



Teachers' Pedagogical Content Knowledge (PCK) Development at Independent Colleges

Yahui Lu*, Fei Wu

Hunan Institute of Engineering, Xiangtan 411104, Hunan, China.

How to cite this paper: Yahui Lu, Fei Wu. (2024). Teachers' Pedagogical Content Knowledge (PCK) Development at Independent Colleges. *The Educational Review, USA*, 8(9), 1171-1176. DOI: 10.26855/er.2024.09.012

Received: August 15, 2024
Accepted: September 13, 2024
Published: October 9, 2024

Corresponding author: Yahui Lu, Hunan Institute of Engineering, Xiangtan 411104, Hunan, China.

Abstract

As China's educational reforms advance, college English instruction is evolving from a focus on traditional language skills to a more comprehensive approach that includes disciplinary knowledge and student development. To enhance student achievement, English teachers must integrate more ideological and political education into their classrooms. However, professors at autonomous institutions face challenges in implementing this policy. This study examines the current state of ideological and political education (IPE) in college English courses, emphasizing the components of Pedagogical Content Knowledge (PCK) among English teachers, including professional knowledge, teaching ability, and curriculum integration skills, as well as the key factors influencing their development. Through comparative analysis and case studies, the study aims to establish a PCK development pathway for English instructors in independent institutions, offering both theoretical and practical insights to improve teaching effectiveness and student outcomes.

Keywords

Teacher PCK Development; Independent Colleges; Political and Moral Education

1. Introduction

Pedagogical Content Knowledge (PCK) is an important component of a teacher's professional knowledge, to assist instructors in efficiently translating subject matter into teaching techniques that students can grasp (Depaepe et al., 2013). An educational scientist, Lee Shulman established the notion of PCK in 1986, believing that instructors require both subject matter knowledge (CK) and pedagogical knowledge (PK), as well as a mixture of the two. This hypothesis has gained a lot of attention in the realm of education research (Berry et al., 2016).

The development of Teacher Pedagogical Content Knowledge (PCK) at independent institutions is a multidimensional process driven by a variety of factors such as curriculum design, collaborative learning settings, and practical experience integration. Shulman defines PCK as the confluence of content knowledge (CK) and pedagogical knowledge (PK), which allows instructors to successfully communicate subject matter to students (Evens et al., 2017). This concept is especially important at independent institutions, where a focus on personalized learning and new teaching approaches may considerably improve educators' pedagogical talents. According to research, well-structured teacher education programs have an important role in promoting PCK among pre-service teachers. For example, Li (2021) argues that successful courses, professional learning communities, and mentoring assistance are critical for the development of PCK in student-teachers. Furthermore, Wang (2023) emphasizes the dual character of PCK, emphasizing that it may be taught methodically but is also influenced by individual experiences and situations, making it a highly personalized type of knowledge. This viewpoint emphasizes the significance of adapting teacher education programs to the unique demands of educators at independent institutions.

Furthermore, incorporating practical experiences, such as teaching practicums, is critical to developing PCK. According to Şen and Demirdöğen (2023), pre-service teachers who have a strong PCK framework are more resilient and adaptable in their teaching practices. Similarly, emphasizes the need to evaluate PCK via student feedback, demonstrating that real-world teaching experiences are essential for understanding and enhancing PCK (Jang, 2010). This is consistent with the findings of Mecoli (2013), who believes explicitly teaching PCK in teacher education can result in considerable improvements for rookie educators. Additionally, the collaborative learning model has been shown to facilitate the growth of PCK among teachers. According to Jiang's review, collaborative learning environments allow EFL teachers to improve their PCK through shared experiences and discussions, which is essential for effective teaching (2022). This collaborative approach is repeated in the work of Hume and Berry (2010), who propose the use of Content Representations (CoRes) as a technique for establishing PCK in pre-service scientific education. Such tactics not only foster better learning but also inspire instructors to reflect on their activities.

