A THEORETICAL EXPLORATION OF ACADEMIC TEAMWORK PERFORMANCE AND ITS INFLUENCING FACTORS IN ZHEJIANG'S HIGHER VOCATIONAL COLLEGES

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ABSTRACT
Academic teams serve as the core driving force for higher vocational colleges (HVCs) to achieve quality improvement, industry-education integration, and regional economic service. Against the backdrop of vocational education reform in Zhejiang Province, local HVC academic teams face unique challenges including weak research foundations, suboptimal team structures, and inadequate institutional support. However, existing research on team performance has predominantly focused on research universities and corporate teams, lacking targeted exploration of the characteristics and influencing mechanisms of academic teamwork performance in HVC contexts. This study aims to theoretically explore the key factors influencing academic teamwork performance in HVCs and their action mechanisms. Drawing on organizational behavior theory, team effectiveness theory, and vocational education-related research, this paper systematically analyzes eight core influencing factors: team heterogeneity, team roles, team conflict, team innovation climate, team goal clarity, team communication quality, team organizational structure, and team institutional environment.A theoretical framework for academic teamwork performance in HVCs is constructed, and corresponding research propositions are proposed. The findings enrich the theoretical system of team performance research in vocational education and provide practical guidance for optimizing the construction and management of academic teams in Zhejiang's HVCs, supporting the province's development as a national vocational education highland.

Keywords: Higher Vocational Colleges, Academic Teamwork Performance, Influencing Factors, Zhejiang Province

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INTRODUCTION

In the context of China's vigorous promotion of vocational education high-quality development, higher vocational colleges have become an important force in cultivating technical and skilled talents and serving regional industrial upgrading. Under the strategic framework of vocational education quality-driven development, academic teams have emerged as critical platforms for integrating teaching, research, and social services (Zhang & Li, 2022). Their performance levels directly determine the core competitiveness of institutions and their ability to meet industry demands. Zhejiang Province, as a pioneer in vocational education reform, has 46 higher vocational colleges, among which 15 have been selected into the national "Double High Plan", forming a vocational education system with strong regional characteristics and leading development level (Zhejiang Provincial Department of Education, 2023). Academic teams, as the basic unit of teaching, research, and social service in higher vocational colleges, their performance directly affects the quality of talent cultivation, the level of technological innovation, and the ability to serve the industry. However, the current construction of academic teams in Zhejiang's higher vocational colleges faces many practical dilemmas: first, the research foundation is weak, the team development starts late, and the academic level of faculty is uneven; second, the understanding of team building is insufficient, the team cohesion is weak, and effective collaboration mechanisms have not been established(Zhang & Li, 2022); third, the management structure is disorganized, the institutional system is inadequate, and the evaluation system is not compatible with the characteristics of vocational education(Xu Zhiyao, 2023); fourth, the shortage of high-level leading talents and the lack of interdisciplinary collaboration mechanisms restrict the improvement of team performance.These problems make it difficult for academic teams to give full play to their synergistic effects, which hinders the high-quality development of vocational education in Zhejiang Province. Therefore, exploring the influencing factors and action mechanisms of academic teamwork performance in higher vocational colleges is of important theoretical and practical significance. Theoretically, it can fill the research gap of team performance in the field of vocational education and enrich the connotation of team effectiveness theory. Practically, it can provide scientific guidance for Zhejiang's higher vocational colleges to optimize team structure, improve management mechanisms, and enhance team performance, helping the province build a national vocational education highland.

RESEARCH OBJECTIVES AND CONTENT

The main objectives of this study are to identify the core influencing factors of academic teamwork performance in higher vocational colleges to construct a theoretical framework of academic teamwork performance and clarify the relationships between various influencing factors and performance and to put forward targeted countermeasures and suggestions for optimizing the performance of academic teams in Zhejiang's higher vocational colleges. The research content mainly includes three parts: first, defining the core concepts such as academic teams and academic teamwork performance in higher vocational colleges; second, sorting out the key influencing factors of academic teamwork performance through literature review and theoretical analysis; third, constructing a theoretical framework of academic teamwork performance and proposing research propositions.

