

Academic Management Strategies to Enhance Teachers Based On the Concept of Creative Thinking Skills in Jiangsu Food and Pharmaceutical Vocational and Technical College, China

Xie Guoquan¹ and Wassana Sangpum²

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Abstract

This research aimed to: 1) investigate the current and desirable conditions of academic management and teachers' creative thinking skills; 2) develop academic management strategies based on the concept of creative thinking skills; and 3) evaluate the suitability and feasibility of the developed strategies. A multiphase mixed methods design was employed. The sample consisted of 302 teachers selected using Yamane's formula and stratified random sampling. Instruments included evaluation forms, questionnaires, and focus group discussions. Quantitative data were analyzed using frequencies, percentages, means, standard deviations, and PNI modified, while qualitative data were analyzed through content analysis.

The findings revealed that: 1) current conditions were at a "high" level, whereas desirable conditions were at the "highest" level. Priority weaknesses included evaluation and incentive systems, teacher training, originality, and elaboration. 2) Four strategies were developed: Develop Creative Curriculum Management; Strengthen Innovation-Oriented Teaching Supervision; Enhance Teacher Development for Creative Thinking Skills; and Improve Evaluation and Incentive Systems. 3) The strategies were evaluated as highly suitable (overall mean = 4.37) and feasible (overall mean = 4.22). This study provides a systematic framework for integrating creative thinking into academic management, addressing the urgent need for teacher professional development and innovation-driven talent cultivation in vocational education.

¹ Master of Faculty of Education, Dhonburi Rajabhat University. Email: 6822031018@dru.ac.th

² Faculty of Education, Dhonburi Rajabhat University.

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Introduction

In recent years, China has regarded vocational education as a key driver for building a powerful education nation, emphasizing industry-education integration and innovation-driven development (State Council, 2015). The Made in China 2025 initiative lists biomedicine as a priority field, requiring vocational education to cultivate talents with innovative thinking. The revised Vocational Education Law (2022) further establishes innovation-driven development as a core principle, requiring institutions to align academic management with national strategies.

The food and pharmaceutical industries are characterized by high technological intensity and rapid innovation. Pharmaceutical R&D requires breaking traditional thinking patterns, while food industry transformation demands interdisciplinary competencies (Ge & Zhang, 2023). However, higher vocational students often exhibit rigid thinking due to exam-oriented education, lacking innovative application skills. This necessitates that teachers innovate their teaching methods to cultivate students' creative abilities (Liang et al., 2025).

Although the college has implemented teaching competitions and lectures, these initiatives focus on teaching form rather than systematic training in teachers' creative thinking. Jiangsu Province's innovation-driven strategies require deeper industry-education integration, while digital transformation demands teachers develop digital literacy. As industry shifts to intelligent manufacturing, teachers without creative thinking cannot meet interdisciplinary talent demands. Existing research primarily focuses on students' innovation, with limited systematic study on teachers' creative thinking (Ma, 2024).

Therefore, this research addresses the gap by developing academic management strategies specifically designed to enhance teachers' creative thinking skills in food and pharmaceutical vocational colleges.

Research Objectives

1. To study the current and desirable conditions of academic management and creative thinking skills at Jiangsu Food and Pharmaceutical Vocational and Technical College, China.
2. To develop academic management strategies based on the concept of creative thinking skills at Jiangsu Food and Pharmaceutical Vocational and Technical College, China.
3. To evaluate the developed academic management strategies based on the concept of creative thinking skills at Jiangsu Food and Pharmaceutical Vocational and Technical College, China.

Research Methods

This study employed a multiphase mixed methods design across three phases, integrating quantitative and qualitative approaches. The theoretical foundations encompass academic management theory (Brundrett, 2004; Li et al., 2023; Xie et al., 2022; Zhao, 2021), creative thinking theory (Guilford & Hoepfner, 1971; Torrance, 1984; Ma et al., 2023), and SWOT/TOWS matrix analysis (Wehrich, 1982).