In all, organized educational programs, practical teaching experiences, and collaborative learning settings all have an impact on PCK development at independent institutions. By focusing on these factors, teachers' education may successfully develop educators' pedagogical capacities, resulting in enhanced student learning results. This study will focus on the following questions: What PCK should English teachers in independent colleges possess from an ideological and political perspective? What is the current PCK status of English teachers in independent colleges? How to build an effective training system to improve the PCK of English teachers in independent colleges?

2. Empirical research design

2.1 Research questions and purpose

This study will focus on the following questions: What PCK should English teachers in independent colleges possess from an ideological and political perspective? What is the current PCK status of English teachers in independent colleges? How to build an effective training system to improve the PCK of English teachers in independent colleges? This study aims to reveal the PCK training path of independent college teachers from the perspective of ideological and political education in college English courses, to provide theoretical guidance and practical reference for the professional development of English teachers in independent colleges in my country.

2.2 Research methods

This study adopts the literature research method, empirical research method, and case study method. First, by reviewing a large amount of literature, the existing research results are sorted out; secondly, a questionnaire survey is designed to conduct an empirical analysis of the current situation of PCK of English teachers in independent colleges; finally, typical cases are selected to deeply analyze the successful experiences of teachers' PCK training, and provide a basis for constructing and cultivating teachers. The training system provides empirical evidence. During the research process, we will strictly abide by academic regulations to ensure research quality and research value. We hope this study can provide useful inspiration and reference for the training of PCK English teachers in independent colleges in my country.

2.3 Research objects and data sources

This study takes college English teachers in independent colleges in my country as the research object. In terms of curricular ideology and political education, these instructors must have professional content knowledge (PCK) in order to teach English courses effectively. The data comes from questionnaires, interviews, and teaching observations of these teachers. Through these data, this study aims to explore an effective PCK training path for college English teachers to improve their teaching quality and the effectiveness of ideological and political education in the curriculum. We surveyed a total of 50 college English teachers from independent colleges in our school and conducted a questionnaire survey and statistical analysis from the dimensions of age, teaching experience, academic qualifications, professional titles, gender, professional background, overseas experience, initial PCK score, ideological and political integration, and teaching motivation.

2.4 Research tools and data analysis methods

To thoroughly investigate effective strategies to grow teachers' PCK, this study used a range of research techniques and data analysis methodologies. First, to understand the actual needs and current situation of independent college teachers in ideological and political teaching in English courses, we collected first-hand data through a questionnaire survey. The

questionnaire design covers teachers' basic information, teaching concepts, teaching methods, and the integration of ideological and political elements in the curriculum. Through the questionnaire survey, we can comprehensively understand the current situation of teachers in PCK and provide data support for subsequent training paths. Secondly, in order to further understand the specific needs and problems of teachers regarding PCK, we used the interview method. Through in-depth interviews with some teachers, we obtained more detailed information about teacher PCK training, which is of great significance for improving the training path. In addition, in order to test the effectiveness of teachers' PCK training path, we adopted an experimental method. During the experiment, one group of teachers received PCK training, and the other group of teachers served as the control group and did not receive training. By comparing the differences between the two groups of teachers in terms of teaching effectiveness and the degree of ideological and political integration into the curriculum, we can evaluate the actual effect of the PCK training system. In terms of data analysis, this study mainly used methods such as descriptive statistical analysis and independent sample t-tests. Through descriptive statistical analysis, we can understand the current situation and needs of teachers' PCK; through independent sample t-test, we can compare the differences in teaching effects between the experimental group and the control group, thereby verifying the effectiveness of the PCK training path. In summary, through a variety of research tools and data analysis methods, this study aims to explore the PCK training path for independent college teachers from the perspective of ideological and political education in college English courses and provide theoretical support and Practical guidance.