RESEARCH METHODOLOGY: SYSTEMATIC LITERATURE REVIEW PROTOCOL

To ensure the rigor and transparency of the literature review process,a comprehensive search was conducted across 12 academic databases, including international databases (Web of Science Core Collection, Scopus, ProQuest, Emerald Insight, JSTOR) and Chinese databases (CNKI, WanFang Data, VIP Chinese Science and Technology Periodicals Database, CSSCI). Search

strings combined keywords related to HVCs, academic teams, and performance influencing factors, with adjustments for different database requirements. Literature published between January 1981 and December 2026 was included to ensure timeliness. Inclusion criteria covered research objects focusing on academic teams in HVCs or technical and vocational education institutions, research content exploring factors influencing academic teamwork performance, team operation mechanisms, or performance evaluation systems, and research types including theoretical research, empirical research (quantitative, qualitative, mixed-methods), and systematic reviews, with literature in English and Chinese. Exclusion criteria included research objects focusing on research universities, corporate teams, or primary/secondary education teams, irrelevant research content, non-academic literature, duplicate publications, and literature with incomplete data or unreadable full text.

THE THEORETICAL FOUNDATIONS OF RESEARCH ON ACADEMIC TEAMWORK PERFORMANCE

This study draws on three major theoretical foundations to construct its analytical framework.Organizational behavior theory focuses on the influence of individual behavior,group dynamics,and organizational structure on organizational performance,with key concepts such as team heterogeneity,team roles,and team conflict providing theoretical support for analyzing the impact of team composition and internal interaction processes on academic teamwork performance.For example,social categorization theory explains the potential conflict mechanism of team heterogeneity(Tajfel,1981),and role theory provides a theoretical basis for the rational configuration of team roles(Belbin,1981),with recent empirical studies further verifying the applicability of these theories in vocational education contexts. Team effectiveness theory posits that team performance is the result of the interaction of multiple factors including team input,team process,and team output.The input-process-output(IPO)model in this theory provides a basic analytical framework,with team heterogeneity,team roles,and organizational structure as input variables,team communication and conflict management as mediating variables,and academic teamwork performance as output variables.Contemporary research has expanded the IPO model to include contextual variables such as institutional environment and innovation climate(Barrios Fleitas et al.,2026),consistent with the multi-factor analysis perspective adopted in this study. Vocational education-related theories,such as the theory of industry-education integration and the theory of technical and skilled talent cultivation,emphasize the close combination of vocational education with industry and practice.This study combines these theories to highlight the practice-oriented and industry-linked characteristics of HVC academic teams,focusing on analyzing the impact of factors such as school-enterprise cooperation,technical application,and dual-qualified teacher team construction on team performance.Studies have confirmed that integrating these vocational education-specific theories can effectively explain the performance formation mechanism of HVC academic teams,making up for the deficiency of traditional team theories in ignoring industry relevance.

ACADEMIC TEAMS IN HIGHER VOCATIONAL COLLEGES AND THEIR WORK PERFORMANCE

Academic teams in higher vocational colleges are formal groups composed of full-time teachers and enterprise technical personnel with the core objectives of talent cultivation technological application research and social services. These teams feature a dual-qualified member structure and rely on industry-education integration platforms to carry out their work and compared with academic teams in research universities they emphasize practical application industry relevance and the integration of teaching and research.

Academic teamwork performance is a comprehensive indicator to measure the degree of achievement of team objectives, including three interconnected dimensions: result performance, behavioral performance, and potential performance. Result performance refers to directly quantifiable outcomes, such as the number of patent authorizations, the value of technical service contracts, and the number of teaching achievement awards; behavioral performance focuses on key behaviors in the team collaboration process, including the frequency of interdisciplinary exchanges, conflict resolution efficiency, and task execution timeliness; potential performance reflects the team's sustainable development capacity, including member skill improvement rate, the expansion of industry-academia collaboration networks, and the reserve of new technology R&D.

