

Analysis of the Learning-Practice Transformation Dilemma in G Mining Company Based on the Baldwin-Ford Training Transfer Framework

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Abstract: Against the dual constraints of rigid work safety supervision and green mine transformation, small private mining companies generally face the problem of “training-practice disconnect”, characterized by insufficient training resources and difficulties in applying learned skills to actual jobs. This paper adopts the Baldwin-Ford three-dimensional framework of training transfer and takes G Mining Company as a case to systematically analyze the mechanism behind the dilemma of frontline employees’ training transfer in small mining enterprises. The study finds that the deficiencies in the three dimensions of employee characteristics, training design and organizational environment in G Company do not exist in isolation but interact with each other. Insufficient employee involvement and declining training effectiveness reinforce each other, which subsequently leads the management to reduce resource input. The three dimensions form a mutually causal vicious cycle, which is the deep-rooted cause of persistently low training transfer effectiveness. Accordingly, this paper constructs a full-process training transfer system consisting of pre-training activation, in-training optimization and post-training follow-up, and proposes a simplified Kirkpatrick four-level evaluation closed-loop system, so as to provide practical references for improving training implementation in G Company.

Keywords: Training Transfer; Learning-Practice Transformation; Small Mines; Baldwin-Ford Framework

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1. Introduction

The “Safety Production Law” revised in 2021 further compacts the main responsibility of safety education and training for employees in mining enterprises^[1]. The “Three-year Action for Safe Production (2024-2026)” deployed by the Security Committee of the State Council lists improving the safety quality of employees as a core governance task. Driven by the goal of “double carbon,” the mining industry is undergoing a profound transformation to safety, green and intelligence, which puts forward higher standards for the risk identification ability, emergency disposal ability and heavy metal protection ability of front-line miners. In recent years, major safety accidents in domestic mines have fully exposed the deep problems of heavy production and light training in a large number of enterprises, the training is a mere formality, and the learning can not be transformed into the practical ability of the post.

The above-mentioned learning-to-use transformation dilemma is particularly prominent in small mining enterprises. According to statistics, in China’s hazardous chemicals, coal mines, non-coal mines, metal smelting and fireworks and other

five industries of about 18 million employees, the proportion of junior high school and below education level reached 34 %, of which only about 20 % of the personnel received formal vocational skills training, about 10 percentage points lower than the national average^[2] ; migrant workers with zero-based safety skills account for about 40 % of employees in high-risk industries^[2]. At the same time, small and medium-sized mining enterprises generally face the dilemma of shortage of training resources; small coal mines, small mines, small chemical and other small enterprise accidents account for more than 80 % of the total number of accidents in related industries^[2]. Such mines generally face structural constraints such as limited scale of operation, no full-time training personnel, tight training funds, mostly local middle-aged and elderly labor force, and high mobility of personnel^[2]. It is difficult to directly transplant the standardized training migration mechanism of large state-owned mines^[3].

The academic circles have continued to discuss the training of mining enterprises. It is generally believed that there are some shortcomings in mining training, such as lack of demand analysis, weak pertinence of curriculum design, and single training mode^[4]; the lack of training needs analysis and incomplete training evaluation are the core problems in the training management of some high-risk industries^[5]. The above research shows that the outdated training content and single form are the common difficulties faced by the mining industry, but most of the research still stays at the level of problem diagnosis, and fails to rely on the systematic theoretical framework to deeply analyze the internal mechanism of learning and not using. Another limitation of the existing research is that the research object is highly concentrated in the state-owned large and medium-sized mining industry. For example, Jiang Hua and Zhang Xiaolong respectively carried out a study on the influencing factors of safety training transfer results in Jinhua Gong Coal Mine of Datong Coal Mine Group^{[6][7]}; Li Hongmin and Li Jizu studied the effect of coal mine safety training from the perspective of knowledge transfer^[8]. In contrast, there is a lack of special attention to small private mining, and the training base of this type of enterprise is weaker, and the training investment and resource guarantee ability are not as good as those of large and medium-sized state-owned mines; most of the proposed optimization schemes rely on sufficient funds and full-time manpower support, which is difficult to match the resource-constrained operation status of small mines.