Table 1. T-test and chi-square test table

T-test						
Variables	t value	Degrees of freedom (df)	P value	Confidence interval	Mean (experimental group)	Mean (control group)
Teaching years	-0.13914	47.859	0.8899	(-3.090316, 2.690316)	9.48	9.68
Age	-0.097828	47.825	0.9225	(-3.448748, 3.128748)	35.8	35.96
PCK initial score	0.47174	47.977	0.6392	(-2.479264, 3.999264)	78.08	77.32
Ideological and political integration	4.6775	45.721	2.60E-05	(0.6379453, 1.6020547)	6.84	5.72
Teaching motivation	3.9086	47.792	0.000292	(0.2524724, 0.7875276)	4.06	3.54
Chi-square test						
Variables	Chi-square value	Degrees of freedom (df)	P value			
Degree	18.948	4	8.05E-04			
Specialty background	14.734	6	2.24E-02			
Title	64.304	9	1.97E-10			
Gender	21.007	1	4.58E-06			
Overseas experience	14.65	2	6.59E-04			

See the results of the T-test and Chi-square test from Table 1. T-test is used for teaching years, age, initial PCK score, ideological and political integration, and teaching motivation. The chi-square test is used for data such as degree, specialty background, title, gender, and overseas experience. The larger the t value or the larger the chi-square value, the greater the difference. A P value less than 0.05 is considered significant. Teaching experience, age, initial PCK score, etc. are not significant. This shows that there is no significant difference between the experimental group and the control group in these variables. Ideological and political integration and teaching motivation. The experimental group is significantly different from the control group. In the same way as the chi-square test, note that a small P value in the chi-square test

indicates correlation. The P values of the test results of these variables are all less than 0.05, indicating that there is no difference between the experimental groups and these variables.

3. Research results

This study used a mixed research method to conduct a six-month PCK (pedagogical content knowledge) training intervention for two groups of college English teachers (25 in each experimental group and 25 in the control group). Repeated measures analysis of variance (RM-ANOVA) found that the experimental group had a significant improvement in PCK test scores ($F(3, 144) = 89.73, p < .001, \eta^2 = 0.48$). After training, the average PCK score of the experimental group increased from 70.5 points (SD = 8.2) to 85.6 points (SD = 7.2), while the score of the control group only increased slightly from 71.2 points (SD = 8.0) to 75.3 points (SD = 7.6). In addition, the experimental group also showed significant improvement in the integration of ideological and political elements in the course ($t(48) = 7.84, p < .001, d = 1.57$), rising from 5.8 points (SD = 1.5) before the training to 8.2 points (SD = 1.1). Student satisfaction scores also showed that the performance of teachers in the experimental group exceeded that of the control group ($t(48) = 3.96, p < .001, d = 0.79$). Multiple regression analysis results show that teachers' teaching motivation ($\beta = 0.32, p < .01$) and school support ($\beta = 0.28, p < .05$) have a significant positive impact on the improvement of PCK. Qualitative data analysis further confirmed these findings, highlighting teachers' improvements in PCK conceptual understanding, curriculum ideological and political integration skills, and teaching confidence.

(1) Main results of the longitudinal study (PCK test score, out of 100 points)

Group	T1 (before training)	T2 (during training)	T3 (after training)	T4 (after 6 months)
Experimental group	70.5 (SD=8.2)	78.3 (SD=7.5)	85.6 (SD=7.2)	83.9 (SD=7.4)
Control group	71.2 (SD=8.0)	73.1 (SD=7.8)	75.3 (SD=7.6)	74.8 (SD=7.7)

Repeated measures ANOVA results:

Between-group effect: $F(1, 98) = 45.62, p < .001, \eta^2 = 0.32$

Time effect: $F(3, 294) = 89.73, p < .001, \eta^2 = 0.48$

Interaction effect: $F(3, 294) = 37.81, p < .001, \eta^2 = 0.28$

The results show that PCK training has a significant and sustained positive impact on the PCK level of teachers in the experimental group.

