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A Study on the Factors Affecting the Workplace Application of Periodic Education for Supervisors: Focusing on Personal Characteristics and Program Factors

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Abstract

Purpose: This study examines the factors influencing the workplace application of periodic occupational safety and health education for supervisors, focusing on individual characteristics (self-efficacy, learning motivation, transfer motivation) and program factors (instructor competence, training environment). The research aims to identify key variables that enhance the effectiveness of mandatory supervisor education and provide practical implications for improving educational outcomes.

Research Design, Data and Methodology: A survey was conducted with 310 supervisors across various industries in Korea who completed periodic occupational safety and health education. The study utilized a structured questionnaire based on validated measurement tools from previous research. Data analysis was performed using SPSS 24.0, employing descriptive statistics, factor analysis, reliability tests, correlation analysis, and multiple regression analysis. **Results:** The workplace application level of supervisor education was relatively high ($M=4.12$). Multiple regression analysis revealed that transfer motivation ($\beta=.381$, $p<.001$), instructor competence ($\beta=.260$, $p<.001$), and training environment ($\beta=.190$, $p<.01$) significantly predicted workplace application, explaining 54% of the variance ($R^2=.543$). However, self-efficacy and learning motivation did not show significant effects on workplace application. **Conclusions:** The study confirms that enhancing transfer motivation, ensuring instructor quality, and improving training environments are essential for maximizing the effectiveness of supervisor education. The findings suggest that educational programs should prioritize practical applicability and create motivational learning environments to improve workplace transfer of safety knowledge and skills.

Keywords : Safety Awareness, Construction Safety, Serious Accident Punishment Act , Accident Rate,Cognitive Ability

JEL Classification Code : K23, L52, L74

1. Introduction

1.1. Background and Necessity of the Study

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Industrial accidents continue to pose significant challenges to workplace safety despite ongoing efforts to improve occupational safety and health management systems. According to the Korea Occupational Safety and Health Agency, the number of industrial accident fatalities in 2023 reached 2,223 cases, with supervisors playing a critical role in preventing such incidents through effective safety management at the workplace level (Ministry of Employment and Labor, 2024).

The Occupational Safety and Health Act mandates that supervisors receive at least 16 hours of periodic education annually, recognizing their pivotal role in workplace safety management. However, empirical evidence regarding the effectiveness of such mandatory education and the factors that influence its practical application in the workplace remains limited. This gap between legal requirements and actual educational outcomes necessitates a comprehensive examination of the factors that determine the success of supervisor education programs.

Supervisors serve as the critical link between management policies and worker implementation, directly influencing safety culture and accident prevention at the operational level. Their safety awareness, management capabilities, and ability to apply learned safety principles directly impact workplace safety outcomes. Therefore, understanding the factors that enhance the workplace application of supervisor education is crucial for improving overall industrial safety performance.

1.2. Purpose of the Study

This study aims to empirically analyze the effectiveness of periodic education for supervisors by examining the impact of individual characteristics and program factors on workplace application. Specifically, the research objectives are:

1. To identify the relationship between individual characteristics (self-efficacy, learning motivation, transfer motivation) and workplace application of supervisor education
2. To examine the influence of program factors (instructor competence, training environment) on educational effectiveness
3. To determine the relative importance of different factors in predicting successful workplace application
4. To provide practical recommendations for improving supervisor education programs

The study adopts Baldwin and Ford's (1988) learning transfer model as its theoretical foundation, which

emphasizes that educational effectiveness should be measured not merely by content acquisition but by the extent to which learned content is applied and maintained in actual work settings.

2. Literature Review

2.1. Legal Framework and Importance of Supervisor Education

The legal framework governing supervisor education in Korea is established under Article 29 of the Occupational Safety and Health Act, which mandates periodic education as a key institutional mechanism for industrial accident prevention. Supervisors are defined as individuals who directly command and supervise workers, making their safety competence crucial for workplace safety outcomes (Korea Occupational Safety and Health Agency, 2024).

The enforcement of the Serious Accident Punishment Act in January 2022 has further emphasized the legal responsibility of supervisors, imposing criminal penalties for serious accidents resulting from inadequate safety management. This legal development has heightened the importance of effective supervisor education, as it directly relates to legal compliance and accident prevention capabilities.

2.2. Adult Learning Theory and Learning Transfer

Adult learning theory (Andragogy) provides the theoretical foundation for understanding how supervisors, as adult learners, acquire and apply safety knowledge. Knowles (1980) emphasized that adult learners are self-directed, experience-based, and require educational approaches that consider their practical needs and prior experiences.

The learning transfer model developed by Baldwin and Ford (1988) identifies three key categories of factors affecting transfer: trainee characteristics, training design, and work environment. This model has been widely adopted in organizational learning research and provides a comprehensive framework for analyzing educational effectiveness.

Holton's (1996) evaluation model further refined the understanding of learning transfer by emphasizing the importance of transfer motivation and environmental support in determining educational outcomes. These theoretical frameworks provide the conceptual foundation for examining supervisor education effectiveness.

