

The Correlation Between Instructors' Perceived Error Management Climate and Innovative Behavior at China Shandong Yingcai College

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Abstract: This study examined instructors at China Shandong Yingcai College as the research participants of Excellence and explored the relationship between teachers perceived error management atmosphere and Innovation behavior based on organizational behavioral perspectives. The research framework focuses on organizational error tolerance, overcommunication, and continuous learning, and advocates treating errors as a resource for organizational growth rather than as a mere negative outcome. It aims to shed light on the mechanisms that influence teacher innovation behaviour by the mistake management atmosphere and provides theoretical and practical evidence for colleges and universities to establish a management environment conducive to teacher innovation. The convenience sampling method was used to collect 278 valid questionnaires, and the independent sample t-test, SPSS statistical analysis, single factor variance analysis, and other methods examined the correlation between the atmosphere of mistake management and innovation behavior, as well as the impact of demographic variables such as sex age, school qualification, teaching age, and position, and validated research hypotheses through differential analysis and correlational analysis. The results show that compared with demographic variables, the organizational context factor of error management atmosphere has a more significant impact on teachers' innovative behavior than other factors; both are significantly positively correlated, and the error management atmosphere plays an outstanding positive role in promoting teachers' innovation performance. The findings showed that the atmosphere for error management at the organizational level was more influential in influencing teacher innovation behavior than the characteristics of individual populations. It is recommended that universities optimize fault management mechanisms, strengthen organizational learning or pentation, build supportive organizational environments, and weaken the influence of demographic variables.

Keywords: Error Management Climate, Innovative Behavior, College Instructors.

1. Introduction

Against the backdrop of the knowledge economy and innovation-driven development, university instructors' innovative behavior has become important for improving teaching quality, research development, and higher education innovation. As China's higher education shifts from scale expansion to intensive development, encouraging instructors to innovate in teaching, curriculum design, research, and management has become a key issue in university reform (Dogan & Arslan, 2026).

However, innovation involves uncertainty, trial and error, and possible failure. Traditional management often treats errors as negative outcomes and controls them through accountability and evaluation systems. Although this approach may maintain order, it can also reduce instructors' willingness to explore and innovate (Jiang & Guo, 2023).

Building on this foundation, the fields of organizational behavior and human resource management have progressively introduced the

concept of error management climate to describe organizations overall attitudes toward errors, their handling approaches, and learning orientation. This framework emphasizes organizational tolerance for errors, open communication, and continuous learning, advocating for viewing errors as vital resources for organizational growth rather than mere negative outcomes (Wang & Kou, 2023). Research indicates that a positive error management climate can alleviate organizational members' fear of failure, enhance psychological safety, facilitate knowledge sharing and problem reflection, thereby creating favorable contextual support for innovative behaviors (Yin & Hoang, 2026).

Error management climate provides a more positive view of errors. It emphasizes error tolerance, open communication, and learning from mistakes, viewing errors as useful resources for improvement rather than only negative results (Wang & Kou, 2023). A positive error management climate can reduce fear of failure,

influencing IB. Since innovation involved uncertainty and trial and error, members were more willing to propose and apply new ideas when errors were tolerated, discussed, and used for learning (Tahir & Rabbani, 2025).

A positive PEMC could reduce fear of failure, improve psychological safety, and encourage knowledge sharing. In universities, this climate helped instructors reflect on teaching errors, share experiences, and improve teaching practices. In contrast, a punitive climate might make instructors more conservative and less willing to innovate (Liou et al., 2025).

Overall, existing studies supported a positive relationship between PEMC and IB. However, research on university instructors in Chinese higher education remained limited. Therefore, this study examined the relationship between PEMC and IB among college and university instructors.

2. Materials and Methods

This study adopted a quantitative research design based on a structured questionnaire survey to examine the relationship between error management climate and innovative behavior among university instructors. The research process followed a standard empirical research procedure, including literature review, questionnaire survey, and statistical analysis stages.

The questionnaire on instructors' perceived error management climate was adapted from the Perceived Error Management Climate Scale by Xing (2023). It included 21 items and divided perceived error management climate into five dimensions: error improvement and innovation, error learning, error tolerance, error analysis and resolution, and error communication. There were no reverse-scoring questions in the perceived error management climate section. The higher the score obtained from the questionnaire, the higher the perception of perceived error management climate among China Shandong Yingcai College instructors.

After completing data cleaning, the valid questionnaire data were imported into SPSS statistical analysis software for processing. The study first conducted frequency statistics and descriptive analysis to understand the basic characteristics of the sample and the overall status of key variables. Subsequently, independent samples t-tests and one-way ANOVA were employed to examine differences in perceived error management climate and innovative behaviors across various background variables. Finally, correlation analysis methods were utilized

to assess variable relationships, thereby validating the research hypotheses.

research variables. Background variables: Gender, age, education level, teaching experience, and position of instructors at China Shandong Yingcai College, which were the five background variables.

