and training design on training satisfaction, utilizing Baldwin and Ford's transfer of training model as the theoretical framework. The study identifies how these factors influence training satisfaction and provides actionable insights for improving training effectiveness in China's coal industry. **Design/Methodology/Approach:** A cross-sectional design that allowed the study to capture data at one point in time from a large sample of employees was employed to conduct an online survey involving 251 employees from the Huaibei Mining Group in Anhui Province, China. The survey was administered over three months, capturing a diverse sample with nearly equal gender distribution (51% male, 49% female) and a majority aged between 21 and 40. The participants represented various educational backgrounds, with 52.19% holding an undergraduate degree and most occupying entry-level positions (74.9%), providing a broad workforce representation. **Findings:** The research indicated that personal traits were the chief predictor of training satisfaction, showing a beta coefficient of 0.585 (95% CI: [0.423, 0.747]). Linear regression modeling indicates that training satisfaction is strongly related to organizational attributes ($\beta = 0.276$ with a confidence interval of 95% [0.109, 0.443]). In contrast, training design did not appear to be a strong predictor ($\beta = 0.094$, 95% CI: [-0.012, 0.200]). Employee training satisfaction was the principal outcome measure, measured with a 5-point Likert scale. The independent variables covered personal characteristics, organizational characteristics, and training design, all measured through validated items taken from former research. The consistency of the questionnaire from the inside was strong, as Cronbach's alpha values stood between 0.891 and 0.936. We completed statistical testing using SPSS 27.0, complemented by multiple linear regression, to study the interactions between the variables. **Practical implications:** This research contributes to the literature by emphasizing the necessity for context-specific training approaches within the coal industry. It highlights the importance of considering personal and organizational characteristics when designing training programs to enhance employee satisfaction. The study suggests further exploration of the multifaceted factors influencing training satisfaction, reinforcing the relevance of Baldwin and Ford's theoretical model in understanding training effectiveness. Ultimately, the findings provide valuable insights for organizations seeking to improve training outcomes and foster a more engaged workforce. **Conclusion:** The study concluded that personal and organizational characteristics significantly impact employee training satisfaction in the coal industry, with personal characteristics being

the strongest predictor. The beta coefficient for personal characteristics was 0.585, indicating a strong positive relationship. Organizational characteristics also had a positive effect, with a beta coefficient of 0.276. However, training design did not show a significant impact on training satisfaction. These findings highlight the need for coal companies to focus on personal and organizational factors when designing training programs to enhance satisfaction and improve training outcomes.

Keywords: training satisfaction; personal characteristics; organizational characteristics; training design; coal industry; economic growth

1. Introduction

In the accelerating pace of modern society, human resources have emerged as a crucial factor in enterprise development. The rise of intellectual capital as a dominant competitive element in business means that companies are placing a premium on enhancing their employees' professional qualities. Training is a key strategy many enterprises have adopted to bolster their core competitiveness (Barakat et al., 2023; Wong et al., 2024). The efficacy of such training is often indicated by employee satisfaction, as satisfied employees are more likely to apply their acquired knowledge to their work (Ouyang, 2019).

While research on satisfaction has been extensive, it primarily focuses on customer, job, and employee satisfaction, with training satisfaction being an essential yet under-studied component of employee satisfaction (Dubois, 2024). Training satisfaction plays a significant role in determining how effectively employees utilize training resources and apply learned skills, directly influencing organizational performance. Studies often evaluate training effectiveness from the enterprise's perspective, employing models such as the renowned Donald Kirkpatrick four-level evaluation model for training effectiveness. These models provide a structured framework for assessing various dimensions of training impact; however, they frequently overlook the employees' subjective experiences.

Although these methods are established, there is a significant lack of research investigating employee training satisfaction from the employees' viewpoint, especially within specialized sectors like the coal industry (Poddar et al., 2021). The coal industry, characterized by its unique operational challenges and workforce dynamics, requires tailored training approaches that address its employees' specific needs and expectations. Additionally, while international research on training satisfaction often centers around fields like medical knowledge training, nursing training, and volunteer training, domestic research tends to focus on service industries like hotels and tourism (Ouyang, 2019). This distribution of research reveals a distinct gap within China's coal industry, where training initiatives may be inadequately designed or executed due to a lack of empirical understanding of employee satisfaction.

Such a gap becomes increasingly concerning, considering that many Chinese enterprises, especially in the coal industry, lack comprehensive and effective training systems (Chidananda and Udayachandra, 2018). The absence of a systematic approach to employee training can lead to reduced effectiveness of training programs and, consequently, lower levels of employee satisfaction. Furthermore, the recent decline

in China's coal production due to various socio-economic factors has brought numerous challenges, including shifts in employees' attitudes towards work, resistance to training, and decreased job satisfaction (Chen et al., 2022). These factors underscore the importance of addressing training satisfaction to ensure employees remain engaged and motivated.

