

Strategies for Promoting Interdisciplinary Integration Through Master Teachers' Studios

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Abstract: Against the background of key-competency-oriented education reform, interdisciplinary integration has become an important approach to breaking disciplinary barriers and improving education quality. As a key carrier for teachers' professional development, Master Teachers' Studios feature multiple advantages, including resource aggregation, demonstration leadership, and teaching-research innovation, making them an important force in advancing the implementation of interdisciplinary integration. Based on senior high school teaching practice, this paper systematically constructs strategies for promoting interdisciplinary integration through Master Teachers' Studios from seven dimensions: top-level design, teaching-research models, curriculum development, platform support, project leadership, evaluation reform, and team development. It provides theoretical references and practical pathways for regional high-quality education development, teachers' professional growth, and the cultivation of students' core competencies.

Keywords: Master teachers' studios; Interdisciplinary integration; Core competencies; Teaching-research innovation; Teachers' professional development

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1. Introduction

With the deepening of the new curriculum reform, single-subject teaching can no longer meet the practical needs of students' comprehensive ability development and complex problem-solving^[1]. Interdisciplinary integration emphasizes breaking disciplinary boundaries, integrating knowledge, methods, and thinking from multiple subjects around real-world problems to achieve holistic and comprehensive education goals^[2]. As professional learning communities led by disciplinary leaders and joined by key teachers, Master Teachers' Studios play an irreplaceable role in concept dissemination, teaching reform, and teacher training^[3].

At present, some schools still face problems such as vague objectives, incomplete mechanisms, fragmented teaching and research, unsystematic curricula, and single evaluation methods in interdisciplinary practice, resulting in superficial and unsustainable interdisciplinary integration. Master Teachers' Studios can effectively coordinate resources, guide the direction, and solve difficulties, providing institutionalized, normalized, and professional support for interdisciplinary integration. Therefore, exploring effective

strategies for promoting interdisciplinary integration through Master Teachers' Studios is not only an inherent requirement of teacher team development in the new era, but also an inevitable choice to deepen education and teaching reform and fulfill the fundamental task of fostering virtue through education ^[4].

From its establishment, the studio must be committed to identifying moral education elements across subjects and adhere to the principle of fostering virtue through education. For example: In Chinese classes, cultivate qualities and pass on sentiments; in math classes, promote rationality and uphold truth-seeking; in English classes, broaden horizons and understand tolerance; in physics classes, seek truth and dare to explore; in chemistry classes, safeguard health and protect the country; in biology classes, respect life and love nature; in history classes, understand moral failures and shoulder missions; in geography classes, care for the world and keep the original aspiration; in politics classes, clarify directions and adhere to the bottom line; in music and art classes, search for beauty, discover beauty, advocate beauty and spread beauty. Once these moral education elements are made clear, through the meticulous demonstrations of teachers in open classes of various subjects, teachers of all subjects can quickly absorb the moral education elements of other subjects and integrate and permeate them in their own teaching, breaking the traditional barriers between liberal arts and science, achieving the maximization of teaching and research benefits, and having a subtle and profound effect, thereby comprehensively enhancing the comprehensive quality of teachers ^[5].

2. Strategies for Promoting Interdisciplinary Integration Through Master Teachers' Studios

2.1. Strengthen Top-Level Design and Build Institutionalized Operation Mechanisms

Master Teachers' Studios should take core competencies as the guideline, include interdisciplinary integration in medium and long-term development plans, and clarify research directions, implementation paths, and expected outcomes ^[6]. Break the limits of single subjects, recruit key teachers from different disciplines, and invite university experts and teaching researchers to form a rationally structured and complementary interdisciplinary research team ^[7]. Meanwhile, improve interdisciplinary teaching-research systems, project management systems, and achievement promotion systems, clarify member responsibilities and activity norms, and shift interdisciplinary integration from temporary activities to normalized and standardized implementation ^[8].

2.2. Innovate teaching-research models and build a normalized training system

Carry out thematic joint teaching-research based on the studio, determine interdisciplinary themes around practical problems, life situations, and teaching difficulties, and organize multi-disciplinary teachers to conduct collective lesson preparation, parallel lessons, classroom observation, and teaching reflection. Implement lesson-driven research, take project-based learning and unit-based teaching as carriers, and refine reproducible and promotable teaching paradigms ^[9]. Establish a "master guidance + peer mutual assistance" mechanism to promote teachers' professional growth in a closed loop of practice-reflection-improvement-enhancement ^[10].

2.3. Focus on curriculum development and integrate curriculum resources

Design interdisciplinary learning projects based on real situations to guide students to comprehensively use multi-disciplinary knowledge in completing tasks and improve practical problem-solving abilities. Sort out curriculum standards of all subjects to identify knowledge intersections and ability connections, develop

thematic interdisciplinary school-based courses, practical courses, and research study courses, and form complete resource packages including teaching designs, study sheets, and evaluation scales. Guided by big concepts, big tasks, and big situations, promote overall unit-based teaching to realize structured knowledge, project-based learning, and explicit competency development.

As teachers of different subjects join the studio, how to achieve interdisciplinary integration based on traditional teaching-research? It is necessary to find integration points among subjects. Taking chemistry as an example: The convergence point of chemistry and biology lies in the diet and health in campus meals; the convergence point of chemistry and mathematics is the operation of logarithms and the analysis of graphs; the convergence point of chemistry and English is the interpretation of foreign language literature and the understanding of chemical professional vocabulary in reading comprehension; the convergence point of chemistry and politics is the moral education elements in chemistry under the background of the large ideological and political course; the convergence point of chemistry and history is the revitalization of national industries, such as Hou Debang, Chen Guangrong, Xu Guangxian, and Lu Jiayi, etc.; the convergence of chemistry and physics is electrochemistry, chemical thermodynamics, and chemical kinetics; the convergence point of chemistry and geography is the distribution of minerals, the smelting of metals, and the extraction of rare earth elements; the convergence point of chemistry and Chinese language is the standardized use of chemical language and the humanistic sentiments in chemistry, etc. After everyone's joint discussion, only when these convergence points are found can the thoughts of all the people in the entire studio be unified, and they will understand the importance of knowledge integration in the information age, as shown in **Figure 1**.