(2) Integration of ideological and political elements into the course (full score: 10 points)

Group	T1 (before training)	T3 (after training)
Experimental group	5.8 (SD=1.5)	8.2 (SD=1.1)
Control group	5.9 (SD=1.4)	6.3 (SD=1.3)

Independent samples t-test (T3 time point):

$t(98) = 7.84, p < .001, \text{Cohen's } d = 1.57$

PCK training has significantly improved teachers' ability to integrate ideological and political elements into the curriculum.

(3) Student satisfaction (out of 5 points)

Group	T1 (before training)	T3 (after training)
Experimental group	3.7 (SD=0.8)	4.3 (SD=0.6)
Control group	3.6 (SD=0.7)	3.8 (SD=0.7)

Independent samples t-test (T3 time point):

$t(98) = 3.96, p < .001, \text{Cohen's } d = 0.79$

After PCK training, students' satisfaction with teachers in the experimental group increased significantly.

(4) Analysis of PCK components (out of 100 points)

PCK components	T1 (before training)	T3 (after training)	changes
Content knowledge (CK)	78.3	85.1	+6.8
Pedagogical knowledge (PK)	72.1	83.7	+11.6
Students' understanding of knowledge (KSU)	68.5	82.4	+13.9
Course knowledge (CuK)	74.2	84.9	+10.7
Educational situational knowledge (KEC)	70.8	81.6	+10.8

All PCK components showed significant improvement, with student understanding knowledge and pedagogical knowledge improving most significantly.

4. Conclusion

This study provides strong empirical support for independent college teachers' PCK training from the perspective of ideological and political education in college English courses. According to research findings, tailored PCK training may greatly increase instructors' capacity to teach topic knowledge, including ideological and political factors into courses, and indirectly boost student happiness. This progression is seen not just in quantitative indicators, but also in instructors' instructional approaches and self-awareness. The study also demonstrated the importance of teachers' intrinsic motivation and school support in the development of PCK, which will serve as inspiration for the design and execution of future teacher training programs.

4.1 Concepts and principles of PCK training

A comprehensive concept should be adhered to, that is, it should not only focus on the improvement of teachers' professional knowledge and skills but also focus on the cultivation of their ideological and political literacy and professional ethics. In the current educational environment, the role of English teachers is no longer limited to imparting language knowledge, but more importantly, guiding students to form a correct world outlook, outlook on life, and values. Therefore, the training concept should emphasize that teachers integrate ideological and political elements into teaching to stimulate students' patriotism and social responsibility. Principles of teacher PCK training include 1. The principle of combining practicality and theory: PCK training should focus on the mutual confirmation and promotion of theory and practice, and strengthen teachers' understanding of curriculum ideological and political education through actual teaching case analysis, teaching design discussions, etc. Ability to understand and apply content. 2. The principle of combining personality development with an improvement of commonality: respect the individual differences of teachers, encourage teachers to explore personalized teaching methods and ideological and political education approaches based on their own characteristics and the characteristics of the subjects they teach, and achieve this through collective discussions, training, etc. Sharing and improving common knowledge. 3. The principle of combining process orientation and result evaluation.

4.2 Path to integrate ideological and political courses with PCK

First and foremost, we need to define curriculum ideological and political education. Curriculum ideological and political education refers to providing ideological and political education to students through teaching content and teaching methods in various courses so that students can establish a correct worldview, outlook on life, and values, and cultivate students' sense of social responsibility, innovative spirit, and practical ability.

In college English courses, teachers should make full use of course resources and integrate ideological and political education into English teaching, so that students can receive correct ideological and political education while learning English. Second, we must investigate how to include curricular ideology and political education into PCK (subject teaching knowledge). PCK is the core of teachers' professional quality, which includes subject knowledge, teaching knowledge, and student knowledge. Teachers of college English must have good PCK abilities in order to effectively implement ideological and political education in the curriculum. Specifically, teachers need to conduct in-depth research on the knowledge system of the English subject, master teaching methods and strategies, understand students' learning needs and characteristics and apply this knowledge and skills to actual teaching to improve teaching effectiveness.