Variable 1: Perceived error management climate: error improvement and innovation, error learning, error tolerance, error analysis and resolution, and error communication, comprising five dimensions.

Variable 2: Innovative behavior: four dimensions, including thinking patterns, academic exploration, life practice, and academic studies.

The research site of this study was China Shandong Yingcai College. The university had a total of 1000 instructors in the 2025 academic year. The research subjects were the instructors of the university. According to the Morgan table, a minimum sample size of 278 was considered adequate when the total population size was 1000. Accordingly, 278 questionnaires were distributed, and 278 valid questionnaires were retrieved and screened, resulting in an effective response rate of 100%.

In the literature review stage, relevant studies on error management climate and innovative behavior were systematically collected and analyzed to establish the conceptual framework and research variables. In the questionnaire survey stage, validated measurement scales were adapted and administered to collect empirical data. Finally, statistical analysis was conducted using SPSS software to test the relationships among variables and examine group differences.

3. Results

According to the data filled in the questionnaire, among the university instructors who answered the questionnaire, 165 were male (59.4%) and 113 were female (40.6%). Most university instructors were aged 30 years old and below (62.65%). University instructors' education was mainly concentrated at the bachelor's degree level (55.0%). There were 163 people (58.6%) with 5 years or less of teaching experience. There were 201 instructors (72.3%) in teaching-only positions. The basic personal information of university instructors who participated in the questionnaire survey is shown in the following table:

Table. 1: Basic personal information of university instructors

Background variable	classification	N	%
Gender	Male	165	59.4
	Female	113	40.6
Age	≤ 30 Years Old	174	62.6
	31–40 Years Old	65	23.4
	41–50 Years Old	26	9.4
	≥46 Years Old	13	4.7
Education Level	Bachelor	153	55.0
	Master	41	14.7
	Doctor	84	30.2
Teaching Experience	≤ 5 Years	163	58.6
	6–10 Years	58	20.9
	11–15 Years	21	7.6
	≥16 Years	36	12.9
Position	Teaching Only	201	72.3
	Teaching and Administration	77	27.7

1) In the process of comparing the differences in PEMC and IB of university instructors by gender, their p values were .610 and .336, respectively, which were both higher than the standard .05. Therefore, there was no significant difference in the PEMC and IB of university instructors in Shandong Province by gender.

Dimension	Male (<i>n</i> =165)		Female (<i>n</i> =113)		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Error Improvement and Innovation	4.41	.74	4.45	.63	4.42	.60
Error Learning	4.37	.77	4.45	.62	4.38	.66
Error Tolerance	4.37	.77	4.43	.72	4.38	.70
Error Analysis and Resolution	4.39	.76	4.40	.66	4.35	.51
Error Communication	4.38	.78	4.38	.78	4.35	.82
Total	4.38	.73	4.42	.64	4.41	.61

* $p < .05$, ** $p < .01$, *** $p < .001$

Results of Independent Samples T-Test on Instructors' Perceived error Management Climate by Gender

2) In the process of comparing the differences in PEMC and IB of university instructors by age, their p values were .948 and .876, respectively, which were both higher than the standard .05. Therefore, there was no significant difference in the PEMC and IB of university instructors in Shandong Province by age.

Dimension	①		②		③		④		F	p
	≤30 years old		31-40 years old		41-50 years old		≥ 51 years old			
	(n=174)		(n=65)		(n=26)		(n=13)			
	M	SD	M	SD	M	SD	M	SD		
Error Improvement and Innovation	4.41	.74	4.45	.63	4.42	.60	4.29	.92	.19	.907
Error Learning	4.37	.77	4.45	.62	4.38	.66	4.40	.84	.23	.874
Error Tolerance	4.37	.77	4.43	.72	4.38	.70	4.21	1.13	.31	.821
Error Analysis and Resolution	4.39	.76	4.40	.66	4.35	.51	4.29	.98	.40	.755
Error Communication	4.38	.78	4.38	.78	4.35	.82	4.36	.94	.02	.997
Total	4.38	.73	4.42	.64	4.41	.61	4.31	.94	.12	.948

* $p < .05$, ** $p < .01$, *** $p < .001$

Results of One-Way ANOVA on Instructors' Perceived Error Management Climate by Age

3) In the process of comparing the differences in PEMC and IB of university instructors by education level, their p values were .049 and .278, respectively. The p value of PEMC was less than the standard .05, whereas the p value of IB was higher than the standard .05. Therefore, there was a significant difference in the PEMC of university instructors in Shandong Province by education level. According to the LSD post hoc test, instructors with doctoral degrees scored higher than those with bachelor's degrees.

