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A Research Trend Analysis on Teaching Methods for Pre-Service Special Education Teacher Education in China

Yundong Wu

Higher Education, Psychology, and Policy Analysis Laboratory, Naju, South Korea

Corresponding Author: ethanwu0525@gmail.com

ABSTRACT

This study examines research trends in teaching methods used in pre-service special education teacher education in China. A total of 186 relevant journal articles published between 2000 and 2025 were selected from CNKI and Wanfang Data. The studies were examined from four aspects: publication period, teaching method, research method, and research topic. Frequency and percentage analyses were used, with multiple coding applied to teaching methods when one study covered more than one method; research topics were assigned one primary topic per study. The 12 teaching-method categories generated 260 coding cases. Reflective teaching was the most frequently coded method (42 cases, 16.2%), followed by field-based learning (36, 13.8%) and problem-based learning (31, 11.9%). Qualitative research accounted for 48.9% of the studies, followed by quantitative research (30.1%), mixed methods (14.5%), and literature/conceptual research (6.5%). Curriculum and instructional competence was the most frequently coded primary research topic (36.6%), followed by professional identity and development (21.0%) and practical teaching competence (15.1%). Annualized publication rates indicate that research activity increased across all successive periods, with the highest average rate occurring in 2020–2025. The findings indicate a strong emphasis on instructional competence and practical preparation, while assessment and classroom management, digital teaching competence, and rigorous outcome evaluation remain comparatively underrepresented. Because the review describes research attention rather than intervention effectiveness, the findings should not be interpreted as evidence that one teaching method is more effective than another. Future research should use reproducible search procedures, reliable coding, mixed-method and longitudinal designs, university–school collaboration, and competency-specific outcome measures.

Keywords: pre-service special education teachers; research trends; special education; teacher education; teaching methods

1. INTRODUCTION

Special education teachers have an important role in supporting students with disabilities and helping them develop academically, socially, and personally. Effective teacher preparation is therefore closely linked to the quality of special education teaching and the support that students receive. Therefore, pre-service special education teacher education is an important stage for developing professional knowledge, teaching skills, professional attitudes, and practical competence. In China, the development of special education has created a growing need for teachers who can provide

individualized and inclusive educational support. This change has also increased the importance of improving the quality of special education teacher preparation.

Traditional teacher education has often emphasized the transmission of theoretical knowledge. However, special education teaching is a complex professional activity. Teachers need to understand different types of disabilities, identify individual learning needs, design suitable instruction, cooperate with families and other professionals, and adjust teaching according to students' responses. Therefore, teacher education cannot depend only on lectures and textbook learning. It needs to provide pre-service teachers with opportunities to connect theory with practice and to develop problem-solving, reflection, communication, and teaching skills.

Chinese research has pointed out that there are still problems in the preparation of special education teachers. Some teacher education programs have relatively weak connections between university courses and school practice. The curriculum structure also needs to be further connected with the professional requirements of special education teachers [3]. Research on special education teacher preparation has also shown differences among universities in curriculum design, practical training, and professional development opportunities [18]. These issues make the selection and development of teaching methods an important research topic.

The development of professional certification standards has further strengthened the need for competency-oriented teacher education. The requirements for special education teacher preparation increasingly emphasize teaching design, teaching implementation, individualized education, classroom organization, communication, reflection, and practical competence. In this context, teaching methods should not only help students understand theoretical concepts but also provide opportunities to apply knowledge in realistic teaching situations.

To build self-awareness, reflective teaching helps educators review and improve their own practice. Real school environments form the core of field-based learning. In problem-based models, students tackle professional issues through active work. For specific skill practice, microteaching offers a controlled space. By mixing online tasks with in-person classes, blended learning creates more chances for independent study and group interaction. Past studies usually look at these methods one by one. Ren [24] shows how university classes must link to real school practice. Focusing on the students themselves, Chen and Wu [4] explore professional identity, commitment, engagement, and teaching skills in future special education teachers. But these papers stay narrow. They mostly focus on just one method, one course, or one specific issue.

At the program and curriculum level, Chinese scholarship has examined the construction of special education majors under inclusive education, undergraduate program design, curriculum reform, integrated pre-service and in-service preparation, regional training models, and accreditation-oriented training goals [7, 17, 18, 19, 23, 39, 41, 43, 44]. Policy implementation and professional standards have also been discussed as important contexts for teacher preparation [9, 13].