Given the relative lack of research and the challenges faced by China's coal industry, our study aims to investigate employee training satisfaction within this specific industry. Building upon the variables of personal characteristics, organizational characteristics, and training design identified by scholars, we intend to explore their effects on employee training satisfaction. This exploration is essential for understanding how different factors can be leveraged to enhance training experiences and outcomes. By addressing this research gap, our study hopes to contribute to the development of more effective training strategies that enhance not only the competitiveness of these enterprises but also improve job satisfaction and the professional development of their employees. This research is vital for fostering a more engaged and productive workforce in the coal industry, ultimately supporting its sustainability and growth in the evolving economic landscape.

2. Underpinning theory

Baldwin and Ford's transfer of training model (1988) postulates that trainee characteristics, training design, and the working environment directly influence the training outcomes, subsequently affecting the application and retention of the learned skills (Chidananda and Udayachandra, 2018). The model is divided into three sections: Training inputs, outputs, and transfer conditions.

Training inputs encompass personal factors, signifying the traits of the trainees; design factors, which dictate the structure of the training; and organizational factors, representing the work environment. Training outputs, including learning and retention, are directly influenced by these three input factors. Transfer conditions refer to the application and preservation of the acquired knowledge and skills from the training. They are directly influenced by personal and organizational factors and indirectly influenced by training design factors with learning and retention acting as intermediary variables (Jia, 2018). In essence, this process represents the transformation and subsequent application of learned knowledge and skills in the practical work setting. Past study reveals that employee training satisfaction, a critical measure of training effectiveness, shares similar influencing factors with those impacting the training outcomes. Factors such as the design of training courses, methods and content, employee characteristics, and organizational traits all play a role in shaping the training's effectiveness. Baldwin and Ford's model has garnered recognition in academia for its comprehensiveness in evaluating these key factors from the three perspectives: Trainee characteristics, training design, and the work environment (Latif, 2012).

Hence, this study opts for this model as a tool for analyzing the target enterprises from these three angles: Organization, individual, and training design. This approach will serve as a reference for investigating the factors influencing employee training satisfaction within China's coal industry.

3. Literature review

3.1. Training satisfaction

The concept of employee satisfaction was first introduced by Hoppock (1935), encompassing both psychological and physiological aspects related to the work environment. Locke (1976) further refined this idea by identifying training satisfaction as the positive emotional response when employees perceive their work value needs to be fulfilled through training. Training satisfaction is an employee's subjective assessment of the organization's training initiatives. It corresponds with how well the training meets their expectations: Surpassing expectations results in high satisfaction, meeting expectations yields average satisfaction, while falling short generates low satisfaction (Chen et al., 2022). The fulfillment employees characterize it derives from their training, which bolsters their professional competencies and work performance (Okechukwu, 2017). The entire training process of an enterprise is encapsulated in employee training satisfaction. It reflects how effectively the training program aligns with the employees' needs. Hence, it is incumbent on enterprises to align actual perceptions with expectations using efficient training procedures (Blanchard, 2023). Research abroad primarily explores the factors influencing training satisfaction. According to Schmidt (2009), elements such as age, race, gender, job type, and position are closely linked to training satisfaction. Subsequent studies have indicated a positive relationship between training satisfaction and employees' propensity to stay with the organization (Mumtaz and Rowley, 2020). Similarly, a study conducted in Jakarta established a strong correlation between training satisfaction, job satisfaction, and organizational commitment (Aseanty and Prilyana, 2020).

In the Chinese context, studies show a positive correlation between training satisfaction and employee performance (Frenkel and Guan, 2019), as well as knowledge sharing and innovative behavior (Dou, 2019). Training satisfaction is also negatively associated with an intention to leave, with emotional commitment serving as a mediator (Alam and Asim, 2019). Key factors driving training satisfaction in China include the relevance of training content to job duties, the utilization of interactive and participatory training methods, and the provision of a supportive training environment. Additionally, shorter training programs have been shown to boost training satisfaction (Eby et al., 2019). Training satisfaction is shaped by a combination of corporate and personal factors, as well as teaching and service aspects. The latter two are the most adaptable and controllable elements within a training program (Huang, 2019).

