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Academic Literacy among Primary and Secondary School Teachers Guided by the Educator Spirit: Conceptualization, Assessment, and Development Pathways

Yao Wu^{1,*}
¹ Faculty of Education, Guangxi Normal University, Guilin, China

* Correspondence: Yao Wu, Faculty of Education, Guangxi Normal University, Guilin, China

Abstract: Guided by the educator spirit, this study examines the conceptual dimensions, current status, and development pathways of academic literacy among primary and secondary school teachers. Drawing on a literature review, a four-dimensional framework was developed, encompassing academic beliefs, academic thinking, academic competence, and academic ethos. A questionnaire survey was subsequently conducted among 242 primary and secondary school teachers. The results indicate that teachers' overall academic literacy was at a moderately high level, with significant group differences associated with gender, professional title, and educational attainment. Path analysis identified school support, collaborative networks, and technology acceptance as key influencing factors, while configurational analysis revealed three distinct pathways leading to high levels of academic literacy. Based on these findings, this study proposes strengthening the conceptual foundations of academic literacy through the educator spirit, optimizing collaborative networks, establishing intelligent support systems, and improving evaluation mechanisms.

Keywords: educator spirit; primary and secondary school teachers; academic literacy

1. Introduction

In September 2023, the concept of the "educator spirit" with distinct Chinese characteristics was introduced in a letter to representatives of outstanding teachers nationwide, together with an exposition of its core connotations. In January 2025, the Outline for Building China into a Leading Country in Education called for "integrating the educator spirit throughout the entire process of teacher education and professional training." Integrating the educator spirit throughout educational and instructional practice is both an essential requirement for cultivating a new generation capable of shouldering the responsibilities of the times and an intrinsic imperative for building a leading country in education. As the foundation of the national education system, basic education currently faces multiple challenges, including insufficient technology-enabled pedagogical innovation, a persistent disconnect between educational theory and practice, and inadequate intrinsic motivation for teachers' professional development. There is therefore an urgent need to strengthen teachers' professional competence, deepen their professional understanding through educational research, and promote their sustained professional growth [1].

Educational research literacy among primary and secondary school teachers refers to the capacity to conduct empirical inquiry under the guidance of educational theory and with the aim of addressing practical problems. Its central objective is to develop "research-oriented teachers." However, such literacy is often confined to application-oriented inquiry within the field of education and is therefore insufficient to support the transition from research-oriented teachers to expert teachers. Expert teachers should move beyond an applied paradigm whose sole purpose is to improve their own teaching. They should

Received: 09 June 2026

Revised: 15 July 2026

Accepted: 25 July 2026

Published: 29 July 2026



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possess the intellectual foundations and sense of responsibility required for academic inquiry, integrate the multiple roles of teacher, scholar, and intellectual, and contribute to the development of an educational community with a strong sense of mission and responsibility [2]. This requires teachers to possess profound academic literacy, which encompasses not only the empirical competence associated with educational research literacy but also systematic academic thinking, critical theoretical reflection, and the capacity for original research. These qualities enable teachers to develop macro-level insights into educational phenomena and construct theory from multidisciplinary perspectives. Academic literacy thus extends beyond educational research literacy, which primarily focuses on solving immediate practical problems. It is oriented toward a deeper understanding of the nature of education and the creation of new knowledge, making it essential to the development of expert teachers.

Early studies of the components of academic literacy focused primarily on research literacy. Research literacy has been conceptualized as an integrated construct comprising awareness, theoretical knowledge, skills, experience, and affective experience. Other frameworks propose four components: research conceptions, research theory, research competence, and research ethics [3]. From a competency-based perspective, a seven-dimensional competency structure has been developed. Through empirical research, a four-dimensional model encompassing research conceptions, problem awareness, research competence, and research spirit has been constructed. Most of these frameworks therefore encompass cognitive, competence-related, affective-attitudinal, and ethical dimensions, evolving from relatively simple structures toward increasingly complex and differentiated models. Research on scholarly teachers has further enriched the conceptualization of academic literacy. It has been argued that the core qualities of scholarly teachers include educational wisdom, independent thinking, educational knowledge and competence, and professionalism, with independent thought and a reflective and critical disposition constituting the essence of academic literacy. Academic literacy represents the integration of the three roles of teacher, scholar, and intellectual. A qualitative study further indicated that, in practice, academic literacy is manifested in a conscious commitment to one's professional role, transformative and innovative educational and pedagogical beliefs, and the integration of knowledge and action in professional development. These studies suggest that the conceptualization of academic literacy has deepened from an emphasis on research competence to a broader academic orientation. It encompasses not only empirical competence but also academic thinking, interdisciplinary integration, and a commitment to social responsibility.