The population comprised 1,239 faculty members. Sample size was calculated using Yamane's (1973, p. 727) formula: $n = 1239 / (1 + 1239 \times 0.0025) \approx 302$. Stratified random sampling yielded 302 teachers across three strata: food-related (n=120), pharmaceutical-related (n=150), and basic disciplines (n=32).

Instruments included self-designed questionnaires and evaluation forms. Three experts validated the conceptual framework, with IOC values ranging from 0.67 to 1.00, exceeding the 0.50 acceptable standard (Rovinelli & Hambleton, 1977). Cronbach's alpha exceeded 0.8 for all dimensions, confirming good internal consistency (Nunnally & Bernstein, 1994). Seven experts evaluated strategy suitability and feasibility. Eleven experts and stakeholders (including the seven experts plus four additional industry representatives and administrators) participated in focus group discussions to validate the final strategies.

Questionnaires distributed via mail and online (Google Forms) yielded 302 valid responses. Quantitative data were analyzed using SPSS for descriptive statistics (frequencies, percentages, means, standard deviations) and PNI modified. Qualitative data from open-ended responses, expert comments, and focus group transcripts were analyzed using content analysis.

Conceptual Framework

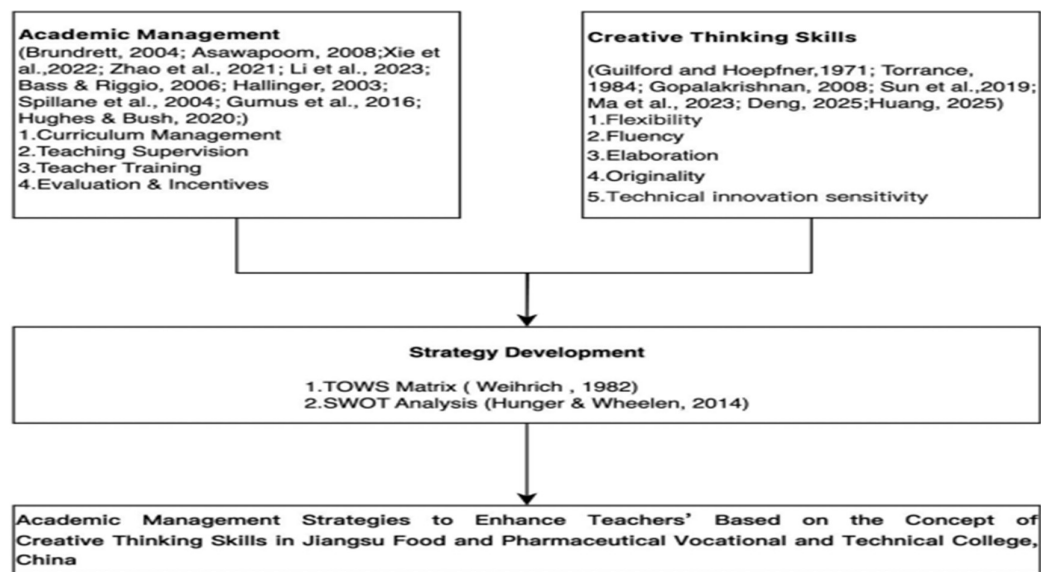


Figure 1 Conceptual Framework of the Research Study

Research Results

1. Current and Desirable Conditions of Academic Management and Creative Thinking Skills

1.1 Current Conditions of Academic Management

As shown in Table 1, the overall current condition of academic management was at a high level (Mean = 3.78). Curriculum Management scored the highest (Mean = 3.92), followed by Evaluation and Incentives (Mean = 3.88), Teaching Supervision (Mean = 3.76), and Teacher Training (Mean = 3.55).