3.2. Personal characteristics and training satisfaction

Active learning techniques, which encompass role-plays, case studies, and simulations, boost employee training satisfaction (Buonomo et al., 2022). Chauvin et al. (2022) posits that pre-training expectations and post-training outcomes can affect satisfaction. Employees with a learning orientation, high emotional intelligence, and self-directed learning abilities tend to be more satisfied as they see training as a pathway to competency enhancement and career development (Findeisen and Michaelis, 2022; Shafait et al., 2021). Pleasant and conscientious personality traits, as

well as factors like gender and age, correlate with training satisfaction, with females and older employees reporting higher satisfaction (Laible et al., 2021; Latif, 2012). Harmonious interpersonal relationships can also improve satisfaction (Starr, 1971). Furthermore, education level and job tenure positively influence training satisfaction among Chinese employees, with higher extroversion and responsibility linked to greater satisfaction (Ju and Li, 2019). Hence, personal characteristics significantly impact training satisfaction, providing insights for designing effective training programs to enhance employee performance. Hence, we hypothesized that:

H1: Personal characteristics have a positive impact on employee training satisfaction in China's coal industry.

3.3. Organizational characteristics and training satisfaction

Organizational support, referring to an organization's dedication to employee development, is associated with higher employee satisfaction with training programs (Gigliotti et al., 2019). Bing and Tuul (2019) advocates building a learning organization, where employees perceive work as an opportunity for continuous learning, leading to optimized skills, expanded knowledge, and faster enterprise learning. Supervisor support, denoting a supervisor's encouragement of employee development, also heightens training satisfaction (Kang and Kim, 2019). Training delivery, whether face-to-face or online, impacts satisfaction, with preferences varying between traditional and flexible online options (Bujang et al., 2021). Furthermore, relevant, engaging, and job-aligned training content enhances satisfaction (Erofeeva et al., 2020). Soegiarto et al. (2024) indicates a positive correlation between a supportive organizational culture and employee training satisfaction. In contrast, AlAbri et al. (2022) and Laker and Powell (2011) found a positive correlation between transformational leadership and training satisfaction and a negative one with transactional leadership. Comprehensive training programs, encompassing on-job and off-job training, are positively related to satisfaction (Huang, 2019). Moreover, Leung and To's (2024) study on Chinese organizations revealed a positive correlation between organizational support and training satisfaction. These studies underline the influence of organizational factors on employee training satisfaction in China, aiding organizations in tailoring training programs to meet employee needs and expectations. Hence, we hypothesized that:

H2: Organizational characteristics have a positive impact on employee training satisfaction in China's coal industry.

3.4. Training design and training satisfaction

Hyasat et al. (2022) discovered a correlation between part-time employees' training satisfaction and the training methodology used by hotels, its duration, job performance, and their received rewards and benefits. The application of multimedia in training has also been found to enhance engagement and satisfaction (Esichaikul and Jayalath, 2022), while flexible and remote-accessible training has been linked to improved satisfaction (Chowdhury and Gkioulos, 2021). Moreover, the relevance of training content to job responsibilities is key to the program's success (Jonnalagadda et al., 2022). Studies like Jaworski et al. (2018) in the hospitality industry, and

Sypniewska et al. (2023) have shown a positive correlation between well-designed, relevant, and interactive training programs and employee satisfaction. In recent years, the use of technology-based training methods, such as online and mobile learning, has also been positively associated with training satisfaction (Aldraiweesh and Alturki, 2022). Timing and frequency of training are significant factors, with more frequent and conveniently timed training resulting in higher satisfaction (Ambu-Saidi et al., 2024). This underlines the importance of training design in determining employee training satisfaction in China. Hence, we hypothesized that:

H3: Training design have a positive impact on employee training satisfaction in China’s coal industry.

The following conceptual framework was built based on a review of the literature and the underpinning theory (refer to **Figure 1**).

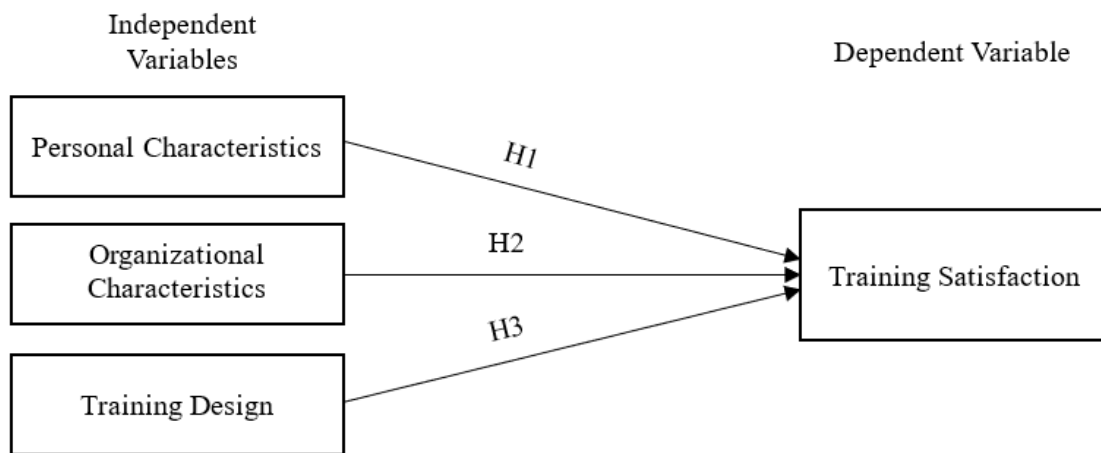


Figure 1. Conceptual framework.