Nevertheless, several limitations remain in the existing literature. Most scales developed for primary and secondary school teachers focus primarily on competence and attitudes, with insufficient attention to comprehensive components such as academic thinking and professional identity. Some studies incorporating non-competence-related components do not examine the current conditions of primary and secondary school teachers. Moreover, previous research has tended to focus on validating dimensional structures, with limited systematic investigation of the factors influencing academic literacy [1, 4]. Accordingly, this study addresses the following research questions: (1) What is the current status of academic literacy among primary and secondary school teachers? (2) What factors influence their academic literacy, and what are the configurational effects of these factors? (3) How can the academic literacy of primary and secondary school teachers be effectively developed?

2. Research Design

2.1. A Framework for Primary and Secondary School Teachers' Academic Literacy

Academic literacy is grounded in educational research literacy and advances through the systematic development of academic thinking and original research capacity. Drawing on prior scholarship concerning teachers' research literacy, the attributes of scholarly educators, and the core elements of the educator ethos—and aligning with evolving

priorities in basic education—this study emphasizes the comprehensive, critical, and innovative dimensions of academic literacy, culminating in a four-dimensional structural model [5, 6].

Academic beliefs constitute a foundational dimension for enhancing teachers' academic literacy [6, 7]. Academic inquiry undertaken by primary and secondary school teachers often demands significant time and effort while producing modest immediate outcomes; thus, teachers' perception of its value and identification with scholarly practice strongly influence their engagement level. Academic beliefs nurture affective commitment and sustained motivation toward scholarly work, whereas academic thinking enables educators to move beyond experiential constraints and generate contextually grounded professional insight, serving as a central cognitive bridge between theoretical understanding and practical innovation. Academic competence provides the methodological foundation for conducting rigorous inquiry, encompassing proficiency in selecting appropriate research approaches, collecting and analyzing evidence systematically, and communicating findings with clarity and precision. Academic spirit furnishes intrinsic motivation and long-term dedication, supporting the evolution from technical skill mastery to a principled, values-driven scholarly identity. This dimension also serves as a distinguishing marker between competent practitioners and educator-level professionals. The specific dimensional structure is presented in Table 1.

Table 1. Framework of Academic Literacy

Primary dimension	Secondary dimension	Description
Academic beliefs	Perceived value of academic inquiry	Recognition of the value of academic inquiry in addressing educational problems and promoting professional development.
	Perceived academic responsibilities	Identification with the responsibilities associated with the multiple roles of teacher, researcher, and scholar.
Academic thinking	Problem awareness	The ability to proactively identify complex problems in educational and instructional practice.
	Innovative thinking	The ability to question and critically examine conventional educational practices, policies, or theories on the basis of scientific evidence.
	Critical thinking	The ability to conduct educational research creatively by proposing alternative approaches and adopting interdisciplinary perspectives.
	Reflective awareness	The ability to systematically evaluate and iteratively improve one's own educational research.
Academic competence	Literature review	The ability to systematically synthesize and critically analyze relevant literature.
	Research design	The ability to select appropriate research methods and develop a research plan according to the research topic.
	Application of research methods	The ability to apply research methods appropriately and rigorously when collecting and analyzing data.

	Synthesis and articulation of research findings	The ability to distill research findings and communicate them in accordance with academic conventions.
Academic spirit	Academic ethics	A conscientious commitment to complying with established norms of research integrity.
	Commitment to academic advancement	The ability to continuously update one's educational knowledge through learning and remain abreast of developments at the forefront of the field.