Table 1 Survey Results on Current Conditions of Academic Management

Dimension	Mean	SD	Level
1. Curriculum Management	3.92	0.45	High
2. Teaching Supervision	3.76	0.49	High
3. Teacher Training	3.55	0.52	High
4. Evaluation and Incentives	3.88	0.47	High
Overall	3.78	0.48	High

The results indicate that the college has established a relatively comprehensive institutional system for curriculum planning and implementation. Teacher Training scored the lowest, suggesting that teachers have higher expectations for professional development opportunities related to creative thinking skills.

1.2 Priority Needs Assessment

This study analyzed the urgency of improvement for each dimension using the Priority Needs Index Modified (PNI_{modified}). A higher PNI_{modified} value indicates a greater gap between current and desirable conditions, and thus a more urgent need for improvement.

Table 2 Priority Needs of Academic Management and Creative Thinking Skills Dimensions

Dimension	Current Mean	Desirable Mean	PNI modified	SWOT Result
Academic Management				
1. Curriculum Management	3.92	4.72	0.20	S (Strength)
2. Teaching Supervision	3.76	4.68	0.24	S (Strength)
3. Teacher Training	3.55	4.76	0.34	W (Weakness)
4. Evaluation and Incentives	3.88	4.73	0.36	W (Weakness)

Dimension	Current Mean	Desirable Mean	PNImodified	SWOT Result
Creative Thinking Skills				
1. Flexibility	3.88	4.74	0.22	S (Strength)
2. Fluency	3.84	4.73	0.23	S (Strength)
3. Elaboration	3.76	4.75	0.26	W (Weakness)
4. Originality	3.52	4.76	0.35	W (Weakness)
5. Technological Innovation Sensitivity	3.96	4.74	0.20	S (Strength)

Note: PNImodified = (Desirable Mean – Current Mean) / Desirable Mean. SWOT classification was based on the median PNImodified values (0.28 for academic management, 0.26 for creative thinking skills).

Among the academic management dimensions, Evaluation and Incentives had the highest PNImodified value (0.36), followed by Teacher Training (0.34), indicating these are the most urgent areas for improvement. Although Evaluation and Incentives scored high in current conditions (Mean = 3.88), the desirable level (Mean = 4.73) far exceeded the current level, representing the largest development gap. Curriculum Management and Teaching Supervision had relatively low PNImodified values (0.20 and 0.24), indicating stable foundations and were therefore classified as strengths.

Among the creative thinking skills dimensions, Technological Innovation Sensitivity had the lowest PNImodified (0.20), followed by Flexibility (0.22) and Fluency (0.23), all identified as strengths. Originality had the highest PNImodified (0.35), followed by Elaboration (0.26), indicating significant competency gaps requiring priority attention.

1.3 Qualitative Validation of Priority Needs

To further explain the priority needs revealed by quantitative data, this study collected qualitative data through focus group interviews. Key findings are summarized below:

Regarding Evaluation and Incentives, experts noted that the current evaluation system tends to emphasize routine performance rather than creativity and innovation, with insufficient assessment of teaching innovation and originality. Incentive measures primarily focus on material rewards, lacking systematic recognition and risk-taking protection for teaching innovation.

Regarding Teacher Training, experts stated that current training primarily focuses on policy briefings and technical skills, with significantly insufficient training on creative thinking. Training activities are mostly short-term intensive lectures, lacking continuous professional learning communities and practical workshops.

Regarding Originality and Elaboration, experts pointed out that although teachers can flexibly employ various teaching methods, they are insufficient in designing entirely new curriculum plans and deeply developing teaching concepts. Teaching reflection tends to remain at the level of experiential description, lacking systematic deepening and theoretical enhancement.

These qualitative findings support the quantitative analysis: Evaluation and Incentives and Teacher Training are the highest priority dimensions, while Originality and Elaboration are the most urgent creative thinking skills requiring improvement.

2. Key Findings from Focus Group Discussion

To gain an in-depth understanding of the strengths, weaknesses, opportunities, and threats related to academic management and creative thinking, eleven experts and stakeholders (including educational administration scholars, vocational education experts, senior administrators, and industry representatives) participated in the focus group discussion.