Training transfer theory provides an appropriate analytical tool for this. This theory is proposed by Baldwin and Ford (1988), which summarizes the factors that affect the transfer of training learning to the work scene into three dimensions: student characteristics, training design and working environment. It emphasizes that the training effect depends not only on the learning itself, but also on whether the trainees can effectively transfer the learning to the actual work^[9]. Holton (1996) further constructed a training transfer evaluation mode^[10]. On this basis, the academic community has gradually formed a migration implementation idea that emphasizes the coordination of the whole process before, during and after training. In the field of mining safety training, scholars such as Jiang Hua and Zhang Xiaolong have applied this theory to the analysis of the influencing factors of the migration results of large-scale coal mine safety training^{[6][7]}. From the perspective of knowledge transfer, Li Hongmin and Li Jizu verified the positive effect of organizational support and students knowledge absorptive capacity on the transfer effect^[8]. However, there is still a lack of systematic application research on this theory in the context of small private mines.

G Mining Company (hereinafter referred to as G Company) located in southern Shaanxi is a typical representative of small private mines. Founded in 2002, the company is mainly engaged in the mining and smelting of polymetallic mines. It has more than 200 employees and is a small private mining enterprise. Similar to similar enterprises in the region, the company is facing multiple operating pressures such as fluctuations in product market prices, stricter environmental supervision, and continuous pressure on underground safety remediation. The training resources are in a tight constraint state for a long time, and the training work lacks systematic planning. It is difficult for front-line employees to effectively apply safety regulations and operational skills to underground practical operation scenarios after training. The problem of disconnection between learning and application is representative. Based on the three-dimensional model of Baldwin-Ford training transfer, this paper analyzes the dilemma mechanism of G company's front-line staff training transformation, and explores the optimization path to improve the effect of training transfer under resource constraints.

2. The Practical Dilemma of G company's Training and Learning Disconnection

From the perspective of training transfer theory, G company's front-line staff training has deficiencies in three aspects: student characteristics, training design, and organizational environment. These three aspects are not isolated, but interrelated and mutually transmitted.

2.1 Students' Characteristic Dimensions: Limited Basic Conditions and Insufficient Migration Motivation

The front-line employees of G company are mainly local rural labor force. From the perspective of the industry as a whole, 34 % of the employees in high-risk industries have a junior high school education or below, only about 20 % have received formal vocational skills training, and this proportion is often higher among employees in small mining enterprises ^[2]. However, the company training usually adopts the methods of standard document propaganda and PPT theory indoctrination. The content is abstract and the expression is written, which is difficult for most front-line workers to effectively absorb. From the current situation of training management, there is a lack of systematic research on training needs. The training content is mostly arranged unilaterally by management, which is out of line with the actual job needs. Employees have limited understanding and poor memory in training, and it is difficult to apply it to on-site practice after class.

At the same time, employees have insufficient motivation to migrate. Because the company does not link the training assessment results, skills landing performance with salary adjustment, job promotion and annual evaluation, employees lack external incentives to actively apply the skills they have learned to work. Industry research also shows that incomplete training evaluation is a long-standing shortcoming of mining enterprises. The training effect evaluation of most enterprises stays at the level of examination and fails to extend to the post application evaluation ^[5]. In terms of management orientation, the daily operation of enterprises takes production tasks as the primary goal, and the tendency of emphasizing production and neglecting training is more common in small mines ^[2]. The theory of training transfer points out that the transfer motivation of students is the primary prerequisite for the occurrence of transfer behavior ^[9]. In such an environment, employees tend to regard training as a procedural matter to deal with inspections, rather than an opportunity to improve their own abilities. It is not difficult to infer that they have insufficient motivation to take the initiative to transfer training to job operations

2.2 Training Design Dimension: Low Content Matching and Deviation from Adult Learning Rules

The formulation of G company's training plan lacks a normalized demand analysis mechanism, and the course content is mostly temporarily designated by the management based on experience, or passively arranged to implement the relevant requirements of the superior. The training adopts a unified teaching mode for all staff, and does not distinguish the differentiated ability needs of different positions such as mining, mineral processing and smelting. The supply of practical contents such as emergency rescue, hidden danger investigation and heavy metal protection urgently needed by underground employees is insufficient, while the proportion of general and theoretical industry standard courses is too high, forming a supply and demand dislocation between post requirements and classroom teaching. Such problems are not unique to G company. Existing research has pointed out that the problem of disconnection between the training content of mining enterprises and the actual job requirements is more prominent. Traditional safety knowledge accounts for a relatively high proportion, while new disaster prevention and control, emergency response and other urgently needed practical content accounts for a relatively low proportion ^[4].