2.2. Questionnaire Design

Based on the conceptual framework and established measurement approaches, an initial 53-item scale was developed to assess teachers' academic literacy. A pilot study yielded 125 valid responses. After conducting reliability and validity analyses—including exploratory and confirmatory factor analyses—items failing to meet psychometric criteria were eliminated, resulting in a refined 31-item scale organized across four dimensions.

The factors influencing academic literacy were grouped into individual and contextual domains. Contextual factors included academic climate, institutional support, collaborative professional networks, and incentive mechanisms; individual factors encompassed research-related psychological barriers and openness to educational technology. Research-related psychological barriers have been observed to influence scholarly engagement in complex ways. As digital transformation advances across education, artificial intelligence offers practical tools for literature synthesis, tracking emerging scholarly trends, and refining research methodology—potentially easing the challenge of balancing teaching responsibilities with scholarly development. Furthermore, academic literacy growth depends not only on resource availability but also on intangible enablers: a supportive academic environment, structured knowledge-sharing within professional communities, and meaningful peer interaction [8, 9]. Understanding how these elements interact may help foster more sustained and proactive teacher engagement in educational inquiry.

The questionnaire comprised three sections: the first collected demographic information—including gender, years of teaching experience, and highest academic degree; the second administered the academic literacy assessment scale; and the third measured influencing factors. Both assessment and influence sections employed a five-point Likert scale, ranging from 1 (strongly inconsistent with my situation) to 5 (strongly consistent with my situation). Participants were frontline primary and secondary school teachers recruited randomly across regions via the Wenjuanxing online survey platform [10]. A total of 253 responses were collected; after excluding incomplete or inconsistent submissions, 242 valid questionnaires remained, representing a 95% effective response rate.

2.3. Reliability and Validity Testing

The reliability analysis showed that Cronbach's α coefficients for the overall academic literacy scale and its four dimensions were 0.976, 0.882, 0.923, 0.967, and 0.930, respectively. The overall Cronbach's α coefficient for the influencing-factor scale was 0.898. All coefficients exceeded 0.80, indicating good internal consistency. Regarding validity, the Kaiser–Meyer–Olkin value for the overall scale was 0.951, and Bartlett's test of sphericity was statistically significant ($p < 0.001$). Principal component analysis extracted four factors, accounting for 69.2% of the total variance [11]. Factor loadings across the dimensions ranged from 0.476 to 0.818, all meeting acceptable criteria. Confirmatory factor analysis further showed that the standardized factor loadings for all dimensions exceeded 0.60, with $\chi^2/df < 3$ and RMSEA < 0.10 ; the NFI, IFI, and CFI values all exceeded 0.80. In addition, the composite reliability values for all dimensions were greater than 0.70,

and the average variance extracted values exceeded 0.50. These results indicate a good model fit and satisfactory convergent validity.

3. Results

3.1. Descriptive Analysis

Descriptive statistics indicated that the overall academic literacy of primary and secondary school teachers was moderately high ($M = 3.774$, $SD = 0.624$). Among the four dimensions, academic beliefs received the highest mean score ($M = 4.15$), whereas academic competence received the lowest ($M = 3.594$). Within academic competence, the subdimension of synthesizing and articulating research findings had the lowest mean score and the greatest variability ($M = 3.47$, $SD = 0.839$).

Significant gender differences were observed in academic thinking and academic competence, with male teachers scoring higher than female teachers [12]. Professional title also showed significant variation across all components of academic thinking: teachers holding intermediate titles scored lower than those with senior titles or those whose titles had not yet been formally classified. Educational attainment exerted a significant positive effect only on academic competence, with no statistically significant association observed for academic beliefs or academic thinking.

3.2. Factors Influencing Academic Literacy among Primary and Secondary School Teachers

Path analysis was conducted to examine the relationships among incentive policies, collaborative networks, school support, technology acceptance, academic climate, and academic literacy, as shown in Table 2. Incentive policies had a significant positive effect on collaborative networks ($p < 0.001$), indicating that their implementation can effectively facilitate the formation and development of such networks [13, 14]. Incentive policies also exerted a significant positive effect on school support, suggesting that policy support can be translated into institutional safeguards and resource provision at the school level.