At the competence and practice level, studies have addressed the integrated development of pre-service teachers' professional competence, teaching implementation, resource-teacher competence, professional competence

improvement, practice-teaching systems, and the evolution of teacher practicum [6, 10, 11, 12, 20, 24, 29, 37]. Research on localized inclusive teaching practice and on the professional development needs and difficulties of special education teachers further underscores the importance of linking university preparation with school-based practice [28, 35].

Another line of research concerns professional identity, learning engagement, attitudes toward inclusion, and inclusive-education competence among pre-service or practicing teachers [1, 2, 4, 8, 14, 15, 16, 21, 25, 26, 27, 30, 31, 32, 36, 38, 40, 42]. Digital competence and technology-supported teacher education have also become visible themes, including TPACK-based development, digital-teaching competence diagnosis, flipped-classroom practice, and AI-related opportunities and challenges [5, 22, 33, 34].

The purpose of the present study is therefore to examine domestic journal research on teaching methods for pre-service special education teacher education in China from 2000 to 2025. The study uses an analytical framework that examines research according to research period, teaching method, research method, and research topic. Multiple coding was used when a study included more than one category, and frequencies and percentages were calculated to identify research trends.

Based on this purpose, four research questions were proposed.

- **RQ1.** What are the research trends by research period in studies on teaching methods for pre-service special education teacher education in China?
- **RQ2.** What are the research trends by teaching methods?
- **RQ3.** What are the research trends by research methods?
- **RQ4.** What are the research trends by research topic?

2. METHODS

2.1 Screening and Eligibility Procedure

The screening process followed four stages. First, records retrieved from CNKI and Wanfang Data were combined and duplicates were removed. Second, titles and abstracts were screened against the predefined scope. Third, potentially eligible articles were assessed in full text. Fourth, articles meeting all inclusion criteria were entered into the coding dataset. Inclusion required (a) publication as a domestic journal article, (b) a focus on pre-service special education teacher education in China, and (c) explicit attention to a teaching method, instructional activity, teaching practice, or method-related training process. Studies were excluded when the participants were only in-service teachers, the focus was unrelated to teacher preparation, the paper addressed general curriculum or policy without a teaching-method component, or the publication type was outside the defined journal-article scope.

In July 2026, searches were conducted in CNKI and Wanfang Data for journal articles published from 2000 to 2025. For reproducibility, the search was structured around combinations of terms for special education, pre-service teacher education, teaching methods, instructional practice, and teacher competence. The core conceptual search string was:

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("special education" OR "special education teacher") AND ("preservice teacher" OR "normal university student" OR "teacher education") AND ("teaching method" OR "instructional method" OR "teaching practice" OR "teaching strategy" OR "practicum").

Chinese equivalents were used in the Chinese-language databases. The search was restricted to journal literature and the 2000-2025 publication window. The initial search retrieved 542 records. After duplicate removal and title/abstract screening, 310 records remained for full-text assessment. Applying the eligibility criteria resulted in 186 included studies. To improve reproducibility, the screening decision rules were applied in the same order to all records: database deduplication, title/abstract relevance screening, full-text eligibility assessment, and final inclusion. Records were excluded when they did not concern pre-service special education teacher education, did not report or discuss a teaching method or instructional practice, were not journal articles, fell outside the publication period, or lacked sufficient information for classification. The final sample therefore comprised 186 journal articles directly relevant to teaching methods in pre-service special education teacher education in China.

2.2 Analysis Criteria

The teaching methods were grouped into 12 categories: reflective teaching, field-based learning, problem-based learning, microteaching, blended learning, case teaching, project-based learning, lecture and direct instruction, inquiry-based learning, portfolio-based learning, action learning, and flipped learning.

Reflective teaching refers to teaching activities that require pre-service teachers to review, analyze, and improve their learning or teaching experiences. Field-based learning refers to learning activities connected with special education schools or other educational practice settings. Problem-based learning refers to learning organized around professional problems or cases that require students to analyze and solve problems.

Microteaching refers to short teaching practice designed to improve specific instructional skills. Blended learning combines online and face-to-face learning. Case teaching uses realistic or simulated cases to help students understand special education problems. Project-based learning requires students to complete a relatively complete project through cooperation and practical activities.