In the form of training, the enterprise takes the centralized teaching in the conference room as the main form, and the underground on-site teaching, practical exercises, accident scenario simulation and other links are relatively weak. The problem of single training method has certain universality in mining enterprises. It is generally believed that the single training method is a common problem in mining training. Most enterprises still focus on classroom teaching, and the practical operation is weak. According to adult learning theory, adult learners' learning tendency is problem-centered rather than subject-centered. Pure theory inculcates the core learning demands of front-line employees to solve practical problems on the spot, which not only reduces the efficiency of knowledge absorption, but also makes employees unable to establish the connection cognition between training content and post operation.

2.3 Organizational Environment Dimension: Lack of Support after Training and Lack of Learning Atmosphere

The theory of training transfer emphasizes that even if employees have the ability and motivation to migrate, it is still difficult to migrate if the working environment is not supported ^[10]. G company also has problems at the organizational environment level.

First, the follow-up mechanism after training is missing. After the employees return to the post after completing the training, they lack follow-up guidance and effect tracking, and it is difficult to consolidate and strengthen the training in the post operation. Secondly, the mentoring pairing and post counseling system has not yet been established, and new employees or employees with weak skills lack effective channels for help in practical problems. Thirdly, the enterprise 's investment in training funds and infrastructure guarantee are insufficient, and the training work lacks planning and normalized organization and implementation. Enterprises with high technical requirements and heavy training tasks for employees can extract education and training funds at 2.5 % of the total wage of employees ^[11]. The “ Coal Mine Safety Training Regulations “ require coal mining enterprises to earmark no less than 40 % of their education and training funds for safety training ^[12]. As Pei Wentian pointed out, some small and medium-sized high-risk enterprises have no training ability, and they are reluctant to invest funds to send out training. The problems of non-training, false training and low standard training are prominent ^[2]. The weakening of the implementation of the system is a prominent shortcoming of safety management ^[13]. The lack of support in the above aspects makes the enterprise not form a learning atmosphere that attaches importance to the landing of skills, and the migration atmosphere in the working environment is relatively weak.

3. Analysis of the Deep Reasons for the Disconnection between Learning and Application

3.1 The Two-Way Aggravation of Insufficient Employee Input and the Decline of Training Effect

From the current situation of the company's training management, front-line employees ' enthusiasm for training is not high, and they believe that training is not related to their own work improvement. Pei Wentian pointed out at the press conference of the Ministry of Emergency Management that some small and medium-sized high-risk enterprises have no training ability and are reluctant to invest funds to send out training. The problems of non-training, false training and low standard training are prominent ^[2]. The training content of some enterprises is separated from the post operating environment, from the on-site risks and hidden dangers ^[2]. Under the background that training is a mere formality in the industry, G company employees tend to regard training as a procedural matter to deal with inspections, rather than an opportunity to improve their own capabilities.

Under this cognitive dominance, employees ' input in the training process is limited, and the learning effect is not ideal. Because the company's daily management takes production tasks as the primary orientation, training often gives way to production, and the attendance rate and learning engagement of employees are difficult to guarantee ^[2]. The training content itself does have prominent problems that are divorced from the underground reality and emphasize theoretical preaching ^[4], which further confirms the employee 's doubts about the value of training. When employees find that the training content is not related to the actual work, the original negative cognition is strengthened, and the training input is further reduced.

