ISSN 2522-6398 Vol. 9, Issue 5: 1-7, DOI: 10.25236/FER.2026.090501

Research on the Influencing Factors and Cultivation Strategies of Intelligent Teaching Competence in Normal University Students

Zhengzheng Lin[1,*], Yuchen Huang[1], Hao Zhang[2], Licai Xu[1], Huixiu Wu[1]

[1]*College of Teacher Education, Longyan University, Longyan, China*
[2]*Yongding District No.3 Middle School, Longyan, China*
**Corresponding author*

Abstract: *Based on social exchange theory, this study explores the influence of perceived organizational support and self-efficacy on normal university students' intelligent teaching competence. A total of 311 normal university students from a university in Fujian Province were selected as the research subjects. The results indicate that perceived organizational support not only directly affects normal university students' intelligent teaching competence, but also indirectly influences it by affecting self-efficacy. Self-efficacy plays a partial mediating role between perceived organizational support and intelligent teaching competence. Based on these findings, targeted cultivation strategies are proposed to enhance the intelligent teaching competence of normal university students.*

Keywords: *Intelligent teaching competency; Perceived organizational support; Self-efficacy; Normal university students*

1. Introduction

The rapid advancement of digital technology is profoundly reshaping the educational ecosystem, driving a deep transformation toward intelligent and personalized teaching. This revolution manifests not only in the smart upgrade of teaching environments but also triggers a fundamental restructuring of pedagogical philosophies and models. As the future backbone of basic education, normal university students must cultivate high-level competencies in intelligent teaching. This represents not only their core competitive edge for entering the teaching profession but also the key to navigating intelligent educational environments, advancing educational digital transformation, and enhancing teaching quality.

Currently, digital teaching resources are becoming increasingly abundant, providing a broad platform for normal students to engage with intelligent teaching tools and accumulate teaching experience. However, in reality, most normal students possess limited digital literacy and skills. Furthermore, existing teacher education programs suffer from a disconnect between teaching methodologies and digital technologies, with curricula failing to organically integrate digital education literacy throughout the entire teacher training process. Additionally, the digital literacy of the teaching faculty itself remains inadequate, creating a bottleneck in cultivating future educators.

Intelligent teaching competency encompasses not only traditional teaching skills but also emphasizes a series of knowledge competencies, teaching abilities, attitudes and values, traits, and motivations that educators must possess when utilizing modern information technology tools within an information-driven and intelligent context. It represents the professional extension of digital literacy within the field of education. Research indicates that intelligent teaching competency is one of the core elements of teachers' digital professional development (Zhao et al., 2025).

As digital natives, normal university students are in the prime period for exploring new technologies. They possess both an innate enthusiasm for learning new things and the ability to quickly master smart technologies. Research indicates that intelligent teaching competency is a key factor for Normal university students to achieve digital professional development. It not only helps them quickly adapt to smart teaching scenarios after entering the workforce but also has a profound impact on their future ability to cultivate students' autonomous inquiry skills, critical thinking, innovative practical abilities, and digital citizenship awareness (Lv, 2024). Teachers with high levels of intelligent teaching competency can effectively leverage technology to integrate teaching resources, innovate instructional methods, and provide students with superior learning experiences, thereby enhancing teaching

ISSN 2522-6398 Vol. 9, Issue 5: 1-7, DOI: 10.25236/FER.2026.090501

effectiveness (Olivares & Castillo, 2018).

Therefore, this study focuses on the influencing factors and countermeasures for normal university students' intelligent teaching competencies, aiming to provide valuable insights for enhancing the overall quality of the basic education teaching workforce and improving teaching standards.

2. Literature Review

As one of the important contextual variables at the organizational level, organizational support serves as a crucial resource for college students to obtain necessary resources. Perceived organizational support reflects the extent to which members perceive support from the organization across various dimensions. According to social exchange theory, interactions between individuals are based on the principle of reciprocity. When members perceive support from the organization, they often develop a sense of obligation to reciprocate in order to maintain the balance of this exchange relationship. This leads them to respond with positive attitudes and behaviors toward the organization, which in turn provides developmental opportunities for enhancing the competencies of organizational members (Zou et al., 2012). Chen et al. (2024) found that social support positively influences the entrepreneurial competence of university students. Organizational support positively predicts teacher competence (Wang & Liu, 2018).