4. Methods

4.1. Samples

This study employed a cross-sectional design with data collection carried out over a three-month period focusing on the employees of the Huaibei Mining Group in Anhui Province, China. Each respondent is treated as a unique data source. Data collection is carried out at one point in time rendering the research cross-sectional (Zikmund et al., 2013). Convenient and snowballing sampling approaches are in use due to their flexibility, simplicity and affordability (Ouyang, 2019). Based on a power level of 0.95, significance level of 0.05, and an effect size of 0.15, G*Power 3.1 software determined that we needed at least 119 participants for this study. The sample size is adequate for generalizing the results (Kock, 2018). Data collection is performed online through surveys shared via personal contacts on social media platforms such as QQ and WeChat, facilitating the efficient gathering of significant data within the specified timeframe.

The study surveyed 251 participants, with a nearly equal distribution between genders: 128 males (51%) and 123 females (49%). The majority of respondents were aged between 21 and 40, with 93 (37.05%) aged 21–30, and 90 (35.86%) aged 31–40. Participants aged 41–50 accounted for 16.33% (41 respondents), while those aged 51

and above represented 10.76% (27 respondents). As for education level, most respondents held an undergraduate degree (52.19%, or 131 respondents). Respondents with a junior college education made up 24.7% (60 respondents), those with a high school education or below were 7.97% (20 respondents), and those with a Master's degree or above were 15.14% (38 respondents). The majority of the participants were in entry-level positions (74.9%, or 188 respondents), followed by those in intermediate/first-level management (12.75%, or 32 respondents), middle management (8.76%, or 22 respondents), and executive or senior management positions (3.59%, or 9 respondents).

4.2. Research instruments

Data collection was conducted using a structured questionnaire administered to employees of Huaibei Mining Group. The questionnaire measured several dimensions of employee training satisfaction and its potential predictors. The questionnaire was divided into sections that captured demographic information and the key study variables. Demographic data collected included gender, age, educational level, and job position, providing a contextual background for analysis. To measure employee training satisfaction (the dependent variable), four items were adapted from Holgado et al. (2006). An example of an item used is, "Training is helpful for my work". These items assessed the participants' overall satisfaction with their completed training programs, reflecting their perceptions of the training's usefulness and relevance.

For personal characteristics (an independent variable), four items were adapted from Ouyang (2019). An example of a statement used in this section is, "In my work, I have the ability to achieve the goals set by myself". This variable aimed to capture individual traits and attitudes that could influence how satisfied an employee might be with their training experience, including self-efficacy, motivation, and learning orientation.

Organizational characteristics, another independent variable, were assessed using four items adapted from Jia (2018), such as, "My company aims to foster employee learning and encourage diligent work". These items measured the extent to which employees felt that their organization supported learning and development, offering a supportive environment that may influence training satisfaction.

Finally, the training design was evaluated using four items adapted from Latif (2012). An example item is, "The training course is very well set up". This section aimed to measure how well the employees perceived the training content and delivery in terms of structure, relevance, and alignment with their job needs.

Each outcome variable included personal characteristics, organizational characteristics, and training design, which all showed high reliability and validity, with Cronbach's alpha figures ranging from 0.891 to 0.936. A 5-point Likert scale, which ranged from 1 (strongly disagree) to 5 (strongly agree), was used to measure all the items, supporting quantitative analysis of participant feedback. With Cronbach's alpha values standing between 0.891 and 0.936, the rigorous internal consistency testing showed a high reliability level for all variables. The data collected received multiple regression analysis in order to discern the influence of personal characteristics, organizational characteristics, and the design of training on employee satisfaction with

training. While organizational characteristics and training design emerged as significant predictors, personal characteristics did not exhibit a statistically significant impact in this model.

4.3. Data analysis

The data was analysed using SPSS 27.0 (Statistical Packages for the Social Sciences) with a significance level set at 0.05. Multiple analyses were performed to ensure that the study met its goals. The data were subjected to descriptive analyses to determine the frequency distribution of the respondents' backgrounds and the research variables. Covariables, such as age, gender, and educational level, were controlled for during the analysis to minimize their potential confounding effects. **Homogeneity was measured using Levene's test, which assessed the equality of variances among groups.** Then, we examined how personal characteristics, organizational characteristics, training design, and training satisfaction were related to one another using a Pearson correlation analysis. Finally, a linear multiple regression analysis was conducted to assess the impact of several independent variables, which are personal characteristics, organizational characteristics, and training design, on the dependent variable, training satisfaction. This model provides insights into the factors influencing employee training satisfaction within the coal industry, allowing organizations to tailor their training programs more effectively. All statistical tests were conducted using a significance level of 0.05.