Table 2. Path Coefficients

Path	Unst d.	Std.	S.E.	C.R.	p
School support → Technology acceptance	0.281	0.378	0.044	6.332	<0.001***
Collaborative networks → Academic climate	0.544	0.588	0.063	8.679	<0.001***
School support → Academic climate	0.170	0.207	0.055	3.062	0.002***
Incentive policies → School support	0.266	0.234	0.068	3.900	<0.001***
Collaborative networks → School support	0.688	0.608	0.068	10.139	<0.001***
Incentive policies → Collaborative networks	0.771	0.766	0.042	18.526	<0.001***
School support → Academic literacy	0.161	0.259	0.041	3.896	<0.001***
Technology acceptance → Academic literacy	0.344	0.412	0.043	8.083	<0.001***
Academic climate → Academic literacy	0.148	0.196	0.048	3.082	0.002***

Note: ***, **, and * represent significance levels of 1%, 5%, and 10%, respectively.

Collaborative networks not only strongly promoted school support but also had a significant positive effect on the development of an academic climate, highlighting their important role in resource integration and the creation of a supportive academic environment. School support had a significant positive effect on technology acceptance, indicating that institutional and resource support provided by schools can effectively promote teachers' acceptance and use of technology [15]. In addition, school support

directly enhanced both the academic climate and academic literacy, demonstrating that it is an important antecedent of teachers' academic literacy.

Technology acceptance showed a relatively large effect on academic literacy, underscoring its critical role in enhancing teachers' academic development [16, 17]. Academic climate also had a significant positive effect on academic literacy, confirming the importance of a supportive academic environment for individual academic growth.

3.3. Configurational Analysis of Academic Literacy among Primary and Secondary School Teachers

3.3.1. Necessity Analysis

Fuzzy-set qualitative comparative analysis (fsQCA) was conducted. The data were calibrated using the direct calibration method, with the 95th, 50th, and 5th percentiles specified as the three anchors, followed by a necessity analysis of each individual condition. A condition is generally considered necessary when its consistency exceeds 0.90 and its coverage exceeds 0.60. The results showed that only school support, policy incentives, and the absence of collaborative networks had consistency values above 0.80 and coverage values above 0.60. However, further examination of the scatterplots revealed that the cases were evenly distributed on both sides of the diagonal, indicating that none of these three conditions constituted a necessary condition for high academic literacy. Configurational analysis was therefore conducted subsequently.

3.3.2. Configurational Analysis

Configurational analysis was conducted to identify combinations of antecedent conditions associated with the outcome. The consistency threshold was established at 0.80, and the frequency threshold was set at 3. The results are presented in Table 6. Three configurations were identified as pathways to high academic literacy, with an overall solution consistency of 0.984 and an overall solution coverage of 0.826. In Configuration 1, the presence of school support and academic climate constituted the core conditions, while the presence of policy incentives and the absence of technology acceptance functioned as peripheral conditions. Configuration 2 shared the same core conditions, with the presence of academic stress and policy incentives serving as peripheral conditions. In Configuration 3, the presence of technology acceptance, collaborative networks, and academic climate constituted the core conditions, while the presence of policy incentives served as a peripheral condition [3, 7].

Table 6. Configurational Pathways to Academic Literacy (N = 242)

Causal condition	High academic literacy			Absence of high academic literacy			
	P1	P2	P3	P1a	P1b	P2a	P2b
Technology acceptance	⊗		●	⊗	⊗		●
Academic anxiety		●			●	⊗	
School support	●	●				⊗	⊗
Incentive policies	●	●	●	⊗		⊗	
Collaborative networks			●	⊗	⊗	⊗	⊗
Academic climate	●	●	●	⊗	⊗		⊗
Consistency	0.976	0.988	0.997	0.996	0.991	0.998	0.983
Raw coverage	0.467	0.592	0.641	0.647	0.505	0.598	0.399
Unique coverage	0.032	0.049	0.158	0.045	0.020	0.032	0.103

Overall solution consistency	0.984	0.985
Overall solution coverage	0.826	0.807

Note: ● indicates the presence of a core condition; ⊗ indicates the absence of a core condition; ● indicates the presence of a peripheral condition; ⊗ indicates the absence of a peripheral condition; blank cells indicate that the condition may be either present or absent.