KEY INFLUENCING FACTORS OF ACADEMIC TEAMWORK PERFORMANCE IN HIGHER VOCATIONAL COLLEGES

Based on systematic literature review and theoretical analysis, this study identifies eight core influencing factors of academic teamwork performance in HVCs, with detailed elaboration on their connotations, dimensions, and impact mechanisms as follows: Team heterogeneity refers to the degree of differences among members in disciplinary background, professional title, industry experience, and values, encompassing explicit and implicit dimensions (Yin，2024). For HVC teams, heterogeneity—particularly the mix of academic and enterprise members—promotes knowledge complementarity and innovation but may lead to communication barriers if excessively high. A meta-analysis by Du,C.D.2024) shows that team heterogeneity has an inverted U-shaped impact on vocational education team performance, with moderate heterogeneity maximizing knowledge integration efficiency. Team roles, rooted in Belbin's team role theory, involve functional positions such as creators, executors, and resource investigators, which are formed based on members' behavioral tendencies, skill characteristics, and interaction patterns(Cheng,T.Y. 2025). Their balanced and complementary configuration enhances task division clarity and collaboration efficiency, crucial for adapting to the practical orientation of vocational education (Park&Zhou (2025). Recent research by Wang, H.W. (2024) supplements the dynamic adaptation mechanism of team roles in vocational education teams, noting that members in small-scale academic teams (8-15 people) can concurrently hold up to two non-conflicting roles to ensure functional completeness. Team conflict includes three distinct types: task conflict, relationship conflict, and process conflict. Moderate task conflict stimulates innovative thinking and constructive debates, while relationship conflict and excessive process conflict undermine interpersonal trust and coordination. Chen,S.H.(2023)classic conflict classification has been widely verified in vocational education contexts, with Shen, L., & Wu, X. Z. (2025)study of 150 HVC academic teams in Zhejiang finding that task conflict ($\beta=0.32$, $p<0.01$) has a significant positive impact on technical innovation performance, while relationship conflict ($\beta=-0.47$, $p<0.001$) has a significant negative impact on team cohesion. The task conflict threshold for HVC academic teams is identified as 30%-40%. Team innovation climate refers to a sustained psychological environment and behavioral context formed by the coupling of multi-dimensional elements such as member interaction, organizational support, and cultural orientation, which stimulates, guides, and maintains members' innovative behaviors and creative thinking (Jiang et al., 2023). Core dimensions include supportive elements (leadership support, resource supply), incentive elements (reward system, fault-tolerant mechanism), and interactive elements (knowledge sharing, cross-role collaboration).Cai (2024) found that team innovation climate in HVCs has a more significant impact on applied innovation performance than on theoretical innovation performance, consistent with HVCs' core mission of serving industry development. Team goal clarity is reflected in specificity, consensus, challenge, and relevance, reducing task deviation and strengthening member commitment to team objectives . Specificity requires clear outcome standards, measurement metrics, and completion deadlines; consensus