4.4. Results

The results demonstrated a significant positive relationship between personal characteristics and training satisfaction, with a beta coefficient of 0.585 (95% CI: [0.423, 0.747]) and an r value of .832 ($p < 0.001$). This finding suggests that factors such as an individual's drive for learning, active participation, goal achievement, and workplace confidence play a vital role in enhancing employee training satisfaction. Similarly, organizational characteristics also positively correlated with training satisfaction, yielding a beta coefficient of 0.276 (95% CI: [0.109, 0.443]) and an r value of .874 ($p < 0.001$). This indicates that a company's commitment to recognizing employee efforts, facilitating skill application, promoting shared learning, and encouraging hard work significantly contributes to fostering training satisfaction.

Additionally, a strong positive correlation was found between training design and training satisfaction ($r = 0.909$, $p < 0.001$). This suggests that well-structured training programs, which strategically align tailored methods, relevant content, and optimal scheduling, are crucial for improving employee training satisfaction. **Table 1** presents the results of the linear multiple regression analysis examining the predictors of training design. The findings indicated that the combination of personal characteristics, organizational characteristics, and training design explained 85.1% of the variance in training satisfaction. Among these, personal characteristics emerged as the strongest predictor (beta = 0.585, $p < 0.01$), followed by organizational characteristics (beta = 0.276, $p < 0.01$). In contrast, training design did not emerge as a significant predictor, with a beta coefficient of 0.094 (95% CI: [-0.012, 0.200]) and $p = 0.075$.

These findings underscore the influence of personal characteristics on training satisfaction, reinforcing existing literature. Consistent with Buonomo’s 2022 study, our research highlights the strong relationship between active learning methods and increased training satisfaction, advocating for more interactive and learner-centric approaches to employee training. Our findings also align with Shafait et al. (2021) conclusions that self-directed employees, characterized by their active involvement in company activities without external pressure, experience greater satisfaction with training programs. This likely stems from their perception of training as a means to control their learning process and achieve their professional goals. Furthermore, our study reaffirms the importance of organizational support in shaping positive employee perceptions of training programs, as indicated by research from Gigliotti et al. (2019) and Leung and To (2024). Additionally, supervisor support—characterized by providing ample resources, regular feedback, and encouragement to apply learned skills—was found to significantly enhance training satisfaction, consistent with Kang and Kim’s (2019) study. Lastly, our results reflect the influence of organizational culture and leadership style on training satisfaction, as highlighted by AlAbri et al. (2022), Laker and Powell (2011) and Soegiarto et al. (2024). Therefore, hypotheses H1 and H2 are supported, while H3 is not.

Table 1. Predictors of training satisfaction (N = 251).

Criterion Variable	Predictor Variable	R ²	Beta	t	p	VIF
Training satisfaction	Personal characteristics	0.851	0.585	10.41	< 0.01	5.25
	Organizational characteristics		0.276	4.707	< 0.01	5.72
	Training design		0.094	1.786	0.075	4.63

5. Discussion

This research aimed to evaluate the impact of personal characteristics, organizational characteristics, and training design on employee training satisfaction in the China HB coal industry. The findings reveal that personal characteristics emerged as the most significant predictor of training satisfaction, followed closely by organizational characteristics. These results align with previous research, providing a deeper understanding of the critical roles that individual traits and organizational support play in enhancing training satisfaction.

The strong connection between personal characteristics and training satisfaction corroborates findings from Buonomo et al. (2022), which emphasize the importance of active learning methods. Intrinsically motivated employees who exhibit a proactive approach to their learning experience higher satisfaction levels from training programs. This reinforces the argument for designing interactive, learner-centric training initiatives that engage employees actively, thereby facilitating their personal and professional growth.

Furthermore, our research resonates with Shafait et al. (2021), who suggest that self-directed employees derive greater satisfaction from training programs due to their ability to take ownership of their learning processes. These employees interpret training as a platform to cultivate their skills and realize their career goals without needing external compulsion. This brings attention to the priority of encouraging a culture that promotes autonomy and helps employees drive their own development.