The research methods were classified into four categories: quantitative research, qualitative research, mixed-method research, and literature or conceptual research.

Research topics were classified into seven categories: curriculum and instructional competence, professional identity and development, practical teaching competence, learner understanding and disability knowledge, digital teaching competence, communication and collaboration, and assessment and classroom management. The categories were developed according to the main purpose and content of the selected studies.

Microsoft Excel was used to organize the selected studies and calculate frequencies, percentages, annualized publication rates, and cross-tabulations. Publication period was single-coded, and each article was counted once. Teaching methods were multiple-coded because one article could examine more than one method; therefore, method

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frequencies sum to 260 coding cases rather than 186 articles. Percentages for teaching methods were calculated using 260 as the denominator. Research method was single-coded according to the dominant methodological design reported in each article. Research topic was also single-coded using one primary topic per article, so topic frequencies sum to the 186 included studies. For publication-period comparisons, the number of studies was additionally divided by the number of years in each period to avoid comparing five-year periods with the six-year period 2020-2025 on raw counts alone. A cross-analysis of teaching methods and primary research topics was conducted at the method-occurrence level. Thus, a single article using two teaching methods could contribute two method-topic co-occurrences. The cross-analysis is intended to describe research concentration and co-occurrence patterns, not to estimate causal effects or teaching-method effectiveness.

3. RESULTS AND DISCUSSION

3.1 Trends by Research Period

Across the dataset, 260 teaching-method coding cases were identified across 186 articles, confirming that multiple coding was used for teaching methods. Because a study could contain more than one method, the method percentages use 260 coding cases as the denominator. Reflective teaching was the most frequently coded method (42 cases, 16.2%), followed by field-based learning (36, 13.8%), problem-based learning (31, 11.9%), and microteaching (28, 10.8%). These four categories together accounted for 137 of the 260 method occurrences (52.7%), indicating that the literature is concentrated around reflection, practice, problem solving, and controlled teaching rehearsal.

The results show a steady increase in research activity over time. Between 2000 and 2004, only 8 studies were identified, accounting for 4.3% of the total. This number rose to 20 studies from 2005 to 2009 and reached 34 studies between 2010 and 2014. Research activity grew more rapidly after 2015. From 2015 to 2019, 53 studies were identified, representing 28.5% of all studies. The number increased again during 2020 to 2025, reaching 71 studies and accounting for 38.2% of the total. Table 1 shows the distribution of studies across the publication periods.

Table 1. Research Trends by Publication Period

Research period	Number of studies	Percentage
2000–2004	8	4.3%
2005–2009	20	10.8%
2010–2014	34	18.3%
2015–2019	53	28.5%
2020–2025	71	38.2%
Total	186	100.0%

Reflective teaching occupied the largest share of method coding, but the difference between the leading categories was modest: reflective teaching represented 16.2% of method occurrences, compared with 13.8% for field-based learning and 11.9% for problem-based learning. This pattern suggests a broad preference for active and practice-oriented approaches rather than a single dominant model. At the same time, the relatively low frequencies of action

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learning (5, 1.9%), portfolio-based learning (10, 3.8%), and flipped learning (12, 4.6%) indicate that some potentially useful approaches have received much less systematic research attention. These frequencies describe what researchers have studied; they do not establish comparative effectiveness.

Training methods for pre-service special education teachers have drawn increasing scholarly attention. This trend may be driven by evolving professional standards and the growing demand for practical competencies in teacher preparation. Particularly between 2020 and 2025, the notable increase in publication frequency reflects a broader transition toward competency-oriented research in special education.

3.2 Trends by Teaching Method

A total of 260 coding cases were identified for teaching methods across the 186 studies, as several publications examined multiple pedagogical approaches within a single study. The specific distributions are summarized in Table 2.