When normal university students gain access to essential resources, advanced smart teaching tools, technical training, and emotional support within the school environment, they are more inclined to invest significant effort in pursuing teaching innovation and professional development out of a sense of reciprocity, proactively exploring the application of smart teaching methods.

Self-efficacy refers to an individual's belief and evaluation of their own abilities. Perceived organizational support is significantly positively correlated with self-efficacy. Individuals who receive a certain level of organizational support show increased confidence in dealing with academic and life situations. Xie & Wang (2024) noted in their research that organizational support, as an important source of social support, can enhance an individual's positive self-evaluation and strengthen confidence in their own value and abilities when they perceive more support from the organization or school. A supportive environment encourages innovation, enabling teachers to try new technologies and teaching methods with greater confidence.

Bandura's (1977) self-efficacy theory emphasizes that an individual's belief in their own capabilities influences their behavior, motivation, and achievements. It is highly correlated with intelligent teaching competence (Birisci & Kul, 2019). Zhao et al. (2024) argue that teachers with higher self-efficacy typically demonstrate a stronger willingness to engage in educational reforms. They are not only more effective in addressing various challenges encountered during the teaching process but also invest greater effort in their teaching practices. Self-efficacy enables teachers to develop a proper and positive understanding of their professional capabilities, fostering the belief that they can overcome difficulties in intelligent teaching. This, in turn, motivates them to actively learn and apply new technologies. When teachers feel confident in using intelligent teaching technologies, they are more inclined to experiment with new tools and explore innovative teaching methods, thereby continuously enhancing their intelligent teaching competence through practice. Conversely, teachers with low self-efficacy may harbor skepticism toward intelligent teaching and lack the motivation to try new technologies, which can hinder the growth of their professional abilities. Perceived organizational support may influence competency through individuals' personal characteristics (Zhou & Jia, 2014).

According to social cognitive theory, individual development results from the combined influence of personal and environmental factors. Therefore, during the internal formation and activation of intelligent teaching competence in normal university students, it is likely influenced jointly by organizational support and self-efficacy. Encouraging feedback, abundant digital resources, teaching demonstrations, and autonomy granted to students by schools can significantly enhance teaching self-efficacy among normal university students. This heightened self-efficacy boosts their confidence, empowering them to experiment with new teaching methods and innovative strategies. As these students continuously engage in exploration and practice during teaching activities, their instructional abilities improve accordingly, enabling them to demonstrate greater competence in integrating intelligent technologies into the teaching process.

Currently, there is a scarcity of empirical research on the factors influencing intelligent teaching competence among normal university students, with insufficient in-depth analysis. Therefore, this study

ISSN 2522-6398 Vol. 9, Issue 5: 1-7, DOI: 10.25236/FER.2026.090501

explores the impact of perceived organizational support on the intelligent teaching competence of normal university students and clarifies the mediating mechanism of self-efficacy between the two. This is of significant importance for formulating targeted enhancement strategies and fostering the development of intelligent teaching competence in normal university students.

3. Subjects and Methods

3.1. Research Subjects

Using convenience sampling, an undergraduate institution in Fujian Province was selected as the research site. A total of 350 questionnaires were distributed, and after excluding 39 invalid responses (e.g., random or incomplete answers), 311 valid questionnaires were retained, resulting in a valid response rate of 88.86%. Among the respondents, 132 were male and 179 were female. The distribution by academic year was as follows: 75 freshmen, 97 sophomores, 69 juniors, and 70 seniors.

3.2. Research Instruments

3.2.1. Perceived Organizational Support Scale

The relatively broad Perceived Organizational Support Questionnaire developed by Chen (2006) was adopted. To better align the questionnaire with the learning and living contexts of normal university students, appropriate adjustments and revisions were made based on the original scale. The revised version aims to assess students' perceptions of their university's attention and support, comprising a total of 16 items. A 5-point Likert scale was used, ranging from "completely disagree" to "completely agree," with higher scores indicating stronger perceived organizational support among the normal university students.

3.2.2. Self-Efficacy Scale

The Chinese version of the Self-Efficacy Scale revised by Wang Caikang et al. (2001) was used. It adopts a 5-point rating system (1 = completely disagree, 5 = completely agree) and consists of 10 items, with higher total scores indicating higher levels of self-efficacy.