Our study points out the important impact that organizational support has on the positive evaluation of training programs. This finding aligns with the work of Gigliotti et al. (2019) and Leung and To (2024), which emphasizes the need for organizations to create enabling environments where employees feel valued and supported. Such environments enhance motivation and engagement, essential for effective training outcomes. The importance of supervisor support also emerged as a crucial factor in our findings, consistent with Kang and Kim's (2019) study. Supervisors who provide ample resources, regular feedback, and encouragement to apply learned skills significantly enhance training satisfaction. This role includes mentoring, offering constructive feedback, and ensuring employees have the necessary tools to succeed, fostering a supportive training environment.

Also, our discoveries point out the roles that organizational culture and leadership style play in training satisfaction, as pointed out by AlAbri et al. (2022), Laker and Powell (2011) and Soegiarto et al. (2024). Training programs can greatly benefit from leadership styles, with those that are transformational encouraging a culture of trust and support, which boosts training satisfaction. New channels for research emerge concerning the way specific leadership behaviors and organizational cultures can contribute to improved training effectiveness.

Interestingly, despite our expectations, the study found no significant relationship between training design and training satisfaction, which diverges from findings in previous studies by Gkioulos et al. (2021), Hyasat et al. (2022) and Jonnalagadda et al. (2022). This discrepancy may be attributed to various factors, including the unique characteristics of our participant group or contextual variables specific to the coal industry. The lack of a significant relationship between training design and satisfaction underscores the complexity of the training environment. It suggests that merely having well-structured training programs may not be sufficient to ensure high levels of satisfaction among employees.

This unexpected result highlights the need for a more nuanced understanding of the interplay between various factors influencing training satisfaction. It challenges the universal applicability of certain training design principles, suggesting that additional research is warranted to explore the specific elements of training design that may or may not contribute to employee satisfaction. Future research should investigate how contextual factors, such as industry-specific challenges and employee demographics, interact with training design to affect satisfaction levels.

In conclusion, this study provides critical insights into the multifaceted nature of employee training satisfaction, emphasizing the significance of personal and organizational characteristics. By fostering a supportive environment and recognizing employees' individual motivations, organizations can enhance training satisfaction and, consequently, improve employee performance and retention. Future research should continue to explore these dynamics, focusing on diverse organizational contexts to develop a more comprehensive understanding of training satisfaction in various industries.

6. Conclusions, limitations, and future research

This study provides clear evidence that personal and organizational characteristics significantly influence employee training satisfaction within the coal industry in China. Employees exhibiting strong intrinsic motivation and those who perceive substantial organizational support reported higher satisfaction with their training experiences. Furthermore, the findings highlight the crucial role of organizational culture in shaping employee behavior, suggesting that a positive culture encourages proactive engagement in training initiatives. Conversely, training design did not emerge as a significant predictor, indicating that while it remains an essential component, factors such as individual engagement and the overall organizational environment are more critical in shaping training satisfaction (Gigliotti et al., 2019; Shafait et al., 2021). These insights underscore the necessity for organizations to develop training programs that address the specific needs of employees, foster a supportive learning culture, and promote constructive employee behaviors. This action allows organizations to improve their training satisfaction, which is likely to lead to improved employee performance and retention (Leung and To, 2024; Ouyang, 2019).

While this study produced important findings, we need to acknowledge particular limitations. Conducted exclusively within the Huaibei Mining Group in Anhui Province, China, the research may restrict the ability to generalize the findings to regions and organizations beyond the coal industry. Also, using a cross-sectional design and self-reported metrics can result in biases because respondents might interpret the questions differently based on their individual histories. In addition, a structured questionnaire might not fully represent the complexity of training satisfaction, missing subtle factors that affect employee perceptions.

Future work ought to broaden the geographic scope by including a larger variety of coal companies from multiple regions within China to improve the generalizability of the results. In addition, qualitative research strategies such as interviews or focus groups can help to gather a deeper understanding of the influences on training satisfaction and to examine the elaborate dynamics of employees' training experiences. Investigation of additional variables, including leadership styles and peer support, may offer a more complete understanding of the influences on training satisfaction. Also, future investigations ought to fully explore how organizational culture impacts employee action and, in turn, training satisfaction. Ultimately, these actions will help create training programs that correspond better with organizational goals and employee needs, building a more engaged and skilled team.