Table 2. Research Trends by Teaching Method

Teaching method	Frequency	Percentage
Reflective teaching	42	16.2%
Field-based learning	36	13.8%
Problem-based learning	31	11.9%
Microteaching	28	10.8%
Blended learning	25	9.6%
Case teaching	22	8.5%
Project-based learning	18	6.9%
Lecture/direct instruction	16	6.2%
Inquiry-based learning	15	5.8%
Flipped learning	12	4.6%
Portfolio-based learning	10	3.8%
Action learning	5	1.9%
Total	260	100.0%

Reflective teaching emerged as the most frequently coded method (n = 42, 16.2%), followed by field-based learning (n = 36, 13.8%), which provides pre-service teachers with practical experience in authentic school environments. Problem-based learning ranked third (n = 31, 11.9%), whereas microteaching (n = 28, 10.8%) offered a structured setting for skill refinement. Conversely, action learning, portfolio-based learning, and flipped learning were represented far less frequently in the dataset.

3.3 Trends by Research Method

Table 3 presents the distribution of the research methods.

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Table 3. Research Trends by Research Method

Research method	Frequency	Percentage
Qualitative research	91	48.9%
Quantitative research	56	30.1%
Mixed methods	27	14.5%
Literature/conceptual research	12	6.5%
Total	186	100.0%

Qualitative research represented the largest proportion of studies (48.9%), as researchers frequently utilized interviews, observations, and case studies to examine educational implementation and participant experiences. Quantitative methods accounted for 30.1% of the literature, focusing primarily on measuring specific variables such as learning engagement and teaching skills. Mixed-method studies constituted 14.5%, while literature and conceptual studies represented 6.5% of the total sample.

3.4 Trends by Research Topic

Table 4 presents the distribution of the research topics.

Table 4. Research Trends by Research Topic

Research topic	Frequency	Percentage
Curriculum and instructional competence	68	36.6%
Professional identity and development	39	21.0%
Practical teaching competence	28	15.1%
Learner understanding and disability knowledge	19	10.2%
Digital teaching competence	13	7.0%
Communication and collaboration	11	5.9%
Assessment and classroom management	8	4.3%
Total	186	100.0%

Curriculum and instructional competence was the predominant research topic, representing 36.6% of the reviewed studies, followed by professional identity and development (21.0%) and practical teaching competence (15.1%). In contrast, digital teaching competence accounted for only 7.0% of the primary topics, highlighting a potential research gap given the rapid integration of educational technology. Communication and collaboration (5.9%) as well as assessment and classroom management (4.3%) received the least research attention.

3.5 Cross-analysis of Teaching Method and Research Topic

The cross-analysis indicates that teaching methods are not distributed randomly across research topics. Reflective teaching was concentrated in curriculum/instructional competence and professional identity/development, whereas field-based learning was more closely associated with practical competence and learner/disability knowledge. Problem-based learning was concentrated on curriculum/instructional competence and learner/disability knowledge, and microteaching was especially connected with instructional competence and assessment/classroom management.

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Blended and flipped learning showed relatively stronger links with digital teaching competence and curriculum-related topics. These patterns suggest that researchers tend to select teaching methods in relation to the competency they wish to develop. However, the cross-analysis shows co-occurrence of research attention, not evidence that a method causes improvement in the corresponding competency.

Reflective teaching was mostly related to professional identity, professional development, and instructional competence. This relationship suggests that reflection is used not only to improve teaching skills but also to encourage pre-service teachers to examine their professional roles. The distribution of teaching methods across major research topics is illustrated in Table 5.

Table 5. Teaching Methods and Major Research Topics

Teaching method	Main research topics
Reflective teaching	Professional identity and development; instructional competence
Field-based learning	Practical teaching competence; learner understanding
Problem-based learning	Instructional competence; disability knowledge
Microteaching	Instructional competence; classroom management
Blended learning	Digital teaching competence; curriculum
Case teaching	Learner understanding; instructional competence
Project-based learning	Practical competence; communication and collaboration
Lecture/direct instruction	Instructional competence; assessment and classroom management
Inquiry-based learning	Disability knowledge; instructional competence
Flipped learning	Digital competence; curriculum
Portfolio-based learning	Professional development; reflection
Action learning	Practical competence; collaboration

Field-based learning was strongly related to practical teaching competence and understanding of learners with disabilities. The connection between field experience and practical competence is consistent with the argument that special education teacher preparation requires opportunities to apply theoretical knowledge in real educational contexts.

Problem-based learning was mainly used to develop instructional competence and disability-related knowledge. It allows pre-service teachers to work with complex educational situations and consider multiple possible solutions.

Microteaching was strongly related to instructional competence and classroom management. Because microteaching provides a limited and structured teaching situation, it is particularly suitable for practicing individual teaching skills.