3.2.3. Intelligent Teaching Competence

Intelligent teaching competence was measured using the Digital Competence Scale compiled by Li (2024). The scale consists of 16 items across four dimensions: competence in learning, competence in teaching, competence in educating, and competence in social engagement. A 5-point Likert scale was employed, with higher scores indicating stronger intelligent teaching competence among the normal university students.

3.3. Statistical Analysis

Descriptive, correlational, and regression analyses were conducted using SPSS 19.0.

4. Subjects and Methods

4.1. Correlation Analysis

The results of the Pearson correlation analysis are presented in Table 1. Perceived organizational support showed significant positive correlations with both self-efficacy and intelligent teaching competence.

Table 1: Correlation Analysis among Variables

Variables	*M*±*SD*	POS	SE	ITC
POS	2.49±1.14	1		
SE	2.38±1.03	0.46***	1	
ITC	2.4±1.07	0.55***	0.54***	1

Note: *** p<0.001. POS=Perceived Organizational Support; SE=Self-efficacy; ITC= Intelligent Teaching Competency

ISSN 2522-6398 Vol. 9, Issue 5: 1-7, DOI: 10.25236/FER.2026.090501

4.2. Regression Analysis

4.2.1. Direct Effect of POS on ITC of Normal University Students

As shown in Table 2, after controlling for grade and gender variables, perceived organizational support significantly and positively predicted intelligent teaching competence, indicating that perceived organizational support has a direct predictive effect on the intelligent teaching competence of normal university students.

Table 2: Predictive Effect of POS on ITC

Variables	*R*	R^2	*F*	*β*	*SE*	*t*
	0.58	0.33	50.5***			
Gender				0.1	0.1	2.16*
Grade				0.14	0.05	3.02**
POS				0.51	0.05	10.51***

Note: * $p<0.05$, ** $p<0.01$, *** $p<0.001$

4.2.2. Relationship Between POS and ITC: The Mediating Role of SE

As shown in Table 3, after incorporating self-efficacy as a mediating variable, perceived organizational support remained a significant positive predictor of intelligent teaching competence, while self-efficacy significantly and positively predicted intelligent teaching competence. Since the direct effect of perceived organizational support on the intelligent teaching competence of normal university students remained significant, self-efficacy plays a partial mediating role between perceived organizational support and intelligent teaching competence.

Table 3: Prediction of ITC by POS and SE

Predictor Variables	*R*	R^2	*F*	*β*	*SE*	*t*
	0.65	0.42	55.94***			
Gender				0.09	0.1	2.04*
Grade				0.11	0.04	2.43**
POS				0.36	0.05	7.14***
SE				0.34	0.05	6.98***

5. Discussion

The findings of this study provide empirical evidence for understanding how normal university students enhance their self-efficacy under the influence of organizational support and its positive effect on intelligent teaching competence.

5.1. Relationship between POS, SE, and ITC

The results indicate that perceived organizational support significantly and positively predicts the intelligent teaching competence of normal university students. This finding aligns with prior related research (Wang et al., 2023). The study extends the application of social exchange theory in the digital context to explain the pivotal role of organizational support in the professional development of normal university students. On one hand, universities actively implement measures such as providing intelligent teaching equipment, resources, and technical training, which lower technological barriers and enable normal university students to integrate more swiftly into the wave of digitalized teaching. This tangible resource support allows students to perceive that "the institution cares about my development," enhancing their sense of belonging and stimulating a reciprocal obligation toward the organization. To maintain the balance of exchange, students are more likely to invest effort in proactively learning new technologies. Such a positive learning attitude and practical engagement will further promote the enhancement of their intelligent teaching competence, forming a virtuous cycle.

On the other hand, by offering recognition, encouragement, and trust, schools effectively foster a supportive and secure environment. Such an environment helps alleviate teachers' anxiety toward technological innovation, encourages them to reciprocate with innovative behaviors, and motivates them to experiment with and adopt intelligent teaching methods, thereby advancing the development of intelligent teaching competence.