3.2 The Training Effect Is Not Obvious and the Cycle of Resource Input Reduction Is Superimposed

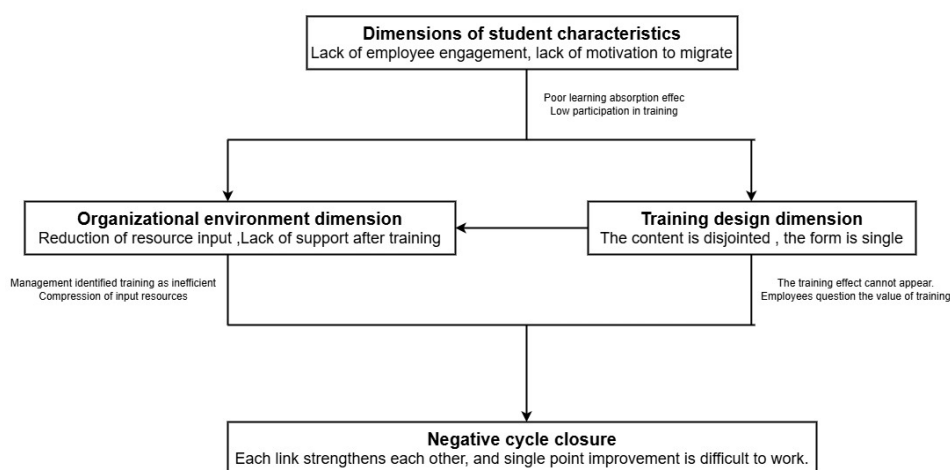
A small number of employees tried to apply the operational norms learned from the training to on-site operations after the training. Due to the lack of follow-up guidance and effect inspection, the improvement behavior was not feedback and recognized, and it was difficult to persist after the attempt. Existing research has pointed out that the training effect evaluation of some enterprises is not comprehensive enough to extend to the post application assessment ^[5]. The training content of some enterprises also has the problem of being divorced from the actual position ^[2].

In the view of the management, the training has invested a lot of working hours, and the performance of on-site operations has not improved significantly. It may be concluded that the training investment has not produced the expected results, which in turn compresses the training funds and reduces the purchase of training equipment and training time. Some small and medium-sized high-risk enterprises are reluctant to invest funds, and the problem of insufficient investment in training is more prominent ^[2]. Lack of follow-up support after training, learning is difficult to land; the management thus finds that the training investment is inefficient, and then shrinks the resource investment, and the training quality is further deteriorated.

3.3 The Three Links Are Nested to Each Other to Form a Negative Cycle

The above two levels do not operate independently, but are interrelated. Employees' learning input is insufficient, and training is difficult to produce results. According to this, the management believes that training has no value, which in turn compresses resource input, and the quality of training decreases. Employees are more distrustful of training. Baldwin and Ford 's training transfer framework points out that there is an interaction between the three dimensions of student characteristics, training design and working environment^[9]; holton's evaluation model emphasizes that the effect of migration is the result of the combination of individual factors, training design and organizational environment^[10]. G company confirms that the three links of student characteristics, training design and organizational environment transmit and strengthen each other, and finally form a cycle that is difficult to break without external intervention. (See Figure 1).

Figure1: The negative cycle transmission mechanism of the dilemma of training learning to use transformation in G company



4. The Optimization Path to Solve the Disconnection between Learning and Application

The key to solving the problem of disconnection between learning and application in G company is to break the negative cycle between student characteristics, training design and organizational environment, rather than the improvement in a single link. According to the three stages of pre-training, training and post-training, this paper puts forward the following optimization paths:

4.1 Pre-Training Activation: Accurate Identification of Needs, Effective Stimulation of the Engine

Establish a simplified job training needs identification mechanism. Collect requirements on a regular basis, and summarize the recent operational violations, operational difficulties and common faults of the position by the heads of each section. Combined with the post operation rules and industry standards, a list of differentiated training needs for different job categories such as mining, mineral processing and smelting is formed. According to this, the training content is designed to ensure that it matches the job requirements, and the pertinence and practicability of the training are improved from the source. Before the start of each training, a short time is used to explain to the employees the corresponding work scenarios and practical problems that can be solved in the current training content, and the goal activation before the training is completed. To strengthen the motivation of migration with institutional traction. A simple training incentive system is introduced, which moderately links the training practical assessment results with the performance bonus, and incorporates the reference conditions for annual evaluation and team leader promotion. Management should continue to pass on the pragmatic orientation of standardized operation to job safety and operation efficiency in pre-class meetings and other occasions, reverse the organizational atmosphere of training, and enhance the intrinsic motivation of employees ' active migration from both institutional and cultural levels.