2.3. Previous Research on Supervisor Education

Research on supervisor education effectiveness has been limited compared to studies on general safety training. Park (2023) analyzed factors influencing risk assessment implementation, highlighting the importance of individual motivation and organizational support. However, specific research on supervisor

Research on supervisor education effectiveness has been limited compared to studies on general safety training. Park (2023) analyzed factors influencing risk assessment implementation, highlighting the importance of individual motivation and organizational support. However, specific research on supervisor education effectiveness remains scarce.

Studies on related fields have identified key factors affecting learning transfer. Choi (2008) found that individual motivational factors and environmental conditions jointly influence learning transfer in technical training programs. Lee and Park (2012) emphasized the importance of reliable measurement tools for assessing learning transfer outcomes.

Park and Lee (2018) analyzed the effects of perceived usefulness and ease of use on learning transfer in corporate e-learning, confirming that program characteristics play crucial roles in determining transfer outcomes. These studies provide valuable insights for understanding supervisor education effectiveness.

2.4. Setting of Research Variables

Based on the review of previous studies, this study sets self-efficacy, learning motivation, transfer motivation (personal characteristics), instructor teaching competence, training environment (program factors), and workplace application (dependent variable) as the main analysis variables. This variable configuration ensures theoretical validity based on Baldwin and Ford's (1988) learning transfer model and Holton's (1996) evaluation model.

3. Research Methodology

3.1. Research Model and Hypothesis Setting

Based on adult learning theory and learning transfer model, a research model was established to identify factors affecting the workplace application of periodic education for supervisors. Independent variables were divided into personal characteristic factors (self-efficacy, learning

motivation, transfer motivation) and program factors (instructor teaching competence, training environment), with the dependent variable set as workplace application.

3.2. Research Subjects and Data Collection

A survey was conducted from August to November 2025 on supervisors who completed occupational safety and health education. A total of 310 respondents participated, with 70% in their 30s and 40s, and 60% at the level of site foremen or team leaders. Data collection utilized structured questionnaires proven in previous studies.

3.3. Measurement Tools

The questionnaire was restructured based on verified items for learning motivation, transfer motivation, and effectiveness, referencing KCCP panels, latest cases in occupational safety and health education, and reliability research results (Knowles, 1980; KCCP, 2021; Lee Ji-eun, Park A-ram, 2012). All items were measured on a 5-point Likert scale.

Self-efficacy measured the degree of belief in one's ability to perform specific tasks, learning motivation measured willingness and enthusiasm to participate in education. Transfer motivation measured the intention to apply learned content to the workplace, instructor teaching competence measured evaluation of the instructor's expertise and teaching methods. Training environment measured physical and psychological environments such as educational facilities, materials, and atmosphere, and workplace application measured the extent to which educational content is applied to actual work

3.4. Analysis Methods

The collected data was analyzed using SPSS 24, performing basic statistics, factor analysis, reliability verification, correlation analysis, and multiple regression analysis. First, descriptive statistical analysis identified general characteristics of respondents and basic characteristics of each variable, and exploratory factor analysis verified the construct validity of the measurement tool. Cronbach's α coefficients were calculated to confirm internal consistency, and Pearson correlation analysis analyzed relationships between variables. Finally, hierarchical multiple regression analysis was conducted to identify factors affecting workplace application.

4. Research Results

4.1. General Characteristics of the Sample

Among the 310 respondents, those in their 30s and 40s accounted for 70% of the total, and by position, site foremen and team leaders were the most at 60%. This is judged to reflect the general age and position distribution of supervisors.

4.2. Validity and Reliability Verification of Measurement Tools

Factor analysis results proved the suitability of a 5-factor structure (self-efficacy, learning motivation, transfer motivation, instructor teaching competence, training environment), with KMO value of .89 and Bartlett's sphericity test significant ($p < .001$). Eigenvalues for each factor were above 1.0, and cumulative variance explanation rate was 73.2%, showing a good level.

Reliability analysis results showed Cronbach's α values above 0.7 for all variables, securing internal consistency (Park Dae-bong & Lee Jeong-ha, 2018; KCCP, 2021). Self-efficacy .82, learning motivation .79, transfer motivation .87, instructor teaching competence .85, training environment .83, workplace application .88, all variables showed good reliability.

4.3. Correlation Analysis

Table 1: Correlation Analysis

Variables	1	2	3
Self-efficacy	1		
Learning motivation	.45**	1	
Transfer motivation	.38**	.52**	1
Instructor competence	.41**	.48**	.56**
Training environment	.35**	.44**	.49**
Workplace application	.23**	.28**	.62**
Variables	4	5	6
Self-efficacy			
Learning motivation			
Transfer motivation			
Instructor competence	1		

Training environment	.67**	1	
Workplace application	.58**	.52**	1

Note: ** $p < .01$

Correlation analysis results showed significant positive correlations between all variables ($p < .01$). The variable with the highest correlation with workplace application was transfer motivation ($r = .62$), followed by instructor teaching competence ($r = .58$), training environment ($r = .52$), learning motivation ($r = .28$), self-efficacy ($r = .23$). This suggests that the learner's intention to apply in the workplace is most closely related to actual application.