Blended learning and flipped learning were more closely associated with digital competence and curriculum reform. Their increasing appearance in recent research reflects the development of information technology in teacher education.

Table 6 details the distribution and co-occurrence frequency between specific teaching methods and primary research topics. Row totals equal the 260 teaching-method coding cases; column totals are co-occurrence counts and therefore should not be compared directly with the 186 primary-topic totals in Table 4.

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Table 6. Cross-Analysis of Teaching Methods and Primary Research Topics

Teaching method	Curriculum & instructional	Professional identity	Practical competence	Learner/disability knowledge	Digital competence	Communication/collaboration	Assessment/classroom management
Reflective teaching	18	12	5	2	1	3	1
Field-based learning	4	2	18	7	3	2	0
Problem-based learning	18	3	6	2	1	1	0
Microteaching	16	2	2	3	0	2	3
Blended learning	7	2	1	4	9	2	0
Case teaching	10	3	7	1	0	1	0
Project-based learning	4	2	7	1	0	3	1
Lecture/direct instruction	8	2	1	1	0	1	3
Inquiry-based learning	8	2	3	1	1	0	0
Flipped learning	3	3	1	1	3	1	0
Portfolio-based learning	1	4	2	1	0	1	1
Action learning	1	0	2	1	0	1	0

4. DISCUSSION

4.1 Discussion

The present study analyzed 186 domestic journal articles on teaching methods for pre-service special education teacher education in China from 2000 to 2025. Four major findings emerged: research activity increased substantially over time; research attention was concentrated in a small group of active and practice-oriented teaching methods; qualitative research remained dominant; and curriculum/instructional competence was the leading primary research topic. The cross-analysis further suggests that different methods tend to be studied in relation to different competency areas. These findings describe the structure and evolution of the research literature rather than the effectiveness of any particular teaching method.

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First, research activity increased substantially over time. The raw number of studies rose from 8 in 2000–2004 to 71 in 2020–2025. After adjusting for the unequal period length, the annualized publication rate increased from 1.60 to 11.83 studies per year. This sustained increase indicates growing scholarly attention to pre-service special education teacher preparation. The pattern is consistent with the manuscript's broader evidence that teacher preparation is increasingly framed around professional competence, practical teaching, and the connection between university learning and school practice [3, 10, 24]. However, the publication trend alone cannot identify which policy, institutional, or pedagogical factor caused the increase.

The temporal pattern also corresponds to a broader competency-oriented framing of teacher preparation. Existing studies cited in this review discuss curriculum reform, professional standards, practical teaching systems, and professional competence [6, 9, 12, 17, 41]. Taken together with the publication trend, these studies suggest that research attention has increasingly moved beyond the transmission of subject knowledge toward instructional design, implementation, individualized support, reflection, and practice. This interpretation should nevertheless be treated as a thematic synthesis rather than a causal explanation of the publication increase.

Second, reflective teaching was the most frequently coded teaching method (42 of 260 method occurrences, 16.2%), but its lead over field-based learning (13.8%) and problem-based learning (11.9%) was not large. The pattern is therefore better interpreted as a concentration around several active learning approaches rather than the dominance of one method. Reflective teaching was commonly associated with professional identity/development and instructional competence in the cross-analysis, which is consistent with studies emphasizing professional identity, engagement, and teacher development [4, 21]. Because the present review did not pool intervention outcomes, the data cannot demonstrate that reflective teaching is more effective than other methods.

Field-based learning was the second most frequently coded method (36 occurrences, 13.8%) and showed a strong descriptive connection with practical teaching competence and learner understanding. This pattern is compatible with research emphasizing practicum development and the need to connect university preparation with school-based practice [12, 24, 28, 29]. The convergence across these studies is important: practical experience is repeatedly treated as a mechanism for connecting theoretical preparation with the complexity of actual classrooms. At the same time, the frequency of field-based studies should not be taken as evidence that field-based learning produces better outcomes than classroom-based approaches.

Third, qualitative research accounted for 91 of the 186 studies (48.9%), substantially more than quantitative research (30.1%) and mixed methods (14.5%). The predominance of qualitative work is understandable because teacher education studies often examine experiences, perceptions, reflection, implementation processes, and contextual conditions. Nevertheless, the imbalance limits the field's ability to estimate the magnitude and consistency of outcomes associated with particular teaching methods. Quantitative designs can estimate changes or group differences, while qualitative evidence can explain implementation and participant experience; their combination would therefore be especially useful for evaluating complex teacher-education interventions.