Strengths : The institution has continuously improved curriculum planning, instructional supervision, and the integration of innovative educational practices. Curriculum management and teaching supervision provide favorable conditions for encouraging teachers to generate ideas, adapt to changes, and respond to technological developments. Experts agreed that the college has a solid foundation in these areas, with standardized curriculum review mechanisms and complete teaching observation and mentoring processes.

Weaknesses : Existing evaluation systems tend to emphasize routine performance rather than creativity and innovation. Professional development activities related to creative thinking skills remain insufficient, particularly in areas associated with originality and elaboration. Experts noted that current evaluation indicators primarily focus on student evaluation scores and research outputs, with insufficient recognition of teaching innovation, while teacher training content lacks systematic cultivation of creative thinking.

Opportunities: Educational reforms and national policies emphasizing innovation, entrepreneurship, and talent development have created favorable conditions for improving academic management. The rapid advancement of artificial intelligence, digital technologies, and online learning platforms provides new opportunities for enhancing teaching and learning. The National Vocational Education Reform Implementation Plan provides policy support, while AI-assisted teaching tools provide technical support for teaching innovation.

Threats: Rapid technological change requires continuous adaptation from teachers and administrators. Insufficient financial support, uneven digital competencies among teachers, and increasing educational competition were identified as significant external threats. Some senior teachers adapt slowly to new technologies, and intensifying competition for students among vocational colleges poses risks to long-term institutional development.

3. Development of Academic Management Strategies

Based on the results of SWOT and TOWS matrix analyses, four academic management strategies were developed, consisting of 4 main strategies, 8 sub-strategies, and 34 implementation procedures:

Strategy 1: Develop Creative Curriculum Management — Focuses on integrating creative thinking skills into curriculum management and promoting innovation-oriented curriculum development through digital technologies.

Strategy 2: Strengthen Innovation-Oriented Teaching Supervision — Emphasizes developing supervision systems that support innovative teaching practices and promoting collaborative learning and professional reflection.

Strategy 3: Enhance Teacher Development for Creative Thinking Skills — Concentrates on developing professional training programs focusing on creative thinking skills and promoting industry-university collaboration for innovation.

Strategy 4: Improve Evaluation and Incentive Systems — Focuses on developing innovation-based evaluation systems and establishing incentive mechanisms that encourage creativity and innovation.

4. Strategy Evaluation Results

Seven experts evaluated the suitability and feasibility of the first draft strategies, with results shown in Table 3.

Table 3 Results of Suitability and Feasibility of the Strategies

Strategy	Suitability (Mean)	Level	Feasibility (Mean)	Level
Strategy 1: Develop Creative Curriculum Management	4.29	High	4.14	High
Strategy 2: Strengthen Innovation-Oriented Teaching Supervision	4.43	High	4.29	High
Strategy 3: Enhance Teacher Development for Creative Thinking Skills	4.57	Highest	4.43	High
Strategy 4: Improve Evaluation and Incentive Systems	4.43	High	4.14	High
Overall	4.37	High	4.22	High

As shown in Table 3, the overall suitability (Mean = 4.37) and feasibility (Mean = 4.22) of the strategies were both at a high level. Strategy 3 received the highest scores (Suitability Mean = 4.57, Feasibility Mean = 4.43), indicating that experts considered teacher development the most important and practical direction for enhancing creative thinking skills. Strategy 2 and Strategy 4 also received high ratings

(Suitability Mean = 4.43). Although Strategy 1 ranked lowest, its suitability of 4.29 and feasibility of 4.14 remained at a high level. All eleven focus group participants agreed that the proposed strategies were appropriate, practical, and aligned with the needs of the institution.

Research Discussion

Objective 1: To investigate the current and desirable conditions of academic management and creative thinking skills

The findings revealed that both academic management and creative thinking skills were at a "high" level, while the desirable conditions were at the "highest" level. This indicates that although the college has established a good foundation, there remains room for further improvement. This gap reflects the growing demand for innovative talents in the food and pharmaceutical industries, which aligns with China's national policies on vocational education reform (Ministry of Education, 2019; State Council, 2015).