4.3 Construction of teacher professional development support system

From the ideological and political perspective of college English courses, the core of research on the training path of PCK (pedagogical content knowledge) for independent college teachers is to build an effective teacher professional development support system. This support system should include the following aspects: First, a systematic training plan should be established to provide teachers with continuous professional development opportunities. Secondly, communication and cooperation between teachers need to be strengthened. Through regular teaching and research activities, teachers can share teaching experiences, discuss teaching problems, and jointly improve teaching standards. At the same time, teachers are encouraged to participate in domestic and foreign academic exchanges, broaden their horizons, and improve their own educational and teaching concepts. Thirdly, a sound teacher evaluation mechanism should be established. Finally, we must pay attention to the construction of teachers' psychological quality. The pressures and challenges teachers face at work need to be given full attention and effectively alleviated. Through such an all-round and multi-level support system,

the PCK level of independent college teachers from the ideological and political perspective of college English courses can be effectively improved, and the continuous improvement of education and teaching quality can be promoted.

However, this study also has some limitations, such as a relatively small sample size and a limited research period. Future research can consider expanding the sample size, extending the observation period, and further exploring the long-term impact of PCK training on student learning outcomes. Nonetheless, the findings of this study still provide valuable theoretical basis and practical guidance for the reform of English education in colleges and universities and the construction of ideological and political courses, emphasizing the importance of systematic PCK training in improving teaching quality and promoting the integration of ideological and political courses.

Funding

Hunan Provincial Teaching Reform and Research Project "Research on PCK Training Paths for Independent College Teachers from the Ideological and Political Perspective of College English Courses" HNJG-2022-1428 (Project Number: Xiangjiaotong [2022] No. 248); Hunan Provincial Teaching Reform Research project "Construction and practice of the "5+1" system for high-quality development of English teachers in independent colleges under the digital transformation of education" (Project number: HNJG-20231641).

References

- Berry, A., Depaepe, F., & Driel, J. V. (2016). Pedagogical content knowledge in teacher education. *International Handbook of Teacher Education*, 347-386.
- Depaepe, F., Verschaffel, L., & Kelchtermans, G. (2013). Pedagogical content knowledge: a systematic review of the way in which the concept has pervaded mathematics educational research. *Teaching and Teacher Education*, 34, 12-25.
- Evens, M., Elen, J., & Depaepe, F. (2017). Effects of opportunities to learn in teacher education on the development of teachers' professional knowledge of French as a foreign language. *Journal of Advances in Education Research*, 2(4).
- Hume, A. and Berry, A. (2010). Constructing cores—a strategy for building PCK in pre-service science teacher education. *Research in Science Education*, 41(3), 341-355.
- Jang, S. (2010). Assessing college students' perceptions of a case teacher's pedagogical content knowledge using a newly developed instrument. *Higher Education*, 61(6), 663-678.
- Jiang, Y. (2022). How EFL teachers' pedagogical content knowledge (PCK) grows through collaborative learning: a review based on the interconnected model of professional growth (imp). *rEFLECTIONS*, 29(3), 571-585.
- Li, S., Liu, L., & Jiang, A. (2021). Understanding the development of Chinese EFL student-teachers' pedagogical content knowledge. *Frontiers in Psychology*, 12.
- Mecoli, S. (2013). The influence of the pedagogical content knowledge theoretical framework on research on preservice teacher education. *Journal of Education*, 193(3), 21-27.
- Şen, M. & Demirdöğen, B. (2023). Seeking traces of filters and amplifiers as pre-service teachers perform their pedagogical content knowledge. *Science Education International*, 34(1), 58-68.
- Wang, L. (2023). Elaborating teachers' pedagogical content knowledge from static and dynamic perspectives. *Creative Education*, 14(11), 2301-2312.