Results of One-Way ANOVA on Instructors' Perceived Error Management Climate by

Dimension	①		②		③		F	p	LSD
	Bachelor		Master		Doctor				
	(n=153)		(n=41)		(n=84)				
	M	SD	M	SD	M	SD			
Error Improvement and Innovation	4.28	.78	4.42	.65	4.58	.63	4.84	.009**	③>①
Error Learning	4.32	.74	4.47	.61	4.56	.68	3.33	.037*	③>①
Error Tolerance	4.29	.80	4.40	.85	4.52	.72	2.18	.116	-
Error Analysis and Resolution	4.31	.76	4.50	.62	4.50	.69	2.34	.099	-
Error Communication	4.29	.79	4.45	.75	4.49	.73	2.03	.134	-
Total	4.30	.75	4.45	.64	4.53	.65	3.06	.049*	③>①

* $p < .05$, ** $p < .01$, *** $p < .001$

Education Level

4) In the process of comparing the differences in PEMC and IB of university instructors by teaching experience, their p values were .286 and .206, respectively, which were both higher than the standard .05. Therefore, there was no significant difference in the PEMC and IB of university instructors in Shandong Province by teaching experience.

Results of One-Way ANOVA on Instructors'

Dimension	①		②		③		④		<i>F</i>	<i>p</i>
	≤ 5 Years		6-10 Years		11-15 Years		≥ 16 Years			
	(n=163)		(n=58)		(n=21)		(n=36)			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Error										
Improvement and Innovation	4.43	.72	4.30	.72	4.39	.69	4.54	.68	.93	.428
Error Learning	4.40	.73	4.24	.75	4.36	.69	4.59	.64	1.73	.156
Error Tolerance	4.40	.75	4.30	.75	4.25	.91	4.46	.80	.58	.627
Error Analysis and Resolution	4.42	.72	4.21	.76	4.44	.57	4.56	.72	1.96	.120
Error Communication	4.41	.77	4.22	.81	4.32	.87	4.51	.79	1.19	.316
Total	4.41	.71	4.25	.71	4.35	.69	4.53	.70	1.27	.286

* $p < .05$, ** $p < .01$, *** $p < .001$

Innovative Behavior by eaching Experience

5) In the process of comparing the

members gradually develop consistent environmental perceptions within shared institutional and cultural contexts (Zhi et al., 2025). Therefore, optimizing the organizational environment can enhance instructors' innovative behavior at the systemic level, rather than relying on natural differentiation due to individual differences.

An integrated analysis of empirical results regarding research hypotheses H1, H2, and H3 revealed that instructors' innovative behaviors showed no significant differences across demographic variables, yet maintained consistently high overall levels. These behaviors exhibited a significant positive correlation with error management culture ($r = 0.902$, $p < 0.01$). The findings indicated that innovative behaviors demonstrated pronounced situational dependence, with their emergence and development largely contingent upon institutional support and environmental safeguards provided by organizations.

Based on this, universities should further refine their innovation support systems while building upon existing error management mechanisms to foster synergistic development between error management and innovative practices. From an institutional perspective, innovation activities should be incorporated into faculty performance evaluation systems. By establishing teaching innovation projects, research support programs, and achievement reward mechanisms, institutions can enhance both intrinsic motivation and extrinsic incentives for faculty participation in innovation initiatives (Chen et al., 2025). Institutionalized incentives can effectively improve the sustainability and consistency of innovative behaviors.

From an organizational operational perspective, it is essential to establish a dynamic cycle mechanism of "trial-and-error—feedback—improvement," integrating error management into the innovation process. This enables instructors to progressively enhance their innovative capabilities through continuous experimentation, correction, and optimization. By transforming errors into actionable feedback, organizations can effectively reduce uncertainties in innovation processes while strengthening their overall adaptability and learning capacity.

From a practical perspective, educators should be equipped with diversified platforms for innovative practice. Initiatives such as teaching innovation competitions, curriculum reform pilots, and interdisciplinary collaboration projects can broaden instructors' engagement pathways while

enhancing their ability to translate creative ideas into tangible outcomes. These hands-on activities also foster peer interaction and teamwork among educators, ultimately cultivating a vibrant innovation ecosystem.

Furthermore, it is crucial to emphasize the role of psychological safety in innovative behaviors. By reducing negative evaluations of failure and encouraging instructors to express novel perspectives and experiment with new methods, organizations can mitigate perceived risks during the innovation process (Nguyen, 2026). When psychological safety is ensured, instructors are more likely to transcend traditional cognitive constraints and engage in exploratory practices.

In conclusion, by establishing a comprehensive management system grounded in error learning, supported by organizational frameworks, and driven by institutional incentives, organizations can achieve a virtuous cycle between error management and innovation. Specifically, errors provide empirical foundations for innovation, while innovative practices continuously refine error management mechanisms, thereby fostering sustainable organizational development and capability enhancement in higher education institutions.

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