Among the academic management dimensions, Evaluation and Incentives were identified as the highest priority weakness. Notably, although this dimension scored high in the current conditions survey (mean = 3.88), it had the highest PNImodified value (0.36), because the desirable level far exceeded the current level. This finding is consistent with Danielson's (2013) assertion that effective evaluation systems should encourage professional growth and innovation rather than merely measuring routine performance. Similarly, Darling-Hammond et al. (2017) emphasized that professional development models characterized by continuity, collaboration, and a focus on teaching practice are most effective in improving teacher efficacy and innovation capacity. The results suggest that the current systems at the college may not adequately reward creativity or provide sufficient opportunities for teachers to develop creative teaching competencies, which resonates with Amabile's (2018) finding that organizational encouragement and reward systems positively affect creativity.

Regarding creative thinking skills, Originality and Elaboration were the weakest dimensions. Torrance (1984) emphasized originality as a critical indicator of creativity, reflecting the ability to produce novel and unique ideas. Sternberg and Lubart (1999) also highlighted that originality is essential for long-term creative performance and innovation. The relatively lower scores in originality and elaboration indicate that while teachers can adapt flexibly to technological changes and generate multiple ideas, they require additional support in developing deeper creative processes and producing original solutions. This phenomenon may be attributed to the traditional examination-oriented education background of many teachers (Zheng et al., 2025). These findings are consistent with previous research (Ge & Zhang, 2023), showing a positive association between the cultivation of innovation ability in higher vocational students and teachers' creative teaching practices.

Objective 2: To develop academic management strategies based on the concept of creative thinking skills

The four strategies developed in this study—focusing on curriculum management, teaching supervision, teacher development, and evaluation and incentives—provide a comprehensive framework. The strategies were developed through systematic SWOT and TOWS matrix analyses, ensuring that the strategies align internal institutional capabilities with external environmental conditions. This methodological approach is consistent with Fullan's (2016) assertion that educational transformation requires institutions to continuously adapt to technological and social changes. The emphasis on digital technologies in Strategies 1 and 2 reflects the increasingly important role of artificial intelligence and digital platforms in vocational education (Wu, 2022). Li et al. (2023) found in the Chinese vocational education context that academic management reform has a significant positive impact on teacher innovation capacity. Strategy 4 (Improve Evaluation and Incentive Systems) had the highest priority need, echoing Amabile's (2018) assertion regarding the influence of organizational environment on creativity.

Objective 3: To evaluate the suitability and feasibility of the developed strategies

The high suitability and feasibility ratings from the seven experts, together with the qualitative feedback from the eleven focus group participants, validated the alignment of the strategies with institutional needs and external opportunities. The overall suitability mean of 4.37 and feasibility mean of 4.22, both at a "high" level, indicate that these strategies are considered appropriate and implementable. Strategy 3 (Enhance Teacher Development for Creative Thinking Skills) received the highest scores, highlighting the central role of teacher professional development in enhancing creativity.

This result is consistent with Guskey's (2002) view that teacher professional development and effective evaluation mechanisms are key to promoting teaching innovation. Furthermore, Ma et al. (2023) found in a sample of Chinese higher vocational college teachers a significant association between creative thinking development mechanisms and teaching innovation practices. Sun (2020) also pointed out that the establishment of multi-dimensional evaluation systems helps stimulate teachers' motivation for innovation. The suggestions provided by experts during the evaluation process, such as strengthening monitoring mechanisms for strategy implementation and clarifying division of responsibilities and accountability, are all consistent with the continuous improvement principles proposed by Fullan (2016).

New Knowledge

This study contributes a context-specific strategic framework for enhancing teachers' creative thinking skills through academic management in food and pharmaceutical vocational colleges. The framework integrates four core strategies: creative curriculum management, innovation-oriented teaching supervision, teacher development, and evaluation/incentive systems. It emphasizes the cultivation of five creative thinking dimensions—flexibility, fluency, elaboration, originality, and technological innovation sensitivity—specifically tailored to vocational education.