ISSN 2522-6398 Vol. 9, Issue 5: 1-7, DOI: 10.25236/FER.2026.090501

5.2. The Mediating Role of SE

Self-efficacy plays a mediating role between perceived organizational support and intelligent teaching competence, which is consistent with previous related research (Xie & Wang, 2024). At the same time, it further deepens the theoretical understanding of the relationships among perceived support, self-efficacy, and competence. The stronger the perceived institutional support among students, the higher their self-efficacy, which in turn more effectively enhances their level of intelligent teaching competence. Supportive initiatives such as training in the use of intelligent teaching equipment and the establishment of online teaching exchange platforms not only directly improve normal university students' proficiency with intelligent teaching tools but also indirectly strengthen their professional capabilities by reinforcing the belief that "I can succeed in intelligent teaching." Individuals with high self-efficacy tend to choose challenging tasks and invest effort in accomplishing them. This psychological trait drives them to continuously push their limits, deeply integrate intelligent technology with teaching content, seek innovative solutions, and pioneer new teaching models. Conversely, normal university students with lower self-efficacy may, even in resource-rich environments, miss developmental opportunities due to a lack of confidence. They may adopt a wait-and-see attitude toward new technologies, resulting in slow improvement in their intelligent teaching competence. Therefore, while providing hardware support, institutions should also focus on cultivating normal university students' self-efficacy. Through methods such as sharing success stories and creating opportunities for successful experiences, they can help students develop positive psychological affirmations of "I can do it," thereby more effectively translating organizational support into enhanced intelligent teaching competence.

6. Conclusion and Enhancement Strategies

High-quality development is a crucial mission for advancing basic education. To achieve high-quality education, it is essential to enhance teaching quality as an internal driving force. It is evident that in the process of digital educational transformation, focusing on improving the intelligent teaching competence of normal university students can provide a new practical paradigm for addressing challenges in educational development. Research findings indicate that perceived organizational support, as a significant predictor of intelligent teaching competence, influences intelligent teaching competence through both direct and indirect pathways (with self-efficacy as a mediator). Therefore, practical approaches to enhancing the intelligent teaching competence of normal university students should prioritize the following three key dimensions:

(1) Optimize the Training System for Teacher Candidates to Facilitate Their Rapid Adaptation to Future Intelligent Teaching Environments

During the training phase for normal university students, institutions should develop a forward-looking curriculum system that integrates intelligent teaching technologies and the application of digital teaching resources as compulsory modules. Through practices such as simulating smart classrooms and virtual teaching research, normal university students can become familiar with the operational procedures and instructional strategies of intelligent teaching tools in advance. Simultaneously, efforts should be made to establish digital teaching practice communities between universities and primary or secondary schools, implementing a "dual-mentor system" where university instructors and exemplary frontline teachers in basic education jointly provide guidance. This ensures that normal university students not only grasp theoretical frameworks but also gain hands-on practical experience. Additionally, organizing activities such as intelligent teaching skill competitions can stimulate normal university students' proactive interest in exploring intelligent teaching, fostering a virtuous cycle of "learning through practice and practicing through learning."

(2) Strengthen Organizational Support and Build an Empowering Ecosystem for Intelligent Teaching

As the primary setting for the professional development of normal university students, universities must collaborate across three dimensions: hardware provision, institutional safeguards, and personnel support. At the hardware level, there should be accelerated upgrading and renovation of infrastructure such as digital teaching laboratories and blended learning experimental platforms, providing normal university students with tools such as interactive smart panels, intelligent course design systems, and intelligent teaching diagnostics. At the institutional level, clear development plans for normal university students' intelligent teaching competence should be established, with phased objectives and corresponding scientific evaluation mechanisms. Normal university students who demonstrate outstanding performance in intelligent teaching innovation should receive recognition and rewards.

ISSN 2522-6398 Vol. 9, Issue 5: 1-7, DOI: 10.25236/FER.2026.090501

Furthermore, universities should establish regular intelligent teaching seminars and workshops, regularly inviting experts from both within and outside the institution to conduct lectures and training sessions. This will foster an ecosystem for intelligent teaching empowerment that progresses from technological enablement to practical application and feedback.

(3) Enhancing Efficacy Beliefs to Stimulate Intrinsic Motivation for Autonomous Growth

The influence of perceived organizational support on intelligent teaching competence through self-efficacy represents a process of transforming external resources into internal psychological resources. This indicates that the teaching competence of normal university students is not merely "trained" but also "cultivated" through a carefully crafted supportive environment. This mechanism reveals the underlying principle that in the context of digital transformation, "external investment" and "psychological resources" must be advanced simultaneously. Only when normal university students maintain a positive perception of their profession can they generate sustained motivation for educational and instructional reform.