4.2 Optimization in Training: Paste Synthesis of Human Learning Rules, Strengthen the Transfer Design

Reconstruct the scene-based and practical training form. Compression of long-term centralized teaching, the implementation of pre-class short-term education, production gap on-site practical teaching and typical operation case resumption of the combination mode, to alleviate the time conflict between production and training. For employees with low education level, a

pocket operation manual based on schematic diagrams and supplemented by text can be compiled, and simple textbooks with both pictures and texts can also be used. Under the premise of budget permission, portable VR training equipment can be configured for scenario simulation training of high-risk operation links and complex operation processes. For small mines that are unable to purchase VR equipment, lower-cost alternatives such as simulated props and role-playing can be used.

Combine the migration design elements in the training course. Each period of training arranges sufficient practical exercises or case discussion time, designs operation tasks around typical job scenarios, and selects some employees to carry out on-site operation exercises. Employees who are not selected need to orally retell the operation process and key points, and are immediately corrected by the trainer or the section leader. At the end of the course, the post application plan is set up to guide each employee to think about how to apply the training knowledge after returning to the post, and to complete it by oral sharing or brief record, so as to help students take the initiative to establish the connection cognition of learning, practical operation and post.

4.3 Follow-Up after Training: Build a Migration Support System and Create an Organizational Atmosphere

Establish a mentoring and job inspection and counseling mechanism. Carry out the mentoring system of old and new and mature students, and make it clear that during the follow-up period after the training, the master must continuously observe and feedback the standardized operation of the apprentice. At the same time, the section chiefs are required to incorporate the application of training skills into the daily inspection content, correct the problems on the spot, extend the organizational support from the training period to the post-training position, and implement the post-training follow-up requirements.

Create an organizational learning atmosphere that supports migration. The enterprise separates the annual training special funds, and gives priority to the guarantee of practical teaching aids, graphic teaching materials and necessary training conditions. Regularly organize job skills competition and operation standard evaluation, and give public recognition and material rewards to employees who can use training standards and effectively improve the quality of job operations. Incorporating the training transformation effect of each section into the performance evaluation index of the section leader promotes the formation of a learning atmosphere that attaches importance to the landing of skills.

4.4 Simplified Training Effect Evaluation Closed Loop

Combined with the current situation of human resources in small mines, the four-level evaluation system is simplified and extended on the basis of the existing training sign-in, and the evaluation data is collected by the administrator part-time. On the reaction level, after class, a concise questionnaire was used to collect employees' evaluation of the practicality of the course and the degree of job matching; at the learning level, after the training, the on-site simple practical operation assessment is carried out to test whether the key operation steps are mastered; at the behavioral level, the section chief continuously recorded the changes of employee operation norms for a period of time after training, and adopted the key event recording method to focus on the compliance of key operations. On the result level, the data of operation standard compliance rate, post skill assessment pass rate and equipment failure rate of each section are summarized regularly as reference indexes to measure the long-term effect of training.

4.5 The Implementation Guarantee of the Implementation of the Plan

In order to ensure that the optimization path of G company to break the disconnection between learning and application is truly implemented, it is necessary to provide guarantee from four aspects: organizational rights and responsibilities, management cognitive risk, resource input and production coordination.

4.5.1 Organizational responsibilities

A training improvement working group was established, which was led by the main head of the enterprise, and participated by the deputy head of the mine, the head of the section and the administrator. The effectiveness of training transfer was included in the list of the performance of the head of the enterprise, and the effect of training transfer was added as a fixed topic in the regular meeting. Administrators co-ordinate training plans and assessment data summary; the heads of each section are responsible for demand collection, post-training inspection and daily supervision of mentors and apprentices, mainly based on on-site observation and oral feedback, and the training transformation effect of each section is included in

the performance appraisal ; the management is responsible for the approval and implementation of the incentive system, as well as the approval of annual training funds.

4.5.2 Management cognitive risk

Management 's cognitive risk is a key variable for the implementation of the plan. If managers reduce their investment in the short term, the whole optimization system may be interrupted. In the early stage of the implementation of the training program, the administrator regularly submits feedback on the training effect, focusing on indicators such as the rate of skill operation compliance and the application of training methods and positions, so that the management can observe the behavioral changes after the training. In the later stage, it transitions to quarterly assessment briefings, showing the trend of training transformation in each section, and preventing the negative cycle from re-entering due to the lack of short-term effect.