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References

- AlAbri, I., Siron, R. B., Alzamel, S., Al-Enezi, H., and Cheok, M. Y. (2022). Assessing the employees' efficiency and adaptive performance for sustainable human resource management practices and transactional leadership: HR-centric policies for post COVID-19 era. *Frontiers in Energy Research*, 10, 959035.
- Alam, A., and Asim, M. (2019). Relationship between job satisfaction and turnover intention. *International Journal of Human Resource Studies*, 9(2), 163.
- Alturki, U., and Aldraiweesh, A. (2022). Students' perceptions of the actual use of mobile learning during COVID-19 pandemic in higher education. *Sustainability*, 14(3), 1125.
- Ambu-Saidi, B., Fung, C. Y., Turner, K., and Lim, A. S. S. (2024). A Critical Review on Training Evaluation Models: A Search for Future Agenda. *Journal of Cognitive Sciences and Human Development*, 10(1), 142–170.
- Baldwin, T. T., and Ford, J. K. (1988). Transfer of training: A review and directions for future research. *Personnel psychology*, 41(1), 63–105.
- Barakat, B., Milhem, M., Naji, G. M. A., Alzoraiki, M., Muda, H. B., Ateeq, A., and Abro, Z. (2023). Assessing the impact of green training on sustainable business advantage: exploring the mediating role of green supply chain practices. *Sustainability*, 15(19), 14144.
- Blanchard, P. N., and Thacker, J. W. (2023). *Effective training: Systems, strategies, and practices*. SAGE Publications.
- Bujang, N., Paramsivam, M., Dasril, Y., and Basar, A. (2021). Training Method Transformation for Millennials Employees. *Research in Management of Technology and Business*, 2(1), 1473–1483.
- Buonomo, I., Piccinini, M., Benevene, P., Blasutig, G., and Cervai, S. (2022). Job training satisfaction and knowledge sharing in IT company: a case study. *Journal of Workplace Learning*, (ahead-of-print).
- Chauvin, R., Yennek, N., Laurent, P., Lôrant, S., and Fenouillet, F. (2022). Enrolment in workplace multimodal training programmes: The weight of trainee reactions to previous training experiences. *International Journal of Training and Development*, 26(2), 315–342.
- Chen, S., Xu, K., and Yao, X. (2022). Empirical study of employee loyalty and satisfaction in the mining industry using structural equation modeling. *Scientific Reports*, 12(1), 1158.
- Chidananda, H. L., and Udayachandra, P. N. (2018). Relationship of training design and use of transfer strategy with transfer of training. *International Journal of Management Studies*, 4(4), 32–37.
- Chowdhury, N., and Gkioulos, V. (2021). Cyber security training for critical infrastructure protection: A literature review. *Computer Science Review*, 40, 100361.
- Dubois, R. (2024). *Emotional Intelligence and Job Satisfaction in Non-Managerial Food-Service Employees: A Correlational Predictive Study*. Grand Canyon University.
- Eby, L. T., Allen, T. D., Conley, K. M., Williamson, R. L., Henderson, T. G., and Mancini, V. S. (2019). Mindfulness-based training interventions for employees: A qualitative review of the literature. *Human Resource Management Review*, 29(2), 156–178.
- Erofeeva, M. A., Stolyarova, A. N., Terekhova, A. I., Ignatyeva, A. V., Deberdeeva, N. A., Zebnitskaya, A. K., and Leontev, M. G. (2020). Innovative methods in management and raising the quality of higher professional education in Russia. *Propositos y representaciones*, e653.
- Gigliotti, R., Vardaman, J., Marshall, D. R., and Gonzalez, K. (2019). The role of perceived organizational support in individual change readiness. *Journal of Change Management*, 19(2), 86–100.
- Guan, X., and Frenkel, S. (2019). How perceptions of training impact employee performance: Evidence from two Chinese manufacturing firms. *Personnel review*, 48(1), 163–183.
- Holgado Tello, F. P., Chacon Moscoso, S., Barbero Garcia, I., and Sanduvete Chaves, S. (2006). Training satisfaction rating scale: development of a measurement model using polychoric correlations. *European Journal of Psychological Assessment*, 22(4), 268–279.
- Hoppock, R. (1935). *Job satisfaction*. Harper.
- Huang, W. R. (2019). Job training satisfaction, job satisfaction, and job performance. *Career Development and Job Satisfaction*, 25, A25-dq.
- Hyasat, A. S., Al-Weshah, G. A., and Kakeesh, D. F. (2022). Training Needs Assessment for Small Businesses: The Case of the Hospitality Industry in Jordan. *Geo Journal of Tourism and Geosites*, 40(1), 20–29.