Self-efficacy is malleable. On one hand, the self-efficacy of normal university students can be strengthened through successful practical experiences in their professional development environment. By setting achievable small goals, engaging in proactive learning, regularly reflecting on their teaching practices, and continuously deepening their understanding of intelligent teaching methods, they can gradually build self-confidence. On the other hand, supportive feedback serves as a vital source for enhancing the self-efficacy of normal university students. Universities should establish an open and inclusive evaluation system that encourages positive interactions among students and between students and teachers, offering timely affirmation and specific guidance for every step of progress they make in exploring intelligent teaching. For instance, creating an "Intelligent Teaching Growth Portfolio" to document highlights and breakthroughs in their teaching practices, regularly organizing exchange and sharing sessions to disseminate successful experiences within the group, and fostering a positive cycle of motivation. Additionally, introducing peer support mechanisms, such as collaborative group learning and co-teaching preparation, allows normal university students to reinforce their belief in "I can do it" through mutual encouragement. Furthermore, universities can invite experts or outstanding educators in the field of intelligent teaching to conduct lectures or workshops, providing role models and inspiring students to strive for higher levels of achievement through intrinsic motivation.

Acknowledgements

This paper presents the research findings of Longyan University's 2025 projects: the Longyan City Basic Education Teaching Reform Research Project (Project No.: 2025JCJY29) and the College Students Innovation and Entrepreneurship Training Program (Project No.: 202411312003).

References

[1] Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review,84(2):191 -215.
[2] Birisci, S & Kul, E. (2019). Predictors of technology integration self-efficacy beliefs of preservice teachers. Contemporary educational technology,10(1):75-93.
[3] Chen, LB, Li, T, Wang, XH, et al. (2024). How family socioeconomic status influences college students' entrepreneurial competence: The mediating role of social support. Research in Educational Development,3:55-64.
[4] Chen, ZX. (2006). Chinese knowledge-workers perceived organizational support and its influence on their job performance and turnover intention (Doctoral dissertation). Huazhong University of Science and Technology.
[5] Lv, XY. (2024). Construction and application of a digital teaching competency model for university-based international Chinese language teachers. Journal of Yunnan Normal University (Teaching & Studying Chinese as a Foreign Language Edition),22(3):82-92.
[6] Olivares, DD & Castillo, RR. (2018). ICT in the classroom: Primary education student teachers' perceptions of the interactive whiteboard during the teaching practicum. Education and Information Technologies, 23:2309-2321.
[7] Zhao, YT, Tang, YW, Wang, FH, et al. (2025). Smart classroom teaching competency of normal university students: Conceptual framework, key elements and structural model. Modern Educational Technology,35(3):55-65.
[8] Zou, WC, Tian, Q & Liu, J. (2012). Give a plum in return for a peach: A review of reciprocity theory

ISSN 2522-6398 Vol. 9, Issue 5: 1-7, DOI: 10.25236/FER.2026.090501

of organizational behavior. Advances in Psychological Science,20(11):1879-1888.
[9] Wang, CK, Hu, ZF, & Liu Y. (2001). Evidences for reliability and validity of the Chinese version of general self-Efficacy scale. Chinese Journal of Applied Psychology ,7(1):37-40.
[10] Wang, J & Liu, Z. (2018). The effect of perceived organizational support on work-family conflict-The mediating role of teacher competence. Education Research Monthly,11:65-70.
[11] Wang, JQ, Cao, X & Chen ZN. (2023). Organizational support and competence of university psychological commissioners: A chain mediating model of psychological capital and coping efficacy. Journal of Xi'an Jiaotong University (Medical Sciences) ,44(1):55-59.
[12] Xie, ZY & Wang, H. (2024). The influence of digital continuous professional development on rural teachers' digital teaching literacy-Examining the mediating roles of sense of organizational support and digital teaching self-Efficacy. Journal of South China Normal University (Social Science Edition) ,1:105-116+206.
[13] Zhao, YD, Miao, PZ & Zhang, JT. (2024). The relationship between vocational college teachers' self-efficacy and work values: The mediating role of career commitment and sense of life meaning. Education Research Monthly,7:66-73.
[14] Zhou, F & Jia, B. (2014). On Perceived Organizational Support. Journal of Liaoning University (Philosophy and Social Sciences Edition),42(3):105-109.