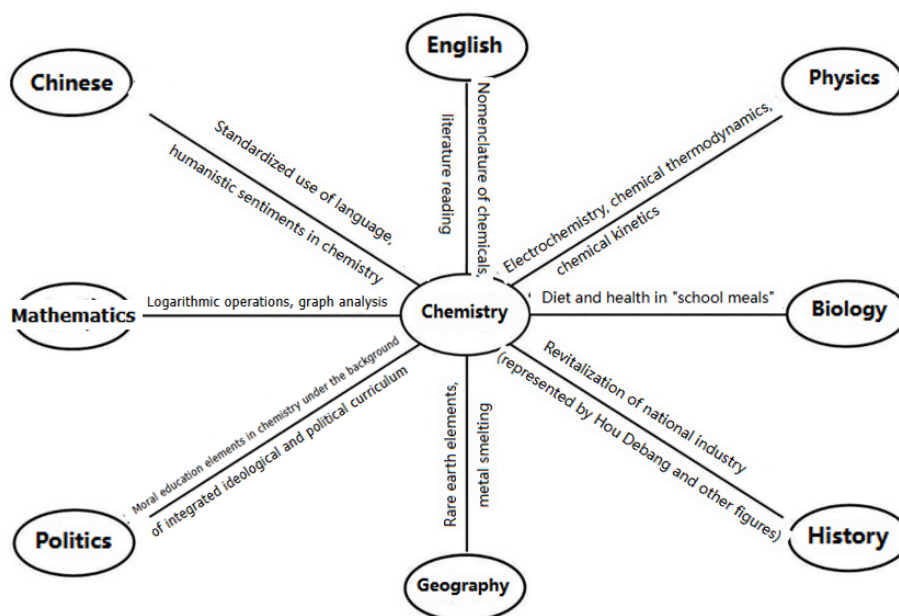


Figure 1. Interdisciplinary Integration Points of High School Chemistry.

2.4. Build diversified platforms and expand collaborative development space

Strengthen coordination among internal departments, incorporate interdisciplinary integration into teaching plans, moral education activities, and research projects to form a fully participatory and universally covered integration pattern. Establish regional Master Teachers' Studio alliances to carry out joint training, teaching demonstrations, achievement exchanges, and resource sharing to expand demonstration and radiation effects.

Rely on digital platforms to build interdisciplinary resource databases, carry out online lesson preparation, live teaching-research, and remote evaluation, break time and space limits, and realize inclusive sharing of high-quality resources ^[11].

2.5. Adhere to project leadership and deepen research-based integration paths

Apply for various projects around key issues such as interdisciplinary teaching models, curriculum development, teacher literacy, and evaluation systems to guide teaching practice through research. Encourage teachers to carry out action research based on classrooms, identify problems, optimize plans, and summarize experiences in real teaching scenarios. Transform research results into papers, cases, courses, micro-lectures and other tangible achievements, promote their application through forums, exhibitions, and training, and advance interdisciplinary integration from individual exploration to regional popularization ^[12].

2.6. Reform evaluation methods and establish a diversified evaluation system

Adopt a combination of process evaluation and summative evaluation for students, and use diversified methods such as growth portfolios, work exhibitions, and task reports to comprehensively evaluate students' core competency development. Establish standards for classroom teaching evaluation from the dimensions of situation creation, knowledge integration, task design, student participation, and competency achievement. Include interdisciplinary teaching design, curriculum development, project research, and radiation effects in teacher assessment to stimulate teachers' enthusiasm for participating in interdisciplinary integration ^[13].

2.7. Focus on team development and improve interdisciplinary professional literacy

Regularly organize interdisciplinary training, academic exchanges, and off-campus study to broaden teachers' knowledge horizons and improve interdisciplinary teaching design and implementation capabilities. Establish an echelon training mechanism of "masters – key teachers – young teachers" to promote the rapid growth of young teachers through master-apprentice pairing, task-driven, and project tackling ^[14]. Encourage teachers to take the initiative to learn related subjects and modern educational technology to build a versatile teacher team adaptable to the requirements of the new era.

3. Conclusion

Interdisciplinary integration is an important trend in education reform in the new era. As a key engine for teachers' professional development, Master Teachers' Studios have unique advantages and important missions in promoting interdisciplinary integration.

By strengthening top-level design, innovating teaching-research models, focusing on curriculum development, building collaborative platforms, adhering to project leadership, reforming evaluation systems, and enhancing team development, Master Teachers' Studios can effectively solve practical problems and drive teaching from closure to openness, separation to integration, and knowledge-based to competency-based.

In the future, we should further leverage the leading role of Master Teachers' Studios, continuously deepen interdisciplinary integration practice, and provide solid support for fulfilling the fundamental task of fostering virtue through education and cultivating a new generation capable of shouldering the mission of national rejuvenation.

Six years after the studio was founded, the concept of promoting professional integration among teachers

has taken root. With the full implementation of the new college entrance examination, members of the studio are unified in thinking and full of confidence. They can turn the responsibilities and pressures given to teachers in the information age into internal driving forces for progress. We believe that with professional guidance, every member of the studio will move from ordinary to professional, from professional to excellent, from excellent to outstanding, and from outstanding to brilliant!

Disclosure statement

The author declares no conflict of interest.

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