- Jaworski, C., Ravichandran, S., Karpinski, A. C., and Singh, S. (2018). The effects of training satisfaction, employee benefits, and incentives on part-time employees' commitment. *International Journal of Hospitality Management*, 74, 1–12.
- Jayalath, J., and Esichaikul, V. (2022). Gamification to enhance motivation and engagement in blended eLearning for technical and vocational education and training. *Technology, Knowledge and Learning*, 27(1), 91–118.
- Jia, M. Y. (2018). Research and Application on Influencing Factors of Training Effect of TF Company—CNKI. <https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD201802&filename=1018991731.nh>
- Jonnalagadda, R., Singh, P., Gogineni, A., Reddy, R. R. S., and Reddy, H. B. (2022). Developing, implementing and evaluating training for online graduate teaching assistants based on Addie Model. *Asian Journal of Education and Social Studies*, 28(1), 1–10.
- Ju, B., and Li, J. (2019). Exploring the impact of training, job tenure, and education-job and skills-job matches on employee turnover intention. *European Journal of Training and Development*, 43(3/4), 214–231.
- Kim, E. J., Park, S., and Kang, H. S. (2019). Support, training readiness and learning motivation in determining intention to transfer. *European Journal of Training and Development*, 43(3/4), 306–321.
- Kock, N. (2018). Minimum sample size estimation in PLS-SEM: An application in tourism and hospitality research. In *Applying partial least squares in tourism and hospitality research*. Emerald Publishing Limited.
- Laible, M. C., Anger, S., and Baumann, M. (2020). Personality traits and further training. *Frontiers in psychology*, 11, 510537.
- Laker, D. R., and Powell, J. L. (2011). The differences between hard and soft skills and their relative impact on training transfer. *Human resource development quarterly*, 22(1), 111–122.
- Latif, K. F. (2012). An integrated model of training effectiveness and satisfaction with employee development interventions. *Industrial and Commercial Training*, 44(4), 211–222.
- Locke, E.A. (1976) The Nature and Causes of Job Satisfaction. In: Dunnette, M.D., Ed., *Handbook of Industrial and Organizational Psychology*, Vol. 1, 1297–1343.
- Michaelis, C., and Findeisen, S. (2022). Influence of Person-Vocation Fit on Satisfaction and Persistence in Vocational Training Programs. *Frontiers in Psychology*, 13, 834543.
- Mumtaz, S., and Rowley, C. (2020). The relationship between leader–member exchange and employee outcomes: review of past themes and future potential. *Management Review Quarterly*, 70, 165–189.
- Okechukwu, W. (2017). INFLUENCE OF TRAINING AND DEVELOPMENT, EMPLOYEE PERFORMANCE ON JOB SATISFACTION AMONG THE STAFF. *Journal of Technology Management and Business*, 4(1).
- Ouyang, X. (2019). Research on the Satisfaction of Employees' training in Small and Medium-sized Technological Enterprises CNKI. <https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD202001&filename=1019093973.nh>
- Poddar, S., Mukherjee, U., Shasmal, N., and Panday, M. (2021). PSYCHOSOCIAL ISSUES ASSOCIATED WITH MINING INDUSTRY: A BRIEF REVIEW. *Indian Journal of Health Social Work*, 3, 3.
- Prilyana, C., and Aseanty, D. (2020). The Effect of Training Satisfaction to Turnover Intention Mediated by Organizational Citizenship Behavior and Job Satisfaction in Employees of Bank Syariah in Jakarta. *Webology*, 17(2), 551–567.
- Schmidt, S. W. (2009). Employee demographics and job training satisfaction: the relationship between dimensions of diversity and satisfaction with job training. *Human Resource Development International*, 12(3), 297–312.
- Shafait, Z., Khan, M. A., Sahibzada, U. F., Dacko-Pikiewicz, Z., and Popp, J. (2021). An assessment of students' emotional intelligence, learning outcomes, and academic efficacy: A correlational study in higher education. *Plos one*, 16(8), e0255428.
- Soegiarto, I., Sihite, M., and Usmany, P. (2024). The Influence of Training and Development Programs, Job Autonomy, and Organizational Culture on Employee Job Satisfaction and Performance. *International Journal of Business, Law, and Education*, 5(2), 1577–1583.
- Starr, R. C. (1971). The culture collection of algae at Indiana University—Additions to the collection July 1966–July 1971. *Journal of Phycology*, 7(4), 350–362.
- Sypniewska, B., Baran, M., and Klos, M. (2023). Work engagement and employee satisfaction in the practice of sustainable human resource management—based on the study of Polish employees. *International Entrepreneurship and Management Journal*, 19(3), 1069–1100.
- To, W. M., and Leung, V. W. (2024). Training orientation, organizational support and training satisfaction—the mediating role of perceived value of training. *Journal of Workplace Learning*, 36(1), 1–26.
- Tuul, O., and Bing, S. J. (2019). Employee training in small and medium-sized enterprises in Mongolia. *Proceedings of the Mongolian Academy of Sciences*, 75–84.

- Wong, C. H., Arumanathan, S. R., Moosa, V., Zhu, L., and Prompanyo, M. (2024). Factors influencing job satisfaction in teaching online classes among academics in Malaysia. *Pakistan Journal of Life and Social Sciences*, 22(2), 1104–1125.
- Zikmund, W. G., Babin, B. J., Carr, J. C., and Griffin, M. (2013). *Business research methods*. Cengage learning.