The relatively low proportion of mixed-method studies should consequently be interpreted as a methodological gap rather than as a weakness of qualitative research itself. A more mature evidence base would connect implementation evidence with measurable outcomes such as instructional competence, assessment accuracy, classroom-management performance, professional identity, or teaching self-efficacy. Such designs could also help identify whether an observed improvement is associated with the method itself, the course context, instructor support, field experience, or other confounding factors.

Fourth, curriculum and instructional competence was the most frequently coded primary research topic (36.6%), followed by professional identity and development (21.0%) and practical teaching competence (15.1%). The concentration of 72.6% of studies in these three areas indicates that research has primarily addressed what pre-service teachers teach, how they develop as professionals, and how they perform practical teaching tasks. This emphasis is consistent with Chinese scholarship on curriculum systems, professional competence, teaching implementation, and practicum [10, 18, 24].

At the same time, digital teaching competence represented only 7.0% of the primary topics. The small share is notable because the reference set includes work on TPACK, digital-teaching competence diagnosis, flipped classrooms, and AI-related educational opportunities and challenges [5, 22, 33, 34]. This suggests that technology-related teacher preparation is visible but remains less developed as a sustained research stream. Future studies should move beyond describing technology use and examine how digital tools are selected, adapted, and evaluated for diverse learners with disabilities.

Assessment and classroom management were the least frequently coded primary topic, accounting for 8 studies (4.3%). This is a substantive gap because special education teachers need to collect evidence of student learning, formulate individualized goals, monitor progress, organize instruction, and respond to classroom behavior. The low frequency does not mean that these competencies are unimportant; rather, it indicates that they have received comparatively little research attention within the reviewed teaching-method literature. Future research should therefore develop competency-specific measures and examine whether teaching methods can improve observable assessment and classroom-management performance.

4.2 Limitations

This study has a methodological limitation concerning coding reliability. All 186 articles were coded by a single coder, and no independent second-coder reliability check was conducted. Accordingly, inter-rater agreement and Cohen's kappa could not be calculated. Although predefined coding criteria were applied consistently across the dataset, the possibility of coder subjectivity in category assignment cannot be excluded. Future reviews should use at least two independent coders, document coding decisions, and report inter-rater reliability statistics to strengthen the reproducibility and methodological rigor of the analysis.

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5. CONCLUSIONS AND IMPLICATIONS

This study reviewed 186 journal articles published between 2000 and 2025 to examine research trends in teaching methods for pre-service special education teacher education in China. The findings reveal four main patterns: increasing research attention over time, growing interest in active and practice-oriented teaching approaches, a strong reliance on qualitative research, and a concentration on instructional and professional competency development.

The temporal analysis shows a substantial increase in research activity. The number of studies rose from 8 in 2000–2004 to 71 in 2020–2025, with the annualized publication rate increasing accordingly. This sustained growth indicates that teaching methods in pre-service special education teacher education have received increasing scholarly attention. For teacher education programs, this development highlights the importance of continuously adapting curricula to changing professional competency requirements and strengthening the connection between university-based preparation and authentic school practice.

The analysis of teaching methods identified 12 categories, among which reflective teaching, field-based learning, problem-based learning, and microteaching were the most frequently studied. Together, these approaches accounted for 52.7% of all teaching-method coding cases. This pattern reflects an increasing emphasis on reflection, practical experience, problem solving, and structured teaching practice. The cross-analysis further suggests that different approaches tend to be connected with different competency areas. Therefore, Chinese special education teacher preparation programs may benefit from combining complementary teaching methods according to specific competency objectives rather than relying on a single instructional model.

A further important finding concerns research methodology. Qualitative studies constituted 48.9% of the reviewed literature, compared with 30.1% quantitative and 14.5% mixed-method studies. Qualitative research has provided valuable insights into pre-service teachers' experiences, perceptions, reflection, and learning processes. Nevertheless, the relatively limited use of mixed-method and longitudinal designs points to a need for stronger empirical evaluation of teacher preparation outcomes. Future studies should increasingly examine observable competencies, including instructional performance, assessment, classroom management, professional identity, and teaching self-efficacy.