The model highlights the interconnectedness of academic management components and creative thinking skills, providing a systematic pathway for institutional improvement. Teachers' teaching ability should be interpreted as a comprehensive competence covering multiple dimensions: rich industry background knowledge to ensure cutting-edge and applicable content, flexible teaching methods and individualized instruction to address diverse student needs, integration of latest technologies into teaching practice, curriculum development capabilities that embed creative thinking into learning outcomes, and reflective and collaborative competences for continuous professional growth. These interconnected competences collectively form the foundation for sustainable enhancement of creative thinking skills in vocational education settings.

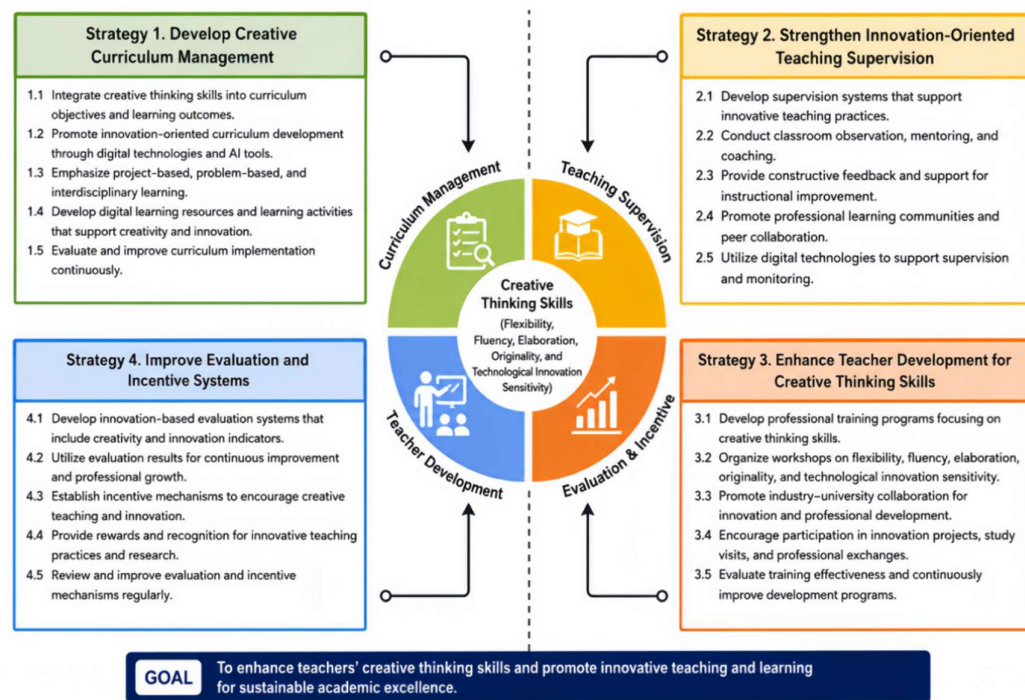


Figure 2 New Knowledge

Research Suggestions

1. Policy Recommendations:

College administrators should prioritize the implementation of Strategy 4 (Improve Evaluation and Incentive Systems) as it had the highest priority need.

Institutional policies should integrate creative thinking indicators into teacher performance assessments and reward mechanisms.

2. Practical Recommendations:

Teachers should actively participate in professional training programs focusing on originality and elaboration.

Academic departments should strengthen interdisciplinary and project-based learning activities to foster creativity.

Regular monitoring and evaluation of strategy implementation should be conducted to ensure continuous improvement.

3. Recommendations for Future Research

Future studies should conduct evaluation research on the implementation effectiveness of the developed strategies.

Research should focus on developing specific intervention models for improving originality and elaboration.

Comparative studies across different vocational colleges could further validate and refine the strategic framework.

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