4. Discussion and Recommendations

4.1. Discussion

4.1.1. Current Status of Academic Literacy among Primary and Secondary School Teachers

The sampled teachers demonstrated a moderately high overall level of academic literacy; however, the internal structure was imbalanced, characterized by strong academic beliefs but relatively weak academic competence. Academic beliefs received the highest score, whereas academic competence received the lowest score and exhibited considerable variation. In particular, teachers showed pronounced weakness in synthesizing and articulating research findings. Although teachers express willingness to engage in research, their ability to systematically synthesize and communicate research outcomes remains limited due to insufficient research training, limited opportunities for research practice, and inadequate support systems.

Group differences showed that male teachers outperformed female teachers in academic thinking and competence, which may be associated with disparities in access to research opportunities and socially prescribed role expectations. Teachers with intermediate professional titles demonstrated lower levels of academic thinking, suggesting a possible career plateau. Educational attainment had a significant effect only on academic competence, indicating that trainable competencies and deeply internalized dispositions may develop through different mechanisms.

4.1.2. Factors Influencing Academic Literacy among Primary and Secondary School Teachers

The path analysis identified school support as a central mediating factor. External policies were translated into substantive school-level support by stimulating the development of collaborative networks. School support not only directly enhanced academic literacy but also exerted indirect effects through technology acceptance and academic climate. Technology acceptance has become deeply embedded throughout the research process and constitutes a key element in the development of academic literacy in the digital era. Academic climate, jointly shaped by collaborative networks and school support, also made an independent contribution to academic literacy. These findings indicate that initiatives targeting a single factor are likely to have limited effects and that coordinated action across multiple factors is required.

4.1.3. Findings from the Configurational Analysis of Academic Literacy

The configurational results identified three pathways to high academic literacy. The first, an institutional environment-driven configuration corresponding to Configuration 1, was characterized by school support and academic climate as core conditions. Even in the absence of technology acceptance, a robust institutional environment could effectively support the development of academic literacy, while incentive policies further reinforced this pathway. Material and non-material incentives have been shown to increase teacher engagement in professional development.

The second, a pressure-transformation configuration corresponding to Configuration 2, incorporated academic challenge into the same supportive institutional environment. This finding suggests that academic challenge can be channeled into intrinsic motivation

within a positive academic environment, although such channeling depends on a well-developed institutional support system.

The third, a technology–collaboration configuration corresponding to Configuration 3, was characterized by technology acceptance, collaborative networks, and academic climate as core conditions. This pathway operated independently of direct school support, demonstrating the substitutive and compensatory effects of technology-enabled practices and collaborative networks. Technological tools can improve the efficiency of collaboration, offering a feasible pathway for schools with relatively limited institutional resources but adequate technological and collaborative foundations.

4.2. Recommendations

First, the educator spirit should be translated from an abstract ideal into concrete approaches to instructional research and professional dispositions through case-based and context-sensitive seminars and narrative inquiry. Immersive professional cultures should be cultivated through platforms such as expert-teacher workshops and academic salons, thereby establishing a virtuous cycle in which educational ideals guide practice and practice, in turn, reinforces those ideals.

Second, conventional teaching and research groups should be transformed into academic communities that conduct collaborative research projects centered on authentic educational problems. Partnerships with universities, research institutes, and interschool alliances should be expanded to introduce cutting-edge academic resources. Schools should also cultivate internal academic leaders and stimulate organizational initiative through professional studios and regular academic forums.

Third, differentiated technological support should be provided for teachers with varying levels of digital competence, and intelligent technologies should be more deeply integrated with research methods. For example, learning analytics and collaborative platforms can be used to broaden teachers' research perspectives. School-based and regionally shared databases should also be established to create an integrated online–offline academic ecosystem. Fourth, a diversified evaluation system should be established to recognize representative scholarly works, teaching cases, research project reports, and other forms of academic output, with particular emphasis on the practical contribution of research to instructional improvement and student development. Dedicated professional development funds should be established, and academic contributions should be linked to professional title evaluation and the conferral of honors to strengthen incentive signals. Platforms for the sharing and application of research findings should also be developed, together with a supporting academic recognition system, to enhance teachers' identification with their academic roles.

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