The distribution of research topics also reveals a clear concentration. Curriculum and instructional competence accounted for 36.6% of studies, followed by professional identity and development (21.0%) and practical teaching competence (15.1%). Together, these areas represented 72.6% of the reviewed literature. In contrast, digital teaching competence, communication and collaboration, assessment, and classroom management received comparatively less attention. This imbalance suggests that special education teacher preparation in China should broaden its competency framework and give greater attention to these less-developed areas.

Taken together, the findings indicate a gradual movement toward more competency-oriented and practice-connected special education teacher preparation in China. Teacher education programs should integrate reflective learning, field-based experience, problem-based activities, and structured teaching practice while strengthening university–school

collaboration. Greater attention to digital competence, assessment, and classroom management is also warranted. At the research level, more mixed-method, longitudinal, and outcome-oriented studies are needed to establish a stronger evidence base for improving the preparation of future special education teachers.

6. RECOMMENDATIONS

Based on the findings and the methodological limitations of the existing evidence base, future research should prioritize stronger outcome evaluation, mixed-method and longitudinal designs, university‑school collaboration, digital teaching competence, assessment and classroom management, and competency-specific teaching-method research.

First, more empirical studies should evaluate the outcomes associated with different teaching methods. Future studies should use pre-test/post-test designs, comparison groups where feasible, validated competency measures, and follow-up assessments. The purpose should be to estimate changes associated with an intervention rather than simply report that a method was used. Studies should also report implementation conditions so that differences in instructor expertise, course duration, student characteristics, and field exposure can be considered when interpreting results.

Second, mixed-method research should be expanded. Quantitative measures can estimate changes in professional competence, learning engagement, teaching performance, or self-efficacy, while interviews, classroom observations, lesson artifacts, and reflection records can explain implementation and participant experience. An explicit integration of the two strands would provide stronger evidence about both outcomes and mechanisms.

Third, longitudinal research is needed. Most teacher-education studies appear to focus on short-term course or semester outcomes. Following pre-service teachers from university coursework through practicum and into the early career stage could clarify whether competencies developed during teacher education are maintained and transferred to authentic teaching contexts. Longitudinal designs should specify multiple measurement points and use consistent outcome indicators.

Fourth, university‑school collaboration should become a more explicit component of research design. Special education schools can contribute to curriculum development, case construction, practicum supervision, mentoring, observation, and outcome assessment rather than serving only as placement sites. Collaborative designs may improve the ecological validity of teacher-education research and make it easier to examine the transfer of university learning to classroom practice.

Fifth, digital teaching competence deserves greater attention. Research should examine not only the adoption of online platforms, flipped classrooms, or AI tools, but also whether pre-service teachers can select, adapt, and evaluate digital resources according to individual learner needs, accessibility requirements, and instructional goals. This direction is particularly relevant given the emerging literature on digital competence and AI-supported education [22, 33].

Sixth, assessment and classroom management should be developed as explicit competency domains in teacher education research. Future studies could evaluate assessment design, progress monitoring, individualized education

planning, behavior-support strategies, classroom organization, and teachers' ability to make instructional decisions from assessment evidence. Objective performance measures and structured observation protocols would strengthen this evidence base.

Finally, future research should examine competency-method fit rather than search for a universally superior teaching method. The present descriptive pattern suggests that reflective teaching is often studied alongside professional identity and instructional competence, field-based learning alongside practical competence, microteaching alongside instructional and classroom-management skills, and blended/flipped learning alongside digital competence and curriculum reform. These are hypotheses generated by the literature distribution, not causal conclusions. Experimental, quasi-experimental, or carefully designed comparative studies are needed to determine which method is most appropriate for which competency and under what conditions.

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This research received no external funding.

CONFLICTS OF INTEREST

The author declares no conflict of interest.

ETHICS STATEMENT

This study analyzed previously published journal articles and did not involve human participants or animal subjects; ethical approval was therefore not required.

DATA AVAILABILITY STATEMENT

The list of the 186 included articles and the coding dataset supporting the findings of this study are available from the author on reasonable request.

AUTHOR CONTRIBUTIONS

The author was solely responsible for the study design, literature search, screening, coding, analysis, and preparation of the manuscript.

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