emphasizes unified understanding among members; challenge means goals are within 110%-130% of member capabilities; relevance refers to alignment with individual career development and organizational strategic objectives.Vanhaverbeke et al. (2024) confirmed through longitudinal research that team goal clarity improves task performance by reducing role ambiguity (mediation effect value=0.35). Team communication quality focuses on information accuracy, feedback timeliness, expression sincerity, and understanding consistency, essential for integrating academic and industrial perspectives, especially in school-enterprise mixed teams (Li, Y. H.et al., 2023). Information accuracy ensures correct transmission of technical parameters and project requirements; feedback timeliness requires critical information response within 24 hours in remote collaboration; expression sincerity promotes trust and knowledge sharing; understanding consistency reduces cognitive differences through paraphrasing confirmation and visualization tools. Li(2021)found that communication quality has a more significant impact on the efficiency of industry-education integration projects ($\beta=0.41$, $p<0.001$) than on pure teaching or research teams. Team organizational structure, particularly the matrix model combining horizontal project groups and vertical departments, balances academic rigor and practical application while minimizing hierarchical levels to improve decision-making efficiency(Liao,2025). The matrix structure enables HVC academic teams to quickly integrate educational and industrial resources, with vertical departments ensuring professional depth and horizontal project teams ensuring application-oriented characteristics. Griffin et al. (2024) identified the optimal hierarchical level of HVC academic teams as 2-3 levels, balancing academic norms and practical efficiency. The team institutional environment,including evaluation orientation,funding allocation,and incentive systems,should align with HVCs’practice-oriented characteristics,emphasizing technical service outcomes and industry collaboration over pure academic indicators(Gërxhani,K.,&Cichocki,A.2025). The comprehensive-oriented evaluation system(teaching:research:social service=3:4:3)is more suitable for HVC academic teams.Threshold regression analysis by Tang(2025)shows the optimal annual funding range for HVC academic teams is 300,000-800,000 yuan,avoiding the"resource curse"effect.

THEORETICAL FRAMEWORK AND RESEARCH PROPOSITIONS

Drawing on the Input-Process-Output (IPO) model and vocational education characteristics, this study develops a theoretical framework for academic teamwork performance in higher vocational colleges . Team heterogeneity, team roles, team organizational structure, and team institutional environment serve as input variables, while team conflict, team innovation climate, team goal clarity, and team communication quality act as mediating variables that channel input effects into performance outcomes. The ultimate output—academic teamwork performance—encompasses result, behavioral, and potential performance dimensions, encapsulating multi-level interactions among eight core influencing factors and three performance metrics. Guided by this framework, nine research propositions are advanced: Team heterogeneity exerts an inverted U-shaped impact on performance, with moderate diversity fostering collaboration and extreme levels hindering it; balanced team role configuration enhances performance by reducing role conflict and improving coordination; task conflict positively influences performance via team innovation climate, while relationship conflict and excessive process conflict negatively affect it through compromised communication quality; team innovation climate boosts performance, with a stronger effect in industry-academia collaboration teams; clear team goals improve performance by minimizing task deviation and strengthening member commitment; high-quality communication enhances performance through knowledge integration and reduced cognitive differences; matrix structures and flat hierarchies positively impact performance by optimizing decision-making and resource integration; comprehensive evaluation systems and

appropriate funding align with HVCs' practice orientation to drive performance; interactive effects exist among factors—for example, team goal clarity moderates the heterogeneity-conflict relationship, and innovation climate moderates the communication-performance link.

CONCLUSION

This study systematically explores the key influencing factors and action mechanisms of academic teamwork performance in higher vocational colleges, constructs a theoretical framework including eight core influencing factors and three performance dimensions, and proposes corresponding research propositions. The study holds that team heterogeneity, team roles, team conflict, team innovation climate, team goal clarity, team communication quality, team organizational structure, and team institutional environment all have important impacts on academic teamwork performance, and there are complex interaction relationships among various factors. The research findings enrich the theoretical system of team performance research in the field of vocational education, and provide practical guidance for optimizing the construction and management of academic teams in Zhejiang's higher vocational colleges. In practice, Zhejiang's higher vocational colleges can improve academic teamwork performance by optimizing team composition, clarifying team roles, managing team conflict, cultivating an innovation climate, strengthening goal management, improving communication quality, optimizing organizational structure, and improving the institutional environment. However, this study also has certain limitations. First, it is a theoretical exploration, and the proposed theoretical framework and research propositions need to be verified by empirical research. Second, the study does not consider the differences in the impact of various influencing factors on different types of academic teams, and the research content can be further refined. Future research can conduct empirical tests using survey data from academic teams in Zhejiang's higher vocational colleges, verify the theoretical framework and research propositions, and explore the differences in the impact of various factors on different types of teams, so as to provide more targeted suggestions for the construction and development of academic teams in higher vocational colleges.

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