4.5.3 Commitment of resource

In terms of resource investment, priority is given to low-cost alternatives. Training funds focus on ensuring basic expenditures such as printing materials, skill competition awards, and simple materials required for assessment work. The hardware configuration with a large one-time investment such as VR equipment must be evaluated by trial operation to confirm the demand before making decisions, so as to avoid idle equipment. Continue to carry out job demand collection, mentoring, post-training inspections, etc., not affected by hardware procurement decisions.

4.5.4 Production collaboration

Combining the training with the existing production rhythm, the short-term theoretical teaching is carried out by using the pre-class meeting, the on-site practical exercises are arranged by using the shutdown maintenance day, and the typical operation case review is integrated into the production meeting, without additional production time. The training content is unified with the post operation standard, so that the training is used by the post, and the psychological conflict of the employees is alleviated from the root.

Conclusion

Based on the three-dimensional analysis framework of training transfer theory, this paper systematically analyzes the dilemma, deep mechanism and solution path of G company's front-line staff training transformation. The research shows that the dilemma of G company's learning-to-use transformation is not caused by the weakness of a certain link, but a negative cycle formed by the three dimensions of student characteristics, training design and organizational environment, which are nested and mutually causal. The shortage of staff input and the decline of training effect aggravate each other, and superimpose with the reduction of resource input, so that the three links conduct and restrict each other, and the training system falls into an inefficient state for a long time. The local improvement of a single link is difficult to work, which is the structural root of G company's long-standing training problem but difficult to break through. This paper proposes a three-stage collaborative training migration support path of pre-training activation, training optimization, and post-training follow-up, as well as a supporting simplified evaluation and improvement mechanism, following the principles of simplicity, practicality, operability, and replicability, which can provide reference for G company and similar small mining enterprises.

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Conflict of Interests

The authors declare that there is no conflict of interest regarding the publication of this paper.

Reference

- [1] General Office of the Standing Committee of the National People's Congress. (2021). Production Safety Law of the People's Republic of China: the latest revision. China Democratic Law Press.
- [2] Pei, W. T. (2019). Speech at the Press Conference of the Ministry of Emergency Management's Action Plan for Improving Safety Skills in High-risk Industries [EB/OL]. Ministry of Emergency Management.
- [3] Ministry of Emergency Management, Ministry of Human Resources and Social Security, Ministry of Education, et al.

- (2019). Implementation Opinions on the Action Plan for Improving Safety Skills in High-risk Industries [EB/OL].
- [4] Li, C., Guo, H. M., & Cheng, L. H. (2019). Analysis of problems and countermeasures in safety training of coal mine enterprises. *Coal Mine Safety*, 50(6), 281–284.
- [5] Du, F. C. (2021). Study on the optimization of safety production training management system of Jinguang Copper Industry [Master's dissertation]. Hunan University.
- [6] Jiang, H. (2019). Study on the influencing factors of the migration results of safety training in Jinhuaogong Coal Mine. *Shandong Coal Science and Technology*, (11), 219–221, 223.
- [7] Zhang, X. L. (2020). Research on influencing factors of safety training results in Jinhuaogong Coal Mine. *Coal Mine Modernization*, (4), 188–190.
- [8] Li, H. M., & Li, J. Z. (2021). Research on influencing factors of coal mine safety training effect based on knowledge transfer perspective. *Coal Technology*, 40(5), 205–208.
- [9] Baldwin, T. T., & Ford, J. K. (1988). Transfer of training: A review and directions for future research. *Personnel Psychology*, 41(1), 63–105. <https://doi.org/10.1111/j.1744-6570.1988.tb00633.x>
- [10] Holton, E. F. (1996). The flawed four-level evaluation model. *Human Resource Development Quarterly*, 7(1), 5–21. <https://doi.org/10.1002/hrdq.3920070103>
- [11] Ministry of Finance, All-China Federation of Trade Unions, National Development and Reform Commission, et al. (2006). Notice on Printing and Issuing "Opinions on the Management of the Extraction and Use of Education Funds for Enterprise Employees" [EB/OL]. *Caijian* No. 317.
- [12] General Administration of Work Safety. (2018). Regulations on Coal Mine Safety Training [EB/OL]. Decree No.92 of General Administration of Work Safety.
- [13] Zhang, X. G., Ma, S. X., Zhan, J. Z., et al. (2026). Construction and practice of safety management system for a fluorite mine. *Modern Mining*, 42(3), 210–215.