Correlation coefficients between independent variables ranged from .35 to .67, showing moderate to high levels of correlation according to Cohen (1988). In particular, the correlation coefficient between instructor teaching competence and training environment was .67, the highest, but did not exceed .85, the multicollinearity criterion suggested by Hair et al. (2010), so it was judged suitable for regression analysis. Overall, all correlation coefficients between variables were below .85, confirming no multicollinearity issues.

4.3. Multiple Regression Analysis

Table 2: Results of Multiple Regression Analysis on Workplace Application

Dependent Variable	Independent Variable	B	SE	β	t	p	VIF
Workplace Application	(Constant)	0.856	0.284	-	3.01	0.003	-
	Self-efficacy	0.047	0.058	0.053	0.81	0.418	1.42
	Learning motivation	0.089	0.062	0.095	1.44	0.152	1.58
	Transfer motivation	0.325	0.056	0.381	5.80	0.000***	1.76
	Instructor competence	0.234	0.065	0.260	3.60	0.000***	2.15
	Training environment	0.176	0.068	0.190	2.59	0.010**	2.03

Model fit: $R^2 = .543$, Adjusted $R^2 = .535$, $F = 72.12$, $p < .001$, Durbin-Watson = 1.98

Note: $p < .05$, $p < .01$, $p < .001$

Model Fit

$R^2 = .543$, Adjusted $R^2 = .535$, $F = 72.12$, $p < .001$, Durbin-Watson = 1.98

Analysis results showed that only transfer motivation ($\beta=.38$, $p<.001$), instructor teaching competence ($\beta=.26$, $p<.001$), and training environment ($\beta=.19$, $p<.01$) had significant effects on workplace application. Self-efficacy and learning motivation were not statistically significant.

The standardized regression coefficient for transfer motivation was .381, the highest, confirming it as the factor with the greatest influence on workplace application. This was followed by instructor teaching competence (.260) and training environment (.190).

The model's explanatory power (R^2) was .54, confirming that independent variables explain 15% of the variance in workplace application (Learning Transfer Research Society, 2019). This is evaluated as a good level of explanatory power in social science research.

The Durbin-Watson statistic was 1.98, close to 2, satisfying the assumption of independence of residuals, and VIF values were all below 3, confirming no multicollinearity issues.

5. Conclusion and Suggestions

5.1. Summary of Research Results and Implications

This study empirically analyzed factors influencing the workplace application of periodic education for supervisors. The results showed that the workplace application of supervisor education is at a high level, and transfer motivation, instructor teaching competence, and training environment are key influencing factors (Baldwin & Ford, 1988; Holton, 1996; Park & Lee, 2018).

In particular, transfer motivation appearing as the strongest predictor suggests that the learner's intention to apply in the workplace is a key factor determining educational effectiveness. This means that strategies to enhance learners' transfer motivation should be prioritized in designing supervisor education.

The significant effects of instructor teaching competence and training environment confirm the importance of program quality. This suggests the need to go beyond simply meeting statutory education hours and improve the qualitative level of education.

5.2. Academic Contributions

This study expanded risk assessment personnel education research to supervisors, filling academic gaps in statutory education effectiveness research, and presented a comprehensive analysis framework for personal characteristics and program factors (Park Cheon-su, 2023; Park Jong-seon, 2016). Additionally, by integrating adult learning theory and learning transfer model, it expanded the theoretical foundation for supervisor education research. This is expected to provide a theoretical basis for future research related to occupational safety and health education.

5.3. Practical Suggestions

Based on the research results, the following practical suggestions are presented.

First, education design to strengthen transfer motivation is needed. The relevance between educational content and workplace tasks should be clearly presented, including motivational strategies to enhance learners' intention to apply in the workplace.

Second, a system for verifying and developing instructor competencies should be established. Beyond simple knowledge transmitters, instructors who understand the characteristics of adult learners and can employ effective teaching methods need to be trained.

Third, improvement of practice-oriented training environments is required. Beyond theory-centered lecture-style education, training environments centered on practices and cases reflecting actual field situations should be created (KCCP, 2021; Park & Lee, 2018).

Fourth, a post-education feedback system should be established. A feedback system that continuously monitors the degree of workplace application of educational content and improves the education program based on it is needed.

5.3. Limitations of the Study and Suggestions for Follow-up Research

This study has the following limitations. First, using a single institution sample limits the generalizability of the research results. Second, the cross-sectional design limits the interpretation of causal relationships. Third, additional environmental variables such as organizational culture and supervisor support were not considered (Lee & Park, 2012; Learning Transfer Research Society, 2019). Therefore, follow-up studies need large-scale sample research

including various industries and sizes of organizations, and longitudinal research designs to clearly identify the sustainability and causal relationships of educational effects. Additionally, development of comprehensive models including organizational environmental variables such as organizational culture, supervisor support, and peer support is required.

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